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EFFICIENT RADIO SETS

HOW TO MAKE
AND OPERATE
RECEIVING SETS.



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FROM THE LARGE CITIES,
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No. 9105. FIELD GLASSES. Price Postpaid... **\$1.00**

Temple Field Glasses



You See All of The Action

SIX POWER

Keep up with the action! Follow every move without the jerky irregular motion of ordinary glasses. A front row seat to any game, fight or sport. Sit back in your seat and enjoy every moment. Captains of boats use them, aviators use them, sport broadcasters use them, and YOU can, too at this new low price. We have never seen these sold for less than \$5.00 before, yet you get the same high quality 6 power lens with screw type adjustment. Fit snugly and stay put. Slip them on when you begin and take them off when you've finished—no thing more to think or worry about. Postpaid.

No. 6732. Temple Field Glasses. Price... **\$1.00**

Astronomical & Terrestrial TELESCOPE

Over 10 Power
5 Drawer
\$2.50



Fig. 3
Power, 5 10 power telescope. Ideal for solar observations, long distance, nature study, star gazing. Examine the Milky Way and many of the brilliant stars. Look at sun spots, examine the flames which shoot off the sun over 250,000 miles! Study the craters and valleys of the moon, red seas, etc., etc. Finely ground and finished top. Nickel-plated draw tubes, length 26 1/2".

No. 6725. Astronomical Telescope, 10 Power	\$2 50
No. 6726. 14 Power, 3 1/2" Telescope	\$3 50
No. 6727. 20 Power Achromatic, 3 1/2"	\$4 50

Marine Spy Glass A beautifully finished solar and terrestrial telescope. One drawer with brass tube body, black crystalline finish. 16 inches in length. 26 power. Postpaid.

No. 6728. Marine Spy Glass. Price **\$2.00**

FIELD GLASSES 25c

SIX POWER

WOW! What a bargain! Real, genuine Field Glasses with six power magnification. Center piece, quick, one-finger focusing. Permits full, unhampered, two-eyed vision that gives you remarkable scope and clarity. Swell for nature study, sports, outdoor work and a thousand other things. Each set is complete with cord and packed in box, black leatherette finish. Postpaid.

No. 6730. 6 Power Field Glasses. Price... **25c**



POCKET TELESCOPE

Eagle Eye Vision
See Sun Spots
Six Power

25c



Fig. 3
drawer, 6 power telescope for only 25c! Swell for outdoors, nature study, sports, looking at the moon. Converted into a **SOLAR TELESCOPE** by using smoked glass so you can see sun spots, etc. 5 in. long.

No. 6731. POCKET TELESCOPE. Price... **25c**

Fountain Pen Telescope



Few telescopes can claim the mechanical perfection and convenience that are incorporated in this **Fountain Pen Telescope**. Slips into the pocket, and appears to be an ordinary fountain pen. Yet the cover may be instantly removed and you have a powerful, five lens telescope. Made of hard rubber. With cover and nickel clip. 6 1/2 inches in length. Postpaid.

No. 6729. Fountain Pen Telescope. **\$1.00**

THINGS FAR AWAY SEEM VERY NEAR

Always A Front Seat

JOHNSON SMITH & CO., DETROIT, MICHIGAN

HOW TO BUILD
EFFICIENT RADIO SETS

by F.S.Winger.

Before beginning the details of construction, I wish you to clearly understand that from a purely scientific standpoint it is not a whit more marvelous to "listen in" on a radio set, than it is to be able to see thru a pane of glass.

The fact that glass is transparent seems to have satisfied us ever since we flattened our stubby little baby noses against the window pane. If we have been reasonably thoughtful during later boyhood or adult life, the term "transparent" should require further explanation, as in order to affect the sense of sight, these ether or light vibrations have to get through this solid pane of glass.

Electro-magnetic waves of radio frequency, and light waves, are both of the same nature—that is, they are both vibrations of the ether, the chief difference being in their wave lengths and frequency. Radio wave lengths are many thousands of times longer than those of light, but they both travel at the rate of 186,000 a second.

You will naturally say,—"then why does every one you meet marvel at radio waves if they are so much like light waves?" Well it is simply this,—nature has provided us all with the sense of sight with which sense we can interpret directly and without the necessity of any mechanism, while with electro-magnetic

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waves of radio frequency we have no sense by which we can detect them, so we have to build a radio set in order to take note of their very existence.

At the present time the most convenient sense to use is that of hearing. In the near future other senses will be made to respond when the proper instrumentalities will have been devised.

Without going into details at this time, I will merely state that electro-magnetic waves of radio frequency must be changed from their alternating nature to pulsating direct currents of audio frequency, in order to be heard in the phones, and this involves the use of a detector which is merely a form of rectifier.

Radio frequency is a term applied to those ether vibrations or frequencies which are more than 10,000 per second: frequencies slower than 10,000 to as low as 16, come within the range of hearing. To illustrate this:-

In the mountains of Switzerland at high altitudes, where absolute silence generally prevails, there is a species of cricket whose chirp or note is pitched so high as to be extremely annoying to some of the tourists who annually visit there, while others are absolutely incredulous that the crickets are making any sound at all: in other words some can hear it while others cannot, for the range of hearing varies greatly with different people.

The higher limit of vibrations as I have already stated is 10,000 per second, hence 10,000 and slower to as low as 16 per second are audible:-i.e., audio frequent.

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SET I

This is a crystal set (mineral detector) capable of hearing the broadcasting stations within a radius of 25 to 50 miles on from 200 to 600 meter wave length.

DETAILS OF CONSTRUCTION OF THE INDUCTANCE

FIG. I

With a pair of dividers and a straight edge, mark out Fig. I on a heavy piece of card board about $1/16$ " in thickness. After you have done this, cut out the $4 \frac{3}{8}$ " disc with a pair of scissors, and then the slots also.

Using the one so made as a pattern, mark out another one, and when done give them both a heavy coat of shellac and allow to dry before doing anything else with them. The coating of shellac will help to stiffen the form on which you will do your spiral winding and will also prevent them from absorbing moisture.

When thoroughly dry, make two little holes at A.B. which may be adjacent to any one of the eleven sections which you may happen to select.

Thread your insulated wire (size 24 B&S Double Cotton Covered wire) down through hole B and then up through hole A. You now have your starting end securely fastened. (Leave about 8" sticking out of A for connection).

Now proceed with the weaving of your spiral as follows:- After unreeling enough wire from the spool to allow you freedom of movement, hold the disc with your left hand braced against the body, and pass the wire down through the slot C.

You will notice that this causes the wire to run back of the flange D.

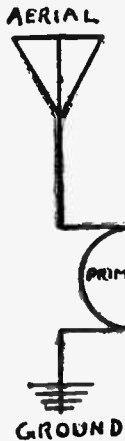


FIG. NO. 2
THE HOOKUP.

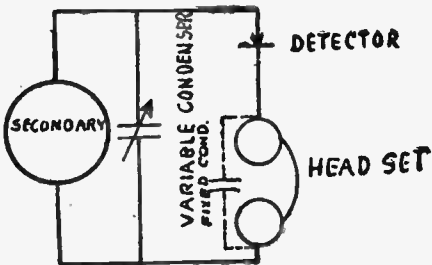
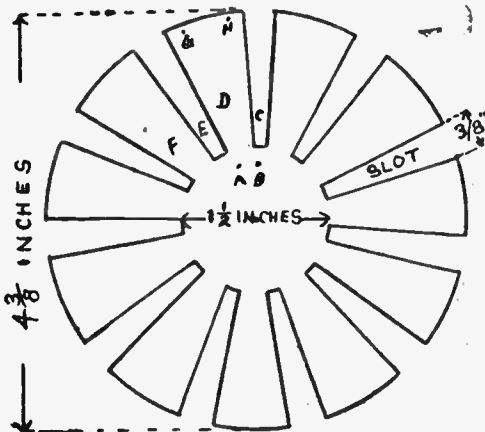


FIG. NO. 1



THE INDUCTANCE.
MAKE TWO OF THEM; ONE
IS THE PRIMARY, AND
THE MOVABLE ONE IS
THE SECONDARY.

CUT IS ONE HALF
ACTUAL SIZE.

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Now bring the wire up through the slot E, and then across flange F, and so on.

When you will have made one complete turn in weaving in and out, you will notice that when you come around to flange D again, that the wire comes up through slot C, and crosses on top of flange D. This alternation should be preserved throughout the entire winding until you will have wound disc full to within about $1/8$ " of the outer edge. This outside or last turn should be fastened at its end at holes G and H in a manner similar to the start at A and B. Leave at least 8" of spare end sticking out of hole G for connections which are to be made later.

When completely wound, you should have approximately 50 or more turns in your woven spiral.

Now, wind the other disc in exactly the same manner. These two discs will require approximately $1/4$ pounds of your #24 D.C.D. wire.

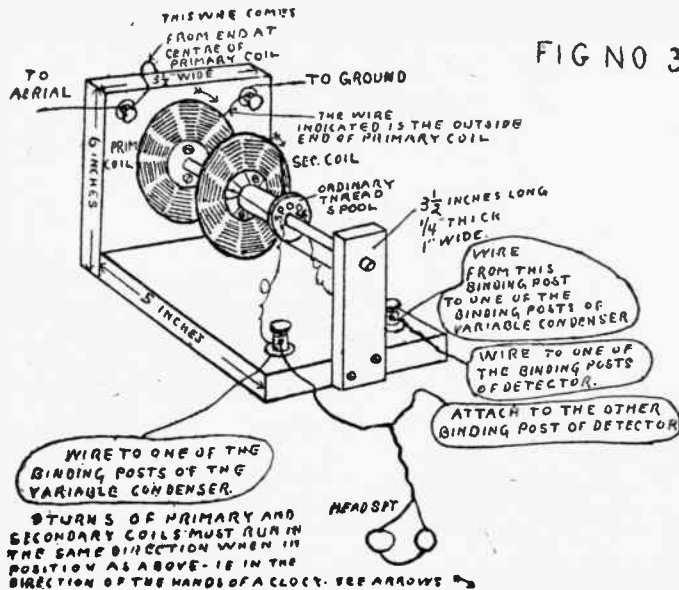
During the winding, care should be taken to keep the wire free from kinks, and also to see that they are evenly spaced on both sides.

It is immaterial which of these two discs or coils you use as a primary, as they are exactly alike, only when placing them in their final positions, you must see that the turns of woven spirals are running in the same direction.

A good pair of phones is a necessity. You should procure phones of at least 1,000 ohms resistance (2,000 total), and do not waste your time with cheap ordinary 75-ohm receivers.

Your galena detector should also be of a design which can be quickly and accurately adjusted. While it is possible for you to make one, you had better pay the nominal

FIG NO 3



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price asked for same by the Radio dealers.

A 23 plate or .0005 microfarad air-spaced variable condenser should also be purchased, as you will find almost unsurmountable difficulties in the making, or even the assembling, of a variable condenser.

The variable condenser is your sole tuning device, and its place in the secondary circuit will be described later (Fig.3) as well as the other instruments just described.

Your aerial should be a single wire about 80 or 100 feet in length, supported between two insulators at either end. The size should be #14 bare copper wire.

Ordinary porcelain cleats will serve very well as aerial insulators.

Any convenient object will serve to support your cleat insulators, but it is advisable that your aerial wire be free from adjacent obstacles and run in a direction as nearly at right angles to any near-by high tension or telephone lines as it is possible to do. The end where you will bring your lead wire down to your receiving set should be slightly lower than the other end: at least it should not be any higher, alightly lower is preferred.

An ordinary 6"-8" or 10" porcelain tube (depending upon the thickness of wall or material through which you have your lead-in wire enter building) will do nicely. In boring the hold into which this porcelain tube is to be inserted, have it slant slightly downward, so rain will not run into it, but rather drain off of it.

If your lead-in wire is unusually long, then have your aerial proportionately shorter as the lead-in wire figures in the wave length.

Your ground connection should be made to a cold water pipe, but if this is not feasible

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a gas or steam pipe will do.

Figure #2 is the hook-up, and need not be referred to, since I have made Figure 3 in perspective, and I think in such a clear manner as to be easily understood.

It is possible that you may get slightly better results if you shunt your phones about a small fixed phone condenser, as shown by dotted lines in Fig. 2 but do this only as a last resort.

In making this design for your reception of broadcasting signals, I have taken into consideration features which will be adaptable to the use of vacuum tubes later on should you care to extend your experimentation to that extent.



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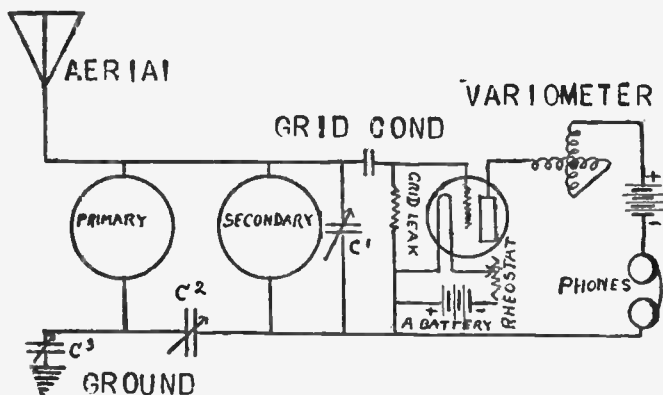
SET 2 FOUR CIRCUIT REGENERATIVE SET

In this set I am going to ask you to use the same Primary and Secondary coils which you have already constructed for Set #1.

In addition to what you have already either constructed or bought, you will require the following:-

- 2 more Variable Condensers .0005 mfd. each.
- 1 Grid Condenser .00025 mfd. capacity.
- 1 Grid Leak-experiment for proper capacity.
- 1 Vacuum Detector Tube.
- 1 Tube Socket.
- 1 Variometer.
- 1 Rheostat- for regulating filament.
- 1 B. Battery — 22½ volts.
- 1 A. Battery (Storage) 6 volts.

SET NO. 2 FOUR CIRCUIT REGENERATIVE SET.



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You will notice from this diagram that the primary and secondary are capacitively instead of inductively coupled. The primary and secondary should, in fact, be separated fully five or six inches, and be in the same plane, so as to be entirely free from any inductive relation.

The signal strength of this set is very good and the tuning remarkably selective.

The two extra variable condensers should have the same capacity as the one described in Set #1: i.e., .0005 mfd. each, though should you have condensers of larger capacities, they can be used to good advantage.

As before stated, if you have constructed Set #1, you already have the primary and secondary coils, only I am going to ask you to take off ten turns and then reverse the position of the secondary coil: i.e., put the spool between the two coils, and then back the Secondary as far away from the primary as the wooden rod upon which it slides, will permit. Further than this would be still better.

Referring more particularly to the hook-up for this Set #2:-

C3-secondary tuning condenser

C2-coupling condenser

C1-antenna tuning condenser

The Grid Condenser you may have to experiment with, as to capacity, but roughly speaking, it should be approximately .00025 mfd. You will also have to experiment a little with the Grid Leak, before you find it entirely satisfactory.

The Variometer in the plate circuit is used to secure both oscillations and regenerations. For sharp tuning, small capacities should be used, and for broad tuning proportionately larger condenser values.

If you have made Set #1 as I am now assum-

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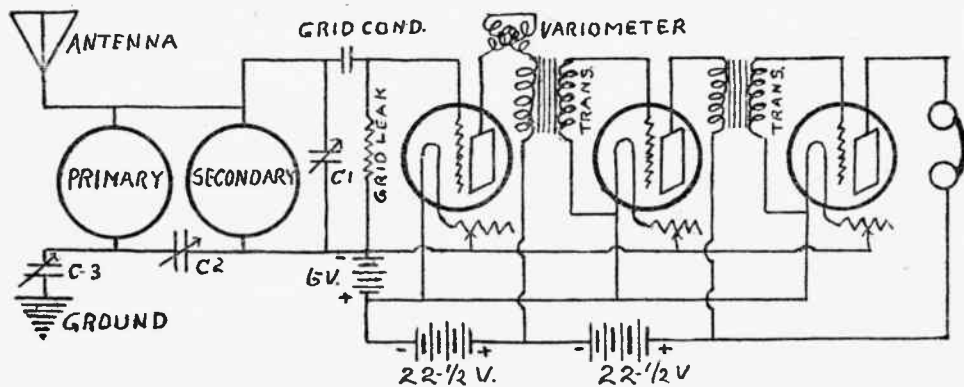
ing you have done, your experience thus acquired, will enable you to connect up the apparatus in Set #2 without the aid of a graphic or perspective drawing.

I am not describing the Variometer, as I think you had better spend a few dollars for one rather than to construct it yourself.

I am not telling you just at present how to arrange Set #2 in a cabinet, but will do so along with description of Set #3, which will be descriptive of two stages of amplification, but will use the same regenerative receiver just described.



SET NO.3- DETECTOR & 2 STAGE AMPLIFIER.



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SET 3

You will notice up to the point where the first Transformer is placed, that all to the left is practically the same as I have shown in Set #2. A few changes in the location of the Batteries are necessary in order to carry Set #2 on through two stages of amplification as shown in Set #3.

Of course you have not constructed Set #2, for I have not as yet furnished you with sufficient details to do so. You are now ready to make a choice between Set #2 and Set #3, and I hope you will decide in favor of #3, for with it your results will be much more satisfactory though of course slightly more expensive.

With the making of the first or experimental set #1, there practically ends your ability to construct portions of the apparatus used, and from now on your efforts should be confined to the proper housing of apparatus which it is really necessary for you to buy. The detail of necessary apparatus and parts is as follows:-

- 1-Primary-you have already constructed--use it.
- 2-Secondary-you have already constructed--use it.
- 3-3 Variable Condensers-43 Plate (.001mfd.) preferred-Panel type.
- 4-1 Grid Condenser.
- 5-1 Grid Leak.
- 6-1 Detector Tube-Cunningham #300 is a good one.
- 7-2 Amplifying Tubes-Cunningham #301 recommended.

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- 8-1 Variometer-Any standard make such as "Chi-Rad", Remler, Amrad, etc.
- 9-2 Audio Frequency Transformers--1 of Ten to One ratio and the other Three to One.
- 10-1 pair high resistance phones. (You now have if you constructed Set #1.)
- 11-3 Filament Rheostats.
- 12-3 Tube Sockets.
- 13-1 Six-Volt Storage Battery (used for lighting filament).
- 14-2-22½ volt "B" Batteries-preferably variable voltage type.
- 15-4-3" Dials--1 each for Condensers C1, C2 and C3-also 1 for Variometer.
- 16-8 Binding posts.
- 17-2-7"x14"x3/16"Formica or Bakelite Panels.
- 18-2 Bottom boards 7"x13"x3/8".
- 19-2 Wood Cabinets 7"x13"x6" inside measurement-make of ½" stock.
- 20-2 Double circuit phone jacks.
- 21-1 Open circuit phone jack.
- 22-Connector wire, Tinned Copper-"Spaghetti" tubing, etc.

This seems like a formidable array of materials and apparatus, but really is not, and can be obtained from any Radio dealer. Your real job is to do the assembling in the two cabinets-one to contain the Primary and Secondary coils together with the three Variable Condensers, and the other cabinet to contain the Detector and the Amplifying Tubes Transformers, Rheostats, etc.

At the extreme left of the cabinet intended for the reception of the capacity coils and condensers, bore two holes in panel about an inch apart one directly over the other. These are to fasten the aerial and ground binding posts--the top one being for the aerial and the other for ground connection.

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The Primary and Secondary coils may be mounted at the extreme ends of this cabinet, their planes being perpendicular to the plane of the panel. In between at equal distances from each other mount your variable condensers. Bore holes through your panel to allow the shafts of your condensers to pass through and then fasten three of your dials to same.

At the extreme right of your panel in the same relative position, provide holes for two binding posts for connecting or bridging to grid and filament binding posts of the cabinet still to be constructed.

The wiring diagram will explain how the connections are to be made on the interior of cabinet. Care should be taken to have connector wires cross each other as little as possible and in all cases have them as far apart as space will permit. This arrangement is left to the individual taste of the designer, and is a detail which I cannot go into in the space allotted here.

The other cabinet or the one to contain the Detector and amplifying units, starts out in the matter of binding posts just as the other cabinet: i.e., two binding posts in the same position. In this panel, the Variometer dial and the three rheostat knobs appear on the exterior, and should be placed equidistant from each other, the Variometer being to the extreme left, and the three tubes and two transformers to fill the balance of the space.

About 2" below each of your rheostat knobs the two circuit jacks should be placed. Directly above, and at proper height, three small holes about 1/4" diameter should be bored. These are for purpose of observing the lighting of your filaments.

The binding posts necessary for plate and battery connections should be at the extreme right of the panel, and their number and use you can work out by studying the diagram.

RADIO SYMBOLS

Varicoupler  Battery - 

Antenna  or  Buzzer 



Condenser(Radio Frequency) 



Condenser(Audio Frequency) 

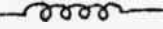
Condenser(Variable)  Tube 

Coupler Inductance 

Coupler Inductance(Variable) 

Detector  Connection 

Ground  No Connection 

Inductance 

Inductance(Iron Core) 

Receivers(Telephone) 

Resistance 

Resistance(variable) 

Transformer(Iron Core) 

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SET 4

A SHORT-WAVE RECEIVER-ADAPTER

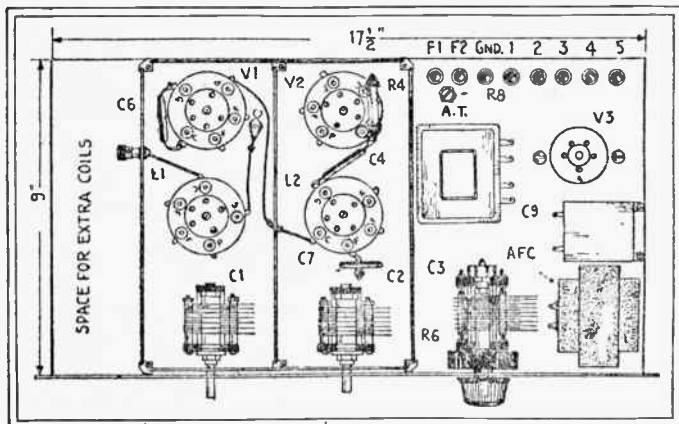
FOR INDEPENDENT USE OR AS A PERMANENT
ADDITION TO A BROADCAST RECEIVER

I am now going to tell you how to build a Short-Wave Receiver-Adapter. Your ordinary Receiver will be all right for the domestic programs, but a new thrill awaits you if you have a ShortWave Receiver. You will be able to tune in on short-wave stations from many different parts of the world. You can listen in direct to London, Paris, Berlin, Buenos Aires, Melbourne and other foreign stations. You can tune in on your local police calls.

The material for this article is taken from a recent issue of "Radio-Craft" and is given by special permission of my friend the editor, Mr. Hugo Gernsback.

Unlike other short-wave adapters, this one becomes an integral part of the broadcast receiver, giving instant choice of short or long waves, by operation of its built-in switch. It may, however, be attached or removed in but a few minutes. Aside from its use as an adapter, it is not, as might be supposed, practically useless. Without changes of any sort, it serves as a complete receiver, using either an elim-

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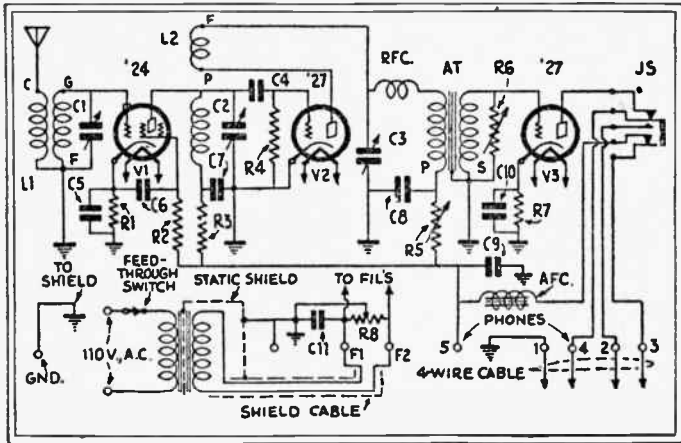
Above, the layout of the tuner of the Short-Wave Adapter-Receiver, as it was built by the author; the filament transformer is placed elsewhere. Attaching the shield covers to the cabinet's lid makes changing coils easier. The unit may be connected to the broadcast set by a plug, as shown, or by a built-in switch.

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inator or "B" batteries for the plate voltage. By getting the "B" potential from the last R. F. stage of the broadcast received (which has a tendency to throw the latter into oscillation) and tuning the broadcast receiver to some broadcast station on the lower portion of the dial, harmonics may be easily picked up down to 10 meters or lower. This method is invaluable in calibrating wavemeters and oscillators.

Because it was designed for use with the dynamic speaker, the tuner is followed by three audio stages, when used with most sets. Although this is unsatisfactory (and entirely unnecessary), with head phones it has been found that it enables the most distant stations to be clearly received on the speaker. And, when the tuner is attached to even a fair receiver, hum and mechanical noises are almost completely wanting. In addition, the use of three stages permits the filtering out of the high-frequency static by use of a suitable tone control; thus providing more enjoyable reception without seriously cutting down on the volume of the signals. A 250,000 - ohm variable resistor and an .006-mf. condenser, shunted in series across the secondary of the set's first audio transformer, make a very satisfactory combination for this purpose.

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The circuit is a standard short-wave detector, preceded by a tuned R.F. screen-grid stage, and followed by an A.F. stage to obviate troubles which might follow its connection directly ahead of the set's A.F. amplifier.

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Although the tuner is shown as used with a modern A. C. broadcast receiver having two audio stages, the constructor must realize that its usefulness is by no means so limited. It may be used with any receiver, by increasing insufficient "B" voltages with one or two "B" batteries, or cutting down anything over 180 volts with a suitable resistor. In districts where A. C. supply is not available, the three filaments may be wired in series, omitting the center-tap resistor, and used in conjunction with a suitable battery. The new tubes available give a wider choice of amplifiers than hitherto available.

CONSTRUCTION OF THE TUNER

The layout diagrammed (see page 22) was chosen because it permits more direct leads; which is of utmost importance in an instrument of this kind. The R.F. and detector stages being side by side, the shortness of the lead between the two eliminates both the need of a shielded wire at this point, and the capacity between the wire and its metal covering. The condensers and resistors not shown are mounted beneath the subpanel, taking great

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care to have them as near their associated coils or tubes as possible.

The separate filament transformer used here is placed several feet away, to lessen any chance of inductive hum and simplify one of the problems of A.C. operation. An individual switch for this transformer allows the tubes to warm up while the broadcast receiver is operating; this may be of any type satisfactory to the constructor. All filament leads and wiring are of shielded cable and grounded.

To facilitate changing coils, the constructor may find it a good plan to mount the lids of the aluminum shields on the underside of the cabinet's lid. The subpanel should be raised enough to assure that the lid rests firmly on the shield; if this is unhandy, the metal lid may be lowered by a thickness of wood.

Because it is difficult to specify definite components which are readily obtainable in any locality, the details of the socket-plug needed are left to the constructor; the only requirement being to separate the plate prong of the detector tube from the plate of its socket, and to bring out a lead from each. For this purpose an old tube base and a socket (UX or UY as needed) may be bolted together, connecting the other prongs to the socket with short lengths of wire.

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OPERATION

To attach the tuner to the broadcast receiver, only a few simple connections are required. The two leads from the socket-plug are soldered to two of the wires of a four-wire cable. The socket-plug is then placed in the detector tube socket of the broadcast set, and the tube is replaced in the socket of the adapter plug. On the end of another of the wires a small loop, which will fit tightly over a tube prong, is made and soldered. This is the tap to the plate of the audio tube. The remaining cable lead goes to the ground of the set; if quick changing is desired, a small test clip may be fastened to this lead.

The cable is then connected to the proper binding posts of the tuner; the antenna is connected; the filament supply is switched on; and the builder sits down to enjoy some of the true marvels of short-wave reception.

If the tuner is placed on top of the broadcast receiver, it may sometimes set up a very objectionable hum, due to interaction with the power transformer of the set. In this case it is necessary to turn the tuner at right angles, or remove it a few feet away.

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For best results with any short-wave receiver, it should be placed as close to the antenna lead-in as possible, for the losses incident to long, straggling leads mount up rather terrifyingly when dealing with the higher frequencies. It is not at all necessary to provide another aerial for this tuner, if the broadcast antenna is of first class construction with as few turns or sharp angles and as far from detracting influences as the location permits. If but one aerial is used, the operator may mount a small S.P.D.T. switch on the back of the tuner's cabinet. The same ground is used, providing it is satisfactory for use on the short waves.

PARTS USED

- C1, C2 - 2 National S. W. condensers, "Type S.E." 125 mmf.;
- C3 - National equicycle condenser, 250 mmf.;
- C4 - Polymet molded fixed condenser, 150 mmf.;
- C5, C6, C7, C10, C11 - Polymet molded fixed condensers, .01 mf.;
- C8 - 1-mf. by-pass condenser;
- C9 - 2-mf. by-pass condenser;
- C12 - X-L Varico-Denser, "Type N";
- R1 - 2000-ohm fixed resistor;
- R2 - 2-meg. grid leak;
- R3 - 500-ohm fixed resistor;

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- R4 - 3-meg. grid leak;
- R5 - Clarostat volume control;
- R6 - Centralab Radiohm, 500,000 ohms;
- R7 - 1800-ohm resistor, preferably variable;
- R8 - Clarostat "Hum-Dinger" hum balancer, 20 ohms;
- AT - Silver-Marshall audio transformer, "Type 225" or "255";
- AFC - Audio filter choke, 80-henry;
- FT - Filament transformer, $2\frac{1}{2}$ volts, 6 amperes;
- JS - Yaxley jack switch, "Type 45";
- RFC - Hammarlund shielded, polarized S. W. choke;
- L1, L2 - 6 Pilot or Silver - Marshall UY coil forms;
- Four Pilot UY sockets; one Eby UY wafer socket;
- One aluminum double can, $8\frac{3}{4}$ x $7\frac{3}{4}$ x $5\frac{3}{4}$ inches;
- 7 x 18-inch metal panel; 9 x $17\frac{1}{2}$ -inch metal subpanel;
- Four-wire cable, hook-up wire, hardware etc.

A very effective resistor, for R3, may be one of the windings from a discarded pair of head phones. If the ends of the coil are carefully soldered, an absolutely silent and permanent resistance will result.

The layout of the front panel is left

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somewhat to the choice of the builder. Two vernier dials may be used for the tuning controls; a more balanced appearance will result, however, if a very small vernier condenser is placed above C1 (in the respective positions of C3 and R6) and plain knobs are used. This construction will also make for quicker tuning, it being difficult to turn a high - ratio vernier with the left hand as quickly as with the right. The jack switch may go beneath the dial of C2.

It has been found best to use a filament transformer which comprises an electro-static shield.

The coils are wound on standard UY coil forms, $1\frac{1}{2}$ inches in diameter, with No.24 D.S.C. wire. The grid winding is at the top in each case, with the tickler $1/8$ inch or the primary $1/2$ -inch below. Beginning at the top of the form, leads are taken off as follows: Grid, "F" (Gnd.); F (to "B" supply) Plate; and, for the primary of L1, "F" (Gnd.), "C" (Ant.).

	TURNS L1	TURNS L2	
METERS	(GRID.) (PRI.)	(GRID.) (TICK.)	
18.5-32	$6\frac{1}{2}$ 5	$4\frac{3}{4}$ $5\frac{1}{2}$	
31.5-52	$9\frac{1}{2}$ 6	$6\frac{3}{4}$ $6\frac{3}{4}$	
50.0-85	$18\frac{1}{2}$ 7	$17\frac{1}{2}$ $8\frac{1}{2}$	

Practical Television

What It Is and What It Does

The Photo-Electric Cell

Before the invention of the telephone, May, a telegraph operator at Valentia, Ireland, discovered a peculiarity of selenium. He discovered that if selenium was heated and allowed to cool slowly so as to crystalize, it would offer great resistance to electricity. However, when a bright beam of light was allowed to fall upon it, the selenium conducted electricity in small currents. May made other experiments and found that the resistance was from two to five times as great in the dark.

Unfortunately one great difficulty arose. Selenium was slow to respond to the impulse of light. The reaction was found to be speeded up considerably when the selenium cell was made in thin films.

Recently a more satisfactory relation between light and electricity has been discovered. This is based upon the fact that electrons, or negative particles of electricity, are expelled from the surface of a metal when a beam of light falls on it. Virtually every metal behaves in this manner, but the effect is most pronounced in potassium and sodium, the soft metals obtained by electrolysis of caustic potash and caustic soda.

For a current of electricity to flow across a photo-electric cell, two electrodes are necessary. The layer of potassium acts as the cathode or negative electrode, and the anode usually is a circular wire grid of nickel. During use the anode is given a high potential by connecting it to the positive terminal of a battery. The flow of electrons is increased by applying a large voltage, but if this is made too great a glow discharge appears in the tube, and the practical limit varies from 120 to 300 volts.

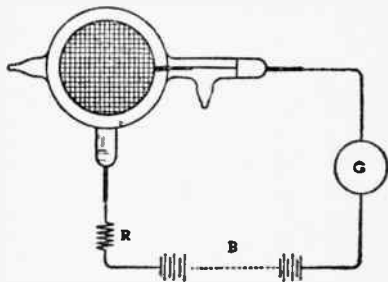
An area of glass is left clear, and it is through this that the light is allowed to act on the potassium, the cell usually being enclosed in a light tight box through which the "window" only is visible. The passage through the "window" of a beam of light causes the electrons to be discharged from the surface of the potassium. As they are negative charges they are attracted to the positive electrode, and thus a stream of electrons passes across the cell—in other words, a current of electricity passes through it and along an outside wire connecting the two electrodes.

The action will be made clear if we compare it with what happens inside an ordinary radio tube. In this the lighted filament throws off electrons, and these are immediately attracted to

the anode, which is connected to the positive of a high tension battery. Thus a current flows along the tube in one direction only, and it is because of this that the tube is used for rectifying and amplifying purposes.

Before we try to understand how the photo-electric cell is used in television let us see how by means of it a single beam of light may be reproduced at a point many miles distant. Suppose we allow the beam to fall upon a photo-electric cell in New York. Through the cell a current will then flow and be amplified by means of radio tubes and transmitted by cable or radio to London or almost any point on earth. In receivers at these points small currents will then flow that vary in sympathy with those passing through the photo-electric cell in New York. They will change as the intensity of the beam of light changes—being strong when an intense beam of light falls on the cell, and becoming proportionally weaker as the intensity of the beam fades.

It only remains to change this varying current back into the light, which may easily be done by means of a special electrical lamp containing neon under low pressure. This glows with a brilliant red light when a current of electricity is forced through it under high voltage. Tubes of this kind have become familiar through their use in illuminated advertising signs.



The currents in the receivers of our light transmitting apparatus are impulses that occur at frequencies of many thousands per second. An ordinary lamp would be useless for recording their passage but the neon glow lamp can be lighted and extinguished at the rate of more than a million times per second and responds almost instantaneously.

As an electric eye a photo-electric cell of this kind is more promising

RADIO AND TELEVISION BOOK

than a selenium cell because it responds to a beam of light almost instantaneously. The electrons shoot out from the metal at speeds that are very close to the speed of light.

Unfortunately the new cell has a serious drawback in that the current which passes through it is very small; that produced by an electric lamp placed only a few inches from the cell is only a few hundred thousands of a milliamperere. In this respect a selenium cell is much better, and some have been constructed that allow a current of an ampere to pass through the circuit containing it.

Summing up, we see that there are two electric eyes that may be used for television and that one of them is very slow while the other gives feeble results. The slowness of the selenium cell prevents its use for this purpose and practically all experimenters now make use of a photo-electric cell along with apparatus for magnifying the current that the cell gives. This may be easily accomplished by means of the ordinary radio tube, and the impulses passed on to a radio transmitter.

Unfortunately this is not all that is required of television, and there are many practical difficulties to be overcome. One of these is that although the electric eye can relay the intensity of a single beam of light, it is unable to take in an entire scene at once.

The electric eye corresponds to one of the microscopic cells of the retina, and in order to imitate the action of the human eye completely we should need millions of photo-electric cells! For each of these cells a wire would be necessary over which the electrical impulse could be transmitted, and at the receiver a corresponding number of amplifiers and neon lamps would be required. Such apparatus no doubt could be constructed, but the cost and labor of building it would be too much, for it has been calculated that, in order to produce a receiving screen for a picture that is not too coarse, no fewer than 90,000 cells would be required.

The Scanning Disc

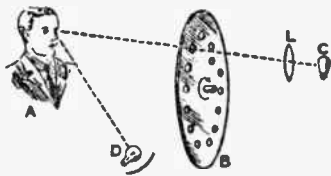
The scanning disc consists of a thin sheet of metal, or some similar substance, around which are drilled a series of holes. Each hole is placed the width of a hole nearer the center of the disc than the preceding hole until one complete set of holes once around the disc is completed. When vertical scanning is used, the radial distance between the first and last holes of the spiral governs the width of the area which can be scanned, which the circumferential distance between successive holes governs the height of the scanned area.

The illustration shows that a beam of

light from the lamp is focused on the edge of the disc so that it can only pass through one of the holes at a time. If the beam is allowed to fall on a white sheet after passing through the hole, only one white spot will be seen. If the disc is rotated slowly the light spot will move slowly in a vertical direction. Just as the spot leaves the screen a second spot will appear at the opposite edge, and, because of the spiral arrangement of the holes in the disc, a little to one side of the path of first spot. As this second spot leaves the screen a third one will appear, and it will continue in the same manner. When one complete revolution of the disc has been made the screen will have been covered by the light spot.

If the screen is rotated faster, the spot travels more quickly and finally it becomes a streak moving slowly from one side to the other. If the disc is revolved still faster the whole screen will be covered before the first dot has vanished due to the persistence of vision. When the disc is revolving very fast the light seems to become dimmer. This is because the impression upon the eye is fading (the impression fades completely in about 1-8th of a second; this is called persistence of vision) and makes the picture seem a little dimmer.

Now we can readily understand that if we substitute for the screen a human face or picture, the light spot will travel over the object. If a photo-electric cell is kept present, at any given



instant the light will fall on some part of the object. If it is dark, the reflection of the light will be poor and the cell will not record the impulse; if it is white, the impulse will be great. And so a series of impulses are transmitted rapidly. The photo-electric cell works so rapidly that the former spot has disappeared by the time the second one appears, which is not the case in the eye. Various shades will reflect differently and the impulses will vary accordingly. At the receiving end, the process is reversed and kept synchronized with the first machine. The picture is reproduced in black and white similar in appearance to a camera picture. Each piece is reproduced just as quickly as the picture is scanned.

The first true complete television set—sending and receiving—for prac-

RADIO AND TELEVISION BOOK

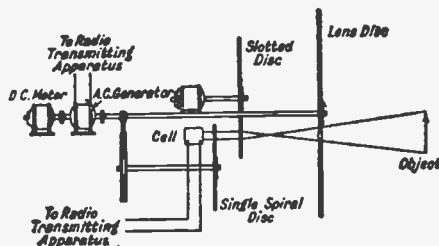
tical operation was an apparatus invented by J. L. Baird, a Scotchman.

The principle employed in this machine has been copied and is used in almost all modern forms of television including the latest cathode ray sets. The object is transmitted and produced in a series of strips close together. This is made possible by the scanning disc as described on earlier pages. The alteration of the intensity of the light rays are focused on a light sensitive cell (similar to the photo-electric cell) causing the current variations or impulses. The variations are transmitted to the receiving apparatus which, in turn, reproduces them in a similar manner.

The apparatus used by Baird consisted of the transmitting end of several discs as shown in the figure. The first was a lens disc with 32 lenses mounted in staggered formation. The second was a slotted disc. The third was a single spiral disc. The cell was located directly behind these discs. All of the discs were revolved by means of the motor at speeds of between 800 and 1000 r.p.m.

The receiving end was very similar to the sending, differing only essentially in that it substituted a neon lamp for the cell. The figure shows clearly the set up for the receiving apparatus. The two discs—both revolved by a motor which is synchronized with the sending motor.

While this apparatus was the first true television set, there have been a few distinctive changes made since that time. The scanning discs are now only made of holes instead of enclosing



a lens, the lens being either in front or behind the disc. The largest improvement is the new cathode ray tube which gives us an exploring device without mechanical limits of any sort. This method will be described later.

During the time that Baird was making his experiments, an American, C. Francis Jenkins, was also developing television. Jenkins' receiver, however, employed prisms and mirrors rather than just magnifying glasses and scanning discs. The light rays were bent to cast their reflections upon some convenient screen. It was not a true television apparatus, however, inasmuch

as it only reproduced "shadow photos" or silhouettes. The design was original and very interesting. The special advantage claimed by Jenkins was the drum scanner (a small cylinder in place of a series of revolving discs) which was much more compact and required less power to operate. The 7 inch drum which gives a picture 2 inches square corresponds to the Baird 48 hole disc, which was 36 inches in diameter. Recently Jenkins has adopted this apparatus to send and receive true television pictures.

The Cathode Ray Tube

The cathode ray tube is one of the latest and most important developments in television. It is becoming more and more practical and promises to replace the familiar revolving disc and motor that has been discussed in previous paragraphs. The cathode ray tube has several notable advantages over the mechanical scanners; one of these is that it eliminates all rotating or other moving mechanical parts.

Although the idea of transmitting pictures in this way is over a quarter of a century old, it was not until the last few years that these ideas have materialized. This is because of the many improvements in the cathode ray tube. Recently Dr. V. K. Zworykin, inventor of one of the variations of the photo-electric cell, who has been spending much time with cathode ray tubes, developed a better tube and improved upon a system employed by Campbell Swinton, one of the originators of the use of the cathode ray tube.

The illustration clearly shows the cross sectional drawing of the tube with the fluorescent screen. The stream of electrons, which are emitted by the Electron Gun part of the tube, constitute the cathode ray, and can be bent or moved in any direction by either an electromagnetic or electrostatic field. The cathode ray can be caused to oscillate or scan at any desired speed, even up to a million times or more per second.

The two fields mentioned above are acting at right angles to each other and can, therefore, control the rays. It must be remembered that cathode rays are highly magnetic and can be deflected easily by any sort of magnetic or electric charge.

The scanning is similar to the scanning of the screen by the disc described above. The cathode rays are guided across the screen in parallel lines until the entire screen is traversed.

The receiving end of a cathode ray system is illustrated here. This shows the general hook-up of the circuit. The sending part of this type of television is very complicated, and is being revised almost daily. The transmission is not as yet perfected to such a large

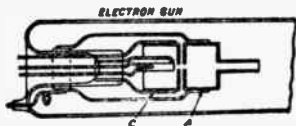
RADIO AND TELEVISION BOOK

degree, but in both America and foreign countries pictures have been successfully transmitted in this manner.

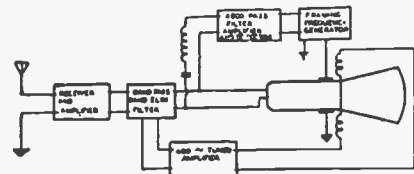
There are several advantages in this system. First, there is no necessity to amplify the incoming signal since it can be applied directly to the cathode stream, provided the signal is not below a certain minimum value. Second, the synchronization of the sender and receiver is much more simple. The only serious drawback is in the expense of the tubes which only last from 200 to 300 hours. There has been difficulty in focusing the rays on the screen, but this is being rapidly overcome by current experimentation.

Color Television

A small change can be made in both receiving and sending apparatus to change it from an ordinary set to a color television set. The exploring or scanning disc is made with a separate set of holes for the three colors red, green and blue. After the operator has the sending apparatus set in motion,



the red, green and blue colors that filter through the scanning disc is synchronized with the first, and the corresponding colors are reproduced in rapid succession so as to appear as a complete color picture. However, in the receiver three lamps are necessary: a neon filled lamp, a helium filled lamp, and a mercury vapor lamp. These give off red, blue and green colors respectively. The proper color effect is obtained, in the receiver, by having a commutator associated with the driving motor. This allows only the neon lamp to be lighted when the red spiral holes are present, the helium filled lamp when the blue spirals are present,



and the mercury vapor lamp when the green spiral holes are present.

Although the three colors are produced in succession, the rapidity of motion is such that these three color images blend into one complete colored picture. The combination of various parts of the three colors will produce many other colors.

The color filters unfortunately absorb a considerable quantity of the light passing through them. This difficulty has been partially overcome by placing a mirror behind them and reflecting additional light. This system cannot be applied to the cathode ray tube type of television and it remains for some person to invent a practical system of colored cathode ray television.

Stereoscope Television

Just as we have two eyes to give our eye-sight depth and size in respect to distances, so have there been similar applications to television. The effect of television as it is today is like a picture in the theater or like having one eye closed. By an application of a similar principle as used in stereoscope photography, we can give depth to television pictures. The scanning disc has two sets of holes, one inside of the other. The impulses are sent along first as seen by the left eye and then as seen by the right eye. The speed of the disc blends the two together in a finished picture so as to give it the proper quality.

Perhaps the latest development in television is the combination of the stereoscopic television and the color television. This is a vast improvement over the original Baird system of television, although the fundamental principles of both the original set and this modern one are identical. It should be stated that Baird was one of the inventors of both of these last two improvements. Many men all over the world are working continuously on more improvements. The most outstanding men in America have been Jenkins and Alexander. Both have spent considerable time in the development of modern television. Each has his own system. Jenkins is working on a system which employs a drum; Alexander is working on the Cathode ray system.

Building a Television Set

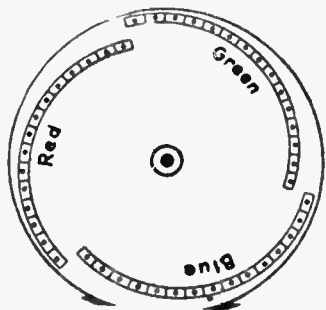
Most people are not so much interested in the sending of the picture as with the receiving of the picture and how it can be brought into their home. The preceding paragraphs have served only as a background for more detailed and experimental work in television. However, it is not the purpose of this chapter to make any specific diagrams or plans for the construction of a receiver since the fast changing details would make such construction useless. Furthermore, different sending stations use different size discs, motors, etc. which make it even more difficult to designate one set that would meet all the requirements. The advancement of the cathode ray tube television set is proving to be a competitor of the scanning disc type and may even replace it in the course of the next few months.

The aim in this chapter is rather to

RADIO AND TELEVISION BOOK

acquaint the reader with a general plan of the scanning disc receiver and its parts to make understandable such plans as may be printed in radio and television magazines.

In the receiving end there is no need



for a photo-electric cell or any lighting system. The most essential parts consist of the neon lamp and the scanning disc. Of course a radio amplifier is necessary to amplify the feeble signals which come in. A lens and synchronous motor makes up the rest of the receiver. The parts are:

1. Scanning disc.
2. Neon lamp.
3. Synchronous motor.
4. Amplifier.
5. Lens.

The cabinet and the framework to mount the materials can be adjusted to

suit individual needs. Please remember that this list of materials is for a television receiver that employs a scanning disc. It must be stated, however, that this type of set is out-of-date. Recent developments have made the sets employing cathode ray tubes very much more convenient. It would be well for you to obtain plans for this type of set if you intend to build one.

The amplifiers differ little from the type used in radio work. A simple three tube amplifier similar to those used in radio (three tube L. F. amplifier) will sometimes serve the purpose. Variations of all sorts from the usual amplifier have been tried with different degrees of success.

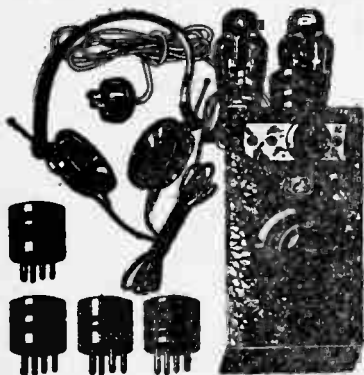
The purpose of the amplifier must always be kept in mind. The currents are amplified at the sending end and sent to the receiving end at a very low frequency. Therefore a low frequency amplifier will be necessary. To light the neon lamp, two or more stages of L.F. amplification is necessary. In building an amplifier for television purposes there are a few things that should be kept in mind. Everything that tends to distort the image or current must be eliminated. The eye can quickly notice the smallest change. There must be no L. F. oscillation. This is generally due to inefficient wiring or weak batteries.

The lens will vary with the type of outfit that you are building and instructions for this piece are usually given with the diagram.

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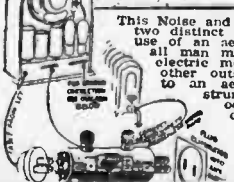
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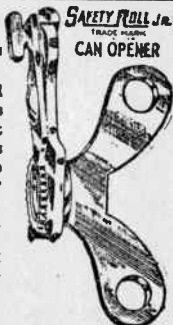
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This is a new and improved type of can opener that puts the old style in the shade. It is simplicity itself to use, works right or left handed, shears the top out of any size and any shape can with standard rim. Works smoothly and simply and with ease, shearing a safety rolled edge. Leaves no jagged edges to cut the fingers or mar the contents. Entire cover comes off in a jiffy, permitting quick, easy removal of the contents. **PRICE 15c POSTPAID.**



Luminous Ghost

IT SHINES AT NIGHT. When displayed in a perfectly dark place, glows with a ghastly cold bluish radiance, enough to give one the "creeps." A real startler for those who come upon it unexpectedly. **PRICE EACH, postpaid.....15c**



THE DYING PIG

The most laughable novelty yet produced. Made of rubber, and you have only to blow it up and stand the pig on his feet, when he begins to squeal as he slowly collapses and finally lies down and dies in the most natural manner. You can blow him up as often as desired, and each time he will go through the same performance to the great amusement and delight of your friends. **PRICE 10c, 3 FOR 25c POSTPAID.**



CIGARETTE MAKER

Roll your own and save money. Better and quicker; costs less than Leaf. Use your favorite brand of tobacco. Neat, useful and handy. Made entirely of metal, nickel plated. **25c. 3 for 85c postpaid.** 160 page catalog of Novelties, Tricks, Puzzles. Free with order.



LOADED CIGARETTES

Just like ordinary cigarettes but such real startlers. Box contains 10 real cigarettes. When about one third smoked, each cigarette goes off with a loud bang. Great fun. Entirely harmless. **25c box postpaid.**

Address all orders for goods described herein to **JOHNSON SMITH & CO., 6615 E. Jefferson Ave., DETROIT, MICH.**

Mechanical Package Magazine No. 3



**A 96 page Magazine in Colors,
together with kit of parts
for building a
MODEL STEAM ENGINE**

No. 3 issue of the Mechanical Package Magazine contains a complete kit of parts for building a miniature steam engine. With these parts anyone possessing rudimentary knowledge of tools plus a little common sense can build himself a workable steam engine—one that will run at the speed of an electric fan on the energy furnished by canned heat or a gas flame. You will thoroughly enjoy putting this together and get a big kick seeing it run after you have finished. In addition there are plans for building a midget seaplane, the first plans ever published for a biplane-seaplane—easy to build, too. Dozens of surprising new how-to-build-its for workshop fans, models, toys, practical experiments. How to build a one man racer from old car parts, how to build your own photo-electric cells for 50c., fun with dry ice, electrifying the lawn mower, chemical experiments, building a static glider flyer, elements of physics, a laminated 3-pole motor, measuring power of small engines, a mechanical album, a spark coil for midget engines, original and instructive articles on shop methods, experimental work and use of tools, etc., all for 25c postpaid.

No. 1993. MECHANICAL PACKAGE MAGAZINE No. 3. Price complete, postpaid.... **25c**

MECHANICAL PACKAGE MAGAZINE NO. 1

**An Interesting Magazine, together with all parts necessary for building a complete
ELECTRIC MOTOR**



This is a most interesting magazine that not only contains 84 pages crammed full of ideas for home, workshop and farm, but there is also included all the parts necessary for building a tri-polar, self-starting electric motor. By following the very simple directions given, any boy can build this motor with an ordinary pair of pliers in fifteen minutes. Items on any No. 6 dry battery, obtainable anywhere. The magazine itself is full of dozens of home workshop construction ideas, handikinks that save money, tells how to build an aero ice sled that goes 60 miles per hour, how to make drawings the Misonne way, modernistic den for bachelors, machining the "mighty Atom," a Movie Star's home workshop, building "handybully" trailer, a 40 mile an hour hydroplane, lights for home workshop, secrets of successful soldering, concrete bird houses, electric launch built of cardboard, etc., etc. Sent postpaid for **ONLY 25c.**



No. 1991. MECHANICAL PACKAGE MAGAZINE No. 1. Price complete, postpaid **25c**

MECHANICAL PACKAGE MAGAZINE NO. 2

**This issue contains a complete Magazine also
all parts necessary for building an
ELECTRIC TELEGRAPH SET**

No. 2 issue of the Mechanical Package Magazine contains complete materials for building one combination telegraph key and sounder, together with full directions, step by step, so plainly written that any boy can assemble them. Learn telegraphy! It is amazingly easy. Get a friend to build a line with you and switch in on some real sport! The magazine itself contains numerous interesting features of interest to all, notes on shop methods, kinks, wrinkles and the use of tools, the inside story of television, a specially interesting article on model hydroplane construction, making stereoscope pictures, instructions and blue prints for building "Fatusha", an inexpensive big little cruising boat, building a 2-pole dynamo, secrets of successful kite flying, building an

exceptionally clever portable cabin, modernistic bedroom suite for men, backyard bird bath, etc. etc. Sent postpaid for **ONLY 25c.**

No. 1992. MECHANICAL PACKAGE MAGAZINE No. 2. Price complete, postpaid.... **25c**



1/2 FORMER PRICE
INKOGRAPH
PENCIL POINTED PEN
NOW REDUCED TO \$1.00



Combines the best features of fountain pen and lead pencil minus the weak points of both, plus improvements not found in either. Capable of doing anything possible and many things impossible with a fountain pen.

The Inkograph writes in ink with the same speed and ease of the softest pencil and is a joy to use. It feeds as fast as you can make your brain think or your hand move, and writes as even and uniform on the last page as it did on the first.

Makes 3 to 4 carbon copies at one time, while the original is in ink, bearing down on the point as hard as you like without injury.

Draws lines to a ruler without smudging. Writing point is shaped like a fine lead pencil point. Anyone can use YOUR pen because no style of writing can spoil its smooth point. Ideal for rough usage.

REQUIRES NO BLOTTER. The ink dries as fast as you write because the flow is fine, even and uniform.

CANNOT LEAK or soil the hands or clothing. Not the tiniest drop of ink will spill. An Inkograph will actually improve your handwriting 100 percent. Has 14 kt. solid gold feed.

Your choice of Black, Jade, Black and Gold, Onyx, Black and White, Marine Green and Black, unbreakable Piroxalin. Every pen guaranteed.

AUTOMATIC FEED that instantly removes any obstruction from the writing point. This feed works freely up and down within the point, effectively removing any sediment and insures a perfect ink flow.

NO COMPLICATED PARTS to worry over—no mechanism to clean or set out of order. **PRICE \$1.00** postpaid.

BIG HUNTING KNIFE

With Genuine Leather Sheath
ONLY \$1.00 POSTPAID



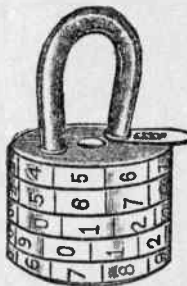
This is the ideal outdoor knife—an indispensable part of the equipment of every sportsman, tourist, Boy Scout and camper. Its utility far exceeds its modest cost. As a protective implement, it is always ready for any emergency.

ALWAYS DEPENDABLE
ALWAYS EFFECTIVE

It's an all-purpose knife for hunting, fishing or canoeing. Thousands of Boy Scouts own these knives. Whether you are cutting your way through underbrush, sharpening tent stakes, slicing bacon, dressing game, or doing one of the innumerable other jobs a sportsman asks a knife to do, you will find it indispensable. Blade is about 5 inches long with mirror-like finish—strong, big, sturdy. Finely ground blade makes cutting easy. Note guard at bottom of handle to help grip and keep knife from slipping. Knife comes complete with genuine leather sheath, slotted so you can carry it on your belt, to hold knife firmly in sheath while carrying it.

PRICE \$1.00 POSTPAID

KEYLESS LOCK



This is a 5-number lock—requires no key to open it. The secret combination is furnished with each lock, without which it is next to impossible for anyone to open it. The tumblers must be placed in their correct order before the lock will open. **EACH LOCK HAS A DIFFERENT COMBINATION.** No two alike. No keys to lose. Whether it is for securing your locker, your motorcycle, your boat, tool chest, bicycle, mail box or any other of a thousand uses, it will be found practical and effective. Very substantial construction, being made entirely of brass, nickel plated all over. The 5-number combination renders it practically thief-proof. **PRICE 20 Cents.**

PUT PHOTOS ON SILK, CLOTH, WOOD, PAPER, LINEN, ETC. **25c**



It is now easy to print your snapshots and other photos on any cloth or other fabric surface—cushions, pillows, handkerchiefs, scarfs, ties, hosiery, underwear, paper, wood, linen, etc. The photos are washable. Will not fade or rub off—long lasting. Easy to do—just follow a few simple directions. One bottle is good for about 50 prints in **RICH TONES.** Thoroughly practical. **PRICE FOR COMPLETE OUT-FIT ONLY 25 CENTS SENT BY MAIL POSTPAID.**

Exploding Matches

More fun than fighting with your wife. They look just like ordinary matches, but explode with a loud bang when lit. 12 matches to a box. **PRICE 10c per box, 3 boxes 25c, or 75c per doz. boxes.** Not available. Shipped by express only.



10c

CREAM EXTRACTOR

This is a most useful household device, for it automatically extracts the pure, thick cream from bottled milk. Simply place it in the bottle and the cream flow will start automatically at once, a automatically stopping when the cream is drawn. Pays for itself in one week's use. Can also be used for syphoning other liquids—gasoline from your car, for instance. Made of pure aluminum in one piece only; will last a lifetime.



PRICE 25 CENTS POSTPAID.

Address all orders for goods described herein to
JOHNSON SMITH & CO., 6615 E. Jefferson Ave., DETROIT, MICH.

MAGIC MONEY MAKER

ONE OF THE BEST NOVELTIES OUT

INSERT A PIECE OF BLANK PAPER, AND OUT COMES A DOLLAR BILL



Demonstrate this machine to your friends and they will think that you have discovered something better than a gold mine. You simply insert a piece of white paper, turn the key and out comes a nice new dollar bill, you insert another paper, give another turn and out comes bill number two. You can repeat as often as you like. This isn't a counterfeiting scheme, but you can have a lot of fun in making your

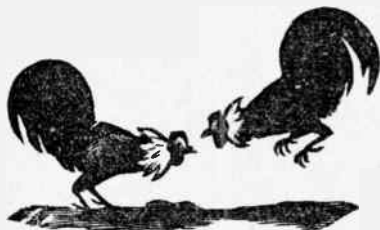
friends believe that you are printing real money.

No. S3198. THE MONEY MAKER. Price Postpaid.....

50c

The Fighting Roosters

A full blooded pair of fighting game cocks
These lilliputian fighters have real feathers
yellow legs and fiery red combs, their movements



when fighting, are perfectly natural and life-like, and the secret of their movements is known only to the operator who can cause them to battle with each other as often and as long as desired. Independent of their fighting proclivities they make very pretty mantel ornaments

No. 3425. Fighting Roosters. Per Pair..... **10c**
3 for 25c., or 75c per dozen postpaid

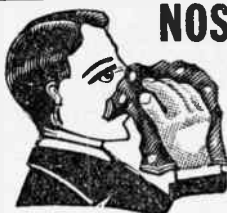
MAGIC FLUTE

The Magic Flute, or Hemanatone, is a unique and novel musical instrument that is played with nose and mouth combined. There is just a little knack in playing it, which when once acquired after a little practice, will enable you to produce very sweet music that somewhat resembles a flute. There is no fingering, and once you have mastered it you can play all kinds of music with facility and ease. When played as an accompaniment to a piano or any other musical instrument, the effect is charming, as it is surprising.



No. S3478. Magic Flute **10c**

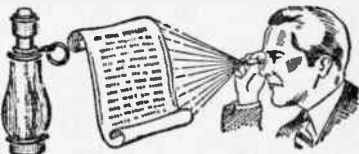
NOSE BLOWER



When some men blow their noses it sounds like a trombone. We have all got accustomed to those queer noises, but now the Nose Blower has come to torment us. It is ingeniously concealed in a handkerchief. On meeting your friends or at a party, after chatting awhile you carelessly take out this handkerchief and proceed to blow your nose. It's like a sudden clap of thunder. The ladies scream, and your male friends will think they hear the whistle of a steam engine. Everybody will put their fingers in their ears when they see you going to blow your nose again. You can blame the hideous noise to your having a very bad cold, and keep up the fun as long as you like.

No. S2192. NOSE BLOWER..... **10c**
3 for 25c., or 75c. per doz. postpaid

Telescope Watch Charms



An imported French telescope watch charm, made of white bone, that contains the Lord's Prayer, the Ten Commandments, Bathing Beauties, etc. Equipped with a microscopic lens so that the Prayer, Commandments, or picture, as the case may be, can be easily read although almost invisible to the naked eye.

No. 8147. Lord's Prayer **15c**
No. 8148. Ten Commandments **15c**
No. 8149. Bathing Beauties..... **15c**
Any 3 for 40c, or \$1.35 per doz. postpaid.

CIGARETTES



You can now order your favorite brand of Cigarettes by mail and have them shipped to you by parcel post, free from observation no matter where you are located. All Cigarettes come twenty cigarettes in a package, ten packages to a carton. Thus each carton, which is the minimum quantity we sell, contains 200 cigarettes. Prices shown below do not include postage. Average shipping weight of each is one pound. Please add sufficient to cover postage. Send remittance in any convenient form. We accept postage stamps in payment of all orders, large or small.

PRICES (NOT PREPAID)

- No. 9147. TWENTY GRAND, carton \$1.10
- No. 9148. WINGS, per carton..... 1.10
- No. 9149. MARVEL, per carton.... 1.10
- No. 9154. CAMEL, per carton..... 1.50
- No. 9155. LUCKY STRIKE, carton. 1.50
- No. 9156. CHESTERFIELD, carton. 1.50
- No. 9157. OLD GOLD, per carton... 1.50
- No. 9165. KENTUCKY WINNER, ctn.1.75
- No. 9166. KOOL, per carton..... 1.75
- No. 9167. SPUD, per carton..... 1.75
- No. 9146. HERB'T TAREYTON, ctn. 1.75
- No. 9144. RALEIGH, per carton.... 1.75
- No. 9162. PHILIP MORRIS, carton. 1.75

Please Add Enough for Shipping Charges

Auto Distributor Intensifier



The "Sparkmaster" is a distributor intensifier that will give you more speed and power with less gas. Will make the motor run smoother and better. Just try this intensifier on your car and see for yourself the difference it makes. Can be slipped onto the distributor in thirty seconds without tools. Do not confuse this with the jump spark intensifiers that do little or no good. This is patented and cannot be copied. Has bakelite case. Only one intensifier needed for 4, 6 or 8 cylinder car.

No. 4934. Distributor Intensifier... **25c**



Made up just like the small books of matches given away at cigar stores. The back row has the regular matches; the front row are the exploding kind. You take a match from the back row which gives a light in the regular way and hand it to your fellow smoker, who gets a big surprise as the match which he takes from the front row explodes as soon as he lights it.

No. 2770. Price Each Book..... UNMAILABLE. SENT BY EXPRESS COLLECT

FLEXIBLE STEEL RULES

Indispensable for Every Handy Man and Mechanic



These Flexible Steel Rules are practically indestructible and are needed by every mechanic and in every home. The rules have very clear markings and can be twisted and turned without damage; they always return to original shape.

- No. 4227. 39 in. Flexible Steel Rule in metal case. Each..... **20c**
- No. 4228. 78 in. Flexible Steel Rule in Bakelite Case. Each.... **35c**



20c

SWISS WARBLER & NIGHTINGALE WHISTLE OR THE DOUBLE THROAT



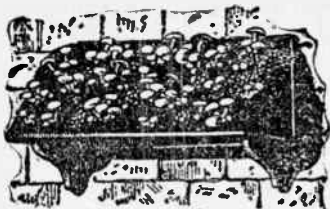
This is the genuine Swiss Warbler or Nightingale Whistle, the original Prairie Whistle and Bird Call. It is a little instrument that fits in your mouth easily and without discomfort. With it you can imitate bird calls and the sounds of various animals by following the very simple directions. It is also sometimes called THE DOUBLE THROAT and as such it is of great aid to ventriloquists. It is used by



professional ventriloquists, vaudeville entertainers, whistlers, and others.
No. 2858. SWISS WARBLER. 1 Sample for 5c, 5 for 10c, or \$1.00 per 100 postpaid

JOHNSON SMITH & CO., DETROIT, MICHIGAN

Mushroom Spawn



Mushrooms are very easily raised from our spawn. All you need is a cellar, basement, closet, or spare room that you can close the light out, as they grow better in the dark. Our illustration shows a small shelf utilized for the purpose in the cellar. You can have shelves all round the closet or cellar and you will be astonished at the large quantity you can raise in a very small amount of space. All the little mushrooms you see on this shelf came out in one night. As an article of food there is nothing more delicious or inviting than mushrooms, and they may be cooked in an almost endless variety of ways. By selling them to your neighbors and storekeepers you can make several dollars a week, and several of our customers have informed us that they have made quite a profitable industry from a small investment.

No. 5241. Price per Brick (weight about 1 1/4 lb.)...50c

Automatic Dime Bank



ENCOURAGE THE YOUNGSTERS TO SAVE.

NO EXTRA CHARGE FOR POSTAGE.

Another good and useful Automatic Savings Bank. All on the one principle. This one holds 50 Dimes (\$5), and opens of its own accord when the last Coin has been deposited. Registered scale at the side with holes enabling you to see at a glance how much money the Bank contains at any time.

No. S2586. Dime Bank.....15c

CHANGE PURSE



Pocket size, nickel plated, and will hold \$2.50 in pennies, nickels, dimes and quarters. Four strong springs hold the coins in place, and a slight pressure with the thumb instantly brings the coin wanted into your hand. No more fumbling in your pocket or pocketbook.

to get a certain coin wanted.

No. S2587. Change Purse.....25c

DANCING SKELETON

A jointed figure of a skeleton fourteen inches in height, will dance to music slow or fast, keeping exact time, and performs various gyrations and movements while the operator may be at some distance from it.



When handed to the operator, it is simply placed in position, when it will seemingly become endowed with life, and begins to move. At the command of the operator (who may be in any part of the room) it will lie down, stand up, dance, etc. For exhibition in the parlor, before social gatherings, etc. it never fails to create fun and amusement. We send full and explicit directions with each Skeleton, by the aid of which anyone can readily make it perform, to the astonishment of their friends or the public.

No. S3433. Dancing Skeleton.....10c
3 for 25 cents, 1 doz. for 75c.

Back Seat Driver's Card



There is a neat cardboard folder, with the wording "INSTRUCTIONS FOR BACK SEAT DRIVERS" on the outside. What it contains on the inside when opened we prefer not to mention here. It isn't confined

to many words, but what it does say is certainly brief and to the point. Have a few of these cards on hand; you'll need 'em.

No. S2856. Back Seat Driver Cards. Each.....5c
3 for 10c., 25c. per doz., \$1.50 per 100.

THE RIBBON FACTORY FROM THE MOUTH TRICK



If you want to have some fun, send for this Ribbon Factory Trick and draw your after yard of various colored ribbons from an apparently inexhaustible supply. After filling a basket or covering the floor with ribbons, you can state that you feel much relieved after getting rid of your load.

No. S3202. Ribbon Factory Trick...10c
3 for 25 cents, 1 doz. for 75c

PEA-MATIC

REPEATER-12 SHOT

HARMLESS
ACCURATE

25c
Post-
paid.



Here it is, boys. You can have an immense amount of fun with this new pistol. It shoots 12 to 15 ordinary peas without reloading. All you need do is to load the gun with peas, pull the trigger and keep on firing until the barrel is empty. Then reload and

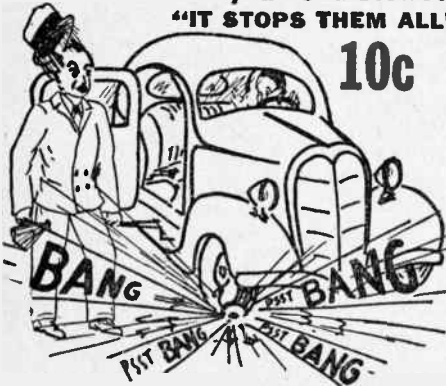
fire again. It is absolutely harmless and safe. Nothing to explode. These pistols sell like hot cakes, so get yours AT ONCE. Be the first boy in your town to own one of these automatic repeating pistols and be the envy of all the other kids in the neighborhood. Remember, unlike most other guns, it costs practically nothing for ammunition.

No. 7481. PEA-MATIC 12-SHOT REPEATER. Price Postpaid.... 25c

AUTO TIRE BANG!

Sounds Exactly Like a Blowout
"IT STOPS THEM ALL"

10c

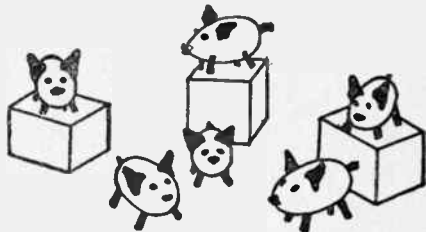


The Auto Tire Bang is attached to a small cardboard disc and a spring wire by means of which it is quickly attached to the tire. If placed underneath the fender it is out of sight. On the first revolution of the wheel, it explodes with a loud bang as soon as the wheel rolls over it. The driver gets out in a hurry to change tires, thinking he has a blowout, and even the victim is pleased when he finds he has merely been the victim of a practical joke. Not available. Shipped by Express only. Not prepaid.

No. 6536. Auto Tire Bang. Each... 10c
3 for 25c. or 75c per dozen.

THE MYSTERY MOVIE PIG

What Makes It Move?



S-S-S-H! Don't tell. It's a secret! | | Every one baffled as to how it works or why the little pig winks its eyes, wiggles its ears and nose, or wags its tail. But YOU know, for all you have to do is to catch a good lively fly or bug and put him inside, and then the fun begins. Put in two or three—the more the merrier. Let them out at night to have their dinner and exercises and get more lively ones in the morning. But don't tell the secret. Keep them guessing. For there is no machinery inside and it is NOT electricity NOT air, NOT radio, NOT water.

No. 2899. Mystery Movie Pig.... 25c

AUTO SCARE BOMB

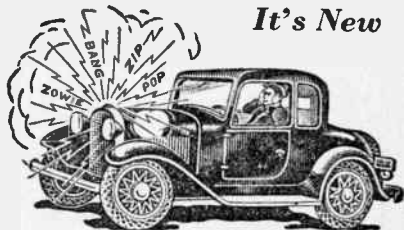
The Auto Bomb is attached to the motor of your car, fastening one wire to the spark plug terminal and the other wire to any part of the motor to serve as a ground. The instant your "victim" steps on the starter, there is a shrill whistle, followed by a loud bang. The driver thinks his car has exploded. Can be attached in a few seconds. Does not harm the car. Gives you more protection than an insurance policy—catches the thief in the act. Not available. Sent by Express only. Not Prepaid

No. 6534. Auto Scare Bomb. Price 15c
3 for 40c or \$1.35 per dozen



The Auto Skunk

It's New



Attach to the motor of an automobile in accordance with the directions, then "STAND BY" and watch the fun. The driver gets out of the car, presses the starter and the contact sets off the Auto Skunk. A dense cloud of smoke immediately envelops the front of the automobile, causing the driver to get out of the car and lift the hood. Upon lifting the hood, the driver receives the full force of the violent odor that has accumulated from the "Skunk." Not available. Shipped by Express only.

No. 6535. AUTO SKUNK. Each... 12c

JOHNSON SMITH & CO., DETROIT, MICHIGAN

LEARN to PITCH real CURVES

By The World's Greatest Pitchers

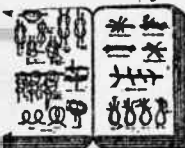
Prepares you mentally, morally and physically to become a great baseball player and a great athlete. Special course of lessons by CHRISTY MATHEWSON, who explains the secret of how to throw the great "FADEAWAY" ball, so much feared by the great batters: ED WALSH, the pitcher who discovered the secret of throwing that famous, mystifying, and unhitatable "SPIT BALL"; JOE WOOD, the "Smoke Ball" marvel, next to the speediest pitcher in the world; WALTER JOHNSON, the man who has struck out more league batters in a single season than any other pitcher known; NAP RUCKER, inventor of the "Knuckle Ball"; and DOC WHITE, who teaches you the art of Shadow pitching by which you can develop control and speed necessary to become a star pitcher. Clearly described and illustrated by 66 pictures. Everything complete for ONLY 25 cents postpaid anywhere. Nothing more to buy.

PRICE
25c



New Book On ROPE SPLICING

Useful Knots, Hitches, Splicing
How Different Knots are Made and What
They are Used For



PRICE
10c
POSTPAID

A most practical handbook giving complete and simple directions for making all the most useful knots, hitches, splices, rigging, etc. Shows how different knots are made and what they are used for—the use of ropes and blocks, different methods of applying them, etc. Gives a table showing the approximate efficiency of knots in a percentage of the full strength of the rope. Over 100 illustrations, including 37 Heraldic Knots. Of great value to mechanics, riggers, campers, boatmen, Boy Scouts, Army and Navy men and others. PRICE 10c postpaid.

Mystery Speed Boat



Sensational
New
Novelty

Runs for hours without mechanism of any kind. Will run several miles per hour. Kicks up the water and put-puts just like a real motor boat. A small lighted candle under pan of boat, or small supply of canned heat generates steam, making it skim over the water like a regular speed boat. Costs practically nothing to operate. Runs wherever there is water—in a bath tub, dishpan, small pond—anywhere at all. Any child can operate it. Made entirely of metal, attractively finished in colors. It is safe, fool-proof. PRICE with supply of candles ONLY 15c postpaid.

SEE-O-SCOPE

Periscope—Detectoscope—Crazyscope
See over a fence, around corners, etc.



THREE DIFFERENT INSTRUMENTS IN ONE — PERISCOPE, DETECTOSCOPE, CRAZYSCOPE. The PERISCOPE permits you to see over fences, look at ball games, around corners, etc., without being seen. If in a crowd you can look over the heads of those in front of you and see all the fun. With the DETECTOSCOPE or LOOK-BACKSCOPE you can see what is going on behind you or see who is following you without turning around. It's like having eyes in the back of your head. The CRAZYSCOPE makes things look "crazy," for it turns everything — people, automobiles, etc., upside down. Every Boy Scout should have a SEE-O-SCOPE for spying and everyone else who wants some rare amusement. Well and strongly made. With ordinary use should last a lifetime.

See
Without
Being Seen

25c

Magic Trick Cards



With these cards you can perform some of the most wonderful illusions. You can change eights to duces, blacks to reds, etc. The transformations are truly wonderful. Price 10 Cents, with instructions, postpaid.

Big novelty catalog 10c. Stamps accepted.

OUR BIG ENTERTAINER -- 15c

326 Jokes and Riddles, 25 Magic Tricks, 10 Parlor Games, 73 Toasts, 13 Fairy Tales, 105 Money-making Secrets, 22 Monologues, 21 Puzzles and Problems, 5 Comic Recitations, 10 Funny Readings, 11 Parlor Pastimes, 13 Flirtations, 110 Girls and Boys Names and their Meanings, 10 Picture Puzzles, 69 Amusing Rhymes, 37 Amusing Experiments, Deaf and Dumb Alphabet, Shadowgraphy, Gypsy Fortune Teller, How to tell Fortunes with Cards, Dice, Dominoes, Crystal, Coffee Cup, etc., Hypnotism, Ventriloquism, Cut-outs for Checkers and Chess, Dominoes, Fox and Geese, 9 Men Morris, Spanish Prison Puzzle, Games of Anagrams, 25 Card Tricks, Crystal Gazing, etc.



ALL FOR 15 CENTS POSTPAID.

Big novelty catalog 10c. Stamps accepted.

Address all orders for goods described herein to
JOHNSON SMITH & CO., 6615 E. Jefferson Ave., DETROIT, MICH.

10c ELECTRIC MOTOR

6,000 Revolutions
per Minute

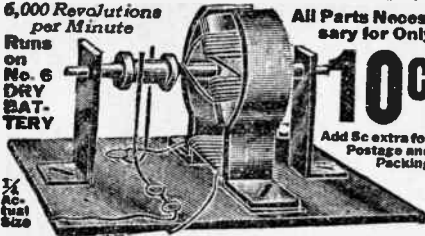
Runs
on
No. 6
DRY
BAT-
TERY

All Parts Necess-
ary for Only

10c

Add 5c extra for
Postage and
Packing

1/2
Actual
Size



An Electric Motor for 10c. Sounds almost unbelievable but it is perfectly true. We send all the parts packed in a neat box, with full directions for assembling. No trouble at all putting it together—it is FUN. Takes but a few minutes. And OH BOY! Isn't it speedy! Runs on a No. 6 or similar dry battery. You can learn more about a motor in 30 minutes than by hours of study. Perform many novel and interesting experiments with it. PRICE 10c with 5c extra for postage and packing. No charge for postage if 3 or more are ordered.

No. 4920. ELECTRIC MOTOR. Price 10c

Explosion Fillers

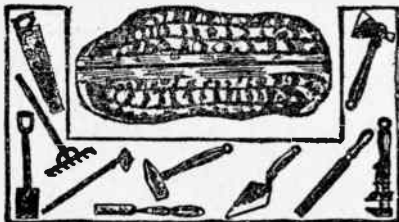


These are small pieces of wood, like the end of a toothpick, that you can insert in cigars and cigarettes to make them explosive. They are chemically treated and after the cigar or

cigarette is alight for a short time, it goes off with a loud bang to the profound astonishment of the smoker. There are 10 pieces in each package.

No. S2741. Explosion Fillers. Pkg. 10c

COMPLETE Tool Set in a Nutshell



The Smallest 10-piece Tool Set in the World, made of white metal, silver finish. Set consists of 1 hatchet, 1 saw, 1 trowel, 1 chisel, 1 file, 1 hammer, 1 wrench, 1 hoe, 1 rake and 1 spade, enclosed in an imitation jumbo peanut 8 inches long.

No. S5778. Tool Set in Nutshell. 15c

3 for 40c., or \$1.35 per doz. postpaid.

JOY BUZZER

(Hand Shaker and Tickler)

FUNNIEST JOKER'S NOVELTY EVER INVENTED!



Use the ring as a key to wind it.



Wear it as a ring—the Buzzer in the palm.



It "shocks" them when they shake hands.



It makes them jump if they are ticklish.



They will hit the ceiling if they sit on it.



Under a sheet it feels like a mouse.

Attached to one end of the Joy Buzzer is a brass ring that slips over the second finger, allowing the Buzzer itself to be concealed unobserved in the palm of the hand. Inside the Buzzer is a clock-work mechanism that is wound up. Projecting from the center of the Buzzer is a brass point, and a little pressure upon this point releases the mechanism. Shake hands with some one and see the shock the person receives when he unconsciously releases the mechanism of the Buzzer. If he is ticklish, watch him jump. Place it on a chair and watch the commotion when some one sits upon it. Place it under a pillow—under a sheet it feels like a mouse. You can use it as an ordinary "tic-tac" on a door or window—use it to awaken a sleeper by holding it on the sole of the foot or just behind the ear—try it on the window of an automobile just as the gears are shifted; they will think the engine is "busted." Dozens of other uses will suggest themselves to you. Made entirely of metal; you will get more than your money's worth of fun out of this little contraption.

No. S2935. JOY BUZZER. Price..... 28c

THREE SHELL GAME



The old shell game. An old one that is always new. You can make the pea appear underneath any shell you wish, and no matter what shell is picked by a spectator he is shown to be always wrong. Watch them sit up and take notice when the little pea moves mysteriously from one shell to the other. NOTE. This trick is sold for entertainment purposes only. Complete with directions.

No. S2936. Three Shell Game... 25c

JOHNSON SMITH & CO.

Solar Telescope



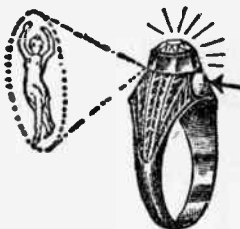
The new Excelsior Solar Telescope is a large and serviceable instrument, nicely made and accurately fitted. When extended it is almost three feet in length, and when closed measures not quite twelve inches in length. Telescopes of this size usually sell for many times this price, but by importing them direct from a large European manufacturer, we are enabled to offer them to our customers for ONLY \$1.25 each, at which price they ought to sell readily. The lenses are well made, the sides are brass bound, and the four sections are perfectly fitted. Here is your chance to obtain a Telescope for a nominal sum. It will be sent postpaid to any address upon receipt of amount in any convenient form. Postage stamps accepted if more convenient.

No. S9110. EXCELSIOR SOLAR TELESCOPE. Price Postpaid.... **\$1.25**

Novelty French Ring with View A VERY GREAT CURIOSITY



Here is a very great novelty in Rings, that is selling in thousands. It is a nicely made ring, finished in imitation platinum, and set with a large imitation diamond. It looks just like an ordinary ring, but in the shank of the ring is a small microscopic picture almost invisible to the naked eye, yet is magnified to an almost incredible degree and with astonishing clearness. There is quite an assortment of pictures that should suit all tastes. Some are pictures of bathing girl beauties, pretty French Actresses, etc., others are views of places of interest in



France, Panama Canal and elsewhere; others show the Lord's Prayer in type, every word of which can be read by persons with normal eyesight. They are interesting without being in any way objectionable.

No. 8322. NOVELTY FRENCH RING. Price Postpaid **25c**
Three for 65 cents, or a dozen for \$2.25 by mail postpaid

Silent Defender or Aluminum Gloves



These aluminum Gloves are used by Police Officers, Detectives, Sheriffs, Night Watchmen, and others, as a means of self protection, and they are certainly effective. They easily fit the hand, the fingers being placed in the four holes, thus tightly grasping the Glove. Very useful in an emergency. Made of aluminum, highly polished, they are very light, weighing less than 2 ounces. They are 3 1/4 inches long and 2 3/4 inches across and will fit compactly in the pocket, always available ready for instant use. You should buy one for each hand.

No. 89095. Silent Defender. Each, **25c**
Or Two for 45c postpaid anywhere.

Elec-Trick Push Button

Did you ever see a youngster pass by a push-button without trying it? Never—it can't be done. That's the psychology back of this Elec-trick Push Button. Place this little contrivance anywhere it will be noticed—in the lapel of your coat or vest if you choose. Upon pressing it the victim naturally expects to hear it ring. The result can be better imagined than described. As soon as he touches it, you will see some of the liveliest dancing you ever witnessed in your life. It gives a smart "shock" as soon as the Button is pressed. Never known to fail. Attach it to your house—WOW! What a shock they get when they press what they think is your door bell. **15c**



No. 2062. Elec-Trick Push Button. **15c**
3 for 40c. or \$1.35 per dozen postpaid

Protect Your HOME and Earnings



with this
25 Calibre
regulation
blue steel

AUTOMATIC

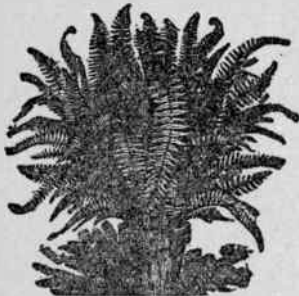
\$9.75

Keep one of these safety brand new automatics in your home and be fully protected against burglars, thieves and holdup men. It's a terrible fright to wake up in the night—hear noises down stairs or in the next room—and realize your neglect has left you wholly UNPROTECTED.

Buy one of these automatics and be always fully protected. Handsome blue steel, gun-metal finish. HAS DOUBLE SAFETY and is practically "fool-proof." Accurate aim, rifled barrel, hard rubber, comfortable checkered grips, safety lever, 7 cartridges. Small, lies flat in pocket. Can be shipped by express only.

- *No. S9045 is 25-calibre, 7-shot, as illustrated. Big Bargain **\$9.75**
 - *No. S9048 is larger size, 32 calibre, military model, automatic 7-shot. **\$11.00**
- Big Value, only.....

FERNS GROWN FROM SEED



Ferns can be grown easily from seed. Fill a clean pot with fine earth. Put the pot in a saucer and immerse with boiling hot water to kill all weed, seeds or insects in the soil. After the soil has cooled, strew the fern seed over the top of the soil but do not cover it. Put a piece of glass on top of the pot, and keep the saucer full of water. Never put water on top of soil. In a short time the soil will be covered with a green moss-like growth, and in a few weeks the little fern leaves will appear.

No. S5060. Per Package..... **10c**

RUBBER TYPE SET



This printer is larger than our No. 21, and contains five fonts of large type, with punctuation marks, three sets of figures from 1 to 10, three \$ marks, pallet with enamelled handle for holding type, ink pad in metal box with cover, and type tweezers for setting type, making a very complete outfit, with which a great variety of printing can be done. With these Printing outfits of ours a boy can combine pleasure and business printing cards, envelopes or small handbills and circulars for his companions or business associates at a profit, and at the same time learn the art of setting type and printing, which in later life may be of great value to him.

No. S2362. No. 22 Type Set.....**30c**

No. 23 Rubber Type Set

This is a still larger outfit as it has both capitals as well as small letters. This outfit contains no less than 266 letters, figures, punctuation marks, ornaments, spaces, etc., and comes complete in box with holder for setting 3 lines of type, tweezers and self-inking stamp pad. Size and style of type is

as follows: **AAAAaaaaaaBB**

This is an excellent set for business or personal use.

No. 2363. Box of Rubber Type..... **50c**

Junior Rubber Type Set

Complete with over 67 letters (capitals only), stops, 2-line type holder, tweezers and self-inking stamp pad. You can mark linen, books, papers, envelopes, cards, etc. As a card printer you can set up name, etc., and print 500 cards an hour. It will thus be found not only a source of profit, but also of great amusement and instruction. Size of type 3-16 inch.

No. 2361. Junior Rubber Type Outfit. **15c**

SURPRISE SOAP



The fellow who unwittingly uses this soap has a very big surprise coming to him. It is an exact duplicate of an ordinary piece of soap; BUT it contains a chemical that acts like a dye as soon as it comes into contact with water. The result can be better imagined than described.

No. S2198 Surprise Soap **15c**

AMERICA AND COMPLETE OUTFIT

(Add 10c for postage and packing)

Make and make your own lectures

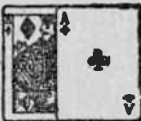
1/2 Photo
1 1/4 in.

Although this apparatus is so MARVELOUSLY CHEAP, it is quite the best, and will take SPLENDID PICTURES. Just the thing for beginners in photography. It takes pictures not quite 2 x 3 1/4 inches with clearness, sharpness and distinctness. Loads in daylight. Has VERY GOOD LENS; BRILLIANT VIEW FINDER, a simple yet effective SHUTTER, time and instantaneous, leatherette handle, comes complete with 4 FILMS, 1 package of PRINTING PAPER, a neat little PRINTING FRAME with glass top, and a SUPPLY OF CHEMICALS for developing, fixing and turning out the finished picture. Full printed instructions so plainly written that a child cannot fail to understand. Never before has such an inexpensive opportunity been offered of indulging in the fascinating art of photography. With this outfit you can take portraits of your friends, views of places of interest you may visit, and snapshots of curious events and quaint characters. THE CAMERA AND COMPLETE OUTFIT FOR ONLY 35c (Canada and foreign 50c) With 10c extra for postage and packing. EXTRA FILM 10c per package of 5 films. EXTRA PRINTING PAPER 10c per package.

Fortune Telling by Cards

Dice, Dominoes, Crystal, etc.

Book shows how to tell fortunes with cards, dice, dominoes, crystal, etc. Tells the meaning and significance of every card. Several different methods explained and fully illustrated. Crammed full from cover to cover with complete information on fortune-telling. PRICE 10c postpaid. Stamps accepted.



Electric Telegraph Set 15c

BOYS!

A private Electric Telegraph Set of your own for 15c. Lots of fun sending messages to your friends. Better still get two sets, hook them up as shown in the directions, for TWO-WAY messages (sending and receiving).

No trouble at all to operate with the simple instructions that accompany each set. Operates on any standard dry battery obtainable everywhere. With this outfit you can learn to transmit and receive messages by the Morse International Code, and in a very short time become an expert operator. Mounted on a wooden base measuring 4 x 3 in. fine glass construction throughout, with key, sounder, magnet, miniature Western Union blank, pocket size case box with full illustrated instructions. ALL FOR 15c without postage. (Canada and Foreign 20c.)



Add 10c for postage book "BOY ELECTRICIAN" Tells how to make batteries, dynamos, motors, radios, bells, engines, alarms, coils, etc. Written specially for boys so anyone can understand it. 100 illustrations. ONLY 10c.

Novelty Catalog 10c.

Send 10c extra for our MAMMOTH CATALOG of novelties, jokes, (Giant, puzzles) books, etc., etc. Only catalog of its kind in existence. JOHNSON SMITH & CO.

35c Blank Cartridge Pistol

REVOLVER STYLE

22 CAL.

MADE IN 3 SIZES

Three new models now out 25c, 50c and \$1.00. Well made and effective. Modeled on pattern of latest type of Revolver. Appearance alone enough to scare a burglar. Takes 22 Cal. Blank Cartridges obtainable everywhere. Great protection against burglars, tramps, dogs. Have it lying around without the danger attached to other revolvers. Fine for 4th July. New Year, for stage work, starting pistol, etc. SMALL SIZE 2 1/2 in. long 25c. MEDIUM SIZE 5 in. long 50c. LARGE SIZE 6 1/2 in. long \$1.00. BLANK CARTRIDGES 50c per 100. HOLSTER (Cowboy type) 80c. Shipped by Express only not prepaid.



25c
50c
\$1.00

BIG STEAM ENGINE

NEW POWERFUL MODEL JUST OUT

25c Add 10c for postage and packing

The world's biggest value in mechanical toys. A great big steam engine, measuring 7 inches in height by 2 1/4 inches in diameter (7 1/4 inches in circumference) for ONLY 25 cents. You should see it run, too. It's a revelation to see the fly wheel spin around at a great rate as soon as you "get steam up." Just light up, fill the boiler with water, and in a few minutes the engine is running at top speed. New model just out, runs on alcohol or canned heat—MORE POWER. Has fly wheel for running small mechanical toys.



Fully Tested—Guaranteed to Run

It is foolproof, harmless, fully tested and guaranteed to run. A scientific toy that illustrates the principle of the steam turbine. Runs for hours on one filling of water. Every boy should have one. Wonderfully well made—splendid value for the money. Sells for ONLY 25c, with 10c extra for postage and packing. Easily worth double—MORE POWER. Has fly wheel for running small mechanical toys. Model of same engine also available. Price 50c, postage 10c extra.

CRYSTAL RADIO RECEIVER \$1.00



Say what you will about Electrical and Battery Sets, a CRYSTAL set has them all beat for simplicity and clearness of tone. There is absolutely no noise and no distortion—no batteries to buy—no tubes to wear out—no maintenance expense whatsoever. Cost nothing to operate and will last indefinitely. Reception is loud and clear. This Receiver is guaranteed to work equal to the most expensive Crystal set you can buy. Has a receiving range of over 25 miles, or under favorable conditions up to 100 miles. Construction of the finest materials throughout, including super-sensitive crystal, accurate tuning fork, and all complete—nothing more to buy. \$2.95 postpaid. Johnson Smith & Co., Dept.

SINGLE AND 100-SHOT AIR PISTOLS

Just what you've always wanted. A powerful high grade Air Pistol, shaped like an Automatic, peck size. Fires B. B. shot obtainable anywhere. Very powerful yet perfectly safe for boys to handle. Two styles—Single Shot Pistol or Repeater. The Repeater fires 10 shots in one loading. The Single Shot Pistol shoots Air Rifle Darts in addition to B. B. shot. Well made and durable; all metal parts (metal plating) and steel grain wood stocks. Front and rear sights. Weighs about 10 ounces. Better than an air rifle. Shipped by Express. Not Prepaid. \$2.50. PRICES: Single Shot Pistol . . . \$2.50 100-Shot Repeating Pistol . . . \$5.00



Shoots B. B. Shots

LIBERTY AUTOMATIC REVOLVER

HIGH QUALITY • RIFLED BARREL • GOOD VALUE

With Shell-
Ejecting
Device
PRICE
\$9.50

.22 Cal.
.32 Cal.
.38 Cal.



One of the most powerful and effective weapons made. The shots can be fired rapidly and in succession, as fast as you can count. The ideal weapon for Express Men, Bank Agents, Pay Roll Clerks, Automobileists, and all others where quick action is absolutely essential. Accidents and discharge impossible. Another feature is the Automatic Shell Ejector, that throws the empty shells out when the barrel is tipped down. The Revolver is exceptionally well made of the very finest of materials and scientifically tested for accuracy. Fitted with Cartridges for above Revolvers - by express only. .22 cal. \$1.00 per 100; .32 cal., \$2.50 per 100; .38 cal., \$3.50 per 100.

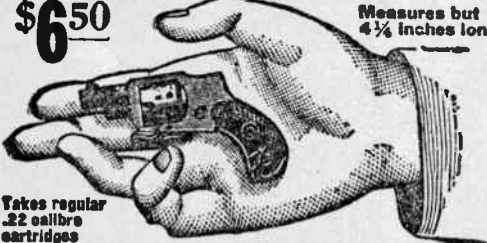
*No. S9022, Liberty Automatic Revolver.... \$9.50 (Revolvers and Cartridges unobtainable)

"The Baby" Double Action Hammerless Revolver

A HANDSOME AND MOST EFFECTIVE WEAPON

\$6.50

Measures but 4 1/4 inches long



Takes regular .22 calibre cartridges

The new Baby Double Action Hammerless Revolver has been produced to meet the ever increasing demand for a revolver that would combine small size and light weight with the essential features of Efficiency and Practicality. It is small in size, yet is just as effective and serviceable as the most expensive weapon you can buy. Every lady should have a revolver and should know how to use it, and there is no safer or better one made than this. A great feature is its safety action that guards against accidental discharge, making it quite safe for young men and ladies. The illustration gives an idea of its appearance, but it must be seen and used to be thoroughly appreciated. The ammunition used is the standard .22-calibre (short) cartridge obtainable anywhere, or you may obtain the cartridges from us (cartridges can be shipped only by express). The revolver fires six shots in one loading. The operation of the charging mechanism is extremely rapid and absolutely reliable; six well aimed shots can be fired in as many seconds. The revolver is very well constructed, with finest nickel plated fluted barrel of cylinder, and it weighs only 4 1/4 ounces. The Price of the Baby Revolver is only \$6.50.

*No. S9025, Baby Hammerless Revolver... \$6.50 (Revolvers and Cartridges unobtainable)

"Young America" REVOLVER

.22 & .32 Cal.

A Good Pocket Gun



A double-action revolver made in two sizes—.22 and .32 calibre. The .22 calibre revolver takes the .22 calibre rim fire cartridges - firing 7 shots at one loading. The .32 calibre gun takes S. & W. center fire cartridges - weights approximately 9 ounces, at one loading. The "Young America" is the most popular Fourth of July revolver. Octagon Barrel accurately rifled, made of best steel—very highly nickel plated and polished. The handle fancy hardened rubber. *No. S9008, Young America Revolver..... \$7.50



Aerial Balloon

A brightly colored balloon that measures sixteen inches long is blown up in the usual way, and, when released, the air pressure sends the balloon soaring upward. The effect is startling. Price 10c each. 3 for 25c.

SOARING UPWARD, the 16-inch propeller SPINNING AROUND AT A LIVELY RATE, the effect is startling. Price 10c each. 3 for 25c.



THE BUDDY PHONE

A Real Telephone. Works Indoors or Outdoors. Though this is merely a very clever toy, it is quite as serviceable for short distances as the most elaborate apparatus made and it is much less liable to get out of order or to need adjustment. In fact it cannot be rendered ineffectual unless roughly handled. No troublesome battery, no intricate "hook-up." Can be set up in a practical use from one room to another, up or down stairs, around corners, etc. The patented sounding diaphragm transmits and receives the voice perfectly, making it a really practical talking telephone. Set consists of two phones, transmission cord and full instructions. Price only 65c per set postpaid.

WONDERFUL X-RAY TUBE



A wonderful little instrument producing optical illusions both surprising and startling. With it you can see what is apparently the bones of your fingers, the lead in a lead pencil, the interior opening in a pipe stem, and many other similar illusions. Price 10c, 3 for 25c.



Exploding Matches

More fun than fighting with your wife. They look just like ordinary matches but explode with a loud bang when lit. 12 matches to a box. PRICE 10c per box, 3 boxes 25c, 75c per doz. boxes. Not available. Shipped by Express only.

10c



ITCHING Powder

This is another good practical joke; the intense discomfort everyone has but themselves is thoroughly enjoyable. All that is necessary to start the ball rolling is to deposit a little of the powder on a person's hand and the powder can be rubbed upon to the feet. The result is a vigorous scratch, then some more scratch, and still some more. 10c box, 3 boxes for 25c or 75c per dozen. Shipped by Express.

ANARCHIST BOMBS

One of these gross vials dropped in a room full of people will cause more consternation than a hamburger cheese. The small entirely harmless illustration in a short time. 10c per box, 3 boxes for 25c., 75c per doz. boxes, or \$7.50 per doz. only by Express. Shipped only by Express.

SNEEZING POWDER

Place a very small amount of this powder on the back of your hand and blow it into the air and watch them sneeze without knowing the reason why. It is most amusing to hear their remarks, as they never suspect the real source, but think they have caught it one from another. Between the laughing and sneezing you yourself will be having the time of your life. For parties, political meetings, car rides, or any place at which there is a gathering of people, it is the greatest joke out.

PRICE 10c, 3 for 25c, 75c per dozen. Shipped by Express.

COMICAL MOTTO RINGS

Lots of harmless fun and amusement wearing these rings. Made in platinum finish (resemble platinum), with various comical mottoes, as illustrated. Price 25c. ea. Postpaid.

MAGIC MADE EASY 250 MAGIC TRICKS

An excellent little book containing 250 Parlor Tricks, illustrated with cards, coins, handkerchiefs, eggs, rings, glasses, etc. So simple that a child can perform them. Practically illus. Sent postpaid, in plain wrapper for 10c. 3 copies for 25c postpaid.

JAPANESE ROSE BUSHES

The Wonder of the World

Japanese Rose Bushes bloom all the year round. Just think of it. Six weeks after planting the seed, the plants will be in full bloom. It may not seem possible, but we positively guarantee it to be so. They will bloom every ten weeks, Summer or Winter, and when three years old the bush will be a mass of roses, bearing from five hundred to a thousand roses on each bush. The flowers are in three shades—white, pink, and crimson. The plants will do well both in and out doors. We guarantee at least three bushes to grow from each packet of seed. Price, 10c packet, 3 pkts. for 25c postpaid.

neso Fragrant Tree Fern

Just introduced; noted for its rapid growth. An exceptionally pretty ornamental plant. Foliage rich dark green. Ferns grand pyramidal bushes about 1 to 1 1/2 feet high. Branches very desirable for decorative purposes, ferns, etc. Seeds 15c pkt., 3 for 40c.

Weather Plant

NATURE'S WEATHER PROPHECY
By mysterious changes that take place, this remarkable and accurately forecasts the weather many hours in advance. Will grow anywhere all the year around. An interesting house plant. Bears large, fragrant, pink butterfly shaped flowers. Seeds, 15c Packet, 3 for 40c. postpaid.

GROUND ALMONDS

Amazingly Prolific—Easily Grown From Seed on Ground! Almond has a flavor that is MOST EXCELLENT, resembling the cocoanut. The seed is snow white, covered with a shell or skin of brown color. It grows to the surface of anything from 200 to 300 Almonds may be potted from a single unit. There is no trouble whatever growing any where and in any kind of soil. May be planted 2 times, and in eight or ten days from the first sowing you will have an ENORMOUS CROP of the MOST DELICIOUS ALMONDS YOU EVER TASTED. Seeds 15c Pkt.

Perfume Plant

Almonds only at night, giving forth the most deliciously scented fragrance for perfume. Causes the perfume to be so strong. For house or garden. Seeds, 15c pkt., 3 for 40c.

Calabash or Pipe Gourds

A luxuriant and rapid growing climber; thrives in any where. Produces the most beautiful gourds for ornamental purposes, in which the famous calabash pipes are made. Grow this in your lawn and make your own. Seeds, 15c Packet, 3 for 40c.

SENSITIVE PLANT

Marvel of the Philippines. Leaves curl, fronds droop when touched. Apparently respects interior of house or garden; very curious and interesting. Seeds, 15c pkt., 3 for 40c.

Japanese Nest Egg Gourd

Very curious. Produces fruit like a bird's nest. Shape and color of fruit like a bird's nest. Matures fruit does not fall off. It is a very curious and interesting house or garden plant. Seeds, 15c pkt., 3 for 40c. S.S.C.O.

Mammoth Peanuts

Peanuts can be easily cultivated. Their culture is simple and exceedingly interesting. Mammoth peanuts grow to an astonishing size. It is a good producer, very prolific, and the plants have a thick, attractive, ribbed protecting shell. The plants are attractive, being of odd shape and of handsome green shade, planted through the winter with white. You will derive much pleasure cultivating this interesting species. Seeds 15c pkt., 3 pkts. for 40c.

Musk Plant

Unusually admired favorite for house, flower garden or greenhouse. A very fine house plant. Lovers of the finest of the sweet scented variety. Also valuable on account of the perfume that can be made from it. Seeds 15c pkt., 3 for 40c.

Japanese Climbing Cucumber

Unusually attractive and vigorous growing vine. Attains a height of 10 to 15 feet. Of ordinary varieties, grows readily. One has an entire row of plants in a summer. Seeds 15c packet, 3 for 40c. postpaid.

GIGANTIC GUINEA BUTTER BEANS

THE NEW EDIBLE VEGETABLE WONDER
Grows to an astonishing size. The Beans measuring 10 to 16 inches long, and weighing anything from 1 to 2 pounds. One Bean is sufficient for a family for several meals. Very palatable and rich in nutritious material. The delicate butterfly flavor is much appreciated. The plants are easily grown, very prolific, and a most welcome and valuable adjunct to your garden. Try them; you will find that the most delicious vegetable you have ever tasted. Imported direct. Unobtainable elsewhere. Sample packets of Seeds with full directions for cultivating and cooking. 25c. postpaid.

Kudzu Vine

Most rapid growing vine known. Will grow 20 ft. in one week. Luxuriant foliage. Lovely purple flowers, very fragrant. Nothing to equal it for its rapid and quick growth. Seeds 15c packet, 3 for 40c.

Yard Long Bean

Produces enormous crop of long, slender, round pods of excellent quality. Can be used as a vegetable or as a pod. Grow from 2 to 3 feet high. Very tender and fine flavor. The plants are very easy to grow; as interesting curiosity. Seeds, 15c Packet, 3 for 40c. postpaid.

THE GREAT FIRELY PLANT

Blooms at Night
Fills the Atmosphere with Fragrant Aroma
One of the most rapid growing vines known. Under favorable conditions it will bloom in a SINGLE WEEK. In a very short space of time it will have climbed to a great height, and is covered with flowers from 1 to 2 inches in diameter. It is indeed, a great novelty, for unlike other plants, the flowers OPEN in the EVENING and remain open until about two hours before day. In dull weather they will remain open all day. It is a most INTERESTING SIGHT to watch the opening and closing of the flowers. They appear and the flowers open every day forth the most DELIGHTFUL AROMA and the whole atmosphere around is full of scented fragrance. It is always the people passing at night stop to see the cause of the charming aroma frequently stopping in an endeavor to satisfy their curiosity. POSTPAID. JERUSALEM SMITH & CO.

The Great Strawberry

A luscious berry that may be grown and raised in any soil or climate. The most interesting method is to cultivate the plant in a bowl or jardiniere filled with water, with two or three inches of good garden soil at the bottom. The plants are sown in two to three inch high and rapidly assume a most pretty pink-like appearance, as shown in the illustration. The plants are surrounded by a whorl of umbrella-shaped leaves, of a waxy appearance. We will send a package of this interesting and beautiful culture, for only 15c or three packets for 40c postpaid.

Shoo Fly Plant

A very remarkable botanical curiosity you should have in your garden. It is said five will not remain in a room where it is grown. It has very bright blue flowers; blooms summer and winter. Grows rapidly from seed. Seeds 15c pkt., 3 for 40c.

Banana Musk Melon

Quite a curiosity. Looks and smells like a banana. The shape and its delicious flavor make it well worth your while cultivating. Flesh is deep and of exquisite flavor. Very rich in oil and contained in choice city markets, as such is a dollar sometimes being demanded for the same. Seeds 15c. 3 pkts. for 25c.

The Great Umbrella Palm

The Japanese Umbrella Palm is a semi-aquatic plant. It is easily grown from seed either in a bowl of water or in a very damp soil. Probably the most unusual, and most interesting method is to cultivate the plant in a bowl or jardiniere filled with water, with two or three inches of good garden soil at the bottom. The plants are sown in two to three inch high and rapidly assume a most pretty pink-like appearance, as shown in the illustration. The plants are surrounded by a whorl of umbrella-shaped leaves, of a waxy appearance. We will send a package of this interesting and beautiful culture, for only 15c or three packets for 40c postpaid.

FAMOUS MEXICAN FIRELY PLANT

Beautiful hedge plant, grows 2 to 2 1/2 feet high and resembles a closely branched green. The globe-shaped flowers are very compact, and of a pleasing light green color. It is grown singly or in the form of a hedge or background. In early autumn the whole bush is covered with glowing light green buds, as in sometimes called selected Seeds, 10c

Butterfly's Own Bush

This plant is a beautiful refuge or haven for butterflies. It attracts all the most beautiful types of butterflies to the neighborhood. Seeds, 15c Packet, 3 for 40c. S.S.C.O.

Asparagus Sprengeri

The best plant for hanging baskets. Blossoms in a very pleasing manner. A very graceful and attractive plant. The foliage when cut for decorative purposes will last for weeks in water. The seed pods are very pretty red berries adding to its beauty. Packet, 25c, 3 pkts. for 65c postpaid.

CACTUS FROM SEED

Very curious, odd looking, strange species of plants; will grow in any soil or climate. A very little of care. Flowers are of a very beautiful and delightful fragrance. You will be surprised at the odd looks of the Cacti just sprouting. Packet, 10c. 3 packets for 25c. S.S.C.O.

TREE OF HEAVEN

This splendid ornamental tree is a native of China and is called the Tree of Heaven on account of its beautiful beauty. Very hardy, thrives in any soil, grows in poor soil, and grows from 10 to 100 feet high. From seed the first appearance of the tree are from 3 to 6 feet in any length giving it a grand appearance. Nothing out of the ordinary. Fine for other purposes. Large panicles of bloom, followed in season by great clusters of colored seed pods, make the tree a thing of beauty. Packet, 15c; 3 packets 40c

FERN SEED

Ferns can be grown from seed. Try growing these beautiful plants for indoor or outdoor. Choice mixed varieties. Packet 10c. 3 for 25c.

Chinese Cabbage

Novelty from China and should be grown in every garden. It can be crossed between Celery and Cos Lettuce. Flavor is more mild than any other cabbage. Can be served on the table and eaten raw or cooked like cabbage, spinach or lettuce or made into salad. Grows very rapidly, easy to cultivate. You can cross between them by cultivating this remarkable novelty. Seeds, 15c packet, 3 pkts. for 40c.

SURPRISE FLOWER GARDEN

Over Hundred Varieties of Mixed Flower Seeds
MANY RARE AND CURIOUS NOVELTIES
An Abundance of Flowers Assured Throughout the Season
A mixture of easily grown annuals that bloom very soon after sowing and a few of the most beautiful and interesting flowers that require the constant care necessary for finely arranged flower beds will give you the most pleasure and enjoyment. Many of the plants may be taken inside as house plants and will bloom during the winter. Fine for other purposes. Packet, 15c. 3 packets for 40c. Postpaid. J. S. & Co.

SURPRISE FLOWER GARDEN

Over Hundred Varieties of Mixed Flower Seeds
MANY RARE AND CURIOUS NOVELTIES
An Abundance of Flowers Assured Throughout the Season
A mixture of easily grown annuals that bloom very soon after sowing and a few of the most beautiful and interesting flowers that require the constant care necessary for finely arranged flower beds will give you the most pleasure and enjoyment. Many of the plants may be taken inside as house plants and will bloom during the winter. Fine for other purposes. Packet, 15c. 3 packets for 40c. Postpaid. J. S. & Co.

WHOOPEE CUSHION

Whoopee Cushion! Is made of rubber, inflated like a balloon, and then placed on a chair, couch, seat, etc. When the victim unsuspectingly sits upon the cushion, it gives forth noises that can be better imagined than described. Price 25c.



LEARN TO VAMP



Would you like to play the piano or organ without going through the drudgery of learning the scales and keys and without tedious practice? The Vamping Tute is a greatly simplified method, which, after a little practice, enables you to play the accompaniment to any song or song writer in any "time" or in any "key." No knowledge of music necessary. Once you have mastered the system, you will be able to play the accompaniment to songs, ballads, waltzes, the latest hits, etc., entirely by ear without any music. Price 12 cents postpaid.

FRENCH PHOTO RING 25c

A handsome ring, finished in imitation platinum, and set with a large imitation diamond in the shape of the ring is a very microscopic picture almost invisible to the naked eye, yet magnifiable to an almost incredible degree. Pictures of bathing girl beauties, French actresses, views of France, Panama Canal, others show the hard's Prayer, every word legible. Only 25c postpaid.



HOME BREWED WINES & BEERS

Over 100 simple recipes for making all kinds of good, wholesome wines, ports, champagnes, brandies, gin, rum, cordials and simple liquors, fruit syrups, etc. Only 10 cents postpaid.



SNAPPY JOKES

A big collection of rich and rare jokes by a jolly bartender for stag parties, smokers, etc. Good clean humor—not a bit vulgar in the whole book. Don't be a clam in company. Get a copy before your friend does. Costs but a dime, but contains a dollar's worth of fun. Hundreds of jokes in one book. Price 10 cents postpaid. RED HOT JOKE BOOK, 10c postpaid. Catalog 10c.



250 Magic Tricks

An excellent little book containing 250 Parlor Tricks, tricks with cards, coins, handkerchiefs, eggs, rings, glasses, etc. So simple that a child can perform them. Profusely illustrated. Entertaining and amuses everybody. Price postpaid 10c.



MERRY WIDOW HANKY

A perfect model of the most necessary lingerie garment worn by ladies, which, when folded and worn in the pocket, has the appearance of being a gentleman's handkerchief. A clever, funny joke. Price 15 cents postpaid.

DANCING SKELETON

A jointed figure of a skeleton 14 in. in height, will dance to music and perform various gyrations and movements while the operator may be some distance from it. It will lie down, stand up, dance, etc. We send full and complete instructions. Price 10 cents. 3 for 25 cents postpaid.

TOY MAKER 10c

Greatest boys' book written. How to make a Camera, Canoe, model Railroad, Telephone, Hooversong, Telephone, Water Wheel, Paddle Boat, Skis, Dog sled, etc. 150 illustrations. Price 10c.

JOHNSON SMITH

125 TRICKS WITH CARDS



Containing all the tricks and deceptions with cards ever invented, including the latest Trick of the most celebrated Conjurers, Magician and Prestidigitators popularly explained, simplified and adapted for home amusement and social entertainments. The whole so explained that any one can, with a little practice, perform the most difficult feat, to his own satisfaction and to the wonder and admiration of his friends. There is also added a Complete Exposure of all the Card Tricks made use of by Professional Card Players and Gamblers. Shows how "skin" Gamblers cheat and win money by their infernal "palm fling," and other tricks. These features make it the best work ever published on Card Tricks.

No. 1174. 125 TRICKS WITH CARDS... 25c

TRICKS AND SOCIAL ENTERTAINER

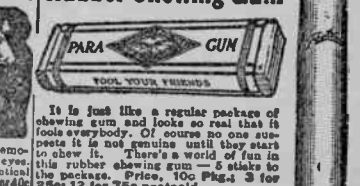


Cleverly performed feats of conjuring, sleight-of-hand and illusion interest everybody, and ability of the kind always makes one a welcome guest. This is a book of 96 pages, with nearly 100 illustrations. The instructions for parties are so plainly given that even a child, with a little practice, can do them, as they only require SIMPLE APPARATUS. The book gives full and clear explanation of an unusually large number of clever tricks of all kinds, and a glance at the partial contents given below will give you a very good idea as to the comprehensive nature of this book. In addition there is a chapter on "SECOND SIGHT," a combination of five different methods which baffles the most astute investigators. The book is well worth the while even for those who merely wish to know how the tricks are done, while for the amateur magician it is a perfect treasury of golden opportunities.

No. 1163. Tricks and Social Entertainer... 25c

INVISIBLE INK / Rubber Chewing Gum

The most confidential message can be written with this ink, for the writing makes no mark. Cannot be seen unless you know the secret. Invaluable for many reasons. Keep your postal and other private memorandums away from prying eyes. Great fun for playing practical jokes. Only 15c a bottle; 3 for 40c.



It is just like a regular package of chewing gum and looks so real that it fools everybody. Of course no one suspects it is not genuine until they start to chew it. There's a world of fun in this rubber chewing gum — 5 sticks to the package. Price, 10c Pkg. 3 for 25c; 12 for 75c postpaid.

Rubber Tacks, Box 10c; Rubber Cigarettes, Price per Box, 20c
Rubber Cigars, Price Ea. 10c; Rubber Matches, Price per Pkg. 10c

Microphone Transmitter Button



You can easily make a highly sensitive detetophonos by using this Transmitter Button to collect the sound waves. You can build your own outfit without buying expensive equipment. It is simple and inexpensive. You can install an outfit in your home and hear conversations being held all over the house. You can connect up different rooms of a hotel. This outfit was used by secret service operatives during the war. It is being used by the military in hundreds of places and is the greatest invention in micro-phones. You can mount the button almost anywhere—card board boxes, stove pipes, and on the wall behind a picture frame, etc. The button is so light and small it cannot be detected. Person can be overheard without suspecting it. You can listen in on conversations in another room. A deaf person in the audience can hear the speaker. Connected to phonograph, piano or other musical instrument, music can be heard in hundreds of feet away. Button may be used to renew telephone transmitters; often makes an old line "talk-up" when nothing else will. Ideal for the radio user; carries other similar experiments along the lines of telephones, etc. Many fascinating stunts may be devised, such as holding the throat or chest to reproduce speech without sound waves. \$5.00 is given to anyone who sends in a good suggestion for the use of the Button providing the manufacturers find it suitable for use in their literature. PRICE \$1.00 POSTPAID ANYWHERE.

current and is extremely sensitive. Amplifies radio signals. Countless other similar uses will suggest themselves. Experimenters find the Button useful for hundreds of experiments along the lines of telephones, amplifiers, loud speakers, etc. Many fascinating stunts may be devised, such as holding the throat or chest to reproduce speech without sound waves. \$5.00 is given to anyone who sends in a good suggestion for the use of the Button providing the manufacturers find it suitable for use in their literature. PRICE \$1.00 POSTPAID ANYWHERE.

No. 2472. Microphone Transmitter Button \$1.00

JOHNSON SMITH & CO., DETROIT, MICHIGAN

PHOTOGRAPHY For Beginners

No other hobby presents so much permanent pleasure as photography. Quite apart from the stimulating pastime in itself this many-sided art offers undreamed of possibilities of application. Whatever aims or objects you have in view, you will always be able to obtain full gratification. Do you want snapshots to remind you of your travels and excursions? If so, let the camera be your companion, and your pictures will be a constant source of pleasant reminiscences to a much greater degree than bought pictures ever could be. Photography is not a very difficult art. It is a simple matter to produce good pictures, and if you will adhere to the methods recommended in this book, you will have no reason to fear that your photographs will be spoiled by failures. Here is a brief summary of the book: How a photograph is made—How a camera works—Making an exposure—Work in the dark room—Developing the negative—Printing the positive—Photography indoors—Outdoor photography—Instantaneous action picture—Home portraiture. Numerous illustrations.



No. 1651. Photography for Beginners 10c

PHOTOGRAPHY Self-Taught

One of the best books for a amateur photographers published. Contains over 150 pages—16 chapters, with numerous illustrations. A complete handbook on photography from start to finish for the amateur and beginner. Everything is written in plain, simple language, and each subject is exhaustively dealt with from start to finish. Every division of this most fascinating art treated in a most thorough and pleasing manner.



No. 1650. Photography Self-taught 35c

HOW TO WRESTLE



This book will put you wise to all the tricks and wrinkles of attack and defense, which, if studied and practiced, will make you a first-class wrestler. With the knowledge contained in this book, a skilled but comparatively weak man can easily establish superiority over a far stronger but less scientific opponent. The book is written by an expert and contains the full instructions of a former champion wrestler. It tells how to trap a man immediately following your initial hold, explains various Holds, Throws, Swing-Overs, Grips, etc., including the Half Nelson, Grape Vine Hold, Head and Crotch Throw, Chancery and Swing Over, Waist Hold, Arm Hold and Back Heel, Crotch Hold, the "Hatch" or Head Throw, the Double Bridge, Cradle Hold, the Buttock and Counter, Foot, Head, Ground and Shoulder Holds, Escapes, Clever Counters, Jiu Jitsu Throw, Various Grips, etc. The book is complete in every respect, contains nearly fifty illustrations, and is written in plain, everyday language that anyone can easily understand. The information given in this book is easily worth ten times the small sum asked.

No. 1267. How to Wrestle. Price 25c

Our Book Of FORBIDDEN KNOWLEDGE

At last here is a book freely revealing many of the Hidden Secrets of the Ancients. This book has been compiled from various rare and secret books, and contains much valuable information. Here is a brief description of the contents: **BLACK MAGIC REVEALED**—Secret method of mesmerism and hypnotism—How to make others think of you and love you—How to charm those whom you meet and love—Electrical psychology—How to perform the Davenport Brothers Spirit Mystery—How to be a spirit medium. **SUPERSTITIONS**—Color superstitions—Lucky and unlucky days—List of fortunate hours—Lucky dreams, etc. **CHARMS, SIGNS AND OMENS**—Talismans, charms, spells and incantations to overcome evil influence—The black cat—Metagrammatism or how to tell fortunes by the transposition of names—The silent language—How to write love letters secretly—How to get rich and live happily married, and much additional information.



No. 1643. Forbidden Knowledge.. 10c

GUIDE TO HORSE OWNERS

This book contains just about everything about a horse worth knowing. Written by a noted veterinary surgeon of great experience. Tells the kind of horse to buy; how to manage horses; break and train horses; shoe a horse; cure all kinds of horse diseases. The very best advice on buying, breeding, rearing, training, shoeing, taming, feeding, breaking and doctoring horses. Tells how to make a horse lie down; how to catch a wild horse; teach a horse to pace; to make a horse stand, sit on his haunches, come down to mount, follow you, make him stand still without hitching, to prevent him from running away; how to tell age of a horse, etc.

No. 1355 Guide to Horse Owners 25c

MONEY MAKING SECRETS

Contains dozens of plans, ideas and money-making opportunities for everybody. Enterprising, ambitious men and women, boys and girls will find scores of dollar-making ideas that can be turned into cash right in your own home in your spare time. Every plan thoroughly practical and has actually been successfully worked. Little or no capital required with many; with a little effort, can be made to yield big profits. Tells how to raise pigeons for profit. Many formulas and trade recipes given and instructions to make many useful household articles, etc. Also tells how to build a practical radio, materials for which can be bought for a few cents.



No. 1253. Star Money Maker..... 10c

10c CHEAP AND POPULAR BOOKS 10c

EACH BOOK CONTAINS 64 PAGES
COVER IN THREE OR MORE COLORS



FORTUNE TELLING BY CARDS
Simple methods for telling fortunes by means of playing cards, past, present and future. No. 1936. PRICE 10c



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A choice collection of automobile jokes, witty sayings, etc. No. 1940. PRICE 10c



COON JOKES
A select collection of coon jokes and witty sayings, comic stories, speeches. No. 1944. PRICE 10c



Smart Set Jokes
A selection of original classical jokes, laughable stories, witty sayings, etc. No. 1948. PRICE 10c



Complete Letter Writer
A complete essay on letter writing, also a course of interesting letters on business, love, courtship and marriage. No. 1937. PRICE 10c



Sparring and Boxing
The science of self-defense easily learned without a master by a professional boxer. No. 1941. PRICE 10c



Good Time Jokes
Containing all the latest and most popular jokes, funny stories, etc. No. 1945. PRICE 10c



YOU-TEL-EM FUNNY SAYINGS
A collection of "You-tell-Em" funny sayings that were all the craze in America. No. 1950. PRICE 10c



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Original letters of friendship, courtship, marriage, etc., with instructions how to write with elegance and ease. No. 1938. PRICE 10c



How to Play Checkers
This up-to-date work contains full instructions for students as well as valuable information for experienced players. Illustrated. No. 1942. PRICE 10c



PRIZE JOKES
Containing a selection of all prize jokes, collected from all sources. No. 1946. PRICE 10c



Speeches & Toasts
A good selection of speeches and toasts for all occasions, and how to prepare and deliver them. No. 1954. PRICE 10c



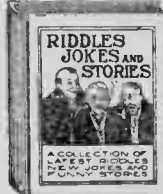
Business Letter Writer
Commercial correspondence, letters of credit agreements, drafts, laws and maxims for business men, etc. No. 1939. PRICE 10c



HOW TO PLAY CHESS
A complete guide to the game of chess, containing valuable information for students and professionals alike. No. 1943. PRICE 10c

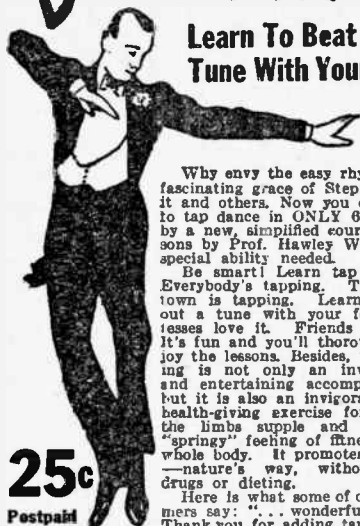


SNAPPY JOKES
A collection of rich and rare jokes, compiled by a jolly bartender for stag parties, smokers, etc. No. 1947. PRICE 10c



Riddles, Jokes & Stories
A splendid collection of the latest riddles and conundrums, new jokes and excruciatingly funny stories. No. 1955. PRICE 10c

TAP DANCING



Learn To Beat Out A Tune With Your Feet It's Easy

Why envy the easy rhythm and fascinating grace of Step'n Fetch-it and others. Now you can learn to tap dance in ONLY 6 HOURS by a new, simplified course of lessons by Prof. Hawley Wilson. No special ability needed.

Be smart! Learn tap dancing. Everybody's tapping. The whole town is tapping. Learn to beat out a tune with your feet. Hostesses love it. Friends adore it. It's fun and you'll thoroughly enjoy the lessons. Besides, tap dancing is not only an invigorating and entertaining accomplishment, but it is also an invigorating and health-giving exercise for making the limbs supple and giving a "springy" feeling of fitness to the whole body. It promotes slimmness—nature's way, without pills, drugs or dieting.

25c

Postpaid

Here is what some of our customers say: "... wonderful benefit. Thank you for adding tap dancing to my accomplishments." And another: "My friends were amazed. I dare not recommend your course for fear of competition."

No. 1304. Tap Dancing. Price... **25c**

Art Of Dancing

LEARN THE CARLO, CONTINENTAL, RHUMBA, KISS DANCE, ETC.

LEARN TO DANCE THE LATEST STEPS. Be popular this season. Really good dancers are always admired—always popular guests. Partners welcome them eagerly. With the aid of this book you can learn the newest, smartest steps without a teacher and become a dancer who is sought after.

After following the instructions in this new book you won't need to make excuses when the dance music starts. Besides, you'll get lots of fun out of parties and dances. If you want to become a perfect dancer, learn to dance at home this new, easy way.

WHAT THE BOOK TELLS:

How to develop poise and control, how to improve your dance steps, the art of holding, how to walk to music, how to lead, how to do the latest Fox Trot Steps, Natural and Reverse Turns, the Reverse Wave and Change of Direction Steps, the Quickstep, awaying to music, how to Waltz, Backward Changes, how to do the Continental, the famous Kiss dance, the Manhattan Dance, the College Rhumba, the Carlo, the Charleston, etc., etc. 16 chapters, nearly 100 illustrations are given; everything is made so plain that you'll be dancing before you know it.

100 ILLUSTRATIONS
16 CHAPTERS



No. 1301. Art of Dancing. Price **25c**

HOW TO DANCE

This book is intended to teach the art of dancing to those unable to avail themselves of the services of a professional teacher. The author has made this book so simple and plain that any person of ordinary intelligence can understand it and learn how to become a first-rate dancer without the aid of a teacher. The Primary Positions of the feet are carefully illustrated and explained; this is absolutely essential in order to learn correctly as it gives the key, and is the starting point for all the rest. Explanations and diagrams of all movements in "ROUND" and "SQUARE" dances and MARCHES, also the MODERN DANCES, including FOX TROTS, TANGOS, ONE STEP, COLLEGIATE STEP, etc., etc. The book contains a few words on the etiquette of the ballroom, which should be read by all, as it tells how to hold your partner, how to ask a lady to dance, conversations, calls, etc. SQUARE DANCES—The March, Quadrille, Movements, The Plain Quadrille, Fancy Quadrilles, The Jig, Gavotte, Minuet, The Sociable, The Star, The Basket, The Surprise Quadrille, The Lancers, The Royal Lancers, The Caledonians, The Prince Imperial, Waltz Quadrilles, The Glide Lancers, The Virginia Reel, Pop Goes the Weasel, The Glide Caledonians; ROUND DANCES, Old and Modern Waltzes, The New Society Waltz, The Redowa, "The Raquet" or "Knickerbocker," The Polka, Polka Mazurka, Polka Redowa, Bohemian Polka, The Schottische, The Gallop, The German, The Maze, Two Step, Three Step; MODERN DANCES, Tango, Fox-Trot, etc. It gives the Figures of the GERMAN The Maze, The Cheated Gentleman, The Mysterious Hands, The Auction, The Rope, Blind Man's Bluff, The Handkerchief Chase, The Serpent, The Two Lines, Puss in the Corner, Knot, Arpent, Baskets' Grand Chain, Jerusalem, etc.

25 CENTS



No. 1302. How to Dance. Price... **25c**

CLOG-DANCING

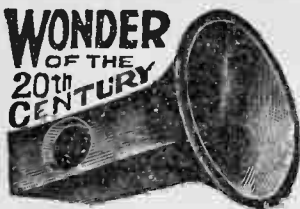


The elements and practice of this art, so popular on the minstrel and vaudeville stage, are simplified and fully explained in this book, showing the steps and figures, giving examples, explanations of the terms used, and all information necessary for becoming a thorough and graceful dancer. The book also contains appropriate music for different styles of dances, also song- and dance sketches with music. It is well printed and bound in a colored cover.

No. 1303. Clog Dancing Made Easy **15c**

Seebackroscope

WONDER
OF THE
20th
CENTURY



**AN OPTICAL
CURIOSITY**

See what is
going on be-
hind you.



With the See-Back-Roscope you can see behind without turning your head. It is like having **EYES IN THE BACK OF YOUR HEAD**, and when people do not know you are looking, you see some interesting sights sometimes. The instrument is made of hard rubber and is placed over the eye in much the same way as the magnifying glasses used by jewelers and watch repairers. Persons are often anxious to see who is following them without attracting attention by turning around, and this instrument does the work for you. If you fear your best girl is flirting with the other fellow, place the Seebackroscope to your eye when she thinks you are not looking. **PRICE 15 CENTS**

DAISY WATER PISTOL

25c
Post-
paid



The Daisy 6 Shot Repeating Water Pistol is the very latest design in Water Guns, patterned after the latest type of Police revolvers. It is made from steel, with blued finish. Very simple to load and discharge. No rubber bulb to get out of order. Great sport for boys and girls, as it throws a fine stream of water a distance of 25 feet. When diluted ammonia is used, it makes a very effective weapon against vicious men and animals. Measures 7 inches in length, and weighs over 6 ounces. **PRICE 25 CENTS POSTPAID.**

SEX INDICATOR

FEMALE



MALE



An amusing
and entertain-
ing novelty.

Hold it over a woman's hand and it is supposed to describe a complete and continuous circle. Hold it over a man's hand and watch it move back and forth like a pendulum. We have made innumerable tests, and while we have never been able to figure out how it's done, we have never seen it fail. Many novel and interesting experiments may be performed with it. Try it for testing the sex of animals, cats, dogs, rabbits, butterflies, etc. Sold as a patent egg tester in Europe. **PRICE, 10c each, 3 for 25c.**

Big novelty catalog 10c. Stamps accepted.

Old Secrets and New Discoveries

"THE TREASURE CASKET OF MYSTERIES"

Containing information of rare value for all classes, in all conditions of society. The following is a summary of its contents:



IT TELLS all about Electrical Psychology, showing how to hypnotize any person, and make him, while under the influence, do anything you may wish him to do, no matter how ridiculous it may be, for he cannot help doing it.

IT TELLS how to Mesmerize. Knowing this you can place any person in a mesmeric sleep, and then be able to do with him as you will. This secret has been sold over and over again for \$10.

IT TELLS how to make a person at a distance think of you—something that all lovers should know.

IT TELLS how to charm those you meet and make them love you, whether they will or not.

IT TELLS how spiritualists and others can make writing appear on the arm in blood characters, as performed by Foster and all the noted magicians.

IT TELLS how to plate and gild without a battery; how to make a clock for 25 cents; how to banish and prevent mosquitoes from biting; how to make cologne water; artificial honey; how to make large noses small; to cure drunkenness; to copy letters without a press; to obtain fresh-blown flowers in Winter; how to make a quart of ink for a dime; how to make different kinds of soap, ink, cements, polishes, glues, perfumery, face paints, etc.; how to make different kinds of candy.

IT TELLS how to make a horse appear as though he were badly foundered; to make a horse temporarily lame; how to make him stand by his food and not eat it; how to cure a horse from crib or sucking wind; how to make a young countenance on a horse; how to cover up the heaves; how to make him appear as if he had the glanders; how to make a true-pulling horse balk; how to nerve a horse that is lame, etc. These horse secrets are being continually sold at \$1 each.

IT TELLS how to make the eggs of Pharaoh's serpents, from which, when lighted, though but the size of a pea, there issues a coiling, hissing serpent, wonderful in length and similar to a genuine serpent.

The book contains all the above and dozens of other valuable secrets. **PRICE ONLY 10 CENTS POSTPAID.** An enlarged edition of the same book is also published, containing 164 pages of secrets and golden money-making opportunities for everybody. **PRICE 35 CENTS, POSTPAID.**

Send orders for goods described herein to **JOHNSON SMITH & CO., DETROIT, MICH.**

6-7th BOOKS OF MOSES

FORTUNE TELLING CARDS



This rare and remarkable book, translated word for word into the English language, is now obtainable in a popular edition. It contains exact copies of over a hundred seals, signs, emblems, etc., said to have been used by Moses, Aaron, the Israelites, Egyptians, etc., in their astonishing magical and other arts, including the period of time covered by the Old and New Testaments. This wonderful translation is of great importance to the Christian, Deist, Jew or Gentile, Episcopalian or Roman Catholic, and dissenters of every denomination. The extracts from the old and rare Mosaic Books of the Talmud and Cabala are invaluable. The book deals at great length with the well known magic of the Israelites, and concludes with a chapter dealing with Astrological influence upon man and the magical cures of the Old Hebrews from Dr. Gideon Brechee's work, "The Transcendental, Magic and Magical Healing Art in the Talmud." The numerous engravings contained in the book are said to be exact copies of those used by the Israelites and Egyptians to accomplish the designs for good or evil. The book contains nearly 200 pages and is sold by us at **HALF THE PUBLISHED PRICE, or 50 CENTS POSTPAID.** Also obtainable with cloth binding for \$1.00 POSTPAID.



Each card is illustrated with pictures, signs and symbols of prophecies foretelling the different events of life, and every one will find them adapted to his or her particular case. With these wonderful cards in your possession you can completely mystify and amaze your friends. They will be so astonished at your cleverness that they will think you are in league with some secret power. Fortune telling in some form or another has existed from time immemorial. Mme. Le Normand, the celebrated Sybil, has left us with a very favorable opinion of her rare talent, and we believe we render a service to the admirers of her system by publishing the cards which were found among her effects after her death. With these cards she prophesied to Emperor Napoleon I his future greatness, and foretold the misfortunes and downfall of many princes and great men of France.

No. 3621. Fortune Telling Cards... 35c

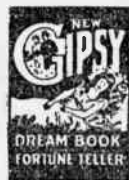
LEARN to be a DETECTIVE



This book of 100 pages tells how. Written by an expert detective, formerly a Pinkerton chief of staff. Contains full information and how to become an adept detective. Gives the necessary requisites, tells all about shadows and shadowing, "piping," "roping," secret and open investigations, deductions, the sweat box, extraditions and requisitions, rewards, etc.

No. 1368. Book On Detective Work... 25c

Tell Your Own Fortune



With the aid of this dream book and fortune-teller. The key to your future. Will you be lucky in love? Successful in business? Will you be wealthy? Complete with dictionary of dreams with descriptions and correct interpretations, with lucky numbers, fortunate days, oracles, divination, palmistry, etc. Also tells how to tell fortunes by various methods, by grounds of coffee or tea, by dominoes, by marks, scars or moles, miscellaneous games with cards, lucky days, weeks, months, years; how to receive oracles by dreams, finger nail observations, etc.

No. 1769. Gypsy Fortune Teller... 10c

The 5-Minute Harmonica Course

A New Easy Self-Teaching Method

The Harmonica, when well played upon, is an instrument that furnishes splendid entertainment and amusement at parties, school, college, etc., and is popular with everyone. Public Schools, Boy Scout Organizations, Y. M. C. A. Clubs, Sunday School and other church organizations are now organizing Harmonica Orchestras. If you want to learn to play the Harmonica quickly, easily and correctly, here is a simplified Self-Teacher that you have been waiting for. Explains how to hold the Harmonica—How to stand when playing—Manner of playing when seated—How to place the Harmonica in the Mouth—How to play the notes of the scale—How to use the tongue—How to produce the Tremolo—How to obtain a rich, mellow tone, etc. In addition a number of well known popular tunes are given with notes correctly numbered so that anyone can play them. Everything is explained and illustrated in the most simple manner, so that the Harmonica can be mastered in 5 minutes if the directions are followed.



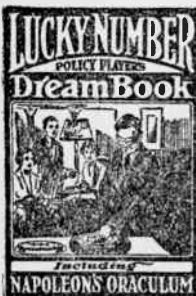
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How to LOVE and be LOVED

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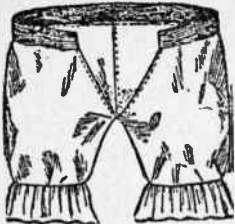
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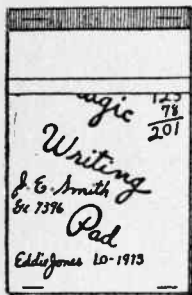
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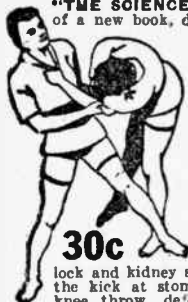
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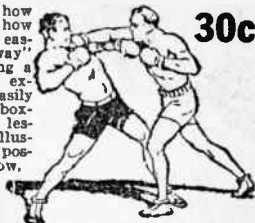
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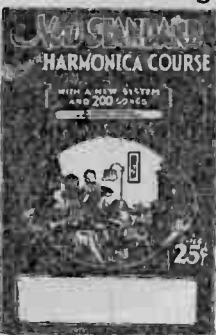
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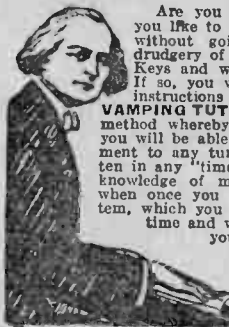
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Are you fond of music? Would you like to play the piano or organ without going through the usual drudgery of learning the Scales and Keys and without tedious practice? If so, you will be interested in the instructions contained in our **VAMPING TUTOR**, a greatly simplified method whereby, after a little practice, you will be able to play the accompaniment to any tune or to any song written in any "time" or in any "key." No knowledge of music is necessary, and when once you have mastered the system, which you can do in a very short time and with very little practice, you will be able to play the accompaniment to songs, ballads, waltzes, the latest hits, etc., entirely by ear and without any music. Everything is explained in simple language in this new book.

No. 1209. Vamping Tutor. Price. . . **12c**

PIANO VAMPING CARD

We can also supply a **PIANO VAMPING BOARD** which will be of great assistance to you in mastering this method. The Vamping Board is placed over the keyboard of the piano, and it is then a simple matter to strike the correct chords by means of a unique color system. It is so simple a child can understand it.

No. 1210. PIANO VAMPING BOARD. . . **15c**

Two New Snappy Books

"**SKETCHES OF NAUGHTY LADIES**" and "**WILD WOMEN OF BROADWAY**" are the titles of two snappy new books just published. Rich, rare and snappy books. **PRICE ONLY 10 CENTS EACH POSTPAID.** Send two dimes and get both.

TALK · SING · PLAY



RADIO-MIKE



A RIOT of FUN

Put on your own broadcast with this RADIO MIKE, the most entertaining radio device yet produced. Sing, laugh, talk, crack jokes from another room and your radio will produce every sound as though you were miles away at a regular broadcasting station.

Lots of Fun at Parties

Imitate the big radio stars and crooners. Do a "Ben Bernie" or "Rudy Vallee." No end of pleasure for grown-ups or kiddies. Excellent training in elocution or broadcast announcing—or for "Amateur Hour" practice! Special cut-out button allows you to switch from home broadcasting to regular radio reception in an instant. Can not injure the radio in any way. Made of handsome black metal with long cord. Can be attached to your radio in about a minute's time.

No. 6595. RADIO MIKE. Price. **75c**

TALK-SING-PLAY thru your own radio

A simplified form of the Radio Mike. Low in price, yet functions quite satisfactorily. Can be used on AC or DC radios. Broadcast your voice on programs coming through your radio, inject wise cracks and jokes, josh and mystify your friends. Put on your own programs at home, parties, club affairs. Barrels of fun. Easy to operate. Complete ready to hook up to your radio. Size 2 1/2 x 3 inches.

No. 6522. WORLD RADIO MIKE. **25c**

MAGIC RADIO WAND

The Magic Radio Wand, or Baton, is the latest radio novelty. With it you can imitate your favorite orchestra, inject rhythm into any music (even classical), etc. Helps you learn musical expressions such as "beats," "rhythm," "gliding," etc. If you play any musical instrument, if you do any dancing or tap dancing, if you like to compose pieces or to learn about orchestration, let this baton help you!

The baton may also be used to produce many novel stunts on your radio. "Radio Wentriloquism" is but one of them. To operate the wand, it is simply necessary to connect it to your radio, in accordance with the instructions (without tools), turn on your radio, and it is all set for action! You control everything that comes out of the radio, the rhythm, tempo, etc., just as though you are the BAND LEADER. More fun than a "Mike." The baton itself is about 12 inches long, complete, fitted with cord for radio connection, with full printed instructions for performing many amusing and educational stunts.

No. B598. MAGIC RADIO WAND... **25c**

GET THRILLING POLICE CALLS



ON YOUR PRESENT RADIO. New Marvel Police Adapter brings them in clearly on your old set. Simple attachment provides reception you have never had before. Quickly attached to any set. Full directions enclosed. Takes less than 5 minutes to connect. No tools! No drilling! No soldering!

GET POLICE, AMATEUR, SHORT WAVE CALLS. You can get them with the new Marvel Police Adapter.

No. B597. RADIO POLICE ADAPTER.. **75c**

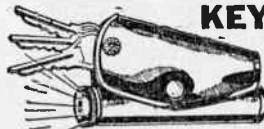
Jewel-Lite Flashlight



A small one-cell flashlight, with cat's eye bulb, that allows a bright beam of light to penetrate the darkness. Ideal for carrying in purse, vest pocket, etc. Will light the way in any emergency. Moulded headpiece and nickel-plated brass case. 3 inches in length, 5-8 inches in diameter.

No. 2571. JEWEL-LITE, COMPLETE **30c**
WITH BATTERY AND BULB.....
No. 2570. EXTRA BATTERIES, Each.....**6c**

KEY-LIGHT



Combination Key Case and Flashlight. Small, one cell flashlight bound right with key case. Holds

4 keys. Compact. Complete with battery and bulb. 2 1/2 x 3 inches.

No. 2569. KEY-LITE. Price Complete.... **35c**
No. 2570. Extra Battery, Each.....**6c**



WEIRD MYSTO LUCKY RINGS

LUCKY SHEIK RING

Why not have Good Luck in Love—the greatest thing in the world. The Sheik, the world's most famous lover, the outstanding hero of gorgeous Arabian Nights, conquers love. Amazing stories are being told of good luck in love by prominent wearers. Get this Arabian Sheik Ring of unique design and unusual beauty. Green gold finish, serpents set with Lucky Mysto Imitation Ruby and Emerald.



No. 8243. PRICE POSTPAID..... **25c**

KING TUT LUCKY RING



This ring of Egyptian ancient art design is said to ward off evil spirits, sickness, spells, etc., and, according to Ancient Belief, to bring Success to the wearer in love, business, games, and All Undertakings.

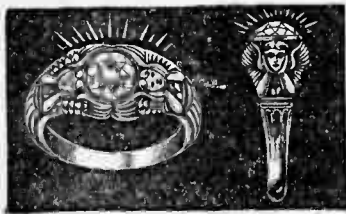
Do you DESIRE LOVE? MARRIAGE? CHILDREN? MONEY? POWER? LIFE? LUCK? Have you enemies? Then wear this Ring—A beautiful reproduction of the ring used by the mighty Pharaoh-Tutankhamen, whose 3300 year treasure tomb has recently been opened. Made of green gold, antique finish.
No. 8239. PRICE POSTPAID... **25c**

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Very uncommon, unique. Silverine finish, with two brilliant flashing gems sparkling out of the eyes. One of the most popular Good Luck Rings we sell. Said to bring Good Luck to the wearer. Wear this ring and be lucky in love, business, etc. Its unique design also makes it popular as an emblem for members of clubs, classes, secret societies, etc.
No. 8234. PRICE Postpaid..... **25c**

Cleopatra Lucky Ring



Whether you believe in Luck or not, Luck is an element that enters into every undertaking. No matter how much we decry it Luck prevails and plays an important part in the lives of everybody. Julius Rosenwald, former head of the great Sears-Roebuck Corporation, once said: "Success is 5 per cent ability and 95 per cent Luck." So why not wear this mystic symbol of good luck? Be lucky in love, business and health. Many believe it wards off evil spirits, sickness and misfortune. It may be merely imagination, but what difference does that make if you get the benefit? Thousands have said it brought them success. The ring itself is quite unique and novel in appearance; platinum finish. It is fitted with a large imitation, sparkling diamond. Many say they cannot tell it from a genuine diamond.
No. 8241. PRICE POSTPAID, Only.... **25c**

EGYPTIAN LUCKY RING



or SACRED SCARAB RING. Fame, Fortune, Happiness, Success in Love and Business, are said by many men and women to have come to them with this LUCKY RING. Sterling silver finish.
No. 8242. POSTPAID **25c**

CRUCIFIX RING



The ring was first made during the 15th century by a Spanish Goldsmith and won immediate favor. It was valued highly, and was handed down from father to son. Its fame has increased during the centuries and it is today the most sought after and treasured guard ring. This beautiful ring is a masterpiece of the jeweler's art. Lovely satin oxidized finish. Guaranteed for 10 years. No. 8282. PRICE POSTPAID..... **25c**

COROZO RING

The Black Beauty of the Tropics.



handmade in PUERTO RICO

The Lucky Corozo Nut Ring

The Corozo Nut Ring is a very unique souvenir from tropical Porto Rico, America's island possession in the West Indies. The Corozo Ring is made from the nut of the well known Corozo palm, which grows in certain tropical countries. The nuts, which are quite hard, are gathered by the natives. They are carved out by hand into the shape of a ring by skillful workmen, and an imitation pearl heart is inserted, as shown in the illustration. The ring is finally polished, until it has a beautiful, permanent, walnut appearance. Being quite hard, the ring for all practical purposes is almost unbreakable. In Porto Rico the Corozo Ring is considered lucky as well as sacred among lovers and takes the place of an engagement ring. If you want something unusual as well as very beautiful in a ring, send for one of these lucky Porto Rican Corozo Nut Heart Rings.

No. 8238. Lucky Corozo Nut Ring **50c**

COMICAL MOTTO RINGS

Each ring has a different motto, as illustrated. Made in platoid finish (to resemble platinum), with wording on enameloid. 25c each. Order by number.



8327 25c



8328 25c



8329 25c



8330 25c



8331 25c



8332 25c

JOHNSON SMITH & CO., DETROIT, MICHIGAN

World Radio History

ELECTRIC HAIR WEAVER

Only \$1 **2.00**

POSTPAID

GIVES NATURAL WAVE IN 20 MINUTES AT HOME

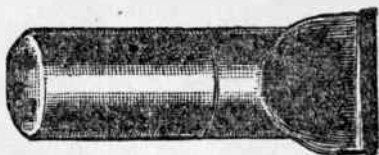


At last! Wave your hair at home with Safe-Kurl, amazing new Electric Hair Weaver! Takes only 20 minutes to give yourself any type wave, and dry your hair. SAFE, gentle heat puts in soft, natural, beautiful, permanent-type curls, waves, ringlets, rolls that last. No more high beauty-shop bills. No more tedious, uncomfortable "overnight" curlers and crimpers. Safe-Kurl gives you professional wave quickly, easily, safely—by electricity.

GUARANTEED BY 12-YEAR-OLD ELECTRICAL FIRM. Plugs into any light socket. Uses any ordinary household current, AC or DC, or home light plant current. Will last lifetime. Made of finest materials. Customer writes: "Safe-Kurl saves me money and keeps my hair waved perfectly. Takes only a few minutes to use." Nothing else to buy. Complete directions included. Satisfaction guaranteed or money back. Mail your order today.

No. 6803. Safe-Kurl Hair Waver **\$2.00**

DEVELINE WHISTLE



For an ear-splitting, soul-harrowing, nerve-shattering noise with which nothing in nature can compare, we recommend the Develine Whistle. If you wish your neighbors to rush for their shot guns, dogs to start for their cellars, cats to die of envy, and all living to start up in heart-broken protests, buy one of these and blow it. This is the **LOUD-EST, STRONGEST AND BEST** of the Develine type of whistle, and much bigger and superior to the cheaper grade of whistle usually sold. **15c**

No. 4499. Develine Whistle.

WORLD'S SMALLEST WIND INSTRUMENT



The world's smallest wind instrument. What is it? A flute? A piccolo? A harmonica? No, nothing else but a **BEAN!** And who can deny that is IS the smallest of wind instruments? A positive **WOW** in any parlor party. Carry it around in your pocket and show it to your friends.

No. 2039. PRICE POSTPAID. **15c**

BOYS! BOYS! BOYS! THROW YOUR VOICE



Into a trunk, under the bed, under a table, back of the door, into a desk at school, or anywhere. You get lots of fun fooling the teacher, policemen, peddlers, and surprise and fool all your friends besides.



The Ventrilo

is a little instrument that fits in the mouth out of sight. Cannot be detected. It is used in connection with the above, and with the aid of this wonderful **DOUBLE THROAT**, or **VENTRILLO**, you can imitate many kinds of birds, animals, etc. Remember you get everything for **ONLY TEN CENTS**—a booklet giving you full instructions how to become a ventriloquist and throw your voice, the **Double Throat**, the **Ventrilo**, and our big catalog of novelties, tricks, puzzles, masks, books, etc.

All Sent Postpaid to Any Address for Only **10c**

RESURRECTION PLANT

Great curiosity. Place in water; plant opens up and starts to grow in few minutes. Taken out it dries up and goes to sleep until put in water again.



PRICE 10c, 3 for 25c. 75c per dozen, postpaid.

U. S. BABY TANK

25 Cents



It goes with real Yankee Pep—by its own power

Most remarkable toy ever invented. By drawing the Tank backward, either with the hand or over the floor of table and then placing it down, it will crawl alone, overcoming all obstacles. In the same life-like manner as the larger Tank that proved so deadly in the great war. What makes it go is somewhat of a mystery, for there is no mechanism to wind up as is usually understood with mechanical toys, yet longer than the ordinary run of toys, 2 1/2 inches long. Price only 25c postpaid. Stamps accepted.

this tank will keep plodding along ten times longer than the ordinary stunted; 2 1/2 inches long. Price only 25c postpaid. Stamps accepted.

JOHNSON SMITH & CO.

MAGICIAN'S BOX OF TRICKS

Apparatus and Directions for a Number of Mysterious Tricks, Enough for a Number of Entire Evenings' Entertainment..... \$1.00

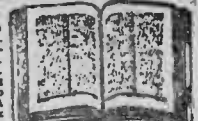
—ANYONE CAN DO THEM

It is great fun mystifying your friends. Get this Magician's Cabinet, and you will be the cleverest fellow in your district. It contains the apparatus for ten first-class tricks, including **THE MAGIC BALL AND VASE TRICK** (a wooden ball is placed inside, and upon replacing the lid has disappeared and is found in someone else's pocket); **THE HINDOO TRICK CARDS** (can be made to change completely no less than five times); **DISAPPEARING COIN BOX** (a coin, placed in the wooden box, vanishes entirely or changes into a coin of another denomination); **THE GLASS COBLET TRICK** (a coin is dropped into a glass of water and when the water is poured out the coin has vanished and is found somewhere else); **THE RIBBON FACTORY FROM THE MOUTH TRICK** (a seemingly endless supply of colored paper ribbons comes out of your mouth); **THE DISAPPEARING HANDKERCHIEF** (a handkerchief held in the hand mysteriously vanishes); **THE WIZARD'S RING COIN TRICK**; **ENCHANTED BOTTLE** (no one but yourself is able to make it lay down); **THE GREAT HAT AND DICE TRICK** (a large die is placed on top of a hat, disappears, and is found underneath yet no one has touched the hat), and last, but not least, the **GREAT PHANTOM CARD TRICK**, or two from five leave nothing. Full instructions are sent for performing each trick. In addition to the above, a number of other feats and illusions are fully explained for which you can easily make or procure the necessary apparatus. Price complete \$1.00 postpaid. JOHNSON SMITH & CO.



GREAT CURIOSITY

Smallest Bible in the World. Size of a post-age stamp. 200 Pages. Bound to bring good luck to the owner. A genuine work of art. Must be seen to be appreciated. Make good money selling them to friends, church acquaintances, etc. PRICE 15c each, 3 for 40c, 12 for \$1.35, 100 for \$7.00. Also obtainable in Leather Binding, with gold edges. Price 50c each, 3 for \$1.25, \$4.50 per doz. Magnifying Glass for use with Midget Bible 15c



SURPRISE MATCHES

More fun than fighting with your wife. Look just like ordinary matches. As the victim tries to light one he gets quite a surprise.



Price 10c per box, 3 boxes for 25c, 12 for 75 cents.

STAR TOY MAKER



Greatest boys' book written. Tells how to make a Pinhole Camera, a Cannon, a Model Railroad, a Telephone, Boomerang, Telegraph Instrument, Box Kite, Talking Machine, Microscope, Etc. etc. Motor, Electric Door Bell, Water Wheel, Paddle Raft, a pair of Skis, a Dog Sled, Bird House, Rabbit Yard, etc. 64 pages. 150 Illustrations. PRICE 10c.

BOYS' OWN TOYMAKER. A new book. Tells how to make chemical toys, electrical toys, galvanic toys, mechanical toys, paper toys, cardboard toys, boats, traps, etc. 200 illustrations. Price 25c postpaid.

AMATEUR ELECTRICIAN. all about electricity in simple language. How to make batteries, dynamo, motors, telephones, bells, electric ovens, engines, lights, etc. Price 10c postpaid.

MONEY MAKING SECRETS. Golden opportunities for everyone. 64 pages copyrighted book chock full of money-making ideas, recipes, formulas, wrinkles, trade secrets, etc. Business that can be started with little or no capital at home in spare time. 10c postpaid.

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125 CARD TRICKS and sleight of hand. Contains all the latest and best card tricks as performed by celebrated magicians with exposure of card tricks used by professional cardmen. Price 25c postpaid.

MAGIC FOR AMATEUR MAGICIAN. Conjurings with cards, coins, etc. step by step in mesmerism, chemistry, electricity, etc. 25c.

MELLER'S BOOK OF MAGIC. Magic and its mysteries. Numerous simple parlor tricks explained and illustrated. 100 pages. 25c.

TRICKS & SOULS ENTERTAINERS. Contains hundreds of simple tricks, illusions, diversions that anyone can do. Also explains secret of second sight. Price 25c postpaid.

83 OLD TIME SONGS. All old time favorites, sentimental, patriotic, sacred, etc., with words and full music. Price 25c postpaid.

WONDERFUL X-RAY TUBE

A wonderful little instrument producing optical illusions both surprising and startling. With it you can see what is apparently the bones of your finger, the lead in a lead pencil, the interior opening in a pipe stem, and many other similar illusions. Price 10c, 3 for 25c.

SERPENT'S EGGS

Box contains 12 eggs. When lit with a match, each one gradually hatches itself into a snake several feet long, with a pipe stem, and many other curls and twists about in a most life-like manner. Price per box, 10c postpaid, 3 for 25c



JOHNSON SMITH & CO.

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Our complete Catalog sent on receipt of 10c., or the De Luxe Cloth Bound Edition for 25c. Bigger and better than ever. Only book of its kind in existence. Contains all the latest tricks in magic, the newest novelties, puzzles, games, sporting goods, rubber stamps, unusual and interesting books, curiosities in seeds and plants, etc., unobtainable elsewhere. Remit by Coin, Money Order, Check or unused U. S., Canadian and Foreign Stamps for all articles listed above.

LATEST CATALOG

LATEST CATALOG

LOW PRICED CIGAR LIGHTERS



Bullet Shape Cigar Lighter. A novelty lighter yet practical. The shell end covers the lighter part. Nickel finish outside.

No. 9318. ... 15c



Octagon Shape Cigar Lighter. Highly polished nickel finished cases, panelled all around. Wheel ignition. A small lighter shaped a little different.

No. 9319. ... 10c



A Real Novelty. Lighter shaped like a key. Working parts concealed on the inside. Outside looks like a real key. Highly polished, nickel finish case.

No. 9320. ... 15c



Cigarette Shape Lighter. Looks like a real cigarette. Bottom enamelled in white. Tip finished in gilt. Lighter part fits under gilt cap.

No. 9321. ... 15c



Thin Model, Flat Shape Cigar Lighter. The case is finished in nickel with a lined design all around. Wheel ignition lighter.

No. 9322. ... 15c

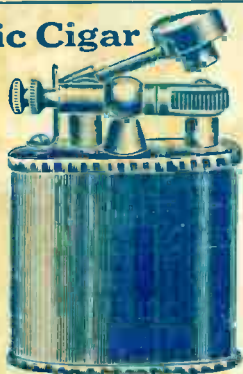
No. 9317. Extra Flints for All Above Lighters. Price, 3 for 10 Cents.

Automatic Cigar Lighter

A Reliable Lighter at a remarkably low price

A New Size Pocket Lighter. This small lighter is of good construction and can be depended upon for good service. Although low in price, it is satisfactory in every respect—the equal of many lighters sold at top prices. Full nickel plated polished finish.

No. 9323. Price, each 25c
No. 9317. Flints. 3 for 10c



New Desk Lighter

With Catalin Base

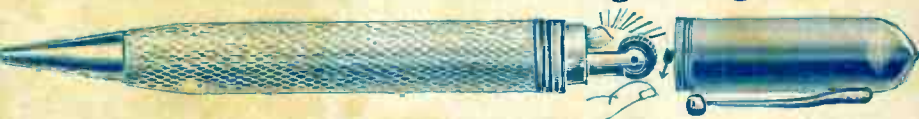


Cigar Lighter. Mounted on a block of Catalin $1\frac{1}{4}$ inches square, this lighter makes an attractive little article to have standing on your smoking or bridge table. The bases come in three beautiful shades, a Pastel Blue, Light Green, and a Capucine Red.

To light remove the shell, turn wheel with the thumb, and ignition follows. This will also make an appropriate bridge prize.

No. 9324. Price, each 30c
No. 9317. Flints. 3 for 10c

Combination Pencil and Cigar Lighter



A Combination Cigar Lighter and Mechanical Pencil. The cap conceals a lighter, located in the space usually set aside for the eraser. To light, turn the wheel with the thumb. Made entirely of metal, with highly polished finish. A very popular and useful article.

No. 9325. Combination Cigar Lighter and Pencil. Price, Postpaid 15c
No. 9317. Extra Flints for Above Cigar Lighter. Price, 3 for 10c

Listen to Music, News, Sports, With A Crystal Radio Receiving Set

**No Batteries! No Tubes! No Distortion!
No Noise! No Expense to Maintain!**

The world's best entertainment and educational features are to be had for the listening in. The very low prices asked for these really good and practical sets puts them within the reach of every man, woman, boy and girl. "If you really wish to learn all about radio," advises the editor of Radio News, "start with a good crystal set." A crystal set has many advantages, but the main ones are simplicity and absolute clearness. There is no distortion and no noise. There are no batteries to buy. No tubes to wear out, in fact there is no maintenance expense whatsoever. They cost absolutely nothing to operate and they will give you constant service for an indefinite period of time. The reception is loud and clear. **Prices below do not include aerial or ear phones.**

Little Wonder Crystal Radio Price \$1.00



Compact in size but big in results. This set will receive broadcasting within 25 miles of a station or even greater distances when conditions are favorable. The open type detector permits adjustments to be made

to the finest degree. The set includes the Philmore supersensitive crystal which assures quick results when "looking" for a station, because the entire surface of the crystal is sensitive.

No. 6581. Little Wonder Crystal Radio. Price Postpaid. **\$1.00**

BLACKBIRD CRYSTAL RADIO

The "Blackbird" is a most efficient crystal radio receiving set. Will receive broadcasting from stations up to 25 miles (greater distances under favorable conditions) loud and clear that will bring joy and happiness to the listener. This radio is equipped with a super-sensitive crystal enclosed in a glass housing, thus effectually keeping out dust, etc. No tubes or batteries required. Price does not include Aerial Kit or Phones. **SHIPPED POST-PAID.**



No. 6583. Blackbird Crystal Radio **\$2.50**

SUPERTONE CRYSTAL RADIO



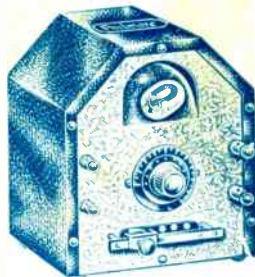
\$1.50

A rigidly constructed radio receiving set which will give everlasting service. Has a range of 200 to 600 meters with a receiving radius of over 25 miles. Under favorable climatic conditions, reception may be had within 100 miles from a broadcasting station. Reception is loud and clear without distortion of any kind.

No. 6582. Supertone Crystal Set **\$1.50**

SELECTIVE CRYSTAL RADIO

Our best crystal set. Possesses unusual selectivity and designed to give most efficient results. Built with a tapped coil matched with a .00035 Mfd. variable condenser. On the panel is a dial for tuning and logging stations, two double posts to take two pairs of headphones, and a dust-proof glass enclosed crystal detector which includes a super-sensitive crystal. With it you can hear messages broadcast anywhere within 25 miles, or even up to 100 miles under favorable conditions.



No. 6584. Selective Crystal Radio **\$3.95**