

A PERSONALLY
CONDUCTED VISIT THRU

WDC

DAVENPORT ... IOWA



Owned and Operated by
**The PALMER SCHOOL
of CHIROPRACTIC**

DAVENPORT,



IOWA, U.S.A.

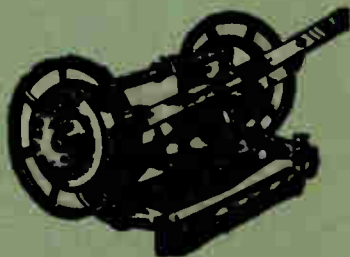
THE Eclipse LAWN MOWER

FIRST for your Lawn
FIRST on the AIR

The Lawn Mower asked for by name—ECLIPSE

There IS a Difference in Lawn Mowers
— a BIG Difference

YOUR NEXT
MOWER—
FOURTEEN
GOOD
REASONS



ASK YOUR
NEIGHBOR—
THEN
YOUR
DEALER

NATIONALLY { BROADCAST
DISTRIBUTED
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INDIVIDUALLY { MANUFACTURED
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The Popular "Eclipse Clippers" are sponsored by
THE ECLIPSE LAWN MOWER COMPANY
PROPHETSTOWN, ILLINOIS

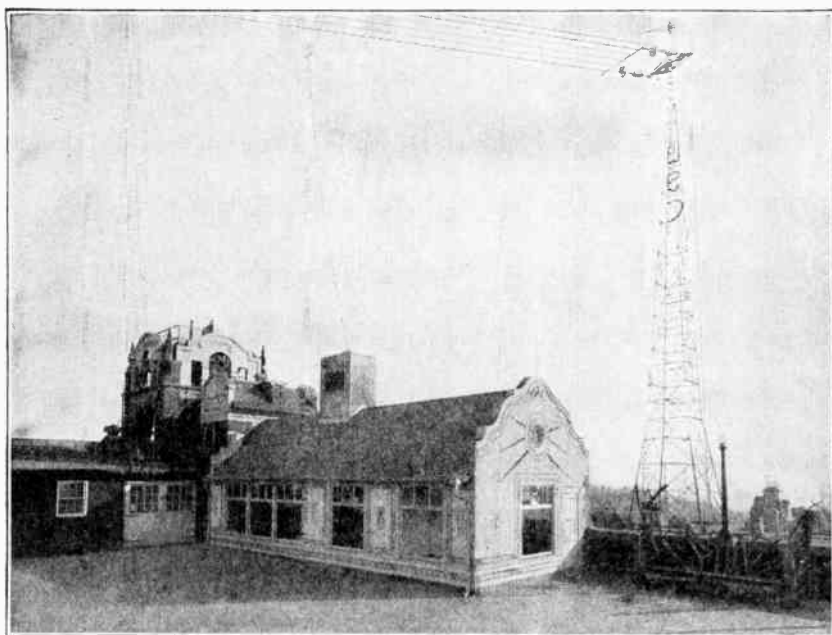
Visit the World's only "Prophetstown" — Just East of Where The
West Begins.

A Visit to WOC

Being a Few Facts about an Ultra-Modern, High-Powered Radiophone Station

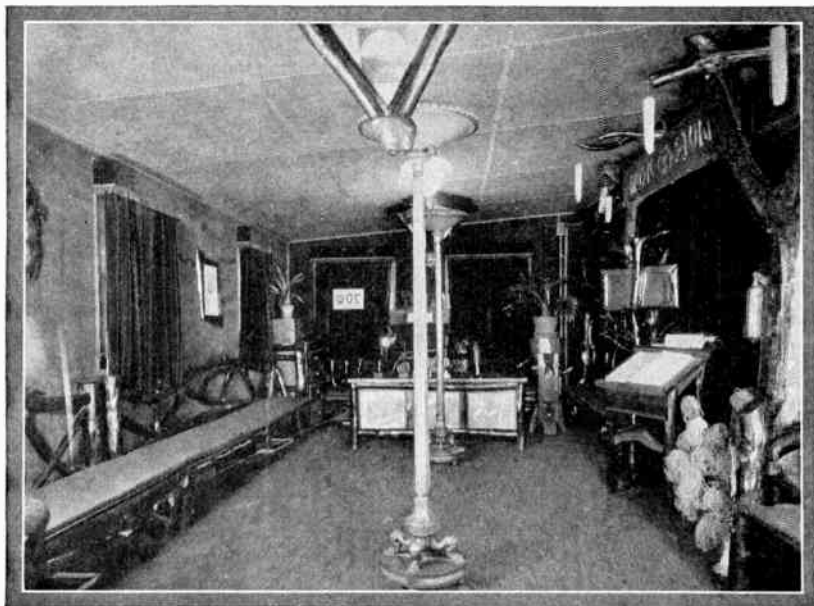


AS WE leave the elevator on the Up-E-Nuf Roof Garden, we face the studio and this sign is the first thing which strikes our attention. Immediately adjacent to it is another—a red electric sign which warns us to “SILENCE”—WOC is on the air. Hundreds of thousands of people from coast to coast, from Texas to Toronto, and beyond might have their enjoyment spoiled by a careless noise. Stepping from the



A CORNER OF “UP-E-NUF” ROOF GARDEN, SHOWING RADIO BUILDINGS AND PART OF ANTENNA SYSTEM
The stucco building in the foreground houses the high-power transmitting equipment, and a part of the structure forming Studios and Reception Room is seen at the left.

The PALMER SCHOOL *of* CHIROPRACTIC
❑ CHIROPRACTIC FOUNTAIN HEAD ❑



INTERIOR OF RECEPTION ROOM

The drapes and wall coverings are of maroon and mouse-colored velvet. The room is built soundproof, so that it may also be used for a studio when necessary. Entrance to the studio is at the right.

entrance to the Broadcasting Studio out onto the open-air roof garden, our attention is at once drawn to the great mastlike steel towers supporting the antenna, and the antenna itself hanging unbelievably rigid one hundred and sixty-five feet above the level of the roofs on which they stand, or two hundred feet above the street.

We have always been curious to see just where and how the radio energy left the broadcasting station and found its way through the antenna wires into the ether. We see now that this is accomplished by an unassuming cage-like arrangement of wires leading from the top of a little tower on the roof of the transmitting room to a point a few feet below the spreading antenna, where it takes a fan-shaped form, each wire of the cage finally terminating in a connection with one of the wires forming the "flat-top" of the transmitting aerial. We are later told by our guide that the other connection so necessary for radio transmission—the ground connection—while not at all conspicuous, is really much more elaborate than the antenna system.

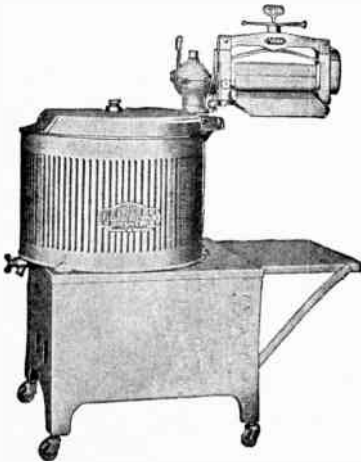
The ground connection is made by a network of heavy cables which are bonded to every available part of the steel structures of all buildings within the field of the antenna, and these are, in turn, connected by a similar network of cables to the extensive system of pipes which comprise the water supply system of the city. From these pipes the ground

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The Voss Vagabonds

A troupe of seventeen artists who entertain you each week over WOC through the courtesy of the manufacturers of THE FAMOUS VOSS FLOTO-PLANE WASHING MACHINES.



Like the Vagabonds, Voss Washers bring many hours of happiness to over a million American homes.

When considering a washer, remember that the Famous Floto-Plane Agitator is an exclusive patented feature and the Voss is the only "Buoyancy Point" washer on the market.

VOSS BROS. MFG. CO.

DAVENPORT

IOWA



NORTH END OF STUDIO

It is sometimes difficult for the artists who are appearing for the first time to do their best with nothing more appreciative in sight than a queer looking "Bird Cage" for an "audience."

connection finds its way to the Mississippi, "The Father of Waters," whose vast expanses cover the entire Middle West.

Reception Room and Studio

HAVING marvelled at length at the majesty of the antenna towers, we are conducted once more to the entrance to the broadcasting studio. Our guide tells us that, in all, five rooms are required to house the various parts of equipment which comprise the broadcasting station, and, in addition the station's rooms include a spacious reception room and studio. The total floor space provided by these seven rooms is over 1800 square feet. All parts of the station are accessible to the sightseer; those parts to which the casual visitor is not admitted, being provided with large plate glass windows through which all equipment and apparatus may be seen without any interruption or interference with the program which is in progress.

The Reception Room, which we face as we leave the elevator, is open at all times and visitors or friends of the performing artists may sit there and listen to the program which is being broadcast, by means of the monitoring cone, the latest and most efficient type of loudspeaker, provided for the purpose. It is in this room also that artists await their turn between appearances on the program.

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 □ CHIROPRACTIC FOUNTAIN HEAD □



S. W. FERRIS
(Founder)



EARL FERRIS
(Present Owner)



S. W. FERRIS, Jr.
(Field Manager)

THREE GENERATIONS OF NURSERYMEN

ooo

IT was back in Civil War days, during the year 1869, that the Ferris Nursery had its beginning. The Founder, S. W. Ferris, started on a single acre of ground, but thru his famous method of root-pruning and transplanting that has made Ferris trees and plants of the highest quality, and handing down this standard, together with the policies of fair dealing and satisfaction to customers, to his son and to his grandson, the Earl Ferris Nursery has grown steadily thru the years until now it is the largest "Direct From Grower To Consumer Nursery" in the United States.

Here in this rich Iowa soil is Produced annually millions of evergreen seedlings under shade and transplanted evergreens in almost all sizes, that go out in great quantities every spring into all parts of the land. There are great fields of shrubs, shade trees, perennials, small fruit plants, and sixty acres alone of Gladioli—truly a splendid sight.

Stop as you drive by this summer, and see all these wonderful growing things, then put your name on our mailing list for the next catalog, or planter's guide.

ooo

AN OPPORTUNITY TO THANK YOU!

During our Springtime Planting Programs from Station WOC, we were particularly pleased with the many thousands of communications we received from our listeners, and to know that the little planting talks and musical programs were helpful as well as enjoyable to our patrons. This response was greatly appreciated. During the coming fall and winter, we hope to be on the air again, and will always be glad to have new and old friends tune in on our programs.

EARL FERRIS NURSERY

HAMPTON - - IOWA

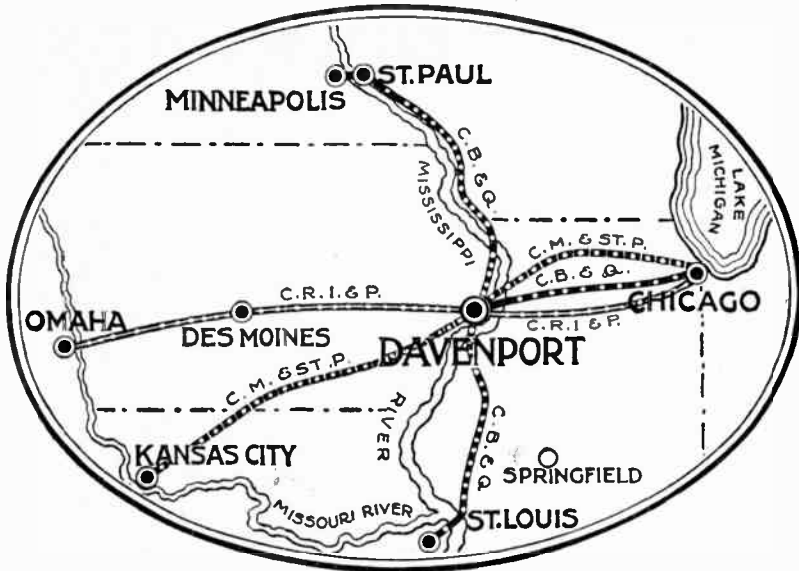


SELLING DAVENPORT TO THE WORLD THROUGH WOC
 Showing Dr. B. J. Palmer in the studio, stopping for a moment to listen to Industrial Commissioner John C. Shenk, of Davenport, broadcast an account of his visit to twenty states.

Adjacent to the Reception Room is the Broadcasting Studio, which is accessible through a soundproof door upon which a brilliantly illuminated "STOP" light appears during the broadcasting of a program. Both the Reception Room and the studio are specially constructed to eliminate street noises and to prevent overtones and echoes which might interfere with the quality of any program being produced in either room; for this purpose both rooms are provided with heavy tapestries hung around the entire room, and even one's steps are hushed by a deep pile carpet on the floor.

We are particularly impressed, as we enter these rooms, with the genuine beauty of the surroundings and picturesque furnishings, as well as the ample accommodation provided for any number of artists who could possibly be used on a single program. Aside from the Mehlin Concert Grand, which is used for accompaniment and solo work, the Cabinet Organ, and other musical instruments in the studio, the only evidence that we are in the broadcasting room is the presence of several inconspicuous-looking "bird cages," which, we are told, are the microphones for picking

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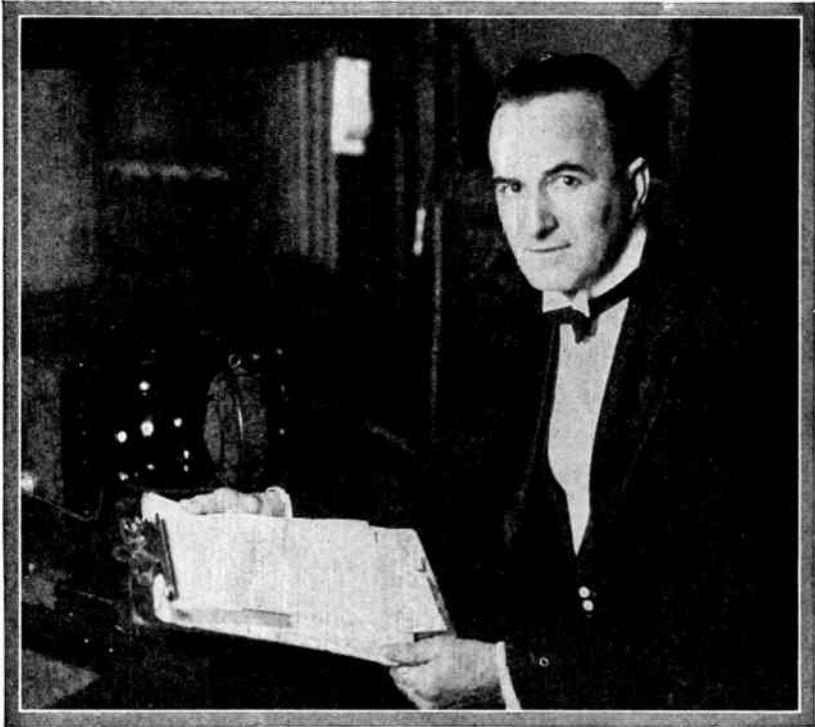


The Davenport Industrial Commission

IS ORGANIZED FOR THE SPECIFIC PURPOSE OF GIVING YOU AND OTHER REPRESENTATIVES OF INDUSTRY, INTELLIGENT INFORMATION REGARDING THE INDUSTRIAL FACILITIES OF DAVENPORT, IOWA, A THRIVING CITY OF SIXTY THOUSAND POPULATION, LOCATED ON THE MISSISSIPPI RIVER.

THE PLAN OF THE COMMISSION PROVIDES THAT OUR INDUSTRIAL COMMISSIONER VISIT YOUR COMMUNITY AT WHICH TIME HE WILL BE PREPARED TO FURNISH DETAILED REPORTS REGARDING THE ADVANTAGES OF DAVENPORT.

Complete Confidential Reports will be compiled at your request.



"This is WOC, The Palmer School Station, Davenport, Iowa." Chief Announcer Peter MacArthur, "the Bobby Burns of the Air," is here seen in the Studio Control Booth. The convenient arrangement of the various controls in this room is largely responsible for the promptness and efficiency which characterize WOC programs.

up the sound, and which remind us that we are in the room where great artists come and go to entertain millions of people in cities and hamlets throughout the North American Continent and beyond.

Also located in the studio is a small keyboard for playing the tower chimes. These chimes are located outdoors, quite a distance away, and are electrically operated by special relays and magnets.

The Studio Control Booth

IN a smaller room at one end of the Broadcasting Studio is the first real evidence we see of the massive equipment which comprises the broadcasting mechanism. This room is provided for the announcer's booth and for apparatus which controls the various microphones located in the studio. The method of control at this point, we are advised, has undergone extensive changes and improvements over the methods used in the earlier days of broadcasting. The announcer is separated from the studio by a

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DAVENPORT,



IOWA. U.S.A.



**BROWN
BEAUTIES**
STRICTLY QUALITY

8c

**2 FOR
15c**

Wherever Good Cigars are Sold You Will Find

BROWN BEAUTIES

MADE BY THE

PETER N. JACOBSEN CIGAR CO.

DAVENPORT, IOWA



partition so constructed as to prevent the passage of any sound. He may, however, observe everything that takes place in the studio through a series of glass windows. During the broadcasting, the announcer has under his control the group of microphones already mentioned, and these are so placed in the room at the beginning of the program that he is able to handle, by means of convenient controls, almost any situation which may arise in the studio at any time. A by-product of the transition to this more adequate means of studio control is an arrangement whereby the announcer may speak to either the Reception Room or Studio at will, without his voice being heard on the air; likewise, the operators, two rooms distant, who handle the control of volume and other parts of the apparatus so necessary to the proper performance of the station, are able to keep in constant touch with the studio and the announcer, through the extensive monitoring system which has been worked out.

Before passing on to the path taken by the speech through the various parts of the transmitting station, it is timely to speak of the new idea made use of in the operation of the studio itself. Here we note that advantage has been taken of the well-known psychological effect which lighting has upon the artist, particularly those accustomed to public appearances; for example, the commonplace use of footlights on the stage when the artists appear for their performance. This idea has been adapted to the broadcasting studio and is accomplished by means of dual room lighting. The ordinary system of indirect lighting in both the studio and announcing booth have been supplemented by a group of direct lamps which are illuminated only when the microphones in that particular room are actually connected to the transmitter. The change in this lighting effect is automatic as the program progresses, and is under the direct control of the announcer. Thus artists in the studio and any others who may be present are subconsciously impressed with the fact that the microphone is on the air. The benefits from this method are apparent in that it breaks up the awkwardness, provides a businesslike air and enhances the smooth-running performance, which has been the subject of a great deal of comment among radio listeners everywhere.

How Broadcasting Is Done

TO THE average "listener-in" the actual procedure which goes on within a broadcasting studio during a program is more or less of a vague mystery.

The operations in the studios are simpler than the novice would imagine. During the broadcasting of any number only the persons actually performing are allowed in the broadcasting room. The remainder of the artists who may be on that particular program await their turns in the comfortable reception room adjacent to the broadcasting studio.

The generators are started five minutes before the program is scheduled, and the transmitting equipment, from microphones to antenna, is tested out so as to avoid possible delay in starting the schedule.

To start the program the announcer signals electrically to the radio operator that he is ready. The operator throws a switch which turns on the microphones, and at the same time illuminates the "Silence" and "Stop" lights described heretofore.

Absolute promptness is an axiom at WOC, so we find that at five seconds before the hour for which a program is scheduled, the announcer, after having received his signal which shows he is on the air, says: "It is now

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GOOD "B" POWER
 MEANS
 GOOD RECEPTION
 WARREN "B" POWER SUPPLY

APPROVED
 BY
 LEADING
 RADIO
 LABORATORIES



\$35.00
 COMPLETE
 WITH
 85M
 TUBE

MODEL T

GUARANTEED TO DELIVER

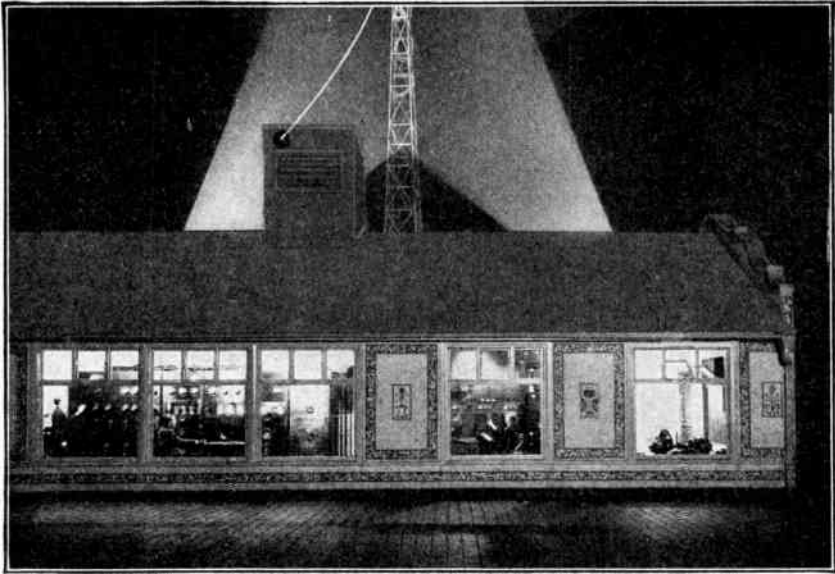
Volts		Mills	Volts		Mills
260	at	25	185	at	55
235	at	35	162	at	65
210	at	45	140	at	75

From 110 volt, 60 cycle, A. C. current, and have sufficient reserve power at all times to meet any emergency. Will operate any set having from one to fifteen tubes, including power tubes.

WARREN RADIO POWER UNITS
 "SPEAK FOR THEMSELVES"

A MONEY BACK GUARANTEE WITH EVERY UNIT

THE WARREN ELECTRIC CO.
 PEORIA, ILLINOIS



This unusual photograph shows one of the Antenna Towers with flood light illumination, and in the foreground through the plate glass panels we see the entire transmitting equipment in operation during the broadcasting of a program. Detail views of this equipment are shown on pages nine and eleven.

exactly — o'clock," synchronizing each word with the second hand of the big Western Union clock in his booth, so that when he states the exact hour, the second, minute and hour hands of the clock are all exactly upon the hour. Announcement of the opening number is then made to the "bird cage," the announcer switches to the studio microphones, and in a moment the music is being broadcast. During the announcement of the following numbers, the artists who have just performed leave the room, quietly, and those for the next number take their places. Thus the program proceeds without noticeable interruption.

In broadcasting an orchestra or group of singers, the procedure is similar except that arrangement of instruments and voices have been worked out so as to give the properly blended effect into the microphones.

Special Building for Broadcasting Equipment

TO FOLLOW the minute speech currents which thread their way from the studio and the announcing booth over special telephone cables to the next point in the system takes us into a new building which has recently been added to the layout of buildings comprising WOC's home. This building is located on the Up-E-Nuf Roof Garden, adjacent to the other buildings just mentioned, and occupies almost the entire south half of the roof garden. Several weeks were spent in preparation and construction of this

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 ▣ CHIROPRACTIC FOUNTAIN HEAD ▣

building, and it is here that the larger portion of the transmitting equipment is housed. The building itself is solidly constructed and its stucco exterior is inlaid with a beautiful Mosaic tile of distinctive design, typifying the purpose for which the building is used. A unique feature of the structure is the full-sized plate glass panels which form the two sides facing the roof garden.

The casual visitor to the station is not admitted to the transmitting and control rooms at any time, and these plate glass panels provide a means whereby the entire equipment may be viewed from the roof garden, which is open at all times. The first of the rooms in this building to which the speech currents are carried from the studio is the control room. It contains the part of the system which might aptly be termed the "nerve center" of the broadcasting station—the speech input equipment.

This equipment is provided primarily for amplifying the tiny electrical impulses coming from the microphone, to the proper energy level necessary before passing them on to the transmitter itself. We note that this amplification is accomplished by means of a series of tubes, in appearance not unlike those found in our receiving sets. The degree of this amplification is under the control of an operator whose duty it is to observe constantly a little instrument, technically known as a volume indicator, but which we chose to term a "wiggler" as it dances up and down, back and forth, with each fluctuation of the voice or music, indicating at all times whether or not the proper amount of energy is being supplied to the transmitting apparatus in the adjoining room. This operator has a single dial by which the amount of this energy may be varied at will.

We are visibly impressed by the seemingly endless arrangement of apparatus in this room, and are told by our guide that at WOC some de-

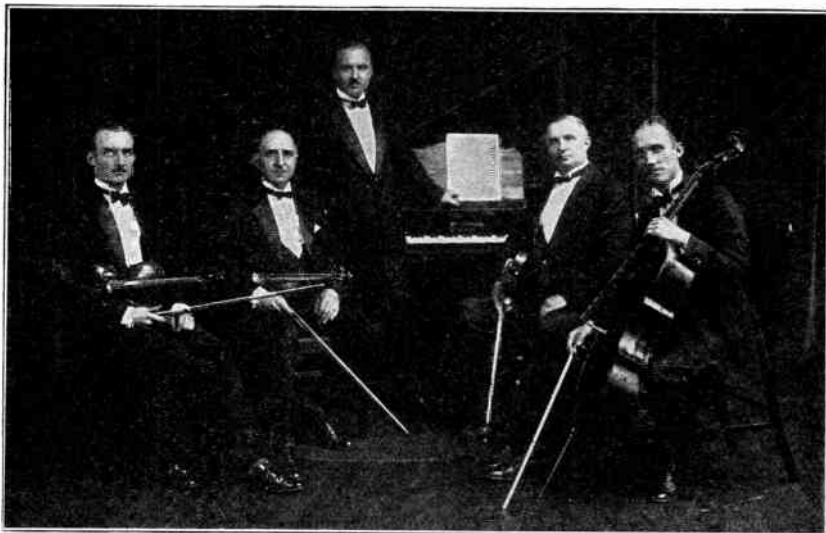
LARGEST SMITH INCUBATOR
EQUIPPED CHICKERIES
IN THE WORLD.



Hear the Farrow Chanticleers
over Station WOC during
February, March and April.



We are always glad to send our Free Catalog to those interested in Farrow Chix. Address
D. T. FARROW CHICKERIES, Peoria, Illinois



The WOC String Quintette, under the leadership of Albert Petersen, who are heard on Sundays in program broadcast from WOC

partures have been made from the standard layout of equipment ordinarily used for the purpose, and that several special features have been incorporated in the plant at this point to meet the special needs that several years of broadcasting have developed, peculiar to the organization.

The Public Address System

THE Public Address System, for example, has become so extensively used throughout the school that it became necessary to enlarge the capacity of this apparatus, and, in doing so, it was placed in the control room with the speech input equipment.

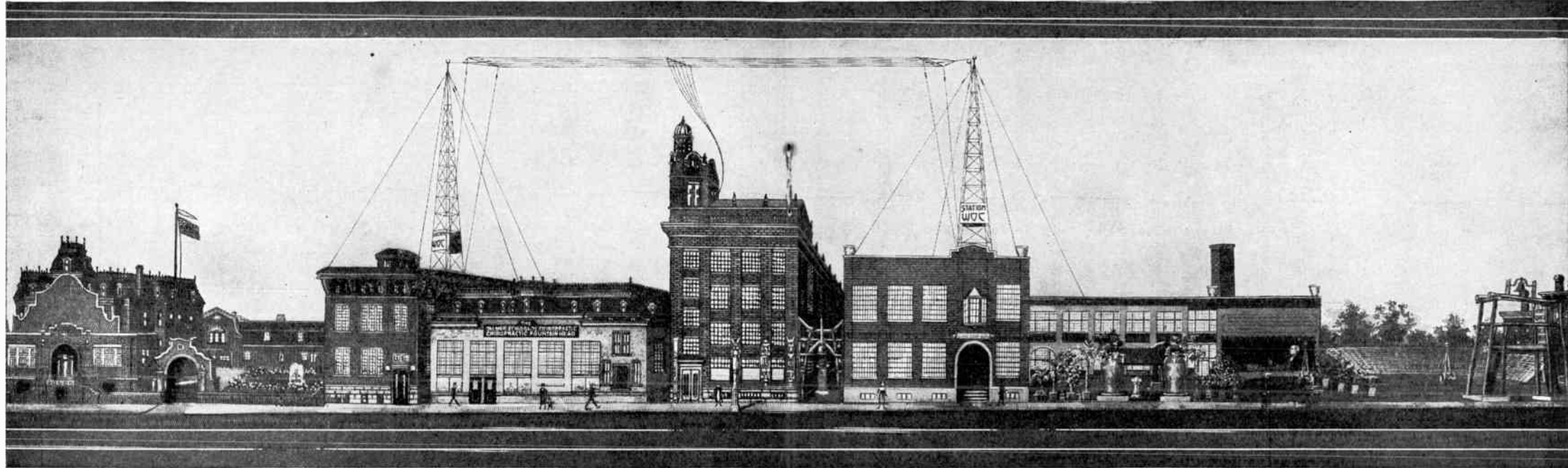
The Public Address System is a highly perfected type of power amplifier, so arranged as to give switching and volume control to a number of loud-speaking horns remotely situated from the source of energy. By means of this device announcements may be made to any selected group, or all of the classrooms simultaneously by a single speaker.

The circuits are also arranged so that incoming radiophone signals which are received may be amplified through this system, and heard by five thousand persons comfortably seated in the classrooms and an equal number on the outdoor stadium on the school campus.

The Palmer School was the first institution of learning to install this sort of equipment and its installation at WOC in the room with the radio equipment was the first installation of the kind on record.

The entire layout in the control room is mounted in standard telephone fashion on a framework of four adjoining racks extending from the floor to the ceiling, a height of approximately eight or nine feet. On these racks,

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 ▣ CHIROPRACTIC FOUNTAIN HEAD ▣



"MABEL" H. PALMER

The Palmer School of Chiropractic

Chiropractic Fountain Head

Davenport, Iowa, U. S. A.

"Where the West Begins"

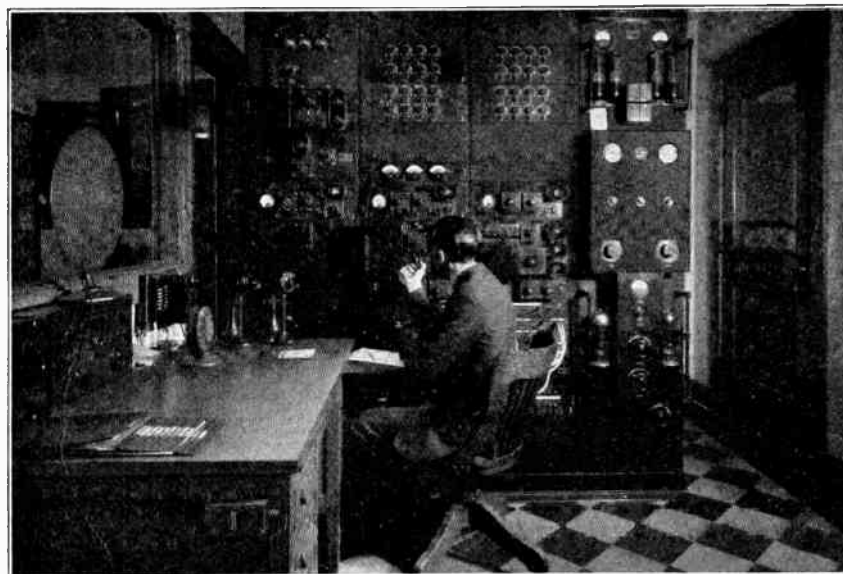


CHIROPRACTIC

offers a wonderful opportunity for those who desire to enter a new and growing profession which holds out unlimited possibilities for professional success and service to humanity. Further information will gladly be furnished upon request.



"B. J." PALMER



THE CONTROL ROOM

The operator is shown at the volume control during a program. It is through this point that all programs must pass before being sent to the Transmitting Room. Here, again, convenience of apparatus contributes largely to efficient operation of the station. The larger units on the right are a part of the Public Address System.

in addition to the public address system and amplifying equipment already mentioned, are mounted various other units of control apparatus and amplifiers for monitoring horns and other purposes—all easily accessible and arranged in a surprisingly orderly fashion. In so neat a fashion is the equipment installed that we are almost unaware that hundreds of wires are required to connect and interconnect these electrical devices until a door is opened in the wall a few feet distant from the speech input frames in which all the cables terminate. Here the cross-connections have been made which provide the circuits between the various pieces of equipment. This method provides a flexibility of circuits which would otherwise be impossible, and, at the same time, makes the necessary provision for expansion when it is needed. The size and scope of the equipment just mentioned is such that extreme flexibility is necessary if the apparatus is to be handled successfully.

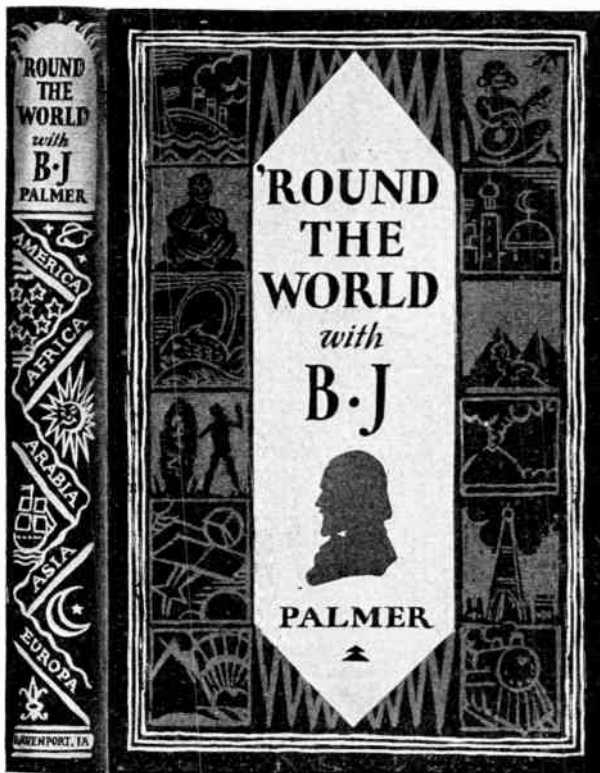
To further bring about such necessary flexibility, each unit of apparatus on the frames in the control room has been brought out, or terminated, on a telephone jack normally connected to the various other pieces of apparatus. In case of necessity, however, any given piece of equipment on the rack may, by means of a telephone cord, known as a patch-cord, be isolated from its normal position in the circuit and another substituted in its place. There are five double rows of these telephone jacks, each jack neatly labelled so that complete changes of circuits may be made in a few

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BICYCLE
 PLAYING CARDS
 A PACK OF SATISFACTION

If You Heard "B. J's" Travelogues From WOC You'll Want This Book



Shown here greatly reduced in size, the book
is exactly 6 x 9 inches

An Outstanding Addition to Your Library

THIS is your opportunity to get this true story of the world we live in; a book of about 800 pages beautifully printed, securely bound in cloth, and stamped in gold. "Round the World With B.J." is profusely illustrated with photographs taken by the Doctor himself. And most of these fascinating pictures are given to the world for the first time in this book.

Thousands of requests for this volume are being received each week. The first edition has been published for those who have already asked for this book. If you desire a copy your order should be mailed promptly. Price \$5.00.



seconds by means of a few of the patch-cords, which are simply telephone cords with plugs on either end.

Broadcasting from Remotely Situated Points

AT THIS point it is well to speak of the methods used for multiple broadcasting, which has come to play such an important part in radio activities during recent months, and, by means of which, the entire country may be linked up with any event of national importance or for programs of such a nature as are sometimes available only in certain large centers, such as New York City. Through one of the little telephone jacks just described, the radio station is able to make connection with programs of such a nature. Remote control programs, as they are sometimes erroneously called, are produced at a certain given point; for example, in the studio of WEA, New York City, or in the Executive Mansion in Washington, D. C., and are picked up on a microphone the same as in any radio studio. The current from the microphone is passed through a series of amplifiers, and then, instead of being sent to the radio transmitter, is placed upon a long distance telephone line which leads to the various points throughout the country where it is broadcast.

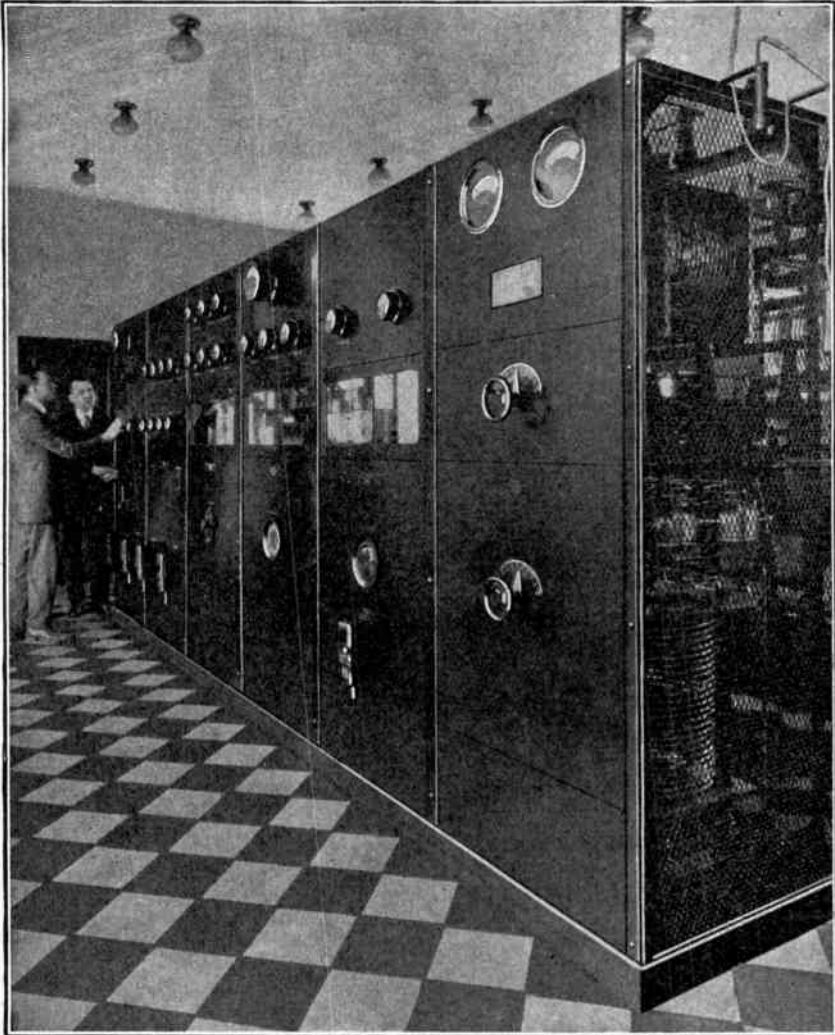
At the broadcasting station this telephone line terminates on one of the telephone jacks already mentioned; another telephone jack nearby connects to the radio station's amplifiers. A patch-cord is used to connect between these two jacks, and in this way the program coming over the telephone line is fed into the amplifiers, which in turn feed into the transmitting equipment.

This, briefly, describes the method used for this work, although to secure the proper quality which characterizes long distance transmission of this kind has required years of research work, specializing on various types of amplifiers and balancing of telephone lines to avoid cross-talk and various other kinds of disturbances which would interfere with perfect transmission. For this research work we are responsible to the engineers of the Bell Telephone Company and the American Telephone and Telegraph Company. For many years these technical experts in their capacity as manufacturing engineers of the Bell Telephone System have been conducting all sorts of experiments with radio, and have, by constant study, discovered things about radio undreamed of a few years ago. It is the engineers of these same associated companies who designed and built the radio transmitter used at WOC. The quality of music and other transmission through stations constructed by the Western Electric Company is recognized as a standard in the radio world.

Other programs picked up outside the main studio are handled in a manner similar to that used for multiple broadcasting from a number of stations, except that, in most cases, the telephone circuits carry the program over comparatively short distances. The microphones and amplifying equipment are always present at the pick-up point, and the telephone line terminates in the control room on a telephone jack as in the former case.

One of the remotely situated studios used for programs from WOC is located in the Music Room of the B. J. Palmer residence, several hundred feet from the transmitting station. At that point the installation of the Pipe Organ gives another unique and unusual form of radio music. This organ is one of the finest in the country. It was made by the Aeolian Company of New York, who have made a specialty of building organs for the past twenty-five years, and their product is to be found in many aristocratic homes, churches and other large halls in America and Europe. The

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 □ CHIROPRACTIC FOUNTAIN HEAD □



FRONT VIEW OF THE RADIO TRANSMITTER

The massive equipment here shown is the 5000-watt Western Electric Transmitter used at WOC. The large water-cooled vacuum tubes can be seen in operation through the glass section of the center panels.

console is located at the east end of the Music Room and the main organ is located in a chamber especially built for it directly overhead. The Echo

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organ is placed in a similar chamber at the extreme west end of the porch, and on account of its relative location to that of the main organ, the most charming and enchanting distant effects are possible.

The instrument which contains the pure organ tones has in addition the orchestral characters, which are faithfully represented. The string and flute are especially fine, as are the clarinet, oboe and trumpet. The Vox Humana, of which there are two (one in the main and the other in the echo), are exceptionally beautiful. The organ also contains a harp and a set of chimes (separate from the large tower chimes), both of which have their own separate expression control, allowing a wide range of expression.

In addition to the organ at the studio in the Palmer residence there is also available a grand piano for accompaniment and solo work. Here two microphones are used to provide the necessary flexibility in handling the more difficult numbers such as vocal solos with organ accompaniment or duets for piano and organ.

Transmitter Room Largest of Group

RETURNING once more to the control room, where the lines from these remotely situated studios terminate, we find that from this room the sound impulses having been amplified to many thousand times the energy at which they were received from the microphone in the studio, are passed through cables underneath the floor to the Transmitter Room.

Our attention is then drawn to the largest of the seven rooms comprising WOC's home in which is located the modern 5,000 watt Western Electric transmitter.

We are simply dumbfounded as we look at this room, at the multitude of switches and coils, dials and knobs, and the intricate electrical equipment, the total weight of which, we are later told, is six and one-half tons. We are amazed that any human being could ever know which handle is which or what to do and when to do it. Inside this room, in the center of an artistic checkerboard floor, is erected a huge cage, accessible on all four sides, within which every available space is occupied by some elaborate piece of electrical equipment.

Such a collection! What bright, shining and strangely interesting coils and condensers, springs and transformers, and above, rods of burnished copper, each connecting a terminal on one side to a terminal on the other. Up through the roof above runs a square shaft, like the conning tower of a submarine, extending a dozen feet above the roof proper, with little wooden ladders in place for the operators to make their inspection; and, running right up through the center of this tower, is another copper rod—the only thing with which the bewildered visitor can perchance be vaguely familiar. That rod is the "lead-in" (or perhaps in radio parlance, the "lead-out," inasmuch as this is a transmitting station), with an enormous switch mounted within the roof of the tower to connect all this intrigue with the antenna high above our heads.

We have a sort of "how-do-they-remember-it-all" feeling until our guide comes to our rescue with an explanation non-technical enough to be understood, yet comprehensive enough to satisfy our yearning for light on the subject.

The cage housing the transmitter is seven feet high and covers a floor space eight feet wide and fifteen feet long. The front of the cage is formed by the power panels, six in number, each of which is named by the function it performs. The first of these panels at the left is the A.C. power

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ONE OF THE REMOTELY SITUATED STUDIOS

A corner of the Music Room in the B. J. Palmer Residence, showing the console of WOC's wonderful pipe-organ, installed expressly for Radio Broadcasting at a cost of \$30,000.

panel, which receives all the energy used in the various parts of the system from two transformers, each of fifteen kilowatts capacity, which are located in a convenient, out-of-the-way space in a ledge on the roof, adjacent to the Chimes tower, several feet distant. From this unit the panels progress in electrical order through the various stages necessary, to the last of the six units which connects to the antenna. Adjacent to the A.C. power panel is the panel for the regulation of the D.C. voltages and currents. This panel also includes a frequency stabilizer for the oscillator-modulator unit on the next panel. The fourth panel is the rectifier unit, supplying the 10,000 volts, D.C. for the plates of the tubes on the fifth panel which is known as the amplifier unit; and the last panel which connects to the aerial is designated as the tuning unit, and contains the coils and condensers for coupling the set to the aerial and also for suppressing harmonics.

On these panels are mounted, in orderly fashion, the various rheostats and other controls necessary for regulating the voltages in the different parts of the transmitter, and adjacent meters which designate the different voltages and currents. Directly back of these panels are mounted the vacuum tubes, transformers, relays, resistances, and the other smaller apparatus which makes possible modern aerial communication.

In addition the equipment in the transmitting room includes a Piezo-electric oscillator, whereby the operator is enabled to ascertain at all times whether the transmitter is operating on its assigned frequency or wavelength.

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The other three sides comprising the transmitter enclosure are made up of expanded metal guards which serve both to protect the apparatus from injury and to prevent accidental contact with those parts subject to high potential. The enclosure is accessible by a single door provided in one of these three sides, and the greater part of the remaining floor space within the enclosure is taken up with the transformer necessary to step-up to a seventeen thousand volt potential the voltage supplied by the city mains and apparatus to filter this voltage after it has been rectified by the tubes in the rectifier unit, already mentioned. The combined weight of this transformer and filtering apparatus is two tons.

In the back part of the enclosure is also mounted the "Dummy antenna," consisting of three units—an inductance, a capacity, and a resistance unit, representing the exact electrical characteristics of the outside antenna circuit. By means of this contrivance, the entire radio station may be put into operation and tested for any purpose that may be necessary without the test being heard on the air. This "Dummy Antenna" may be substituted for the real antenna by the movement of a single switch conveniently located on the back of the tuning panel.

Automatic Protective Devices Prevent Damage

IN ELECTRICAL equipment which employs the amount of energy used at WOC, it is important that extensive protective devices be provided to protect the apparatus from damage which might occur instantly should anything go wrong with any part of the system. Dependence upon the human element, which is never infallible, has been almost entirely removed in the construction of this modern type of equipment and the necessary protection is afforded by safety devices on all parts and in all circuits where such damage is liable to occur. All circuits supplying a high potential are fed through relay-controlled switches which are automatically opened by more delicate relays in case of an overload to any part. On the door entering the transmitter enclosure, switches are also provided which automatically open all these relays when the door is opened, thereby stopping the transmitter and making it impossible for anyone, thoughtlessly entering the cage while the set is in operation, to come in contact with high voltage.

The two larger sets of vacuum tubes are cooled by a water-circulating system, the continuous operation of which is vitally essential to the protection of these tubes against immediate damage. In this system are meters which register the pressure and temperature of the water. On the dials of both of these meters are adjustable maximum and minimum safety points, between which the set will function normally, but beyond which would be a dangerous range in which to operate. The indicating hand of either of these meters, upon coming in contact with the safety point automatically shuts off the current from the transmitter, the same as the other protective devices mentioned, so that any disturbances which might possibly occur in the water-cooling system would immediately and automatically be taken care of without resultant damage.

The water-cooling system itself is very interesting, and to follow the system throughout takes us into the third and fourth rooms of the specially constructed buildings in which the transmitting equipment is located. The third room is given over entirely to two water-cooling radiators, each four feet high and eight feet long, through which the water passes on its way from the vacuum tubes to the pump, which drives it again under twenty-five pounds pressure, through pipes underneath the floor and back

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to the tubes. This pump is located in what is known as the Generator Room.

Generators and Batteries in Separate Room

THE Generator Room extends over the full width of one end of the building, and is second in size only to the transmitter room. It affords housing space for what might be termed the auxiliary power apparatus comprising the remainder of the station's equipment. In addition to the water-circulating pump, which is of the centrifugal type, and its associated motor drive, there are located in this room all storage batteries used in

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connection with the equipment and their switchboard and charging rectifiers, as well as three other motor generator sets.

The smallest of these consists of a one H. P. motor driving a 350-volt generator which provides the negative grid potential for the water-cooled amplifier tubes located in the fifth panel of the transmitter. The second of the motor-generator units furnishes filament current for the same set of tubes, delivering this current at eight-five amperes direct current under twenty-four volts potential. This unit is driven by direct coupling with a four H. P. induction motor. The third motor generator is made up of a five H. P. motor and two D.C. generators in tandem. These generators supply the "A" and "B" voltage for the four 250-watt tubes, as well as the single

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fifty-watt tube located in the Oscillator-Modulator Unit of the transmitter. The filament voltage to this unit is delivered at a fourteen-volt potential and the plate at 1600 volts, which is taken from a double-wound armature delivering 800 volts to the commutator at either end.

The batteries mentioned above, which are located in the Generator Room, are used for filament and plate supply to the small amplifying tubes on the speech input equipment, as well as the battery supply for the operation of microphones, relays, and various other functions throughout the plant performed by low potential D.C. energy.

Many Distance Records Established

WE ARE, at this point, advised by our guide that we have covered the entire radio station, and we cannot but wonder at the magnitude and thoroughness of the equipment which has just been explained. Here is a fortune in dials, plates and coils, panels, transformers and amplifiers, batteries, motors and generators, all assembled with a large staff of operators and technicians who manipulate them—frequently into the wee small hours—in order to give entertainment and instruction to the world and his wife. The truth is evident in a telegram once received at WOC—“Broadcasting is the symbol of unselfishness.”

As we ponder over this wonderful layout which typifies so thoroughly the achievement of modern engineering, our first thoughts are, “How far are programs from a station of this kind being heard?” and “What sort of a business organization is required to handle the work which it seems must be entailed in keeping a system of such vast proportions in smooth-running operation”?

In answer to our first query our guide conducts us once more to the anteroom entrance to the broadcasting studio, and there points out a map of the world on which are shown, by means of numerous lines radiating from a point indicating Davenport, the various distant points which have reported reception of WOC's programs. In the three years that the station has been in operation, many enviable distance records have been established, until, at the present time, with the exception of a few countries in the far east, the map indicates that almost every civilized part of the world has reported reception; and we are told that the enthusiastic reports received from the most distant of these points indicate that the only reason the entire world is not represented is that those countries which do not, as yet, have the little indicating line, are lands in which radio as we in America know it, has not yet become a reality. This conclusion is substantiated by the fact that in a recent tour of the world, Dr. B. J. Palmer, the president of The Palmer School of Chiropractic, after leaving the Islands of the Pacific and traveling westward was unable to find a single receiving station using equipment of the more modern type until he reached the countries of Western Europe. At the time of our visit to WOC, Sweden, France, Holland, Russia, Italy, Argentina, New Zealand, Australia and the Samoan and Philippine Islands were numbered among the more distant points having reported reception, and many of these points, we were advised, tune in for the programs regularly and are seldom disappointed.

Correspondence Entails Enormous Amount of Work

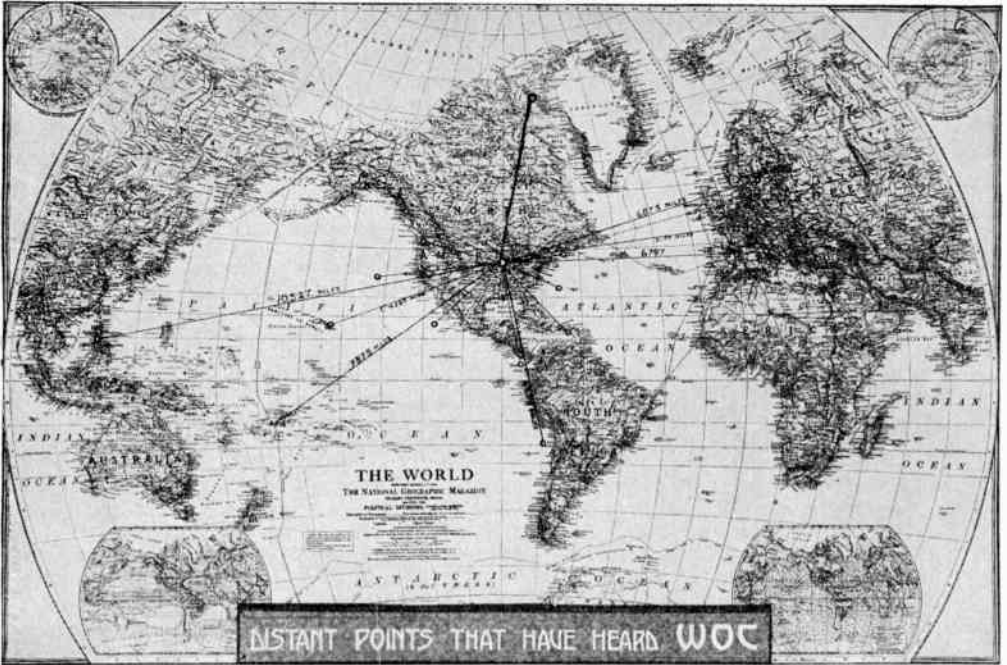
AS TO the business organization required to properly conduct a station of this kind, we are told that the broadcasting work is so interlaced with the business activities of the institution that it is difficult to estimate the number of employes connected with the various phases of handling the

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DAVENPORT,



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broadcasting work. Twelve persons, however, are employed specifically as operators, announcers, directors, etc., comprising the regular station staff, and upwards of fifty employes of the institution are indirectly connected with the upkeep of the station, handling of correspondence, preparation of printed material, and caring for other details which make up the routine of work. As many as 20,000 communications have been received in a single week from radio listeners, many of the letters bearing foreign postmarks and requiring in many instances several weeks to reach Davenport. The work of handling this enormous correspondence has been highly systematized so as to give proper attention to each letter without delay. Individual consideration is given to each suggestion and request received, and letters requiring personal answers are never overlooked.

During the first year of the station's operation, over 100,000 letters were received, acknowledged and filed, and this amount has steadily increased during the three years the station has been on the air. At certain times it has been necessary to employ the services of as many as sixteen persons to open, read and classify the mail which is received each day, so that letters of importance requiring immediate attention may not be delayed.

And once more we reflect that listeners all over the country are being entertained and instructed through the efforts of many fine broadcasting stations, and in many cases these listeners little realize the preparation which is necessary on the part of the artists and station for every single number which is broadcast.

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The good-will of the listeners is the only recompense that The Palmer School asks or hopes to receive for the enormous expense and upkeep of its ultra-modern radiophone installation. Its only aspiration is that the public may feel a little closer and better acquainted with the science of Chiropractic and the greatest non-therapeutical institution in the world, "The Chiropractic Fountain Head, located at Davenport, Iowa, 'Where the West Begins,' and in the State Where the Tall Corn Grows."

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 Supper.....5:00 p.m. to 6:30 p.m.

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Dinner.....11:30 a.m. to 2:00 p.m.
 Supper.....5:15 p.m. to 6:45 p.m.

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7—REED E. SNYDER
Operator and Announcer
4—EDGAR H. TWAMLEY
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Soloist at
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who plays
the Chimes
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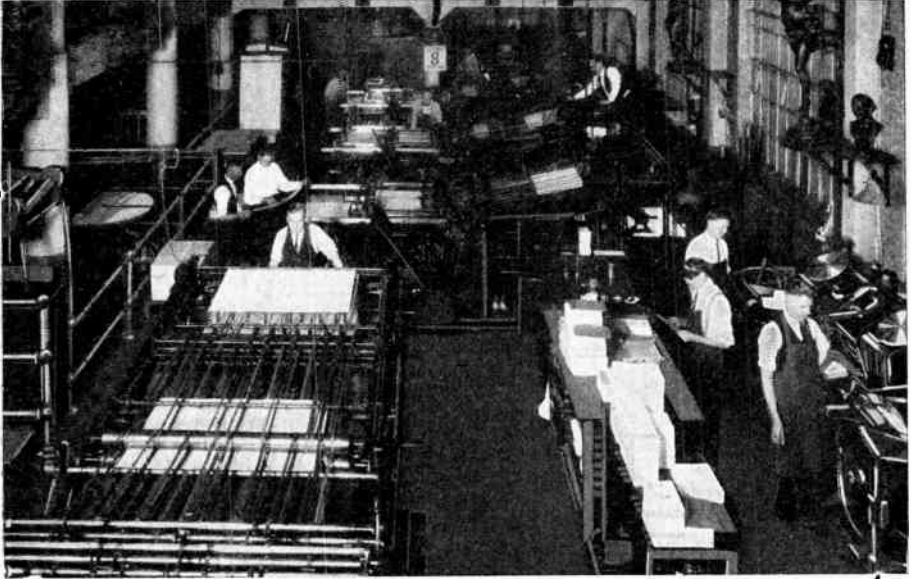
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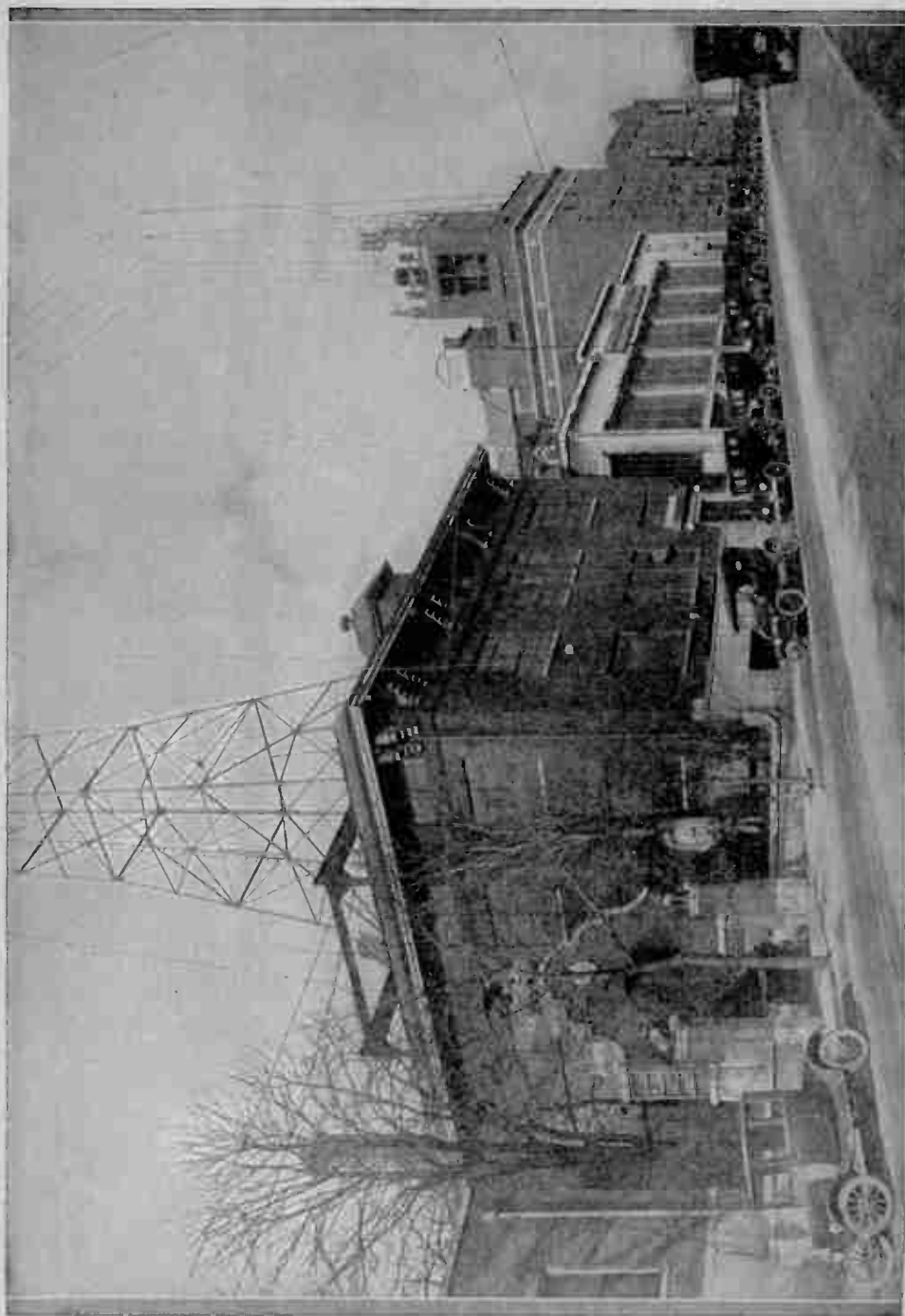
That *these qualities* form the cornerstone
 upon which we are building an industry
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P. S. C.



PRESS

NEATH THE TOWERS OF WOC
 DAVENPORT, IOWA



View of The Palmer School of Chiropractic, Showing Part of WOC Antenna System

The
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