

# RADIO - TELEVISION

Practical

• J. A. ROSENKRANZ, Pres. •

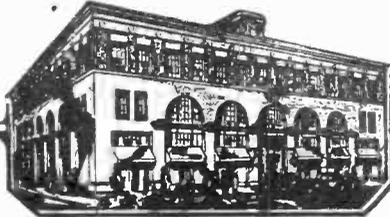
Training

## NATIONAL SCHOOLS

Established 1905

Los Angeles,

California



Copyright 1937 by  
NATIONAL SCHOOLS

Printed in U. S. A.

### Radio and Your Opportunities

*A HISTORICAL INTRODUCTION TO A  
FASCINATING AND PROFITABLE INDUSTRY*

BEFORE WE PLUNGE INTO THE DETAIL OF YOUR TRAINING, IT WILL BE TIME WELL SPENT TO VIEW THE UNDERTAKING AS A WHOLE. SUCH AN APPROACH WILL GIVE YOU AN EVEN KEENER APPRECIATION OF THE OPPORTUNITIES AND A CLEARER IDEA OF WHAT YOU CAN HOPE TO ACCOMPLISH. THAT IS THE PURPOSE OF THIS INTRODUCTION.

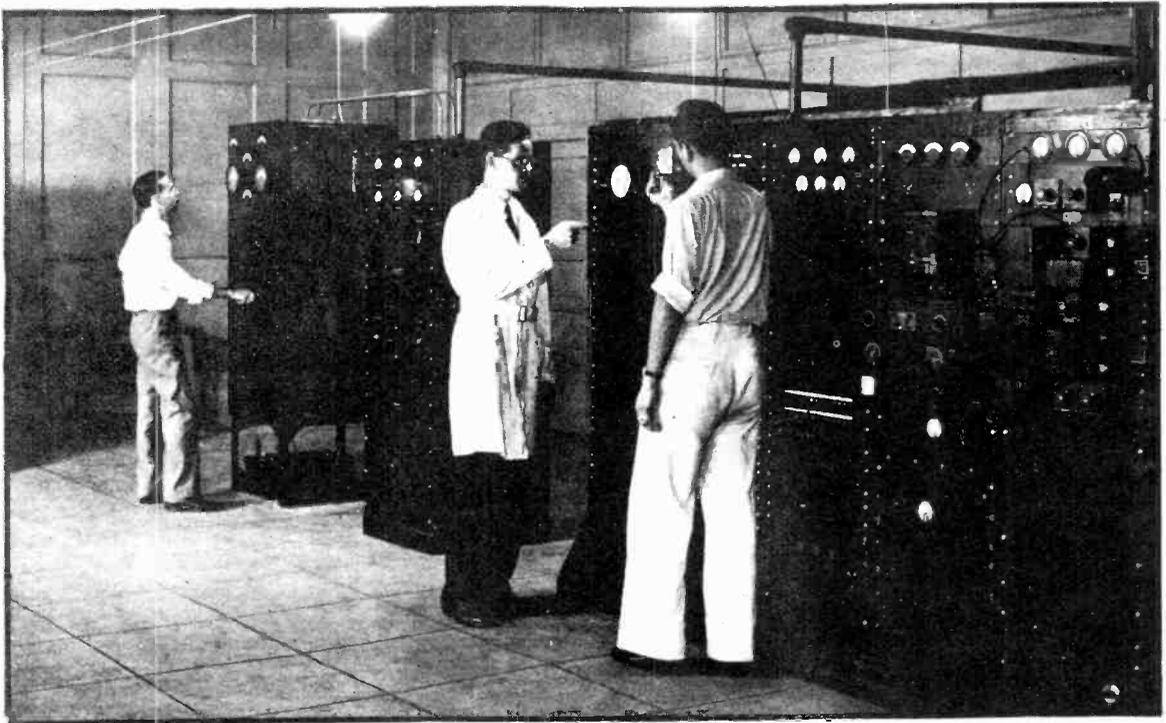


FIG. 1

*A Portion of National's  
Transmitter Room.*

MY FRIEND, YOU ARE PREPARING YOURSELF TO ENTER ONE OF THE MOST ACTIVE AND FASCINATING INDUSTRIES IN THE WORLD. NEVER BEFORE IN ALL HISTORY HAS THERE BEEN AN INDUSTRY WHICH STARTED WITH SUCH A HUMBLE BEGINNING AND REACHED SUCH TREMENDOUS WORLD-WIDE IMPORTANCE AS HAD RADIO. IT IS HARDLY BELIEVABLE THAT IT WAS ONLY BACK IN 1920 THAT THE FIRST BROADCAST STATION IN THE WORLD WENT ON THE AIR, WHEN NOW, ONLY A FEW YEARS LATER, THERE ARE HUNDREDS OF MAMMOTH BROADCASTING STATIONS SENDING THE BEST THE WORLD HAS TO OFFER IN MUSIC, ENTERTAINMENT, AND NEWS TO MILLIONS OF ENTHUSIASTIC RADIO LISTENERS WHO ARE SCATTERED OVER THE ENTIRE FACE OF THE EARTH.

I FULLY REALIZE THAT YOU ARE EXCEEDINGLY ANXIOUS TO START LEARNING ALL ABOUT RADIO, FOR OTHERWISE YOU WOULD NOT HAVE BEEN SO FAR SIGHTED AS TO ENROLL FOR THIS COMPLETE COURSE IN RADIO TRAINING BUT BEFORE WE SETTLE

DOWN TO THE ACTUAL WORK OF TEACHING YOU THE RADIO BUSINESS, I FIRST WANT TO SPEND A FEW MOMENTS WITH YOU, SO AS TO PROPERLY INTRODUCE YOU TO THIS NEW INDUSTRY OF WHICH YOU ARE SOON TO BECOME AN ACTIVE MEMBER.

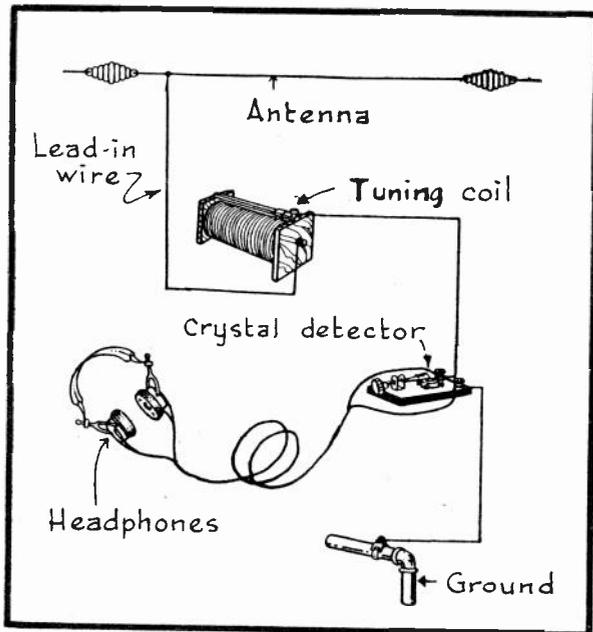


FIG. 2

*An early broadcast receiver.*

NATURALLY, IT IS NOT MY PURPOSE TO TEACH YOU HISTORY. MY ONLY AIM IS TO PROPERLY TRAIN YOU TO BECOME A RADIO EXPERT -- A MAN WHO KNOWS HIS BUSINESS FROM A TO Z AND THE SORT OF MAN WHOM THE RADIO INDUSTRY AS A WHOLE IS ANXIOUS TO ACCEPT INTO ITS RANKS, OF QUALIFIED RADIO TECHNICIANS. NEVERTHELESS, IT IS NO MORE THAN LOGICAL THAT YOU SHOULD KNOW A FEW HISTORICAL FACTS ABOUT YOUR CHOSEN PROFESSION, SUCH AS WHEN IT ORIGINATED, ETC. AND ALSO SOMETHING CONCERN THE HIGH LIGHTS IN ITS DEVELOP-

MENT UNTIL IT FINALLY REACHED THE PRESENT STAGE, WHERE YOU ARE GOING TO ENTER AND HELP MAKE RADIO HISTORY. SO LET US TOGETHER LOOK INTO THE PAST FOR A FEW MOMENTS AND SEE JUST WHAT PROGRESS RADIO HAS REALLY MADE SINCE ITS BEGINNING.

### EARLY RADIO DEVELOPMENTS

ALTHOUGH I MADE THE STATEMENT A FEW MOMENTS AGO THAT THE FIRST RADIO BROADCAST TOOK PLACE IN 1920, YET THIS NEW SCIENCE ACTUALLY CAME INTO EXISTENCE AS EARLY AS 1882 BUT AT THAT TIME AND DURING THE YEARS IMMEDIATELY TO FOLLOW, RADIO WAS MERELY A LABORATORY PROPOSITION AND OF NO PRACTICAL COMMERCIAL SIGNIFICANCE.

THESE EARLY DEVELOPMENTS WERE RATHER SLOW AND RADIO PHENOMENAE AT THIS PERIOD WERE DEEP AND BAFFLING MYSTERIES AND MORE OR LESS A "PLAY-

THING" OF SERIOUS MINDED SCIENTISTS, WHO PROBABLY NEVER REALIZED THAT RADIO WOULD FINALLY REACH THE PERFECTED STAGE IN WHICH YOU AND I FIND IT TODAY. FINALLY, HOWEVER, AROUND THE YEAR 1900, AN ITALIAN SCIENTIST, GUGLIELMO MARCONI, HELPED TREMENDOUSLY IN ADAPTING THESE EARLY LABORATORY PRINCIPLES TO PRACTICAL COMMERCIAL USE IN THE FORM OF THE "WIRELESS TELEGRAPH", AND IT WAS DURING THIS PERIOD THAT THE PUBLIC BEGAN HEARING ABOUT "SPARK TRANSMITTERS". ALTHOUGH THE WORLD WAS STARTLED BY THIS EARLY "USEABLE" SPARK TRANSMITTER, YET IN GENERAL, THE PUBLIC TOOK BUT LITTLE INTEREST IN RADIO.

MARCONI'S SPARK TRANSMITTERS WERE ONLY SUITABLE FOR SENDING RADIO MESSAGES BY MEANS OF THE TELEGRAPHIC CODE AND WERE NOT ADAPTABLE TO RADIATING MUSIC

OR VOICE OVER THE AIR. SOMETHING HAD TO BE DONE ABOUT THIS AND IT DIDN'T TAKE LONG BEFORE THE VACUUM TUBE OR THE THE "HEART OF THE MODERN RADIO" WAS SUFFICIENTLY DEVELOPED SO AS TO PERMIT THE CONSTRUCTION OF RADIO TRANSMITTERS SUITABLE FOR VOICE TRANSMISSION. TODAY, THE RADIO TUBE IS ONE OF THE MOST HIGHLY DEVELOPED UNITS CONSTRUCTED FOR



FIG. 3

*A superheterodyne receiver of the year 1922.*

RADIO PURPOSES AND IT IS IN A LARGE MEASURE RESPONSIBLE FOR THE ASTOUNDING ADVANCEMENT IN BOTH TRANSMITTER AND RECEIVER DESIGN.

### THE FIRST BROADCAST STATION

THE MOST IMPORTANT OF THE RADIO TUBE DEVELOPMENTS OCCURRED IN 1918 AND THESE REMARKABLE TUBE DISCOVERIES SPURRED RADIO ONWARD AT A STILL MORE RAPID PACE UNTIL THE EVENTFUL DAY OF NOVEMBER 2, 1920 WHEN RADIO STATION KDKA "WENT ON THE AIR" AT EAST PITTSBURGH, PENNSYLVANIA, U.S.A. AS THE FIRST BROADCAST STATION IN THE WORLD TO FEATURE REGULAR BROADCAST PROGRAMS. THIS DAY NOT ONLY WAS BROADCASTS' BIRTHDAY BUT IT MARKED THE BIRTH OF THE PRESENT DAY RADIO FAN AS WELL, FOR FINALLY, THE PUBLIC REALLY BECAME ENTHUSIASTIC OVER THE SCIENCE WHICH WAS DESTINED TO BECOME THE WONDER OF THE AGE.

### EARLY BROADCAST RECEIVERS

FROM 1920 ON IS WHERE RADIO EXPERIENCED ITS SPECTACULAR RISE TO BE

COME THE PRESENT DAY "BILLION DOLLAR INDUSTRY". NOW EVERYBODY WANTED A RADIO RECEIVER WITH WHICH TO HEAR THESE NEW BROADCAST PROGRAMS AND IF SOME PERSON WERE FORTUNATE ENOUGH TO OWN ONE, THE WHOLE FAMILY AND ALL THE NEIGHBORS WERE CROWDED AROUND THE ONE LITTLE SET TAKING TURNS ABOUT IN LISTENING-IN THROUGH A SINGLE PAIR OF HEADPHONES. EVEN IF THEY DIDN'T HEAR MUCH OF A PROGRAM -- THEY WERE THRILLED. AT LAST RADIO HAD CAPTURED THE WORLD BY STORM. IT HAD COME TO STAY -- TO GROW AND TO DEVELOP TO SUCH GIGANTIC PROPORTIONS THAT WE EVEN TODAY, CANNOT FORETELL WHAT RADIO WONDERS WE SHALL WITNESS IN THE NEAR FUTURE.

BACK IN 1920, YOU COULDN'T GO INTO A WELL EQUIPPED RADIO SALES ROOM AND PURCHASE A FINE GOLDEN TONED RECEIVER IN A LUXURIOUS CABINET WITH WHICH TO "LISTEN-IN". NO SIR -- COMMERCIAL BROADCAST RECEIVERS

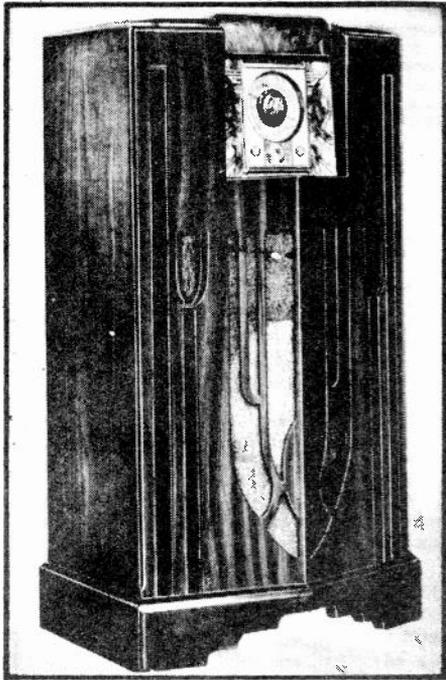


FIG. 4

*A Modern All-Wave Receiver.*

WERE STILL UNHEARD OF AT THAT TIME AND IF YOU HAD THE "RADIO FEVER", THE ONLY THING TO DO WAS TO BUILD YOUR OWN SET, AND HOW WELL I REMEMBER THOSE OLD "HAY-WIRE" RECEIVERS WITH THEIR SQUAWKS AND GROANS, THE FIRST SCREAMING LOUD SPEAKERS, AND THE OTHER IMPERFECT RADIO ACCESSORIES.

FOR YOUR INTEREST, I AM SHOWING YOU IN FIG. 2, A GENERAL LAY-OUT OF A POPULAR BROADCAST RECEIVER OF THE YEAR 1920. MANY OF THESE CRUDE SETS WERE USED BY THE PUBLIC AT THAT TIME TO "BRING-IN" THESE EARLY BROADCAST PROGRAMS.

IT IS A RATHER SIMPLE AFFAIR ISN'T IT? IN FACT, IT CONSISTS OF NOTHING MORE THAN AN ELEVATED COPPER WIRE CALLED THE "ANTENNA"; A COIL OF WIRE AND SLIDER ARRANGEMENT WHICH WE CALL A "TUNER"; THEN WE HAVE AN INTERESTING LITTLE APPARATUS WHICH IS KNOWN AS A "CRYSTAL DETECTOR"; AND FINALLY, A PAIR OF HEADPHONES AND A WATER PIPE WHICH RUNS INTO THE EARTH. THAT'S ALL THERE WAS TO THIS SIMPLE RECEIVER AND IN A LATER LESSON I AM

GOING TO SHOW YOU HOW IT WORKS.

RADIO "PARTS-STORES" SPRANG UP LIKE MUSHROOMS IN THE LARGER CITIES AND PEOPLE BOUGHT MILLIONS OF RADIO PARTS. IN PRACTICALLY EVERY HOME IN THE LARGER CITIES HERE IN THE UNITED STATES, YOU COULD FIND SOME MALE MEMBER OF THE HOUSEHOLD WITH HIS SLEEVES ROLLED UP, FRANTICALLY WORKING AWAY WITH A HOT SOLDERING IRON CONNECTING UP ALL KINDS OF TRICK GADGETS IN AN ATTEMPT TO CONSTRUCT SOME KIND OF A RECEIVER. THE CONTROLS ON SOME OF THESE EARLY HOME-MADE SETS WERE SO COMPLEX AND GREAT IN NUMBER THAT THE CONTROL PANEL LOOKED AS THOUGH IT WERE FITTED TO OPERATE A WHOLE POWER HOUSE, AND IT TOOK PLENTY OF PATIENCE ON THE PART OF THE OWNER TO FINALLY GET THESE CONTROLS ADJUSTED TO THE POINT WHERE HE COULD EVEN LISTEN TO A LOCAL STATION.

#### THE DEMAND FOR LONG-DISTANCE RECEIVERS

FOR A GREAT MANY OF THESE ENTHUSIASTIC RADIO FANS LOCAL RECEPTION

HAD BECOME OF RATHER LITTLE INTEREST AND WHAT THEY WANTED WAS TO LISTEN TO SOME STATION AT THE OTHER EXTREME END OF THE COUNTRY. DISTANCE WAS THE THING FOR THEM AND HERE IS WHERE THEY COMMENCED CROWDING TUBES INTO COMPLEX CIRCUITS AND UPON INSPECTING SOME OF THESE YOUNG "DISTANCE-GETTERS", YOU WOULD THINK THAT THE OWNER'S IDEA OF DISTANCE WAS MARS.

TAKE A LOOK AT FIG. 3. THIS IS A SUPERHETERODYNE RECEIVER FOR DISTANT RECEPTION, WHICH WAS BUILT BACK IN 1922. COMPARE THIS RECEIVER WITH SOME OF THE MODERN COMMERCIAL RECEIVERS, SUCH AS I AM SHOWING YOU IN FIG. 4. SOME DIFFERENCE, ISN'T THERE?

NOT ONLY IS THE RECEIVER OF FIG. 4 MUCH MORE ATTRACTIVE FROM AN APPEARANCE STANDPOINT THAN THE UNIT IN FIG. 3 BUT IT IS MORE SIMPLE TO OPERATE, PROVIDES MUCH BETTER TONE QUALITY, AND OFFERS A MUCH GREATER VARIETY OF ENTERTAINMENT DUE TO THE FACT THAT IT IS DESIGNED FOR SHORT-WAVE RECEPTION AS WELL AS FOR STANDARD BROADCASTS.

#### COMMERCIAL RECEIVERS

DURING THIS SAME PERIOD, COMPANIES WERE ORGANIZED, WHOSE BUSINESS IT WAS TO MANUFACTURE RECEIVERS FOR THE PUBLIC'S USE. THEY EMPLOYED THE MOST SKILLED ENGINEERS OF THAT TIME TO DESIGN THEIR ARTICLE BUT DUE TO THE HIGH PRICE, THE PUBLIC DID NOT AT FIRST ACCEPT COMMERCIAL SETS WITH A GREAT DEAL OF ENTHUSIASM. RESULTS PROVED, HOWEVER,

THAT RADIO RECEIVERS WHICH WERE BUILT BY THOSE POSSESSING SOMEWHAT OF A RADIO KNOWLEDGE WOULD OUT-PERFORM THE AVERAGE HOME-MADE SET. THOSE COMMERCIAL RECEIVERS OFFERED BETTER SELECTIVITY, GREATER VOLUME, AND A HIGHER DEGREE OF TONE QUALITY. THESE ADVANTAGES FINALLY SUCCEEDED IN REACHING THE HEART OF THE INTERESTED PUBLIC SO THAT AN INCREASING NUMBER OF COMMERCIAL RECEIVERS WERE SOLD.

AS PRODUCTION AND SALES INCREASED, THE PRICE BECAME CORRESPONDINGLY LOWER UNTIL RADIO RECEIVER MANUFACTURERS FINALLY GAINED A FIRM FOOT-HOLD IN THIS NEW INDUSTRY.

#### RADIO CONSTRUCTION REVOLUTIONIZED

THE INCREASE IN SALES OF COMMERCIAL RECEIVERS NATURALLY REVOLUTION



FIG. 5  
*A Typical Radio Service Store.*

IZED THE RADIO CONSTRUCTION BUSINESS, WITH THE RESULT THAT HARDLY ANY OF THE RADIO LISTENERS CONTINUED CONSTRUCTING SETS OF THEIR OWN BUT DEMANDED COMMERCIAL RECEIVERS WHICH WOULD PROVIDE THEM WITH NOTHING LESS THAN THE BEST WHICH RADIO HAD TO OFFER. THE RADIO FAN OF TODAY IS NO LONGER LIKE THE FAN OF A FEW YEARS AGO, FOR NOW HE SEEKS COMFORT IN SITTING DOWN IN AN EASY CHAIR, TURNING ON A SIMPLE SWITCH, TUNING HIS RECEIVER TO THE STATION HE WANTS WITH BUT A SINGLE CONTROL AND FINALLY ADJUSTING THE VOLUME TO SUIT HIS INDIVIDUAL TASTE. HE IS NO LONGER INTERESTED IN THE "WORKS" OF HIS FAITHFUL RECEIVER BUT IS EXCEPTIONALLY CRITICAL CONCERNING ITS PERFORMANCE.

MODERN RADIO RECEIVER CIRCUITS HAVE REACHED SUCH A HIGH DEGREE OF COMPLEXITY THAT THE AVERAGE LISTENER CAN NO LONGER MAKE SATISFACTORY ADJUSTMENTS AND REPAIRS WHEN SOMETHING GOES WRONG, AND IS CONTENT TO LEAVE THIS WORK FOR THE SKILLED HANDS OF TRAINED RADIO SERVICE MEN. HERE IS WHERE THE MODERN RADIO DOCTOR CAME INTO EXISTENCE AND NOW HE IS IN

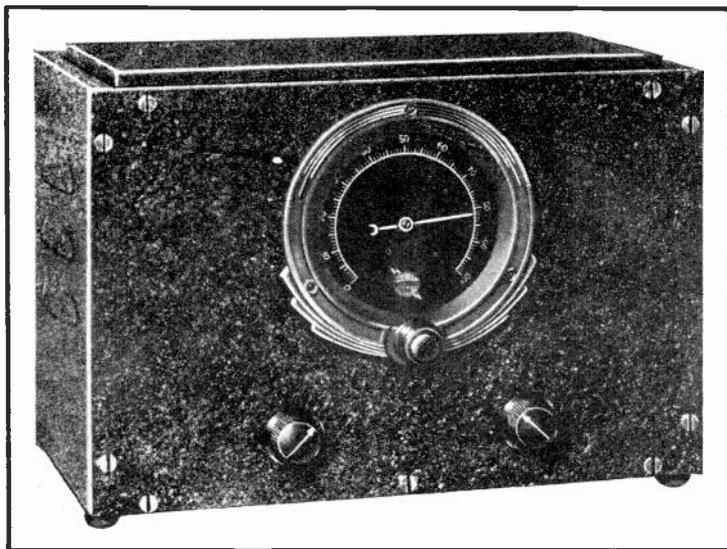


FIG. 6  
*A Typical Short-Wave  
Converter.*

GREATER DEMAND THAN EVER BEFORE, FOR MILLIONS OF RADIO RECEIVERS ARE NOW INSTALLED IN HOMES AND ALL OF THEM REQUIRE EXPERT SERVICING.

NOT ONLY HAS ASTOUNDING ADVANCEMENT BEEN MADE IN RECEIVER CONSTRUCTION BUT BROADCAST EQUIPMENT HAS ALSO BEEN DEVELOPED TO AN EXCEPTIONALLY HIGH DEGREE AND NOW HUNDREDS OF THESE GIANTS OF THE AIR RADIATE THEIR PROGRAMS OUT INTO SPACE WITH TREMENDOUS ENERGY AND WITH UT-MOST QUALITY.

YOUR ENTRANCE INTO  
THE INDUSTRY

NOW THAT YOU HAVE LEARNED ABOUT RADIO FROM ITS VERY BEGINNING TO THE PRESENT TIME, I SINCERELY HOPE THAT YOU WILL REALIZE THAT RADIO IS NOT ONLY NEW TO YOU BUT IT IS ALSO COMPARATIVELY NEW TO THE WHOLE WORLD. THOSE EXPERTS, WHO ARE ALREADY QUALIFIED TO HOLD HIGH SALARIED RADIO JOBS, HAVE VERY LITTLE START AHEAD OF YOU AND THERE IS PLENTY OF ROOM AT THE TOP OF THE INDUSTRY FOR YOU.

#### YOUR CHANCES OF SUCCESS IN RADIO

FROM NOW ON, YOU SHOULD BE LOOKING TOWARD THE FUTURE WHICH LIES AHEAD OF YOU IN RADIO. NATURALLY, YOU HAVE A RIGHT TO KNOW JUST WHAT YOUR CHANCES OF SUCCESS ARE IN RADIO, SO LET US BRIEFLY TOGETHER LOOK OVER THE ENTIRE RADIO FIELD WHICH AWAITS YOU AND AS WE GO ALONG, I WILL POINT OUT MANY DIFFERENT JOBS FOR WHICH THIS COMPLETE TRAINING WILL QUALIFY YOU. NO DOUBT, YOU WILL WISH TO SPECIALIZE IN SOME PARTICULAR

BRANCH OF THIS MAMMOTH FIELD OF RADIO AND THEREFORE, YOU WILL FIND MANY SUGGESTIONS RELATIVE TO THIS MATTER AS WE PROCEED.

### CONSTRUCTING, SELLING, INSTALLING & SERVICING RECEIVERS

FIRST, LET US INVESTIGATE, WHICH IS NO DOUBT THE GREATEST BRANCH OF RADIO, NAMELY, THAT OF CONSTRUCTING, SELLING, INSTALLING AND SERVICING COMMERCIAL TYPES OF RECEIVERS. RADIO FACTORIES TODAY DEMAND THE SERVICES OF MEN WHO KNOW RADIO AND PROVIDED THAT YOUR RADIO KNOWLEDGE IS THOROUGH YOU DO NOT HAVE TO BE CONTENT WITH FACTORY JOBS AS AN ORDINARY LABORER, BUT YOU CAN QUICKLY RISE TO THE POSITION OF TESTER, FOREMAN, SUPERINTENDENT, PRODUCTION ENGINEER, OR EVEN A DESIGNING ENGINEER --- THE ONLY REQUIREMENT IS THAT YOU APPLY YOURSELF TO YOUR WORK CONSCIENTIOUSLY AND STUDY HARD. ALSO REMEMBER THAT THESE DESIRABLE POSITIONS HAVE AN EXCEPTIONALLY ATTRACTIVE SALARY ATTACHED TO THEM, FOR NOWADAYS EXPERTS ARE PAID JUST WHAT THEY ARE WORTH.

PERHAPS YOU ARE MORE INTERESTED IN SELLING RECEIVERS AND TO BE SUCCESSFUL IN THIS LINE OF WORK ALSO REQUIRES RADIO KNOWLEDGE, FOR IT WOULD BE AN EMBARRASSING SITUATION TO HAVE SOME CUSTOMER FIND OUT THAT YOU DIDN'T KNOW ANYTHING ABOUT THE PRODUCT WHICH

YOU ARE TRYING TO SELL HIM. WITH A KNOWLEDGE OF RADIO AND WITH SALES ABILITY, YOU WILL HAVE NO DIFFICULTY AT ALL IN MAKING CONNECTIONS WITH ANY OF THE LARGER RADIO DEALERS. NOT ONLY THIS, BUT WITH VERY LITTLE CAPITAL, YOU CAN START A RADIO SALES BUSINESS OF YOUR OWN. AS YOUR BUSINESS GROWS, YOU CAN SOON BECOME FINANCIALLY INDEPENDENT FOR THERE IS REAL MONEY TO BE MADE IN THIS LINE OF BUSINESS.

CLOSELY ASSOCIATED WITH RADIO SALES, IS THE WORK OF INSTALLING NEW RECEIVERS IN CUSTOMERS' HOMES, IN ADDITION TO TESTING AND SERVICING THESE SETS AFTER THEY HAVE BEEN IN OPERATION FOR SOME TIME. NO MATTER HOW CAREFULLY THE FACTORY BUILDS THE RECEIVER, IT CANNOT POSSIBLY GIVE ITS NEW OWNER THE BEST OF PERFORMANCE IF NOT PROPERLY INSTALLED. IN THIS RESPECT, THE AERIAL MUST BE SUITABLE FOR THE PARTICULAR RECEIVER, THAT IS, IT SHOULD BE OF A CERTAIN TYPE AND INSTALLED IN A CERTAIN POSITION IN ORDER TO ENABLE THE SET TO OPERATE AT ITS BEST. THIS IS PARTICULARLY TRUE OF THE MODERN ALL-WAVE RECEIVERS AND YOU WILL BE INSTRUCTED IN DETAIL RELATIVE TO THIS MATTER IN A LESSON SOON TO FOLLOW.

IF YOU ARE CALLED OUT ON A SERVICE CALL AND CONFRONTED WITH A RE-



FIG. 7  
*A Modern Automobile Receiver Installation.*

CEIVER WHICH FAILS TO OPERATE AS IT SHOULD, YOU WILL FIND THAT MY INSTRUCTIONS WILL ENABLE YOU TO MAKE SYSTEMATIC TESTS, SO THAT YOU WILL FIND THE TROUBLE IN A VERY SHORT TIME. IN ADDITION, I AM GOING TO SHOW YOU JUST EXACTLY HOW TO REMEDY ALL OF THE DIFFERENT TROUBLES TO WHICH RECEIVERS ARE SUSCEPTABLE. EVEN IF A MODERN RECEIVER IS CONSTRUCTED WITH CARE, YET IT WILL SOONER OR LATER DEVELOPE TROUBLE, ESPECIALLY WHEN IN THE HANDS OF AN OWNER WHO HAS A TENDENCY TO ABUSE IT, AND MANY A RECEIVER RIGHT NOW IS BADLY IN NEED OF EXPERT ATTENTION BUT WITH NO COMPETENT SERVICE MAN AVAILABLE.

THINK OF ALL THE CHANCES YOU HAVE TO ESTABLISH YOURSELF IN YOUR COMMUNITY AS THE "LOCAL RADIO DOCTOR". IN FACT, YOU WILL FIND THAT WITH MY SYSTEM OF TRAINING, YOU CAN DO ORDINARY SERVICE WORK BEFORE YOU HAVE EVEN FINISHED YOUR COURSE. IN THIS WAY, YOU CAN ALREADY BE "CASHING IN ON YOUR TRAINING" DURING THE TIME THAT YOU ARE CONTINUING WITH YOUR MORE ADVANCED STUDIES.

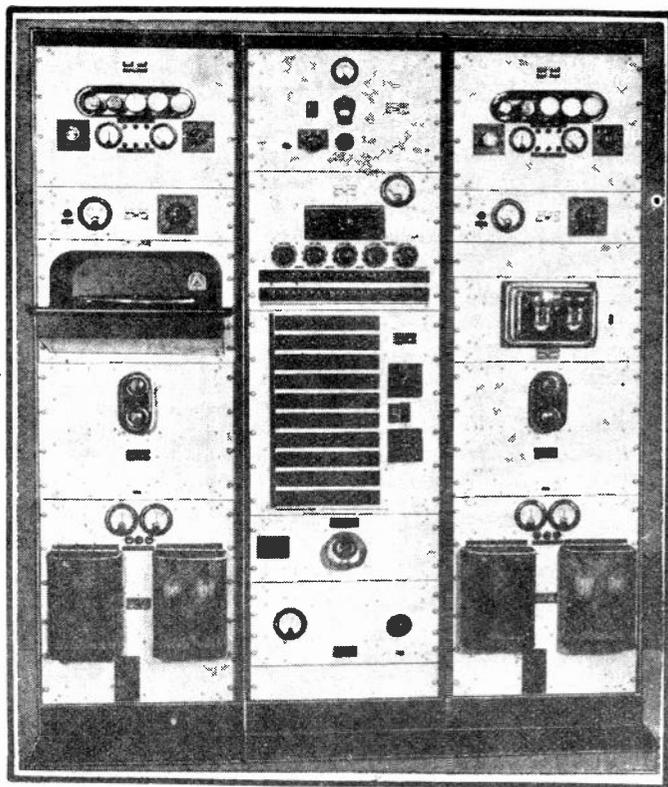


FIG 8  
*Typical Amplifying Equipment.*

### ESTABLISH YOUR OWN RADIO SERVICE BUSINESS

WOULDN'T YOU LIKE TO BE THE OWNER OF A RADIO SERVICE SHOP, SUCH AS THE ONE SHOWN IN FIG. 5? YOU KNOW, IT DOESN'T REQUIRE A GREAT DEAL OF CAPITAL TO START SUCH A BUSINESS, FOR AT THE VERY BEGINNING YOU NEED ONLY PURCHASE THE BARE NECESSITIES FOR TESTING RECEIVERS ETC. AND THEN YOU CAN GRADUALLY PURCHASE MORE EQUIPMENT AND ENLARGE YOUR BUSINESS AS IT PAYS FOR ITSELF.

FINALLY, YOU CAN DO AS THE MAN WHO OWNS THE SHOP SHOWN IN FIG. 5. HE NOT ONLY REPAIRS RECEIVERS BUT HE ALSO SELLS NEW RECEIVERS, SECOND-HAND REBUILT RECEIVERS, TUBES, SPEAKERS AND MISCELLANEOUS RECEIV-

ER REPLACEMENT PARTS SUCH AS TRANSFORMERS, CONDENSERS ETC. BY HANDLING SUCH A LARGE VARIETY OF BUSINESS, HE REALIZES A VERY SATISFACTORY INCOME AND IS SOON ESTABLISHED AS "RADIO HEADQUARTERS" IN HIS COMMUNITY. YOU TOO CAN DO THIS VERY THING AND BY BEING A THOROUGHLY TRAINED RADIO MAN, YOU WILL FIND YOURSELF RESPECTED BY THOSE IN YOUR DISTRICT WHO TURN TO YOU FOR ADVICE AND ASSISTANCE CONCERNING THEIR RADIO TROUBLES. EVEN IF YOU INTEND TO ULTIMATELY SPECIALIZE IN SOME OTHER FIELD OF RADIO YET A KNOWLEDGE OF SERVICE PROBLEMS WILL BE OF GREAT VALUE TO YOU.

CONSTRUCT "CUSTOM-BUILT" RECEIVERS IN YOUR SPARE TIME

A VERY PROFITABLE SPARE-TIME WORK IS THAT OF CONSTRUCTING CUSTOM BUILT RECEIVERS. IN OTHER WORDS, YOU PURCHASE WHATEVER EQUIPMENT IS NECESSARY, CONSTRUCT THE REST AND FINALLY ASSEMBLE A FINE RECEIVER ACCORDING TO YOUR OWN IDEAS. A CUSTOM BUILT RECEIVER IS NOT CLASSIFIED AS JUST ANOTHER HOME-MADE SET BECAUSE THERE IS A VAST DIFFERENCE. A CUSTOM BUILT RECEIVER IS BUILT BY A RADIO EXPERT AND WHEN PROPERLY DESIGNED, WILL OUT-PERFORM MANY OF THE COMMERCIAL SETS. THE PUBLIC IS ALWAYS ANXIOUS FOR "SOMETHING DIFFERENT" AND IF YOU OFFER SUCH ADVANCED IDEAS IN A RECEIVER OF YOUR OWN CONSTRUCTION, YOU WILL FIND MANY OPPORTUNITIES FOR A QUICK SALE.

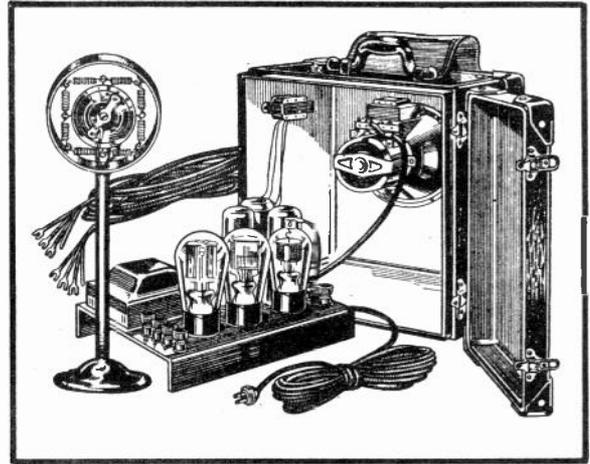


FIG. 9

*A portable public address system.*

BY CONSTRUCTING THE "WORKS" OF THE CUSTOM BUILT SET NEATLY AND INSTALLING IT IN AN ATTRACTIVE CABINET, ITS APPEARANCE WILL EQUAL THAT OF ANY COMMERCIAL RECEIVER. YOU WILL RECEIVE FULL INSTRUCTION CONCERNING THE CONSTRUCTION OF FINE CUSTOM-BUILT RECEIVERS, SO THAT LATER, YOU CAN DO LIKE MANY OTHERS BY CONSTRUCTING SUCH RECEIVERS IN YOUR SPARE TIME AND THEN SELLING THEM AT AN ATTRACTIVE PROFIT. NOT ONLY IS THIS PARTICULAR TYPE OF WORK PROFITABLE BUT IT IS ALSO MOST FASCINATING.

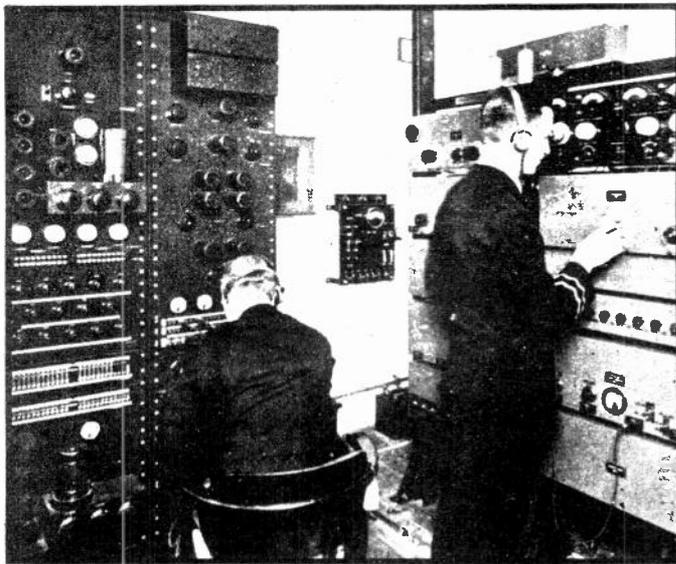


FIG. 10

*Operating a Commercial Transmitter.*

THERE IS A REAL THRILL IN HEARING A RECEIVER OF YOUR OWN CONSTRUCTION "PULLING-IN" DISTANT STATIONS, AS WELL AS TO OFFER CLEAR RICH TONE QUALITY. IN OTHER WORDS, CONSTRUCT A RECEIVER WHICH OFFERS MUSIC THAT IS A TRUE REPRODUCTION OF THAT ORIGINALLY PRODUCED IN THE BROADCAST STUDIO AND YOU HAVE SOMETHING THAT WILL SELL.

HELP SUPPLY THE DEMAND FOR SHORT WAVE APPARATUS

ONLY RECENTLY, MANY NEW DEVELOPMENTS HAVE OCCURRED IN THE RADIO INDUSTRY IN WHICH YOU ARE OFFERED STILL GREATER MONEY-MAKING

OPPORTUNITIES THAN EVER BEFORE. FOR EXAMPLE, RADIO FANS ARE NOW DESERTING THE BROADCAST CHANNELS, AT TIMES, IN AN ATTEMPT TO GET IN TOUCH WITH THE OTHER SIDE OF THE WORLD BY MEANS OF SHORT WAVE RECEPTION. AN ORDINARY BROADCAST RECEIVER IS NOT CAPABLE OF TUNING IN SHORT WAVE STATIONS AND ADDITIONAL RECEIVER EQUIPMENT IS NECESSARY FOR THIS TYPE OF RECEPTION.

THE LISTENER MUST IN THIS CASE EITHER USE A SEPARATE, SPECIALLY DESIGNED SHORT-WAVE RECEIVER, A SHORT WAVE CONVERTER, OR ELSE HE MUST HAVE ONE OF THE UTRA-MODERN "ALL-WAVE RECEIVERS". THIS OF COURSE MEANS MORE WORK FOR YOU AS A RADIO EXPERT BECAUSE THERE IS NOW A TREMENDOUSLY FERTILE MARKET FOR SHORT WAVE RECEIVING EQUIPMENT.

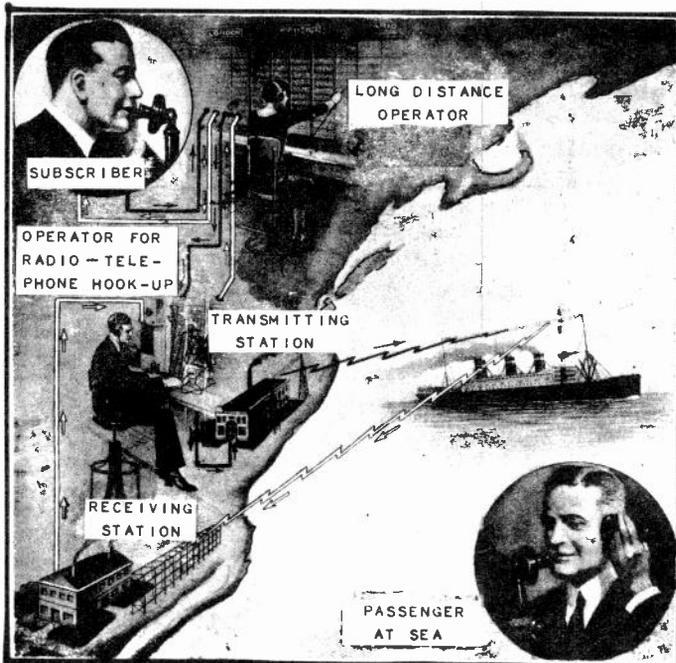


FIG. 11

*A Telephone Conversation  
From Ship to Shore.*

IN OTHER WORDS, YOU CAN ENGAGE IN THE CONSTRUCTION OF SHORT-WAVE RECEIVERS AND SELL THEM TO YOUR ENTHUSIASTIC CUSTOMERS. THEN THEY CAN USE THEIR REGULAR BROADCAST RECEIVER FOR ORDINARY RECEPTION AND YOUR SHORT-WAVE RECEIVER TO SATISFY THEIR HUNGER FOR LONG DISTANCE RECEPTION ON THE SHORTER WAVE LENGTHS.

ANOTHER PLAN IS TO CONSTRUCT AND SELL SHORT WAVE CONVERTERS. THIS SPECIAL APPARATUS PERMITS SHORT WAVE SIGNALS TO BE REPRODUCED BY THE SPEAKER OF THE REGULAR BROADCAST RECEIVER. IN OTHER WORDS, MANY PEOPLE ALREADY OWN A GOOD BROADCAST SET AND NOW THEY DECIDE

THAT THEY WANT TO JOIN THE VAST ARMY OF SHORT-WAVE FANS. THE THING FOR YOU TO DO THEN, IS TO CONSTRUCT A SHORT-WAVE CONVERTER FOR SUCH A PROSPECT.

THIS SHORT-WAVE CONVERTER CAN THEN BE PLACED ON TOP OF THE BROADCAST RECEIVER AND THE OWNER CAN THEN USE HIS BROADCAST RECEIVER FOR BOTH BROADCAST AND SHORT-WAVE RECEPTION WITHOUT THE NEED FOR GOING TO A GREAT DEAL OF ADDITIONAL EXPENSE.

IT IS REALLY VERY SIMPLE TO BUILD SUCH A CONVERTER AND IN MY REGULAR LESSON, I GIVE YOU FULL INSTRUCTIONS RELATIVE TO THIS WORK. THOUSANDS OF SET OWNERS ARE EXCEPTIONALLY ANXIOUS TO HAVE A "ROUND-THE-WORLD" RECEIVER AND AFTER A LITTLE STUDY, YOU WILL BE QUALIFIED TO GIVE IT TO THEM WITH MANY "RADIO-DOLLARS" AS YOUR REWARD.

YOU WILL ALSO RECEIVE FULL INSTRUCTION RELATIVE TO THE CONSTRUCTION, OPERATION AND SERVICING OF MODERN ALL-WAVE RECEIVERS, WHICH ARE SPECIALLY DESIGNED SO THAT THE SAME SET CAN BE USED FOR BOTH BROADCAST AND SHORT-WAVE RECEPTION WITHOUT THE NEED FOR ADDITIONAL ACCESSORY EQUIPMENT. IN OTHER WORDS, YOUR TRAINING IS GOING TO BE UP TO DATE, SO THAT YOU WILL BECOME THOROUGHLY FAMILIAR WITH THE VERY LATEST IN RADIO.

### REMOTE CONTROL OF RADIO

ANOTHER OF THE NEWER RADIO RECEIVER DEVELOPMENTS IS THAT OF REMOTE CONTROL. IN THIS CASE, THE CONSTRUCTIONAL FEATURES OF THE RADIO RECEIVER ARE SUCH THAT THE RADIO RECEIVER ITSELF IS INSTALLED IN ONE LOCATION AND YET THE SET IS COMPLETELY CONTROLLED FROM SOME POINT IN AN ENTIRELY DIFFERENT SECTION OF THE BUILDING. THIS FORM OF RECEIVER CONTROL IS ALREADY BEING USED QUITE EXTENSIVELY IN LARGE HOMES, APARTMENT BUILDINGS AND HOTELS.

A TREMENDOUS AMOUNT OF THIS TYPE OF UP TO THE MINUTE RADIO INSTALLATIONS WILL BE MADE IN THE NEAR FUTURE. THE COST OF SUCH INSTALLATIONS RUNS FROM SEVERAL HUNDRED DOLLARS UP TO THOUS-

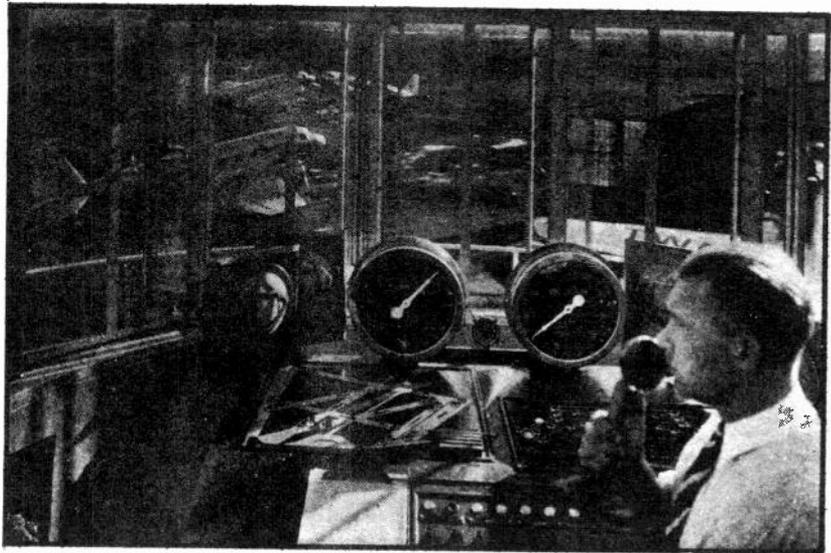


FIG. 12  
*Traffic-Control Tower at an Airport.*

ANDS OF DOLLARS AND THERE IS A CHANCE OF A LIFE-TIME AWAITING YOU IN WORK OF THIS NATURE. ALTHOUGH INSTALLATIONS OF THIS CLASS MAY APPEAR AS BEING VERY COMPLICATED AT THE PRESENT TIME, YOU WILL NEVERTHELESS SOON LEARN THAT AFTER YOU HAVE ONCE MASTERED RADIO, THIS WORK IS REALLY RATHER SIMPLE AND THE TRAINING WHICH YOU WILL RECEIVE WILL QUICKLY QUALIFY YOU SO THAT YOU CAN DO THIS WORK SUCCESSFULLY.

### INSTALL "HOME-RECORDING" APPARATUS

A NEW FORM OF HOME ENTERTAINMENT HAS ONLY RECENTLY CAPTURED THE INTEREST OF ENTHUSIASTIC RADIO LISTENERS. THIS NEW FORM OF HOME ENTERTAINMENT IS GENERALLY CALLED "HOME-RECORDING" AND IN THIS CASE, YOU MAKE YOUR OWN PHONOGRAPH RECORDS RIGHT AT HOME. THAT IS TO SAY, BY MEANS OF VERY LITTLE SPECIAL APPARATUS, YOU CAN MAKE PHONOGRAPH RECORDS OF YOUR OWN VOICE OR THAT OF ANY OF YOUR FRIENDS. PERHAPS ONE OF YOUR RELATIVES OR FRIENDS IS A GOOD SINGER AND IN THIS CASE YOU CAN RECORD A SONG. YOU CAN EVEN GO A STEP FARTHER, FOR BY TUNING IN A FINE RADIO PROGRAM, YOU CAN ACTUALLY MAKE A PHONOGRAPH RECORD OF YOUR FAVORITE ORCHES-

TRA AS IT BROADCASTS ITS BEAUTIFUL MUSIC OVER THE AIR.

THESE RECORDINGS CAN THEN BE PLAYED TIME AND AGAIN FOR YOUR ENJOYMENT EITHER ON A CONVENTIONAL PHONOGRAPH OR THROUGH A SPECIAL ATTACHMENT AND YOUR RADIO LOUDSPEAKER.

THE "HOW", "WHY", AND "WHEREFORE" OF ALL THE CONSTRUCTIONAL WORK PERTAINING TO HOME-RECORDING AND THE REPRODUCTION OF PHONOGRAPH RECORDINGS WITH THE RADIO RECEIVER ARE ALL DISCUSSED IN DETAIL IN A SIMPLE AND INTERESTING STYLE IN THE LESSONS TO COME.

NOT ONLY CAN YOU USE THIS EXCEPTIONALLY USEFUL INFORMATION FOR YOUR OWN ENTERTAINMENT BUT YOU CAN MAKE SUCH INSTALLATIONS FOR YOUR CUSTOMERS AS WELL -- IN THIS WAY, PROVIDING YOURSELF WITH STILL ANOTHER LINE OF PROFITABLE WORK.

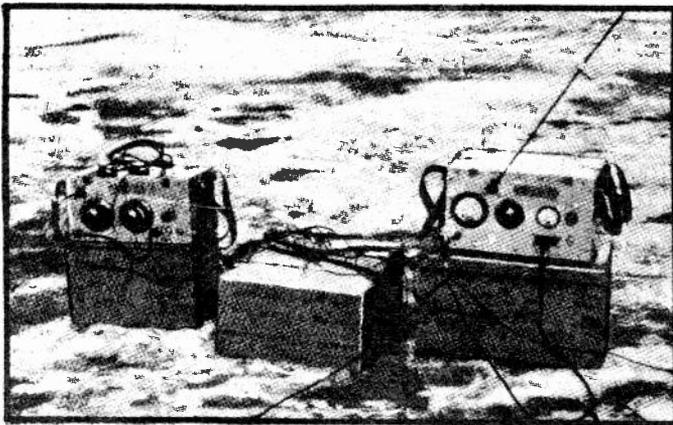


FIG. 13

*Radio is an Important Part of Modern Exploration.*

### EARN MONEY BY ELIMINATING INTERFERENCE

PROBABLY YOU HAVE BEEN LISTENING TO YOUR FAVORITE RADIO STARS AT SOME TIME OR OTHER WHEN ALL OF A SUDDEN, ALL KINDS OF CRACKLING AND CRASHING NOISES CAME OUT OF THE LOUD SPEAKER AND RUINED RECEPTION COMPLETELY. IN SOME CASES, SUCH DISAGREEABLE NOISES, WHICH WE CALL "STATIC," ARE CAUSED BY NATURE ITSELF, IN THAT

THESE STATIC DISTURBANCES ORIGINATE OUT IN THE ATMOSPHERE. ABOUT NINE TIMES OUT OF TEN, HOWEVER, SUCH STATIC DISTURBANCES ARE "MAN-MADE" --- BEING CAUSED BY SOME ELECTRICAL APPARATUS WHICH PRODUCES ELECTRICAL SPARKS ETC. NOW IN THE CASE OF ATMOSPHERIC DISTURBANCES, THERE IS VERY LITTLE THAT WE CAN DO, FOR WE CAN'T GO UP INTO THE SKY AND SHUT-OFF THE LIGHTNING. NEVERTHELESS, "MAN-MADE" STATIC CAN BE REMEDIED VERY EASILY AFTER ITS SOURCE IS ONCE LOCATED.

YOU WILL RECEIVE FULL INFORMATION AS TO THE CONSTRUCTION OF INTERFERENCE LOCATING APPARATUS, AND THE SYSTEMATIC METHODS OF RUNNING DOWN SUCH TROUBLESOME DISTURBANCES. FURTHERMORE, YOU ARE GOING TO BE SHOWN JUST EXACTLY HOW TO REMEDY THE INTERFERENCE WHICH IS CAUSED BY DIFFERENT TYPES OF ELECTRICAL EQUIPMENT.

THE VARIOUS METHODS OF LOCATING MAN MADE STATIC ARE ALSO ALL COVERED IN DETAIL IN YOUR LESSONS AND BELIEVE ME, A MAN WHO CAN RUN-DOWN AND CORRECT SUCH A LOCAL NUISANCE IS MIGHTY WELCOME IN ANY COMMUNITY AND IS WELL PAID FOR HIS TROUBLE. JUST THINK WHAT IT MEANS TO THE LISTENERS TO HAVE THEIR RADIO PROGRAMS CONTINUALLY SPOILED BECAUSE SOME



AS LITTLE INSTALLATION SPACE AS POSSIBLE.

MANY PEOPLE, WHO ENJOY CAMPING TRIPS, FIND THAT THEIR REST IN THE OPEN COUNTRY IS MADE STILL MORE ENJOYABLE WITH A GOOD PORTABLE RADIO RECEIVER AS A COMPANION. WITH ALL OF THE NEW RADIO DEVELOPMENTS WHICH HAVE RECENTLY OCCURRED, PORTABLE RECEIVERS CAN NOW BE CONSTRUCTED WHICH ARE CAPABLE OF OFFERING REMARKABLE PERFORMANCE AND WHICH WILL INDEED CHALLENGE THE SET IN THE HOME FOR FINE RECEPTION.

### YOUR SERVICES ARE NEEDED IN PUBLIC ADDRESS WORK

PUBLIC ADDRESS SYSTEMS HAVE BECOME STANDARD EQUIPMENT IN MOST OF THE LARGE STADIUMS, PARKS ETC. AND IN FIG. 8, I AM SHOWING YOU A TYPICAL AMPLIFIER INSTALLATION AS FREQUENTLY USED FOR THIS WORK. IN THIS



FIG. 15

*Radio Installation in a Police Car.*

PARTICULAR EXAMPLE, THE AMPLIFIER CAN BE USED FOR ENTERTAINING A LARGE CROWD OR AN ENTIRE BUILDING WITH A GOOD RADIO PROGRAM, WITH PHONOGRAPH RECORDINGS, OR ELSE THE VOICE OF A SPEAKER CAN BE AMPLIFIED MILLIONS OF TIMES AND SENT TO THE EARS OF THOUSANDS OF EAGER GATHERED LISTENERS THRU A SERIES OF POWERFUL LOUD SPEAKERS.

EQUIPMENT AS THIS MUST BE OPERATED BY TRAINED RADIO MEN, FOR ITS OPERATION IS BASED SOLELY UPON RADIO PRINCIPLES. MANY OF SUCH INSTALLATIONS ARE STILL TO BE MADE AND MANY EXPERT TECHNI-

CIANs ARE REQUIRED TO DESIGN AND CONSTRUCT THIS EQUIPMENT. THESE AMPLIFIERS ARE CONSTRUCTED TO PROVIDE A VERY FINE QUALITY OF SOUND AND TO MAINTAIN THIS HIGH STANDARD, IT IS NECESSARY THAT IT BE INSTALLED WITH UTMOST CARE. WHEN USING A GROUP OF LOUD SPEAKERS, IT IS ESSENTIAL THAT THEY BE GROUPED EXACTLY RIGHT, SO THAT THE SYSTEM WILL BE ELECTRICALLY BALANCED AND SO THAT THE SPEAKERS BE PROPERLY ORIENTED WITH RESPECT TO THE CONSTRUCTIONAL FEATURES OF THE BUILDING, SO AS TO OFFER THE PROPER SOUND DISTRIBUTION ETC.

IN FIG. 9 YOU WILL SEE PORTABLE PUBLIC ADDRESS EQUIPMENT. AFTER YOU ARE ACTIVE IN THE RADIO BUSINESS, YOU CAN CONSTRUCT SUCH AN AMPLIFIER FOR YOURSELF. THEN WHEN SOME CONCERN, SUCH AS A STORE OR MARKET

HAS A PUBLIC GATHERING FOR ADVERTISING PURPOSES, YOU CAN OFFER TO OPERATE THIS EQUIPMENT FOR THE OCCASSION AT A SPECIFIED FEE. BY "RENTING OUT" THIS EQUIPMENT AND YOUR SERVICES FOR SUCH OCCASSIONS, THE OUTFIT WILL SOON PAY FOR ITSELF AND FROM THEN ON, IT WILL JUST BE A MATTER OF CLEAR PROFIT.

SOME CONCERNS HAVE A TRUCK EQUIPPED WITH AN AMPLIFIER AND A PAIR OF SPEAKERS, WHICH THEY USE FOR ADVERTISING PURPOSES. AFTER YOU HAVE PROGRESSED FARTHER IN YOUR LESSONS, YOU WILL SOON BE IN A POSITION WHERE YOU CAN LAY-OUT, CONSTRUCT, AND INSTALL THIS TYPE OF AMPLIFYING EQUIPMENT, THEREBY OPENING UP ANOTHER CHANNEL OF RADIO PROFITS FOR YOURSELF.

BROADCASTING

PERHAPS YOU ARE MORE INTERESTED IN BECOMING ASSOCIATED WITH A BROADCASTING STATION. THIS TYPE OF WORK IS EXCEPTIONALLY DESIRABLE IN THAT IT IS EXCEEDINGLY INTERESTING, CLEAN, AND OFFERS FINE SALARIES. MANY RADIO TRAINED MEN ARE REQUIRED IN THE MODERN BROADCAST STATION, AMONG THEM BEING OPERATORS, ENGINEERS, ANNOUNCERS ETC. AND WHEN FORTIFIED WITH GOOD TRAINING, YOU CAN TAKE YOUR CHOICE OF ANY OF THESE FINE JOBS.

RADIO OPERATORS NEEDED ABOARD SHIP

TRANSMITTER WORK IS NOT LIMITED TO BROADCASTING ALONE, BUT MEN FAMILIAR WITH THIS WORK ARE ALSO WANTED AS RADIO OPERATORS ABOARD SHIP. MANY YOUNG MEN HAVE TRAVELED ABOARD SHIP AND SEEN THE WORLD AS A RADIO OPERATOR, AND TO THEM THIS WORK OFFERS A REAL THRILL.

SHIP RADIO COMMUNICATION IS NO LONGER SOLELY CONFINED TO SENDING AND RECEIVING MESSAGES BY MEANS OF THE WIRELESS CODE BUT SUCH TREMENDOUS PROGRESS HAS RECENTLY BEEN MADE THAT A PASSENGER ON BOARD SHIP CAN NOW CONVERSE BY TELEPHONE WITH SOME FRIEND

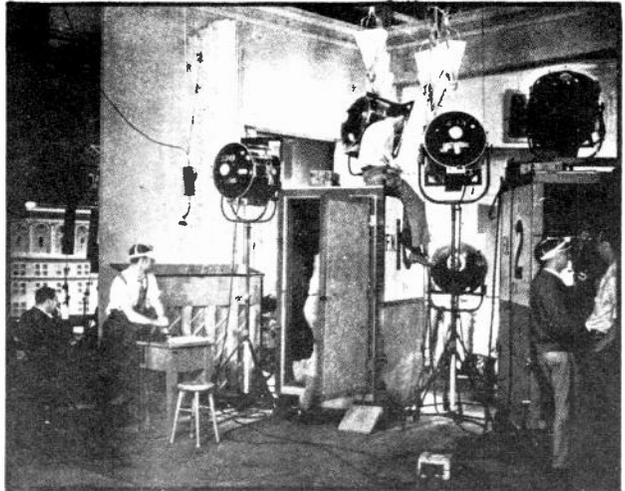


FIG. 16-A  
*Sound Picture Equipment on the Set*

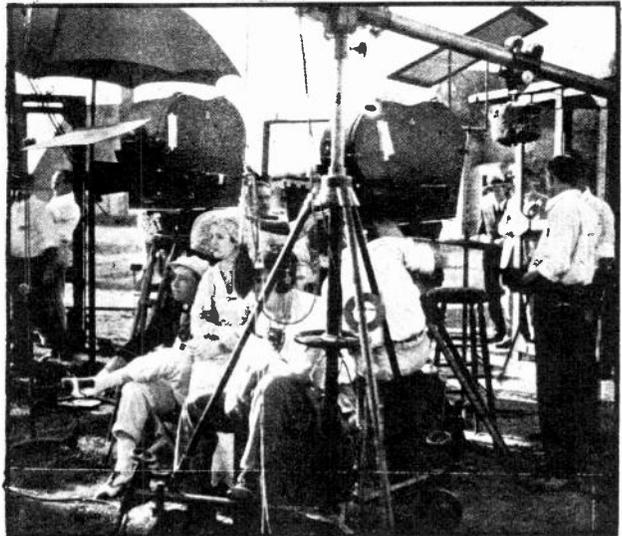


FIG. 16-B  
*"Shooting" A Sound Picture Outdoors.*

OR BUSINESS ASSOCIATE, WHO IS AT THE TIME LOCATED IN SOME METROPOLITAN CITY OF THE CONTINENT.

AN EXAMPLE OF SUCH A SHIP TO SHORE COMMUNICATION IS PICTORALLY DESCRIBED IN FIG. 11 BUT IN A LATER LESSON, YOU WILL BE MADE FAMILIAR WITH THE DETAILS OF HOW SUCH A CONVERSATION IS SUCCESSFULLY CARRIED OUT.

ALL THE NECESSARY EQUIPMENT WHICH TAKES A PART IN COMPLETING THIS REMARKABLE "HOOK-UP" MUST BE MANNED BY RADIO EXPERTS AND PRESENT RESULTS INDICATE THAT IN THE NEAR FUTURE, THIS WILL BE AN EVERYDAY OCCURRENCE FROM ALL SHIPS. THIS MEANS THAT HUNDREDS OF ADDITIONAL MEN WILL BE NEEDED TO TAKE PART IN THIS WORK AND YOU MAY AS WELL BE ONE OF THEM, SO GET READY FOR THIS JOB NOW.

### AVIATION RADIO

TRAVEL BY AIR ALSO DEMANDS THE SERVICE OF THE MIRACLES OF RADIO, IN ORDER TO GUIDE THE PILOTS WITH THEIR PRECIOUS CARGOS OVER THEIR DESIRED COURSE IN EVERY CONCEIVABLE TYPE OF WEATHER. MODERN AIR TRANSPORT COMPANIES KEEP IN CONSTANT TOUCH WITH THEIR PILOTS BY MEANS OF RADIO, ADVISING THEM AS TO VISIBILITY AND GENERAL WEATHER CONDITIONS LYING IN THE PATH AHEAD OF THEM. MANY A PILOT TODAY OWES HIS LIFE TO RADIO, IN THAT IT OFFERED A MEANS WHEREBY HE WAS WARNED FROM THE GROUND TO TURN BACK OR ALTER HIS COURSE, SO AS TO PREVENT RUNNING INTO AN UNSUSPECTED STORM.

THERE ARE MANY IMPORTANT POINTS WHICH MUST BE CONSIDERED IN THE CONSTRUCTION OF RADIO TRANSMITTERS AND RECEIVERS FOR THIS USE AND YOU ARE GOING TO LEARN JUST EXACTLY HOW THIS APPARATUS SHOULD BE CONSTRUCTED AND INSTALLED FOR BEST RESULTS. NO DOUBT IN THE NEAR FUTURE, RADIO EQUIPMENT WILL BE COMPULSORY ON ALL TYPES OF FLYING CRAFT, AS IT INCREASES THE SAFETY FACTOR OF THIS FORM OF TRANSPORTATION TREMENDOUSLY. IN THIS EVENT, IT IS CLEAR THAT A GREAT DEAL OF RADIO WORK AWAITS YOU IN THE FIELD OF AVIATION. FURTHERMORE, THIS EQUIPMENT MUST BE INSPECTED FREQUENTLY BY RADIO EXPERTS, SO THAT THERE WILL BE LITTLE POSSIBILITY OF THIS APPARATUS GOING OUT OF ORDER WHILE IN FLIGHT AND IN THE LARGER AIR TRANSPORT ORGANIZATIONS, A GREAT NEED IS FELT FOR QUALIFIED MEN TO TAKE CARE OF ALL THIS RADIO SERVICE WORK.

NOT ONLY IS AVIATION RADIO CONFINED SOLELY TO TRANSMITTER AND RECEIVER EQUIPMENT BUT THE OPERATION OF MANY OF THE INSTRUMENTS WHICH ARE USED RELATIVE TO NAVIGATION WITH THIS MODE OF TRANSPORTATION ARE ALSO BASED UPON RADIO PRINCIPLES. AMONG THIS EQUIPMENT WE FIND THE RADIO COMPASS, RADIO BEACONS, DIRECTION FINDERS, ETC.

### RADIO AND ADVENTURE

RADIO HAS ALSO PLAYED AN EXCEPTIONALLY IMPORTANT PART IN EXPLORATION AND ADVENTURE. FOR EXAMPLE, IN FIG. 13, I AM SHOWING YOU THE TRANSMITTER AND RECEIVER EQUIPMENT WHICH WAS USED BY SIR HUBERT WILKINS ON HIS EXPEDITION INTO THE FROZEN ARCTIC.

ANOTHER OUTSTANDING ACHIEVEMENT OF RADIO IN THE REALM OF EXPLORATION IS THE WONDERFUL WORK WHICH IT DID FOR ADMIRAL BYRD, WHEN ON HIS

LENGTHY EXPLORATION TRIP DOWN TO THE SOUTH POLE. THINK OF IT -- RADIO WAS THE ONLY MEANS OF COMMUNICATION BETWEEN THIS PARTY OF DARING EXPLORERS AND THE CIVILIZED WORLD. THIS PROVES THAT RADIO CAN CONQUER ALL OBSTACLES, FOR IT CARRIES ITS IMPORTANT MESSAGES OVER MOUNTAINS, OCEANS, AND FROZEN WASTELANDS. RADIO HAS TRAVELED WHERE MAN HAS AS YET NEVER SET-FOOT.

### OPERATE YOUR OWN RADIO TRANSMITTER

HAVE YOU EVER THOUGHT OF HAVING A RADIO TRANSMITTER OF YOUR VERY OWN. THERE ARE AT THE PRESENT TIME THOUSANDS OF AMATEUR RADIO OPERATORS, SCATTERED ALL OVER THE WORLD, WHO COMMUNICATE WITH EACH OTHER ON THE BAND OF SHORTER WAVE LENGTHS, WHICH ARE SET ASIDE BY THE GOVERNMENTS ESPECIALLY FOR THEIR USE. ANY STATION, WHICH IS OPERATED FOR PLEASURE OR EXPERIMENTAL PURPOSES ONLY, IS CLASSIFIED AS AN "AMATEUR STATION."

AN EXAMPLE OF SUCH AN AMATEUR TRANSMITTER, TOGETHER WITH THE RECEIVER IS ILLUSTRATED IN FIG. 14. THIS PARTICULAR TRANSMITTER CAN BE USED TO TRANSMIT VOICE, AS WELL AS THE TELEGRAPHIC CODE. THE COST OF CONSTRUCTING SUCH APPARATUS RANGES FROM ONLY A FEW DOLLARS UP TO THOUSANDS OF DOLLARS, DEPENDING UPON THE SIZE AND POWER OF THE EQUIPMENT. ITS A REAL THRILL TO COMMUNICATE BY THIS MEANS WITH SOME OTHER AMATEUR OPERATOR, WHO IS LOCATED IN AN ALTOGETHER DIFFERENT COUNTRY. SINCE SUCH A WIDE-SPREAD INTEREST IS SHOWN FOR THIS FORM OF RADIO, I HAVE SET ASIDE A SECTION OF THE COURSE WHICH IS DEVOTED ENTIRELY TO THE CONSTRUCTION OF LOW COST AS WELL AS ELABORATE EQUIPMENT OF THIS NATURE, AND IN ADDITION WE TEACH YOU THE "WIRELESS CODE" AND VARIOUS RULES ASSOCIATED WITH THIS FORM OF COMMUNICATION. THEN IF YOU WISH, YOU CAN GO "ON THE AIR" AS OPERATOR OF YOUR OWN STATION AND THE ENJOYMENT WHICH YOU GET OUT OF THIS WILL MORE THAN PAY FOR THE EXPENSE OF CONSTRUCTION. NOT ONLY WILL OPERATING SUCH A TRANSMITTER OFFER YOU ENTERTAINMENT IN YOUR LEISURE TIME BUT IT WILL ALSO PROVE TO BE ESPECIALLY INSTRUCTIVE.



FIG. 17.  
A Television "Pick-up"  
Unit.

### POLICE - RADIO

RADIO IS ALSO NOW BEING USED IN THE LAW'S FIGHT AGAINST CRIME. MANY OF THE POLICE ORGANIZATIONS OF THE LARGER CITIES ARE NOW EQUIPING THEIR CARS WITH RADIO RECEIVERS, SO THAT EACH CAR, AS IT PATROLS ITS

DISTRICT, IS IN CONTINUAL COMMUNICATION WITH POLICE HEADQUARTERS. THE INSTANT THAT A CRIME IS COMMITTED, THE POLICE TRANSMITTER NOTIFIES THE PATROLING CARS SO THAT THOSE IN THE VICINITY IN WHICH THE CRIME WAS COMMITTED CAN RUSH TO THE SCENE BEFORE THE CRIMINAL HAS A CHANCE TO MAKE MUCH OF A "GET-AWAY".

DUE TO THE REMARKABLE RESULTS OBTAINED WITH POLICE-RADIO, THIS FORM OF COMMUNICATION IS RAPIDLY BEING ADOPTED BY OTHER POLICE DEPARTMENTS. HERE AGAIN, THIS RADIO EQUIPMENT MUST BE CONSTRUCTED, INSTALLED AND SERVICED, IN ADDITION TO THE NEED OF EXPERIENCED OPERATORS ETC. AND THIS ALL MEANS MORE PROFITABLE OPPORTUNITIES FOR YOU.

### THE RADIO EXPERT AND SOUND PICTURES

RADIO HAS REVOLUTIONIZED THE MOTION PICTURE INDUSTRY, FOR IN PLACE OF THE FORMER SILENT DRAMA, THE PICTURES TAKE ON LIFE, THE CHARACTERS ACTUALLY SPEAK AND ALL NATURAL SOUNDS REQUIRED FOR THE TRUE REPRODUCTION OF THE SCENE ARE ALL DELIVERED TO THE EARS OF THE AUDIENCE. SOUND PICTURES TODAY WOULD NOT BE A POSSIBILITY WITHOUT RADIO, FOR THEIR SOUND EFFECTS ARE BASED ENTIRELY UPON RADIO PRINCIPLES. IT IS NO WONDER THEN THAT THE MEN WHO HANDLE THIS EQUIPMENT MUST HAVE A THOROUGH RADIO TRAINING.

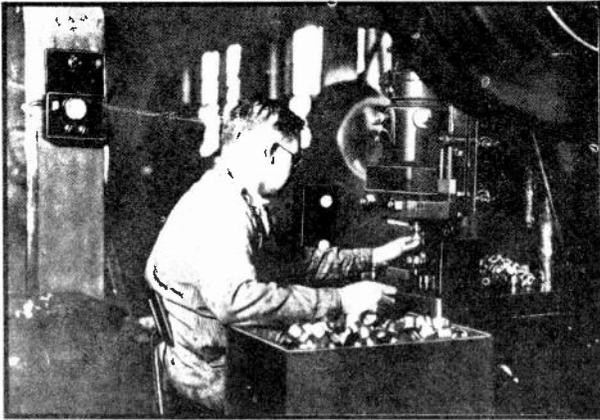


FIG. 18

*Photo-Cell Attachment on Punch Press.*

THE NEED FOR RADIO TRAINED MEN IS NOT CONFINED ALONE TO MOTION PICTURE PROJECTOR OPERATORS. FAR FROM IT -- DOZENS OF RADIO MEN ARE NEEDED TO HANDLE THE SOUND EQUIPMENT WHILE FILMING A SIMPLE SCENE AT THE STUDIO, HUNDREDS OF MEN ARE NEEDED WHO CAN PROPERLY INSTALL SOUND PICTURE EQUIPMENT IN NEW THEATERS. STILL MORE MEN ARE NEEDED WHO CAN PROPERLY SERVICE THIS EQUIPMENT AFTER IT IS ONCE INSTALLED.

YOU ARE GOING TO BE MADE FAMILIAR WITH ALL OF THIS WORK, YES EVEN WITH SUCH DETAILS AS MICROPHONE PLACEMENT, THE CONSTRUCTION AND OPERATION OF THE AMPLIFIER AND SOUND RECORDING EQUIPMENT. THE OPERATION OF MOTION PICTURE PROJECTORS, TESTING AND SERVICING THIS APPARATUS ETC.

SOUND PICTURE EQUIPMENT IS ALSO BEING RAPIDLY ADOPTED BY SCHOOLS, AS WELL AS INDUSTRY IN GENERAL, TO PROVIDE THEIR STUDENTS, EMPLOYEES, AND THE PUBLIC AT LARGE WITH INSTRUCTIVE FILMS. IT IS FOR THIS REASON THAT PORTABLE SOUND PICTURE EQUIPMENT IS NOW IN GREATER DEMAND THAN EVER BEFORE -- ALL OF THIS ACTIVITY MEANS MORE JOBS FOR THOSE MEN WHO ARE QUALIFIED TO HANDLE THEM.

SOUND PICTURES ALONE OFFERS YOU THOUSANDS OF OPPORTUNITIES!

## TELEVISION NEEDS YOUR HELP

NEW WONDERS ARE RAPIDLY TAKING PLACE IN THE REALM OF RADIO AND NOW COMES TELEVISION -- THAT MARVELOUS SCIENCE WHICH ENABLES ONE TO SEE, AS WELL AS TO HEAR BY MEANS OF RADIO. TELEVISION IS STILL IN ITS INFANCY AND FAR FROM BEING DEVELOPED TO WHAT IT SURELY WILL BE IN A FEW YEARS FROM TODAY. THIS IS THE VERY REASON WHY YOU SHOULD LEARN ALL THAT IS KNOWN ABOUT TELEVISION NOW -- SO THAT YOUR KNOWLEDGE OF IT WILL INCREASE AS NEW DEVELOPMENTS OCCUR AND THEN WHEN TELEVISION IS FINALLY USED AS EXTENSIVELY AS OUR MODERN RADIO FOR SOUND, YOU WILL ALREADY BE PREPARED.

IN OTHER WORDS, GET IN ON THE GROUND FLOOR OF TELEVISION AND BE ONE OF THE FIRST TO MAKE BIG MONEY IN THIS NEW FORM OF RADIO. TELEVISION EXPERTS ARE GOING TO BE IN DEMAND AND AT THE PRESENT TIME, THERE ARE MIGHTY FEW MEN WHO HAVE A SUFFICIENT KNOWLEDGE OF THIS SUBJECT TO QUALIFY AS EXPERTS. THIS IS YOUR OPPORTUNITY!

## RADIO'S APPLICATION TO OTHER INDUSTRIES

RADIO PRINCIPLES HAVE ENTERED STILL OTHER INDUSTRIES. FOR EXAMPLE IN FIG. 18 A PHOTO-ELECTRIC SAFETY DEVICE IS SHOWN ASSEMBLED ON A PUNCH PRESS. HERE A BEAM OF LIGHT AND A PHOTO-ELECTRIC CELL ARE MOUNTED IN THE METAL CASE AT THE LEFT OF THE OPERATOR AND A MIRROR IS MOUNTED AT THE RIGHT. ANY INTERRUPTION OF THE BEAM OF LIGHT FOCUSED ON THE MIRROR AND REFLECTED TO THE CELL ACTUATES A RELAY AND WHICH PREVENTS THE OPERATION OF THE PRESS.

THE STUDY OF SUCH APPARATUS IS MOST FASCINATING AND AUTOMATIC SWITCHING DEVICES OF THIS NATURE ARE NOW BEING USED FOR HUNDREDS OF DIFFERENT PURPOSES IN ALL FORMS OF INDUSTRY AND MANUFACTURE. A GREAT DEAL OF THIS EQUIPMENT IS STILL TO BE INSTALLED AND SERVICED AND SINCE IT OPERATES UPON RADIO PRINCIPLES, IT IS CLEAR THAT MEN WITH RADIO TRAINING ARE REQUIRED TO TAKE CARE OF ALL THIS WORK.

I AM SURE THAT I POINTED OUT MANY USES FOR RADIO IN THIS LESSON WHICH YOU PROBABLY NEVER THOUGHT OF BEFORE. MY FRIEND, THERE ISN'T ANOTHER PROFESSION IN THE WORLD WHICH OFFERS YOU SO MANY DIFFERENT WAYS IN WHICH TO EARN MONEY AS DOES RADIO. THIS INDUSTRY IS A GIANT AND THE TRAINING WHICH YOU ARE GOING TO RECEIVE IS GOING TO BE THOROUGH. NOT A SINGLE DETAIL HAS BEEN OVERLOOKED AS REGARDS YOUR SUCCESS IN THIS WORK, FOR I AM GOING TO GIVE YOU THE NECESSARY INSTRUCTION WHICH WILL ENABLE YOU TO ENTER ANY OF THE MANY BRANCHES OF RADIO WHICH I HAVE DISCUSSED WITH YOU IN THIS INTRODUCTORY MESSAGE. IN FACT, THERE ARE STILL MANY MORE OPPORTUNITIES AWAITING YOU AS A TRAINED MAN AND WHICH ARE TOO NUMEROUS TO MENTION AT THIS TIME.

JUST THINK OF WHAT SUCH COMPLETE RADIO KNOWLEDGE WILL MEAN TO YOU. WHY THE BEST ADVICE WHICH I COULD EVER GIVE YOU IS TO "LEARN RADIO AND CHOOSE YOUR OWN JOB". PICK OUT THE RADIO JOB YOU LIKE BEST AND STICK TO IT BUT LEARN IT ALL AND THEN NO MATTER WHAT BUSINESS DEPRESSIONS SHOULD ARISE, YOU WILL NEVER BE OUT OF WORK. THE TRAINED MAN WINS EVERY TIME!

RADIO IS EASILY MASTERED

EVEN IF YOU DON'T KNOW THE FIRST THING ABOUT RADIO AT THE PRESENT TIME, THIS IS NO HANDICAP BECAUSE I HAVE PREPARED MY COURSE OF TRAINING ESPECIALLY FOR YOU. YOU WILL FIND THAT THE LESSONS WHICH FOLLOW, START WITH THE VERY ELEMENTARY RADIO PRINCIPLES SO AS TO GIVE YOU A STRONG FOUNDATION AND AN EASY START. THEN WE WILL GRADUALLY PROGRESS IN EASY STEPS AND YOU WILL BE AMAZED HOW SIMPLE IT REALLY IS TO LEARN THIS FASCINATING RADIO BUSINESS.

I WANT YOU TO FEEL THAT MY PERSONAL INTEREST IN YOU IS SINCERE AND THAT NOTHING WILL MAKE ME HAPPIER THAN TO KNOW THAT YOU HAVE FOUND YOUR PLACE IN RADIO AND THAT YOU WILL FIND YOUR EFFORTS IN PREPARING YOURSELF REWARDED WITH UTMOST FINANCIAL SUCCESS. I ALSO WANT YOU TO FEEL THAT YOU AND I ARE PARTNERS IN THIS IMPORTANT UNDERTAKING OF TRAINING YOU TO BECOME A RADIO EXPERT AND THAT THE TWO OF US TOGETHER WILL WORK SHOULDER TO SHOULDER IN THE STUDIES TO COME.

WRITE TO ME. TELL ME YOUR TROUBLES, YOUR SUCCESS, YOUR PLANS AND HOPES FOR THE FUTURE AND LET ME GIVE YOU THE ADVICE AND HELP THAT I AM SO READY AND ANXIOUS TO GIVE TO ANY OF MY "BOYS".

HAVING IN THIS MESSAGE INTRODUCED YOU TO YOUR FUTURE IN RADIO, I HOPE THAT YOU WILL BE INSPIRED AND READY TO START WITH YOUR FIRST LESSON FILLED WITH ENTHUSIASM AND A DETERMINATION TO SUCCEED. I ASSURE YOU THAT I WILL DO EVERYTHING IN MY POWER TO GUIDE YOU TO A BRILLIANT AND SUCCESSFUL CAREER IN THE RADIO INDUSTRY.

SINCERELY YOURS,

  
PRESIDENT

NATIONAL SCHOOLS

