

MANUAL OF INSTRUCTIONS

DEVRY MODEL RS (16)

16mm.

Sound-on-Film Projector



DEVRY CORPORATION

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OPERATING INSTRUCTIONS

I HOW TO USE THIS BOOK

The DeVry 16mm. Sound Projector incorporates a number of sweeping improvements and advances in the art of 16 mm. projection. Your purchase of the machine indicates a desire on your part to enjoy all the advantages of this modern equipment and a desire to have only first class showings of your film.

If you use this book properly, you will realize this aim, and always be able to operate your equipment to the best advantage, with little or no trouble arising from breakdowns or improper maintenance.

Read paragraph II carefully. It explains how to arrange your equipment to get the best effect from it, how to provide for the comfort of your audience, so that their attention will be concentrated on the pictures and the sound, and how to avoid the common operating blunders which detract so greatly from any show. If you read this first and keep it in mind constantly while learning the operating details, your shows will run smoother and be better for it.

Paragraph III contains the necessary information on getting your machine set up and ready to go the first time, and gives the routine on threading the film, which is the most important single thing to master.

Paragraph IV tells how to run the projector and explains the function and relations of the various controls, and explains how to manipulate them to get the best effects.

Paragraph V, on maintenance, contains sufficient information to enable you to recognize and correct all common, and most uncommon, kinds of trouble which you might have, and tells how to avoid trouble by appropriate cleaning, lubrication, and inspection. It is much better to get into the habit of caring properly for your equipment than to be expert in fixing the breakdowns which occur from lack of care. This paragraph should be studied after you have set up and operated your machine, and before you attempt to run any shows where a breakdown would be a serious embarrassment.

NOTE: Instructions for operating the Sound System will be found in the Amplifier Instruction Manual attached to this book.

II PROJECTION CONDITIONS

A. Projector and Screen Placement.

There are several precautions to be observed when placing the projector and screen. In the first place, try to get the projector on a level with the center of the screen, both being somewhat elevated with respect to the audience, as shown in Fig. 1,A. If it is necessary to have the line of projection at an angle, try to elevate the projector, having it point downward at the screen as shown in B. This causes the light to reflect from the screen into the audience, which is desirable. Too great an angle of projection, however, is to be avoided, as it causes a distortion known as "keystoning," the top of the picture being compressed and the bottom distended.

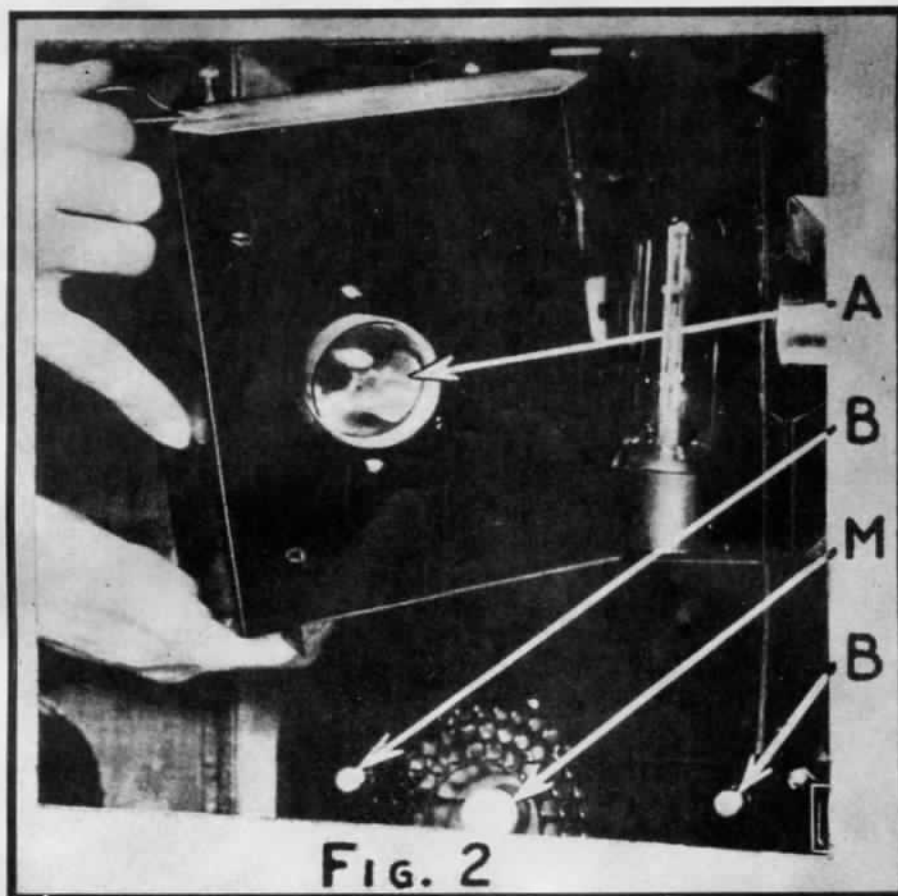
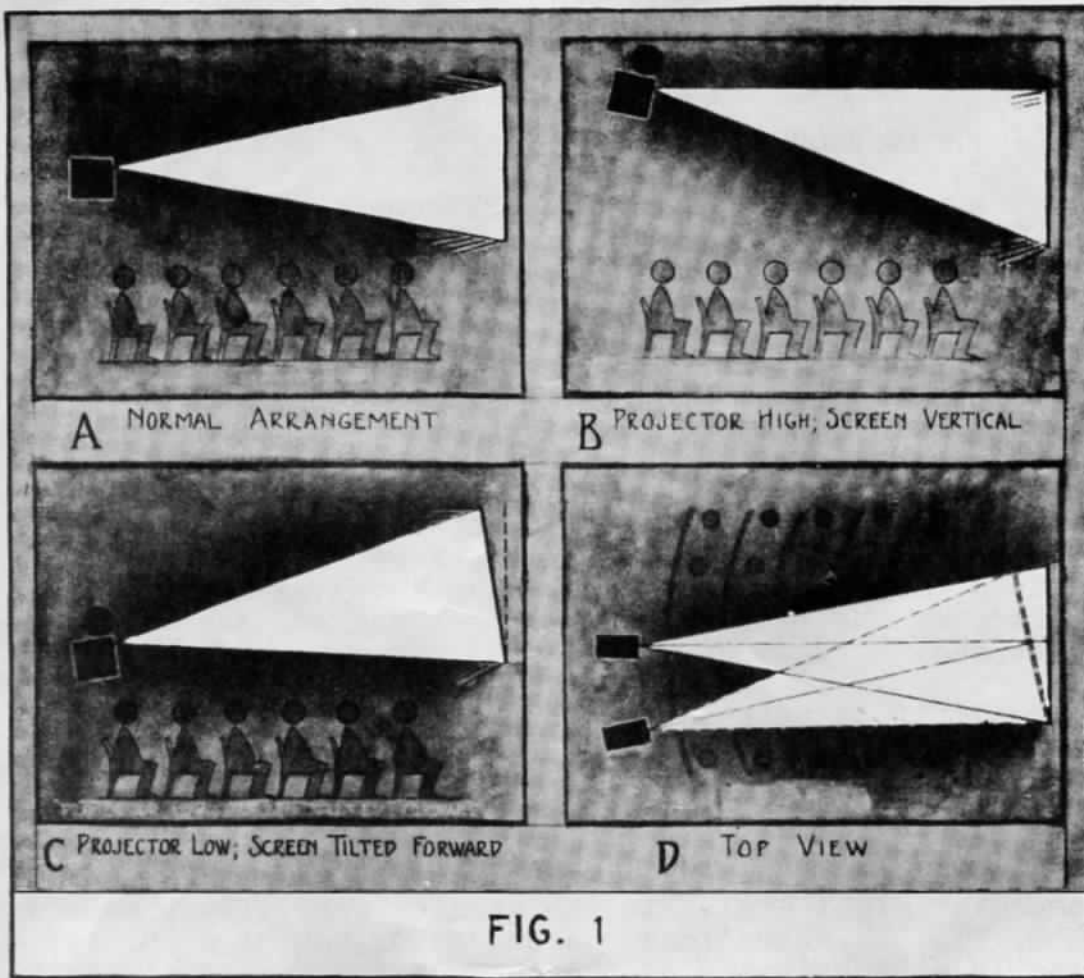
If it is necessary to project upwards, as shown in C, then try to tilt the top of the screen somewhat downward towards the projector, so that too much of the light will not be reflected away from the audience.

Another important point here is always to have the screen at right angles to the axis of projection, as shown in D, Fig. 1. Sometimes the projector cannot be placed exactly at the center of the rear of the audience; in this case, swing the screen until it is at right angles to the projection axis as shown by the dotted lines in D.

B. Loud Speaker Placement.

It is not necessary or desirable to place the loud speaker behind the screen unless a special sound screen is used. If this is done with an ordinary screen, a great deal of sound will be lost, and distortion will take place. The proper position for the speaker is at one side of, and on a level with the center of the screen, or just below the screen. The side position is usually a little better, as it allows the speaker to be directed downward toward the center of the audience, which gives a better distribution of sound and a better general effect.

The speaker should never be placed on the floor, as this concentrates all of the sound on the first one or two rows of the audience, giving them, as well as the rest of the audience, a very unnatural effect. The important thing is to place it so that the sound may proceed directly from the speaker to each person in the audience, just as the light must proceed directly from the screen to each person in the audience.



When a special sound screen of the perforated type is available, the speaker is placed behind the center of it, facing downward toward the center of the audience, the purpose of this arrangement being to heighten the illusion that the sound comes directly from the image on the screen.

C. General Conditions

No portion of your audience should be placed too close to the screen, for obvious and well known reasons. The least distance that allows good results depends, of course, on the size of the screen and length of throw used. Your own good judgment should be sufficient guide in this respect.

It is equally important to see that none of your audience is too close to the projector. The ideal condition is to have a sound-proof booth. The next best thing is to have the machine on a balcony or otherwise placed so as not to be either too visible or too audible. Remember that the less conscious the audience is of the presence of any of the machinery of projection, the more complete will be the illusion created by the picture and the sound.

Sometimes it will be found possible to place the machine in an adjoining room, and project through a glass window, or transom, or through an opening between curtains. This will be found to help a great deal. It must be remembered, however, not to project through a poor grade of window glass, and to have any glass that is used spotlessly clean, or the picture will suffer. It is well known, but nevertheless cannot be over-emphasized that the darker the theatre, the brighter and clearer a picture will appear, and likewise it is true that the quieter the theatre, the more distinct and clear the sound will be.

These two things should always be borne in mind when preparing for a show, and every possible precaution should be taken to insure darkness, quiet, and comfort for the audience.

The acoustics of the room in which you show your film will more often than not be out of your control. However, when a choice of rooms is possible, it is well to avoid those which have a large amount of reverberation, due to smooth, hard walls, lack of hangings, etc. The most important condition in this respect is how well filled with people the room is. A large room with very few people in it will be very "hard" and have an unpleasant amount of reverberation, whereas a smaller room comfortably filled with people will be free from this annoying effect.

D. Little Pointers for Good Shows.

It will add very greatly to your showings if you take the precautions necessary to insure freedom from certain unpleasant effects which are all too common, even in modern theatres. This list covers most of the main points to remember:

1. Whenever possible, have your projector set up, the film threaded, and the picture in focus, before your audience enters the room. It may be necessary to run the first few feet of the picture in order to focus and then rewind it and start again, but that is better than starting the picture out of focus and having to adjust it while the people wait. When finally threading the film, be sure that the picture will start where you want it to start; that is, do not leave any of the leader in the gate, but thread it so that the beginning of the first scene will immediately appear on the screen.

2. When approaching the end of a reel, be sure to shut off the projector light just before the end of the last scene goes through the gate. This will avoid having a white flash on the screen, which is one of the most annoying effects that can be achieved with a projector.

3. When you are focusing the picture and making your final preparations, check the volume of sound at the same time, set the controls where you think they sound the best, notice the settings on the dials, then turn the main volume control back to zero. Within a second or two after the projector is finally started for the show, turn the volume control gradually up to the point you have previously decided upon. Any corrections necessary can then be made, but should always be made gradually and never suddenly. A sudden change in the sound volume is upsetting and takes the mind temporarily off the material which is on the screen. An equally important point is to reduce the volume to zero as soon as you turn off the projector lamp. This avoids any unnecessary clicks and noises caused by the leader going through the sound head. If it should be necessary to stop the machine in the middle of a reel, always reduce the volume to zero before cutting off the motor, and start the motor before turning on the sound again. This will avoid the unpleasant effect caused by the sound "slowing down" and "starting up" again.

4. Before giving any shows where you want everything to be at its best, practice threading your projector until you can remove one reel and thread up a new one in a minimum of time. It is extremely annoying to have to wait while an incompetent operator messes about with his projectors and

reels of film. By using the pilot light and learning to change reels quickly, this nuisance may be minimized to a point where it is no longer objectionable.

E. Using the Special Features.

1. Music Between Reels.

If it is very important to keep your show continuous and when you are using but one projector, it may be advisable to use a phonograph turntable and play a phonograph record during the interval. In this case, the record should be very carefully chosen to be in keeping with the picture, and should be played at a low or moderate volume. It should be turned on gradually and, when the projector is again threaded, it should be turned off gradually. The user can best work out his own problems to achieve the best possible effect on his own audiences.

2. Sound for Silent Films.

When running silent films, you can add your own sound by using either the phonograph or the microphone. Be sure to turn the phonograph clear off while changing records in the middle of a film. Too much manipulation, such as cutting the speech in and out too frequently, or playing with the volume control, will spoil the effects you get this way, and is to be avoided. Details concerning the actual operation of the amplifier will be found in the Amplifier Instruction Manual attached to this book.

III SETTING UP AND THREADING

A. Unpacking.

The projector is shipped from the factory with all parts in place excepting the projection lamp. This will be found in its carton inside the projector lid. Lying in the bottom of the projector will be found an envelope containing the rewind crank. The projector cord will also be found within the projector, and a take-up reel will be found attached to its support on the door.

To install the lamp, first remove the lamp house as shown in Fig. 2. The thumb is used to depress the spring projecting from the top of the lamp house and the forefinger used to withdraw the assembly, which slides out on guides. This uncovers the socket. The lamps we use are of the pre-

focus base type and no adjustment is necessary. Merely insert the lamp in the socket, setting the ears on the lamp base into their slots in the socket, pressing the lamp well downward, and turning it as far as it will go to the right, or in a clock-wise direction. When the lamp bulb is released, the filament will then assume its correct position on the optical axis of the machine, as shown in Fig. 2.

B. Setting Up the Equipment

NOTE: Refer to Drawing in Amplifier Instruction Manual. This drawing shows the correct hook-up of projector, amplifier and speaker.

Set the amplifier on the table from which you will project the picture. The controls on the panel should be towards your right as you stand behind the amplifier and face the screen. Set the projector on top of the amplifier, being careful to set the rubber feet on the bottom of the projector case into the grooves at the ends of the amplifier case.

Insert the twist lock plug end of the projector cord into the receptacle on the projector switch panel marked "LINE" - the other end into your 110 volt power outlet A.C. or D.C.

The amplifier power cord is then inserted into the receptacle on the projector switch panel labeled "AMPLIFIER."

IMPORTANT!

The amplifier supplied with your projector will operate ONLY on 50-60 cycle A.C.

When D.C. is the only power available, it is necessary to use a CONVERTER to change the 110 volts D.C. to 110 volts A.C. in order to operate the amplifier.

BEFORE CONNECTING OR OPERATING THE AMPLIFIER, READ THE AMPLIFIER INSTRUCTIONS ATTACHED.

The photo-cell cable (found inside projector by opening small back door) is inserted through the P.E.C. outlet (See Figure 6) and connected to its receptacle, marked as such on the amplifier. This plug must be pushed all the way in and firmly seated in order to get sound.

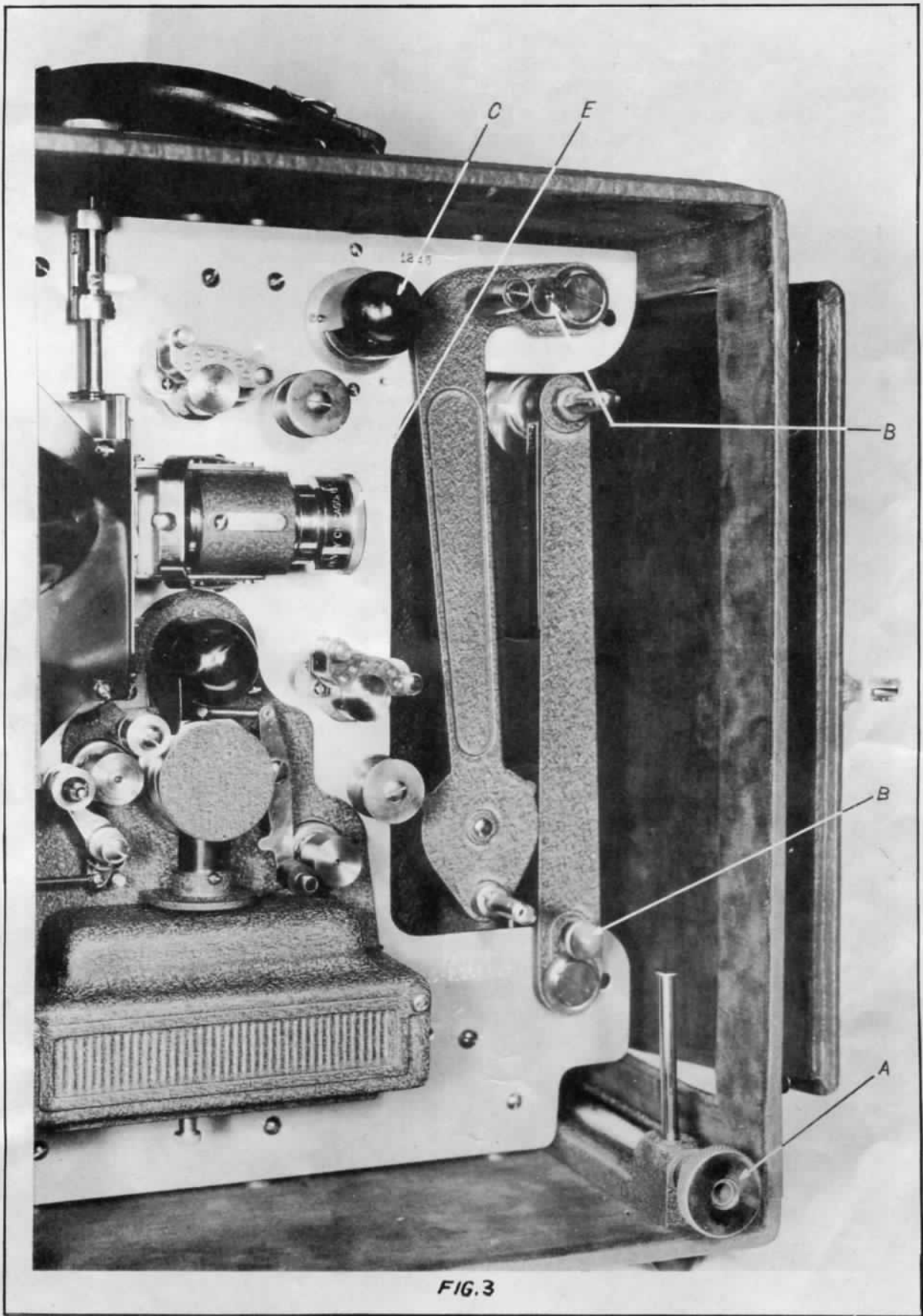


FIG. 3

The loud speaker unit is put in its proper place by the screen and the speaker cable is run back to the amplifier and plugged into its receptacle on the back of the amplifier. The flexible front cover of the speaker should be unbuttoned and rolled back over the top, then buttoned into place.

The exciter lamp cord (See schematic drawing in amplifier instructions attached, showing hook-up of projector and sound system) is connected into its receptacle on the back of the projector, just below the switch panel.

The small front door of the projector is then opened and reel arms are pulled out into place. When they are fully extended, they will automatically lock into position. When it is desired to fold the reel arms back into place, they are unlocked by pulling the knob, one of which will be found on the reel arm, just adjacent to each of the large hinge screws at the inside ends of the arms. These knobs are shown in B in Figure 3, which shows the arms in their folded position.

Arrange your screen in the desired position, then turn on the projector, using the light and motor switches (see Figure 6) and adjust the projector until the screen is properly filled with light. It may be necessary to move the machine nearer to or farther from the screen, in order to get the proper sized picture, or it may be necessary to tilt the projector by raising the front end. To accomplish this, loosen the knob which holds the adjustable legs (A in Figures 3 and 4), lift the end of the projector with one hand until the picture area is properly located, then tighten the clamping knob.

While the machine is running, note whether the exciter lamp is lighted or not. If it is not, ascertain the reason and correct the trouble, being guided by the instructions under the heading of "Exciter Lamps."

C. Threading the Projector.

Before threading the projector, make sure your film is correctly wound on its reel. Refer to Fig. 4. Remember that the sprocket hole edge of the film must be toward you as you put the reel on its spindle, and the film must come down from the right hand side of the reel. The film, of course, must be wound with the front end on the outside of the reel. It will soon become a matter of habit to glance at the film and make sure of this.

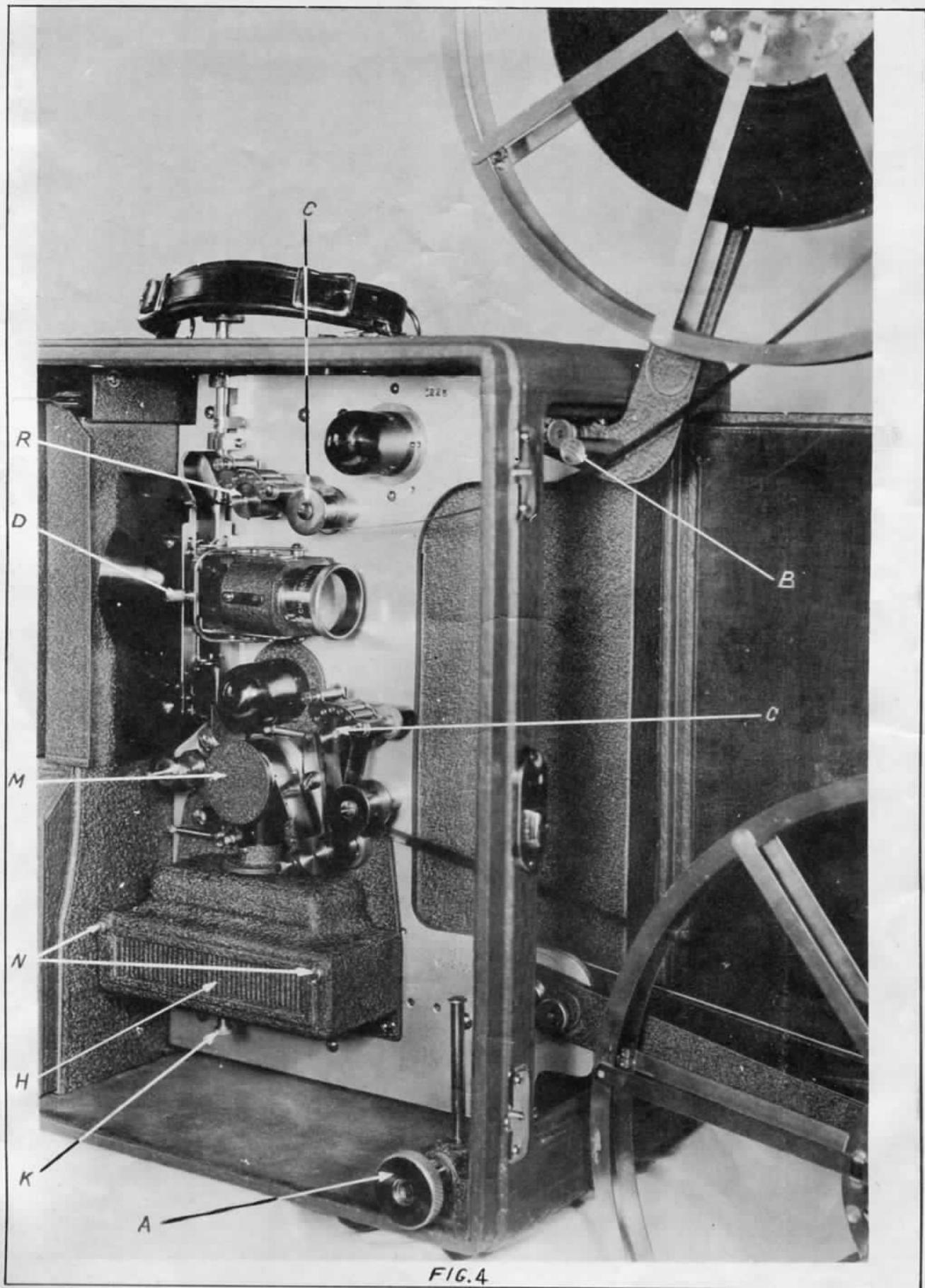


FIG.4

Referring to Fig. 5, open the sprocket idlers as shown at A and C. To release the idlers, press the small button such as is shown at B on the top idler at A in Fig. 5. Open the gate by grasping the knob shown at D in Fig. 4 (closed position) and at D in Fig. 5 and pushing it to the right or toward the front of the machine as far as it will go. This will open the gate so that the film may be inserted therein. Now put the reel of film on the upper reel arm spindle, pull off about a yard of film for threading, pass it under the roller where it enters the case (Fig. 4 at B), under the roller shown at C in Fig. 4, up and around the sprocket (Fig. 5, A), then make a loop as shown in Fig. 5 between the top sprocket and the top of the gate, lay the film in the film channel, and pass it down and let it hang while you close the gate. Close the idler on the top sprocket, then close the gate by pushing the knob (D, Fig. 5) back toward the left as far as it will go, and finally, make sure the film is fully in the gate channel before continuing the threading.

Again referring to Fig. 5, pass the film from the gate down around the stabilizer roller W, by first pulling idler roller X, open with the aid of your finger and slip the film around the stabilizer, release idler roller X, which now holds film in place. Then place film under stationary roller Y, and over sound drum, from the sound drum down under the filter roller at H, holding the knob at E, towards the left, allowing the film to slip into place. Then take film up from the filter roller to the sprocket C, pass it around the top of the sprocket teeth and close the sprocket idler. Finally pass the film down from the sprocket at C, under the roller at J, and to the take-up reel, fastening it to the hub of the reel. Note very carefully the length of the loop L in Fig. 5, between the gate and the roller F. This loop should be long enough so that it never becomes tight as the shuttle operates. Be sure the film is lying snugly in its channel around the top of the sound drum, pull the slack out of the film between the sound drum, the filter roller H, and the sprocket C, then check the length of the loop L, by operating the machine slowly by hand.

To operate the machine by hand, turn the knob on the motor shaft at the lower left hand corner of the mechanism (under the lamp house) counter clockwise. This is shown at M in Figs. 2 and 8. If the machine turns reasonably easily, and if the film loops, both above and below the gate, seem to be functioning correctly, the motor may be started, using the switch on the rear panel of the projector. It is best merely to "kick" the switch quickly on and off for a moment to see if everything is going to run correctly before finally starting it.

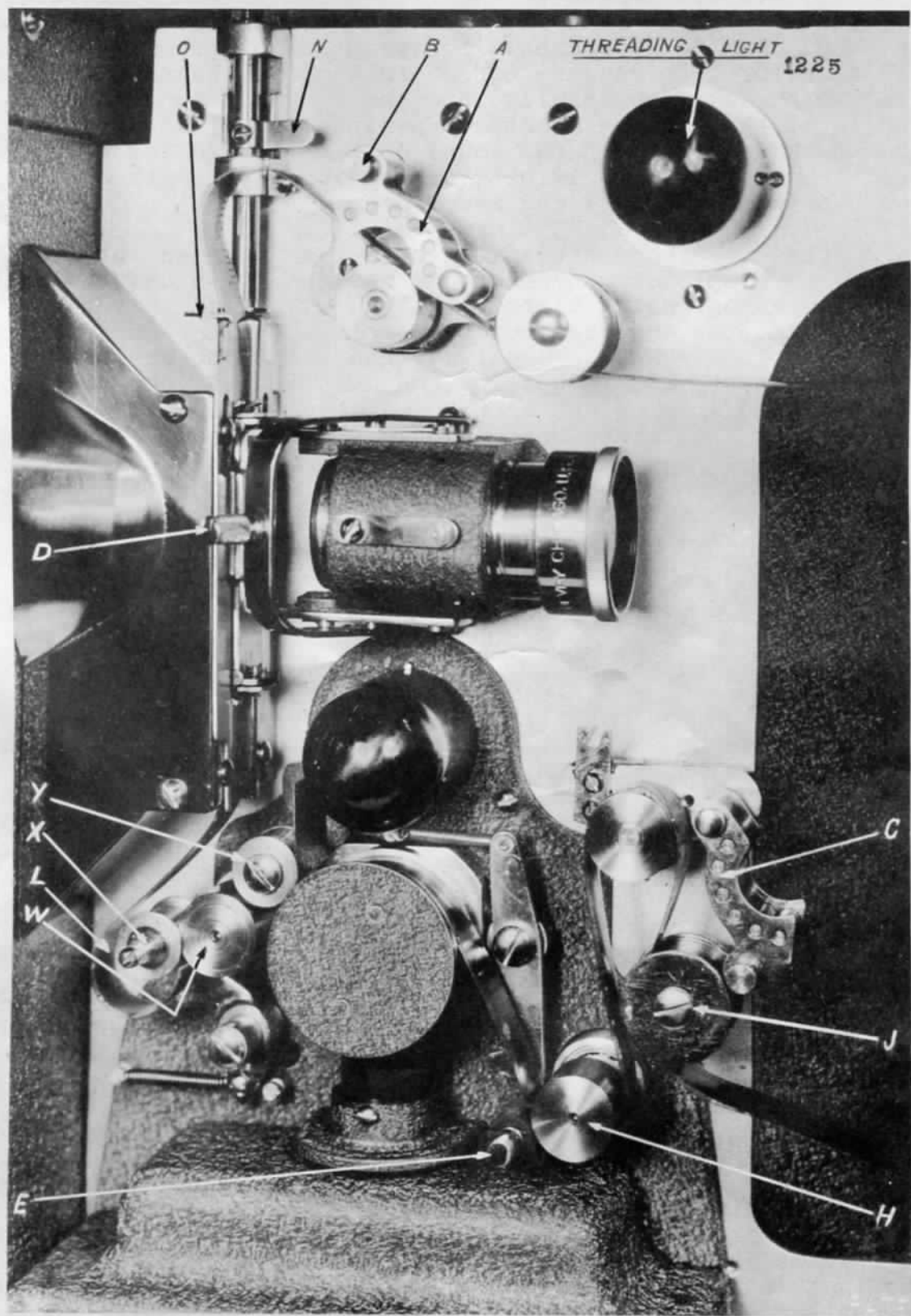


FIG.5

The correct length of the film which should be between the aperture in the gate and the sound aperture in the top of the sound drum is 25 frames. For purposes of practice, it will be helpful to measure off 25 frames on a blank piece of film and thread it carefully into the machine, so that one mark is at the picture aperture opening of the gate and the other mark is just over the sound opening at the top of the sound drum. This will illustrate the correct length of the loop L between the gate and sound drum.

After the above operations have been carried out, the machine is completely threaded and ready to turn on. With a little practice, using blank film, you will find that only a very few moments are required to complete the threading operation; even in darkness or semi-darkness. If you are intent on being expert, and in getting the most out of your showings, nothing is more important than to be able to thread your machine with lightning speed under any conditions.

The take-up is provided with 2 pulleys, one small and one large. For 400 foot reels or smaller use the small pulley, and for 800, 1200 or 1600 foot reels, put the spring take-up belt on the larger pulley.

IV OPERATING THE EQUIPMENT

A. The Projector

After the projector is completely threaded, all that is necessary to show the picture is to operate the motor and light switches. These are shown in Fig. 6. To turn on the projector lamp or motor, the switch is thrown upward. Returning the switch to the downward position stops the machine, or turns out the lamp.

The center switch, marked "Silent--Sound," is left in the lower or sound position for running sound films, and is thrown to the silent position when it is desired to run silent films at some speed other than the standard sound speed of 24 frames per second. When this switch is thrown upward, the "Speed Control" knob assumes control of the motor speed. Turning this knob to the left decreases the speed of the projector.

After threading the machine and before starting the actual showing, you should run a few feet of film in order to get the picture focused correctly and properly aligned on the screen. The aligning of the picture is taken care of by tilting or moving the projector as described in III-B above. Focusing is accomplished by turning the lens in its mount, grasping the front of the lens by the knurled ring shown at E in Fig. 3. Note that in this projector, opening the gate does not disturb the position of the lens and, consequently, the focus. Thus, you may be sure that after you have your picture correctly in focus, it will not need to be reset if the machine is stopped for rethreading between reels.

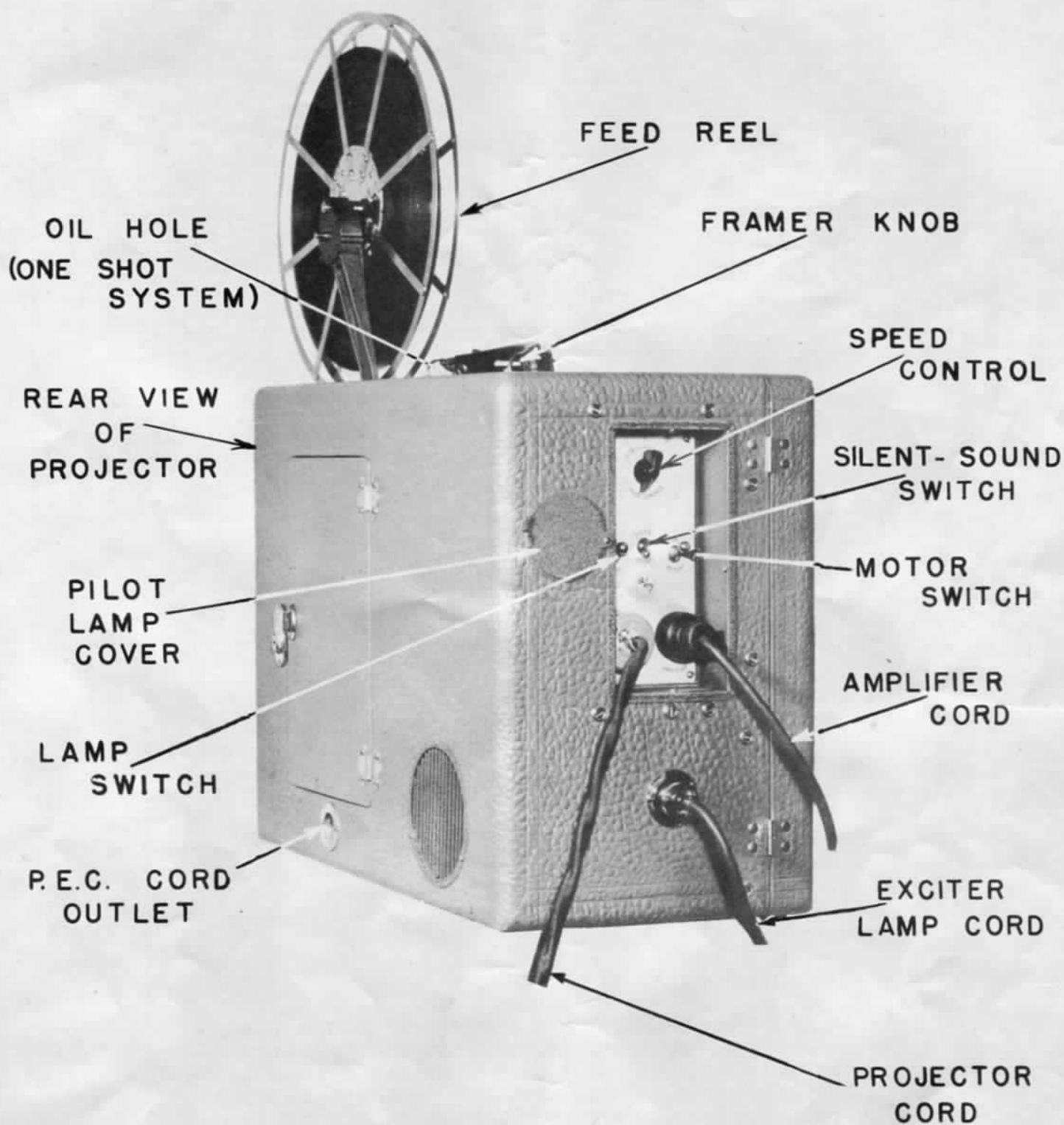


FIGURE 6

If the picture appears out of "frame" on the screen, that is, if a border of the picture appears at the upper or lower edge of the screen, this may be corrected by turning the "framing knob" which protrudes from the top of the case, as shown in Fig. 6.

If you have threaded the reel of film with a long leader which has not been run through the gate, when you start the machine, start the motor first, turning on the light at about the time the first scene of the picture arrives at the gate. This will avoid the unpleasant effect of seeing the leader projected on the screen. When you reach the end of the reel, turn the light off as soon as the last scene is about to finish going through the gate, leaving the motor running to carry the end leader through the machine. This avoids the unpleasant effect of showing a white screen while the end of the film is being run through the sound head and on to the take-up reel.

V. MAINTENANCE OF THE EQUIPMENT

A. Projector Maintenance

1. Cleaning

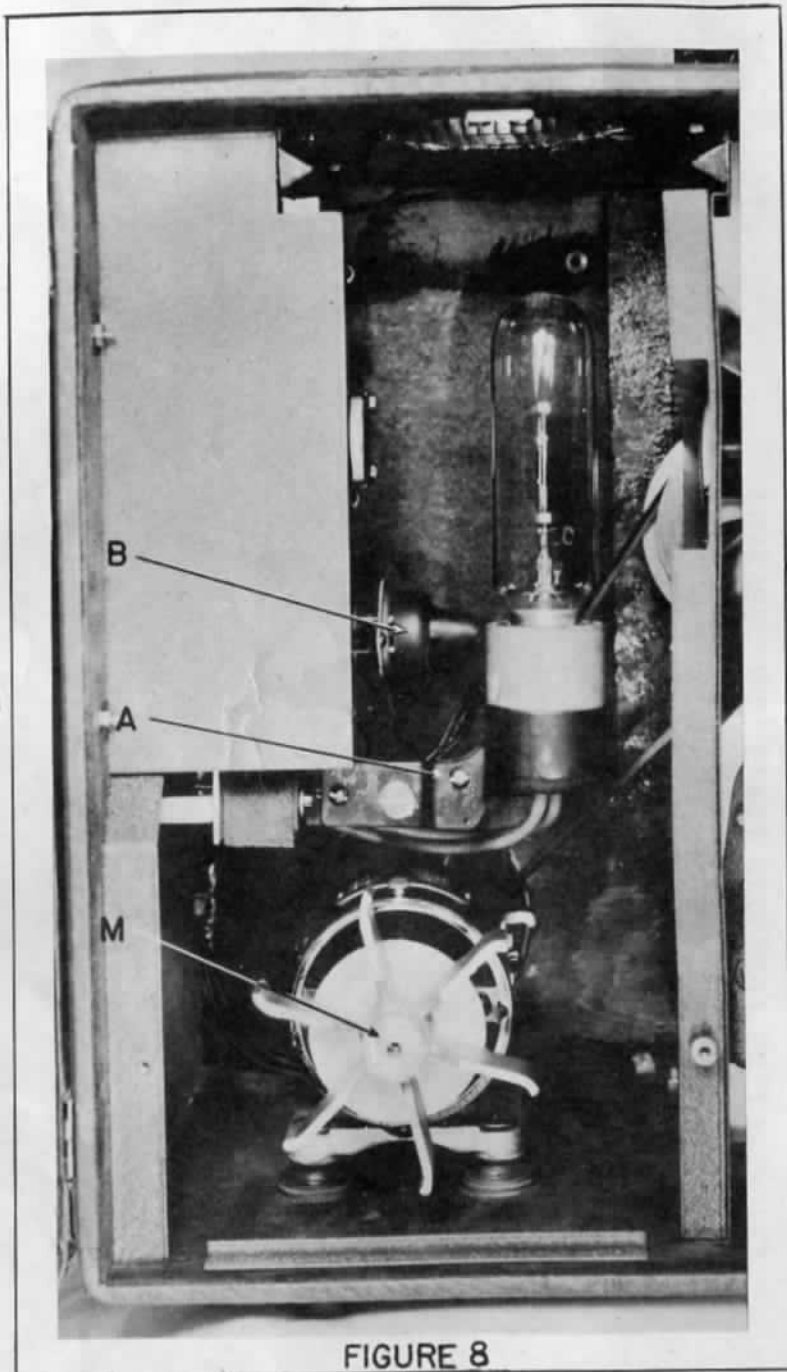
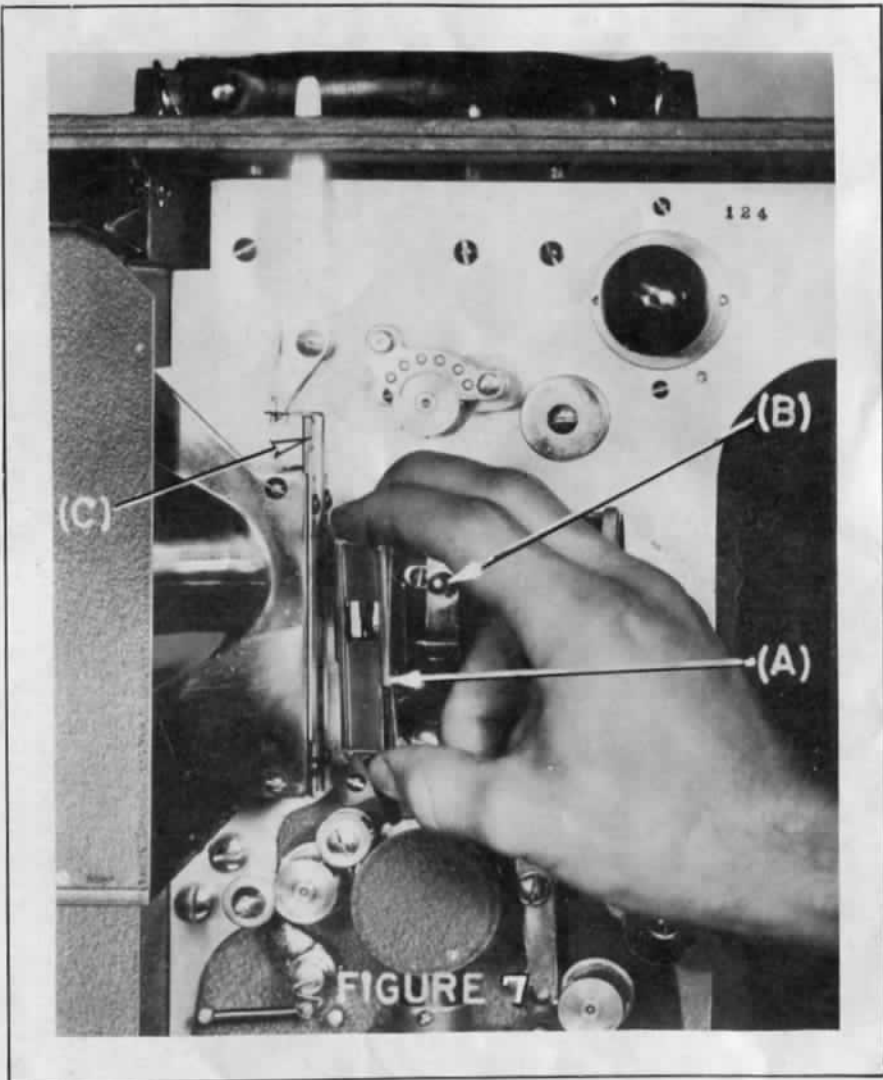
One of the first requirements for complete satisfaction in projector operation is thorough cleanliness of the equipment, especially of the vital parts.

It is vitally necessary, if professional results in pictures are to be maintained, to clean both the aperture plate and the pressure plate before each show. Always do this when the projector is idle.

At times, dust and lint will accumulate on the aperture or/and pressure plate while the projector is in operation and the picture on the screen will become fuzzy around the edges. When this happens, clean both the aperture and pressure plates before running the next reel.

(a) CLEANING APERTURE PLATE

It is not necessary to remove the aperture plate (C - Figure 7) from its housing. When the pressure plate lever is open, (B - Figure 7) there is ample room available to clean the aperture. A match stick or toothpick usually is sufficient. For stubborn cases, use a soft cloth moistened with alcohol or tetrachloride. NEVER use HARD METAL on these parts.



(b) REMOVING PRESSURE PLATE FOR CLEANING

Figure seven (7-A) shows the pressure plate removed for cleaning. This plate is held in fixed position by two studs and moves in and out with the movement of the lever which opens the gate. To remove the pressure plate, first open the pressure plate lever and then simply push the pressure plate upward until it snaps out. When thoroughly cleaned, be sure to replace it into the slot in exactly the same position from which it was removed or film damage may result.

(c) REMOVING AND CLEANING LENS

To remove the lens lift the spring on the lens housing with a screw driver and slide the lens out of its mounting.

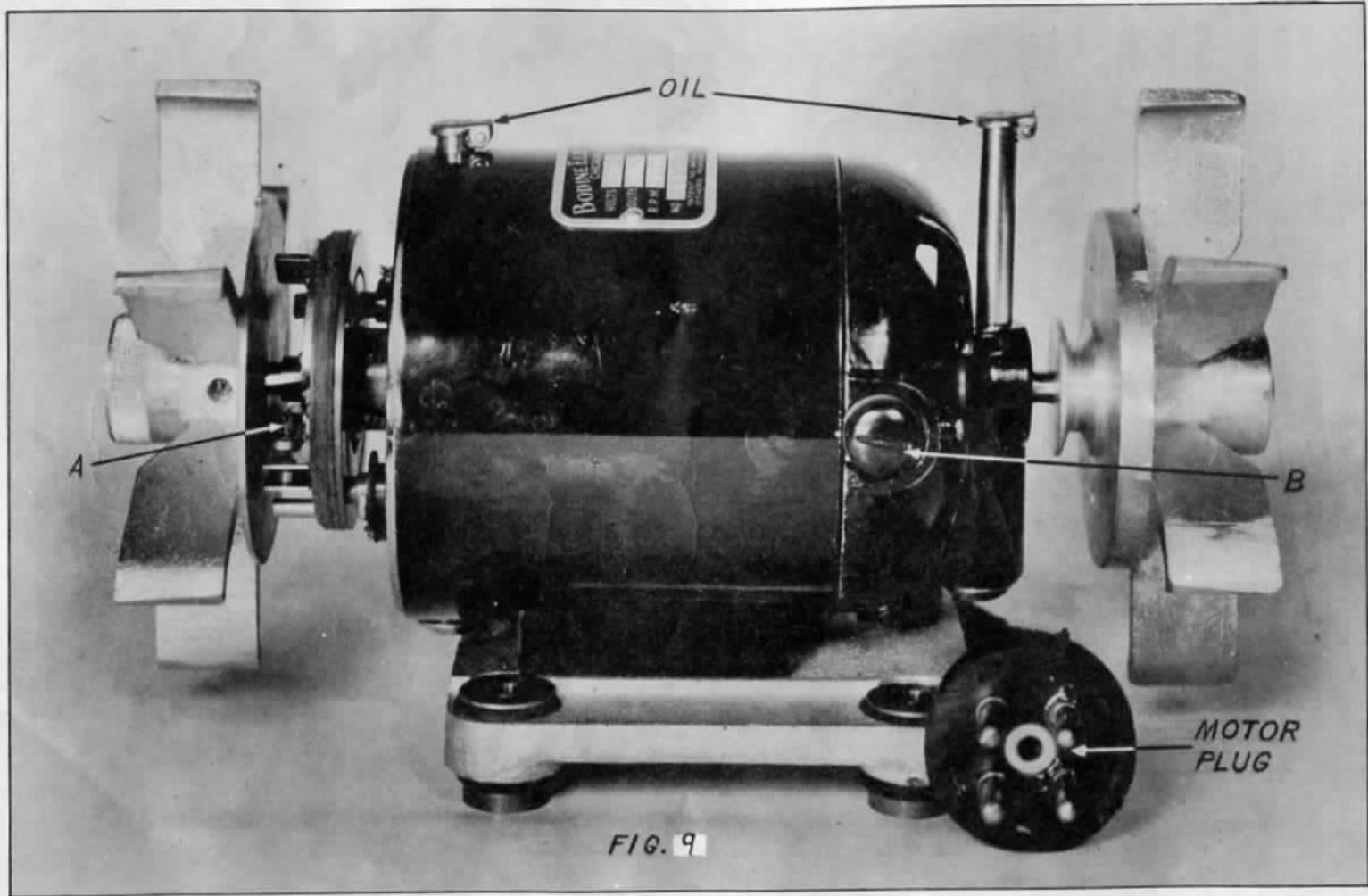
It is highly important that the lens be cleaned frequently to prevent the accumulation of finger prints, dust and other marks or materials that retard sharpness of pictures. To clean, use a very soft cloth or soft tissue paper. Blowing the breath on the lens as you would spectacles facilitates cleaning.

To clean the condenser lens and reflector, the lamp house is removed as shown in Fig. 2. The condenser lens is shown at A in this figure. On the inside rear of the lamp house will be found the reflector mirror, which should also be kept spotlessly clean. Before replacing the lamp house, inspect the lamp bulb itself and see if it is clean.

All sprockets and rollers should be kept clean and free from all kinds of dust, dirt, and oil. If oil or dirt is allowed to accumulate on any of the rollers or sprockets, it will get on the film and have an unpleasant effect on the pictures, as well as on the sound. A stiff toothbrush is ideal for keeping the sprockets clean.

It is wise to clean out the rear of the projector from time to time and to remove any surplus oil or grease which may have accumulated there. To get at these parts, the door on the rear of the case is opened. Fig. 11 shows the rear mechanism as viewed through this door. Never allow oil to accumulate on the belt which connects the motor to the large pulley on the shutter shaft, as this causes the belt to slip and cause unpleasant effects in the sound.

IMPORTANT! The glass elements of both the projection LENS and CONDENSER SYSTEM are COATED for improved transmission of light. Do not destroy this coating by using acetone or similar chemicals when cleaning either the lens or condenser. Use soft cloth or cleansing tissue with water or alcohol ONLY!



A very important point to keep clean is the sound aperture hole in the top of the sound drum. This sometimes has a tendency to fill with dirt and dust when the film is dirty, and when it does, the sound is badly interfered with or cut off altogether. Some dust may also fall on the top of the sound lens, which is just under this hole. This may be removed by pulling off the sound drum cover shown at M in Fig. 4. Fig. 10 shows this cover removed. Removing the photo cell cover and the cell facilitates cleaning the drum, the drum aperture and the lens. They, too, are shown removed in Fig. 10.

2. Oiling.

All shafts are lubricated from the "one shot" oil cup shown in Fig. 6, protruding from the top of the case. Every six or eight times the machine is used, this cup should be filled with a good grade of light mineral oil.

To oil the motor, it is necessary to remove the cover plate, which can be done by removing the two screws shown at B in Fig. 2 and sliding the plate toward the right, or, if the lamp house is out, lifting it away. An oil hole will be found in each end of the motor, as indicated in the close-up of the motor in Fig. 9. Since this is a ball bearing motor, very little lubrication is required. A few drops every six months is sufficient as a rule.

It may be necessary at rare intervals to apply a little lubricant to the drive gears in the rear of the machine. White vaseline or petroleum jelly should be used, and only in small quantities, as any excess here will be thrown against the side of the case.

A very little oil should be applied with a tooth pick to the small rollers in the sprocket idlers, shown at R in Fig. 4, and the film rollers X and Y shown in Fig. 5. These rollers must turn freely to avoid film scratches, but any surplus of oil must be carefully guarded against, so that the film will be kept clean. After oiling these parts, wipe off the rollers carefully with a cloth. A few drops are also needed occasionally on the other film rollers and on the roller at the inside end of the upper reel arm. There are oil holes provided at the outer ends of the reel arms, one on the lower arm and two on the upper. These should receive occasional lubrication.

3. Care of Projector Lamp.

After about one-fourth of the useful life of the projector lamp has been used up, the filament tends to become quite brittle and is much more susceptible to damage than when it was new. This is due to the extreme high temperature at which modern lamps operate. With this in mind, we recommend that when you ship your machine or transport it any distance, say in an automobile, you remove the lamp from its socket and pack it separately.

As stated before, we use only STANDARD pre-focus base lamps. A 750 watt lamp is furnished unless otherwise specified. NO adjustment is necessary, either for the replacing of a new lamp of the same wattage or for the insertion of a lamp of lower (standard 500 watts) or higher (standard 1000 watts) wattage. JUST REPLACE THE LAMPS AS DESIRED.

4. Motor and Governor.

The motor in this projector is controlled by an electric governor which is carefully set at the factory to a speed corresponding to 24 frames per second. If it should be necessary to check the speed of the machine, proceed as follows:

If you can secure a good tachometer, apply it to the center of the sprocket shown at G in Fig. 4. It should show a speed of 180 R.P.M. If the tachometer is not available, an accurate check may be obtained by sticking a small bit of adhesive tape near one edge of the face of the sprocket and counting the revolutions. The use of an ordinary watch with a second hand will be sufficient to determine whether the machine is running at the correct speed. If it should be necessary to readjust the governor to correct the speed, proceed as follows:

Remove the motor cover as described above under V-2. The governor is located at the front end of the motor as viewed from the front of the machine. Fig. 9 is a picture of the motor removed from the case to show the parts more clearly. In this figure, A indicates the adjusting screw which may be reached by turning the motor by hand until it is in an accessible position. Turning this screw to the left, or counter-clockwise, makes the machine run slower and turning it to the right speeds it up. Before attempting to adjust the speed, however, make sure that the trouble does not lie elsewhere, such as in a dirty commutator, worn brushes, or a slipping motor belt. The commutator may be inspected through the openings in the end of the motor frame, and the brushes may be removed by loosening the screw shown at B in Fig. 9, and the one opposite it on the rear side of

the motor. If necessary, the motor may readily be removed for inspection or replacement with a new motor. To do this, first remove the plug shown at B in Fig. 8 from its socket, then remove the four screws which are accessible from the bottom of the case, directly under the motor. When replacing the motor, be sure you get the belt tension approximately the same as it was before, or just sufficient to prevent slipping.

5. Exciter Lamps.

When an exciter lamp goes out during the running of a film, it may be instantly replaced with the other lamp by reaching under the exciter lamp housing (H, Fig. 4) and loosening the screw at K in Fig. 4 and also at K, in Fig. 10. Loosening this screw and pushing it in whichever direction it is free to move, to the limit of its travel, brings the other exciter lamp into position and lights it. Tightening the screw secures it there.

When replacing the lamp, refer to Figure 10 (which is a view of the sound head with the photo cell and all covers removed) and proceed as follows: First remove the exciter lamp cover by taking out the two screws shown at N in Fig. 4, then loosen the lamp carriage as described above and move it so that the good lamp is under the sound lens tube shown at A, Fig. 10. This will leave the defective lamp in the open, where it can be removed merely by loosening the socket clamp screw shown at B. When replacing the lamp with a new one, see that the filament lines up in the same position as the old one occupied and that the base of the lamp is pushed about as far into the socket as the previous lamp was. Then move the lamp carriage back so as to bring the new lamp under the sound lens. The screws shown at C (one at each end of the lamp assembly) regulate the position at which the lamp stops. The lock rings shown at D lock these screws into position after they have been set. To set the new lamp correctly into position, first remove the photo cell cover (in Fig. 5, the lower cover with the DeVry name plate) by simply pulling it off, then remove the photo cell from its socket to allow you to see the top of the sound drum clearly. Then loosen the lock ring of the screw which stops the lamp carriage in position to bring the new lamp under the lens tube. Now put a scrap of film in position over the sound drum. Turn on the light switch of the projector, which will light the exciter lamp. Now a bright line should appear on the film at the top of the sound drum. Moving the lamp carriage slightly will change the intensity of this line of light. Back the adjusting screw well clear of the lamp carriage, then move the lamp back and forth until this line of light is at its extreme maximum brilliance. Lock it in this position, using the screw K. When the carriage is locked tightly, screw in the adjusting screw C

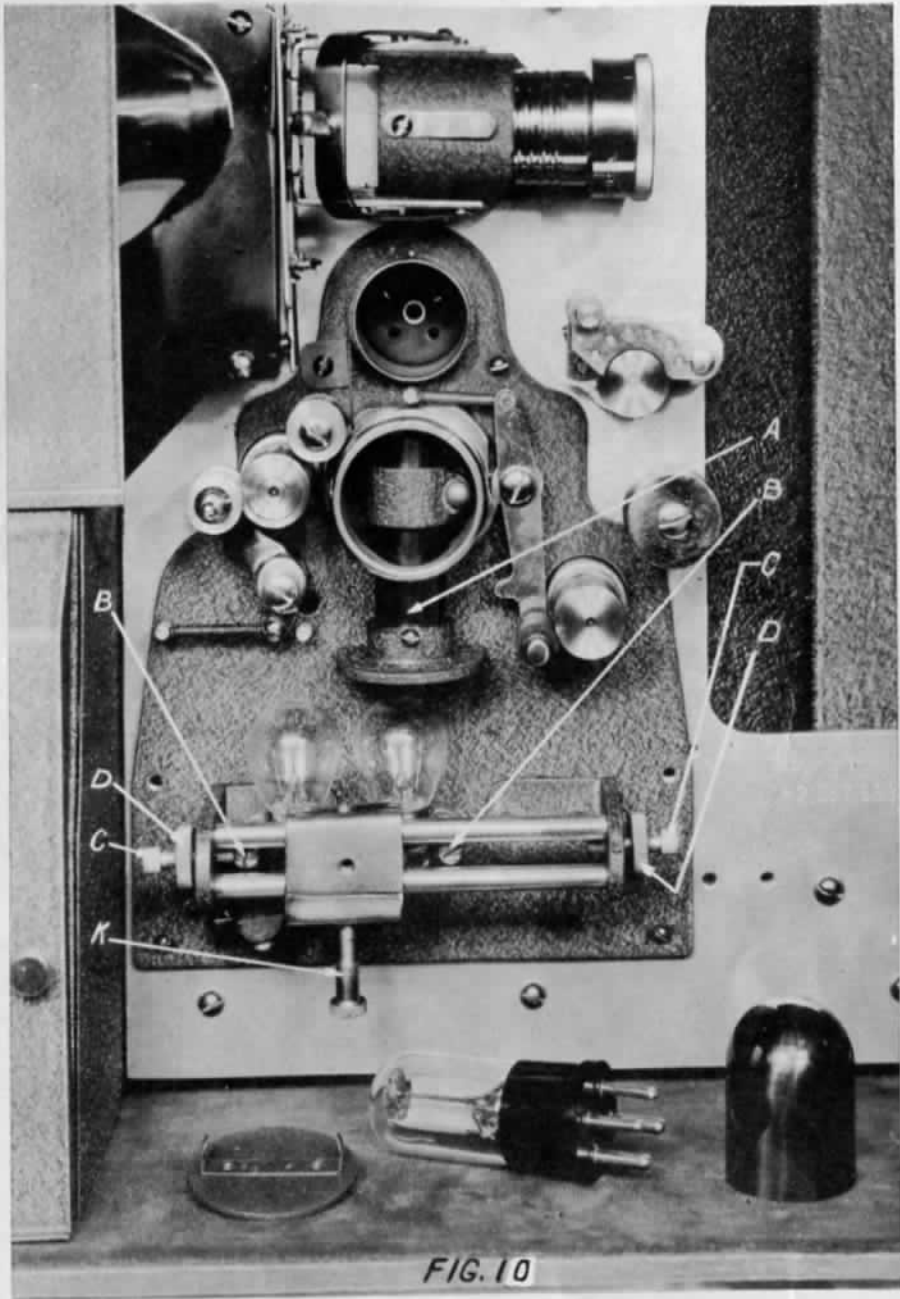


FIG. 10

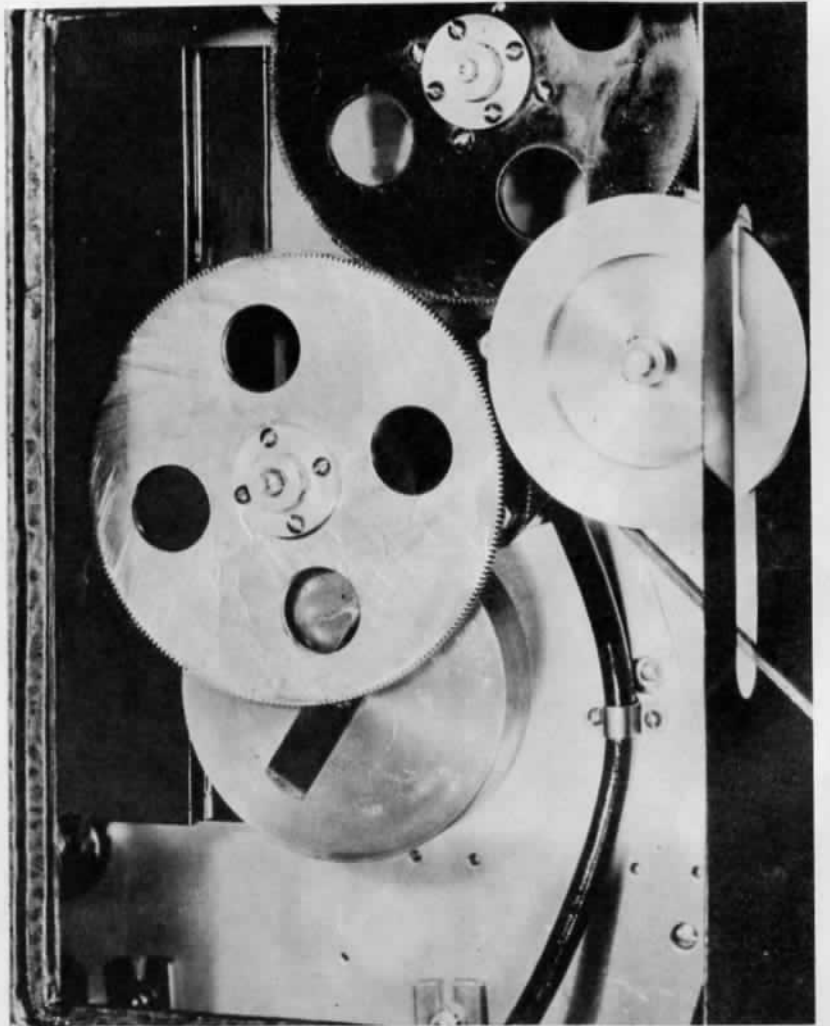


FIG. 11

until it touches the lamp carriage, then lock it firmly in that position, using the lock ring, D. Now loosen the carriage screw, K, sliding the lamp assembly toward the center, then slide it back against the adjusting screw to make sure the screw has been set in the proper position to give maximum light on the film. The cover is then replaced over the exciter lamps and the photo cell and its cover are replaced.

IMPORTANT: When installing a new lamp, the filament must be placed at right angles to the bars on which the lamp carriage slides, so as to get a uniform brightness along the line of light on the film. Otherwise variable area sound tracks will sound distorted.

Also very important is the matter of getting the filament exactly centered to get the maximum of light on the film, as described above. If this is not done, the slight vibration of the lamp as the machine runs will cause a very unpleasant metallic sound in the speaker. This sound would be loudest with no film in place, the motor running, the lamp lighted and the main volume turned up.

6. Pilot Lamps.

The rear switch panel of the projector is provided with a pilot lamp which illuminates this panel at all times, as long as the projector power cord is plugged into a source of power. This also applies to the threading light illustrated in Fig. 5. If the control panel lamp should burn out, it is easily accessible for replacement by opening the cover plate shown just to the left of the central panel in Fig. 8. This cover plate pivots about its lower screw. The threading lamp is replaced by pulling the drum off.

7. Photo Electric Cell.

Modern photo cells also have a long life, but eventually will deteriorate and give less and less volume output. If the sound from your projector seems to be weakening and if you have checked the tubes, the exciter lamp adjustment, and are sure that dirt in the sound drum aperture is not causing the loss of volume, it may be that the photo cell is running down.

B. Miscellaneous.

In the above paragraphs we have tried to cover all common and most uncommon sources of trouble in your equipment. If you should have troubles which are not covered in this book, see your dealer or communicate with the factory. Sometimes amplifier troubles can be ironed out by calling in a local radio maintenance man. The amplifier diagram in the rear of the book should be of considerable assistance in this respect. If you have projector trouble which you cannot take care of, we recommend that you communicate with the factory rather than attempt to get a local mechanic to fix the machine.

PICTURE SIZES OBTAINED WITH VARIOUS PROJECTION LENSES

16 MM MOTION PICTURE PROJECTORS

LENS FOCAL LENGTH	DISTANCE IN FEET FROM SCREEN														
	8'	10'	12'	16'	20'	25'	32'	36'	40'	50'	64'	75'	100'	125'	150'
	WIDTH OF PICTURE														
3/4"	4'0"	5'0"	6'0"	8'0"	10'0"	12'6"	.....	.....	.....	.....	.....	.....	.....	.....	.....
1"	3'0"	3'9"	4'6"	6'0"	7'6"	9'4"	11'11"	13'5"	14'11"	.....	.....	.....	.....	.....	.....
1 1/2"	2'0"	2'6"	3'0"	4'0"	5'0"	6'3"	8'0"	9'0"	10'0"	12'6"	.....	.....	.....	.....	.....
2"	1'6"	1'10"	2'3"	3'0"	3'9"	4'8"	6'0"	6'9"	7'5"	9'4"	11'11"	14'0"	18'9"	23'5"	28'1"
2 1/2"	1'2"	1'6"	1'9"	2'4"	3'0"	3'9"	4'9"	5'4"	6'0"	7'6"	9'7"	11'3"	15'0"	19'8"	22'5"
3"	.....	1'3"	1'6"	2'0"	2'6"	3'1"	4'0"	4'6"	5'0"	6'3"	8'0"	9'4"	12'6"	15'7"	18'8"
3 1/2"	.....	1'0"	1'3"	1'8"	2'1"	2'8"	3'5"	3'10"	4'3"	5'4"	6'11"	8'0"	10'8"	13'4"	16'0"
4"	.....	.....	1'1"	1'6"	1'10"	2'4"	3'0"	3'3"	3'9"	4'8"	6'0"	7'0"	9'4"	11'8"	14'0"

DETERMINING THE RIGHT SIZE OF SCREEN

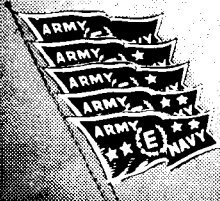
It will be seen from the above chart that the distance of the throw and the size of the lens determine the size of the picture and your screen. For instance, you may determine from the chart that a 2-inch lens will show a picture 6 feet wide at a throw of 32 feet.

It is considered good practice to have the width of the screen equal at least one-sixth of the distance from the screen to the back row of seats. In some auditoriums this rule cannot always be followed, because excessive magnification for those sitting in the front rows is not advisable and with Mazda illumination the screen brilliancy will be reduced when the light is spread over large areas.

Therefore, it would be more advisable to reduce the size slightly below the ratio of one-sixth of the throw.

The De Vry Sales and Service Department will be happy to help you with whatever problem you may have in determining the right size and type of screen.

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