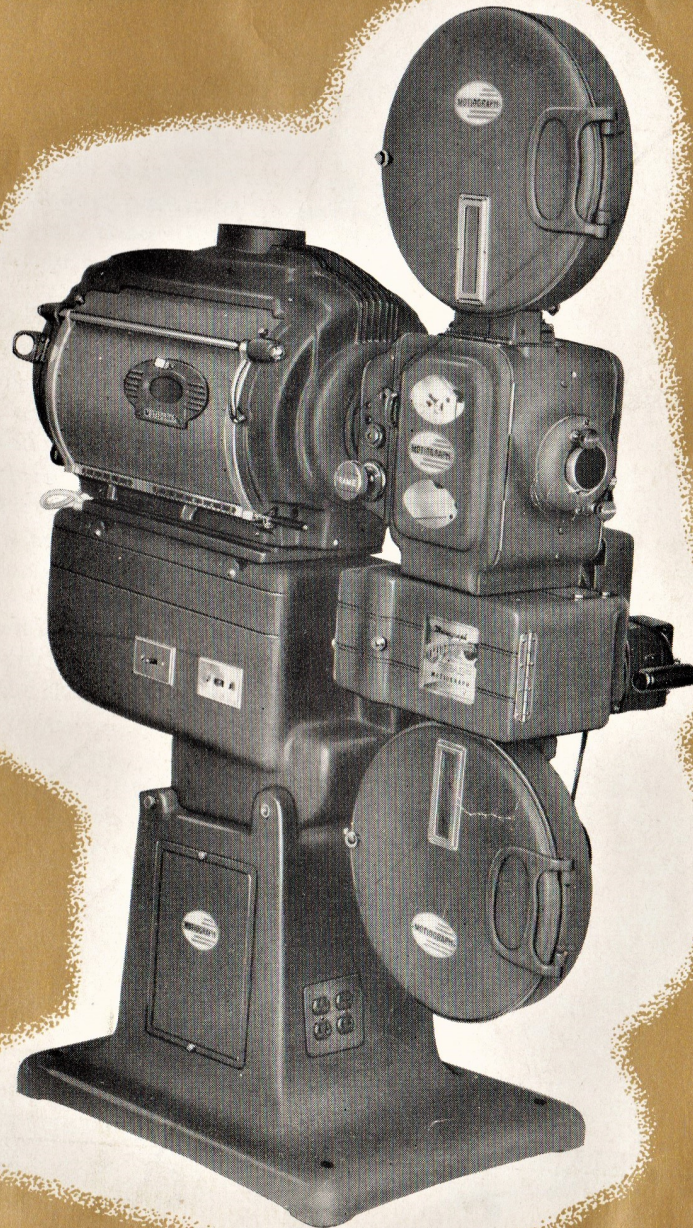


THE SOUND TRACK



THE SOUND TRACK says —

During the years of the war, when virtually all normal production of peacetime products was halted, your Motiograph dealer made every effort to help you in keeping your theatre operating.

Perhaps he was able to bring you but little in the way of equipment and supplies, but there was no lessening of his efforts to give you prewar service and cooperation. In bringing you THE SOUND TRACK throughout these years he made a further effort to provide you with helpful information in the operation of your theatre, in the care of your equipment, and the technical aspects of equipment items.

Now your Motiograph dealer is able to bring you something more—the new Model “AA” projector. In these pages you will find the full technical information on the design and construction of this most modern of all projectors.

Virtually every Motiograph dealer has had long years of experience in the theatre field. After reading the technical information on the Model “AA,” you will understand better why he has selected this model for his customers.

THE SOUND TRACK

VOL. VI

NO. 4

Facts on the “AA”

Technical Data on New Motiograph Projector

The new Model “AA” is the eighth to be produced by Motiograph, and comes fittingly enough on the golden anniversary of the founding of the company. Motiograph was established originally by Mr. Alvah C. Roebuck, co-founder of the Sears, Roebuck Company, in 1896, and is the oldest manufacturer of motion picture equipment in the field. During these fifty years it has pioneered in turning out projection and sound equipment which has set the pace for better performance and higher standards.

In order that theatre owners, projectionists and motion picture engineers may have a good idea of the outstanding advantages which the “AA” incorporates, the present object is to present some of the technical details which go to make up this postwar projector.

Let us first briefly review the basic principles which motivated the design of the Model “AA”. As a preliminary step, an ex-

tensive survey was conducted to determine the design features desired by projectionists and exhibitors. This included a careful study and testing of all present and earlier models of projectors, as well as considerable research to uncover such design features as might advantageously be included.

The underlying thought in regard to the “AA” was that it must be a mechanism of completely new design rather than simply a revision of earlier Motiograph projectors. The designers were thus unhampered by traditions and customs, except in the matter of mounting and drive arrangements, and were free to use improved materials, finishes and processes which were derived from war work, including Motiograph’s own work in producing precision machined components and major assemblies for ordnance equipment.

There were a number of factors that entered into the work of design. It was de-

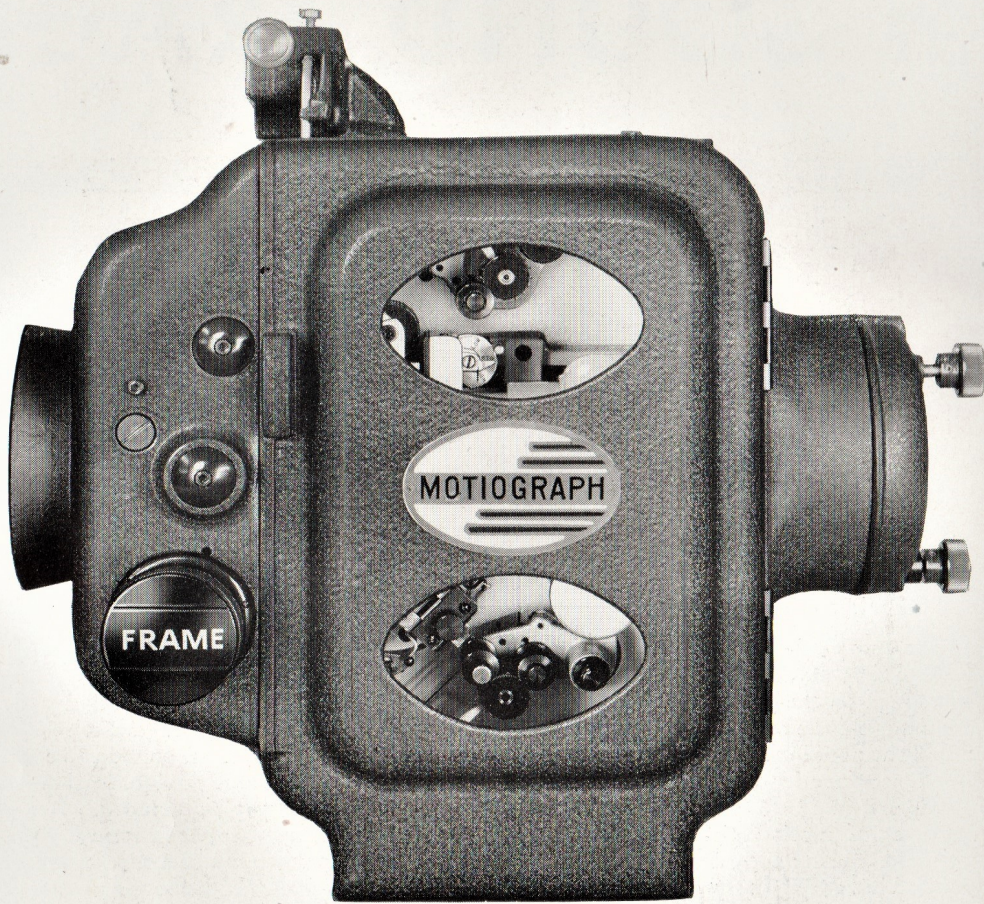


Fig. 1. Motiograph "AA" projector mechanism, operating side

termed first of all to produce a projector that would achieve the best possible picture on the screen as regards steadiness and clarity. The projector would also have to give exceptionally long life, and yet be economically manufactured. Lastly, it was required that it be simple to operate and have little requirement for replacements and repair.

How well these objectives have been

achieved will become evident in the detailed description.

The Projector Housing

To provide for accurate alignment of components and maximum stability in operation, the housing of the Motiograph "AA" is a one-piece casting enclosing all the working parts of the mechanism, including the

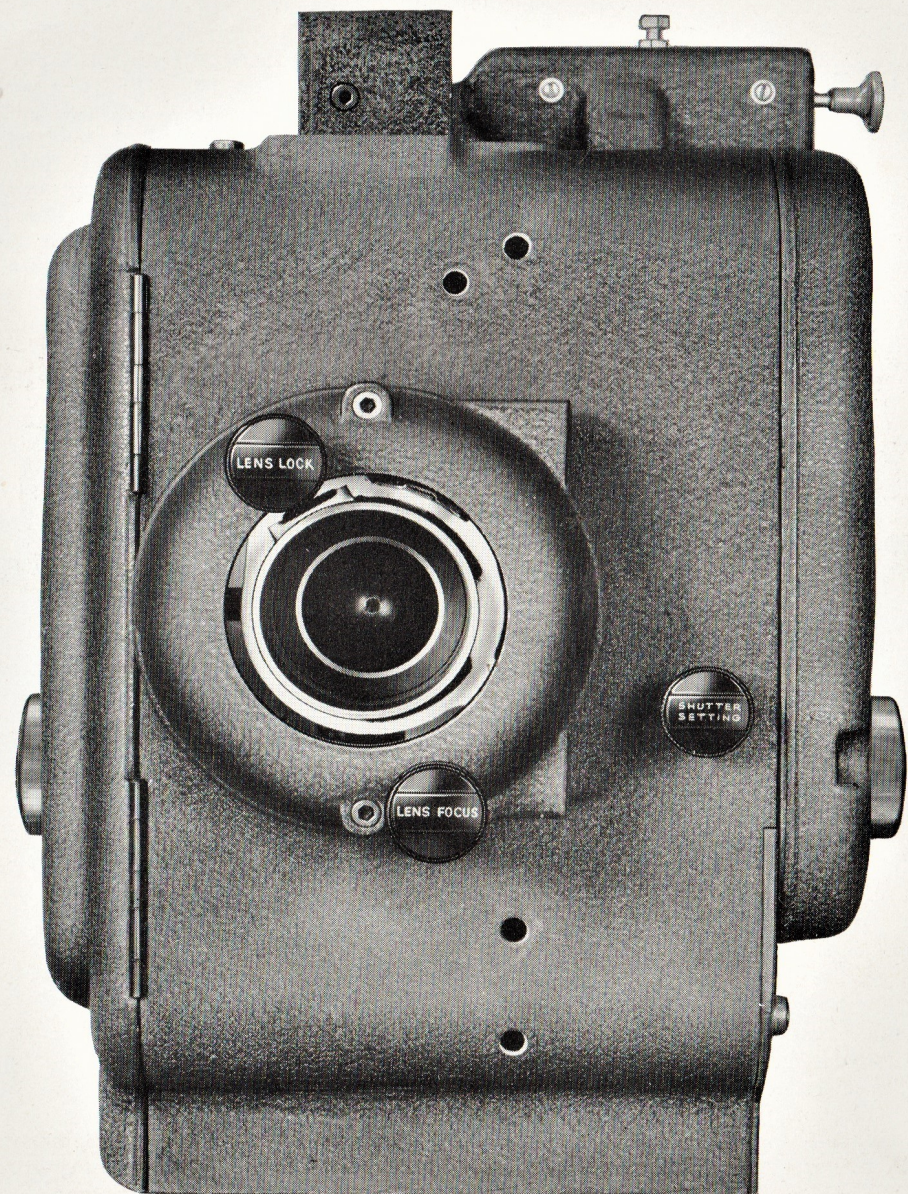


Fig. 2. Motiograph "AA" projector mechanism, front view

twin rotor double rear shutter. The large cast door, hinged at the front, provides access to the interior of the film compartment

lar extension of the main frame casting supports the lens carriage with exceptional rigidity. The drive gear compartment on the

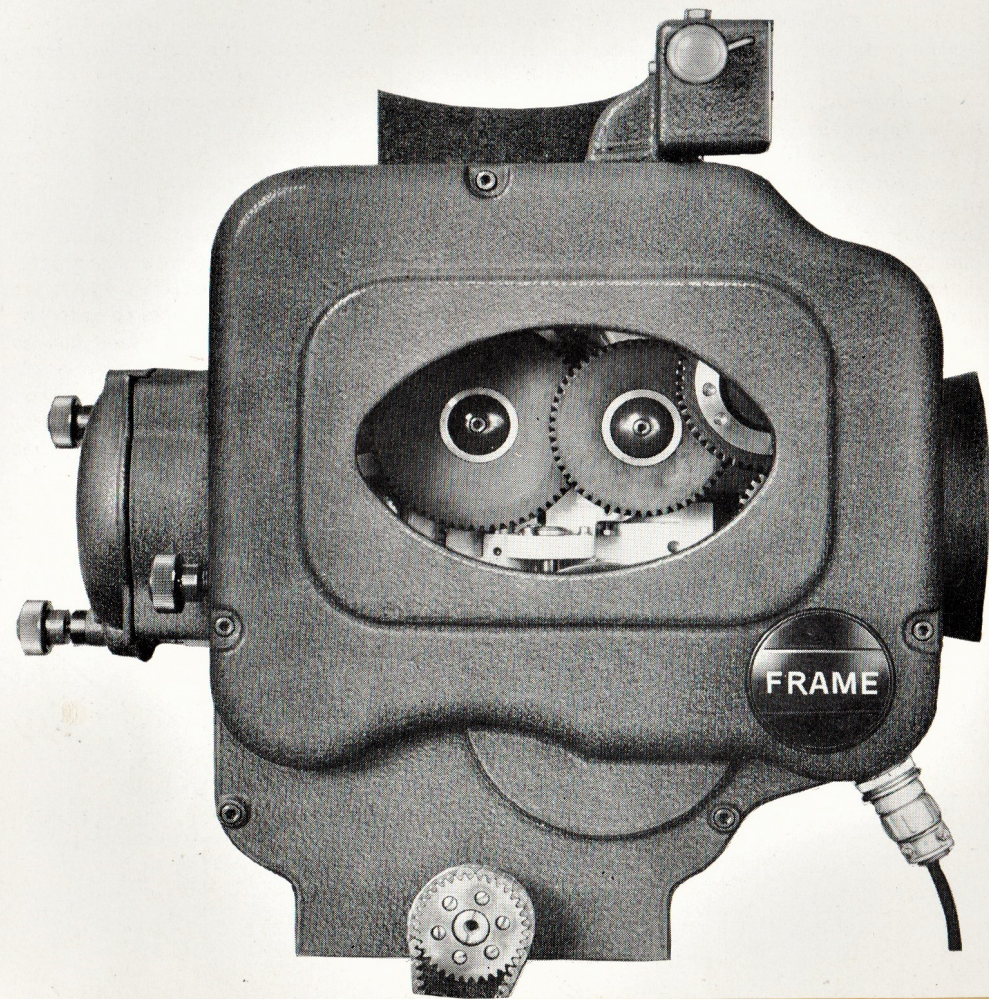


Fig. 3. Motiograph "AA" projector mechanism, drive side

for threading, and its double windows permit the upper and lower film loops to be readily observed during operation. A tubu-

drive side of the mechanism is equipped with a dustproof cast cover firmly held in place by Allen cap screws. This construction is

made possible by the fact that little access to the drive side is required, and thus harmful dirt and grit are kept out of the working components of the machine.

Most of the working parts are supported by the reinforced center frame, which is an integral part of the housing casting. It stiffens the housing, and provides the rigid and stable supporting means for the film drive components and for the optical elements required for minimum machine vibration and maximum steadiness in the projected picture. The entire housing is quite large by former standards, being 15 inches high, 11 inches deep, and 18 inches long. The weight is not cumbersome, however, for all of the major castings are made of light but strong aluminum alloy. The housing corners are rounded and its contours are smooth. The general appearance conforms to accepted concepts of modern streamlined design while

preserving functional efficiency.

Construction of Mechanism

The Motiograph "AA" projector is of unit construction, with all major components easily removable for inspection, cleaning or servicing without the necessity for disassembling the machine. In the drive gearing, this has been accomplished by the virtual elimination of long shafts carrying numerous gears. Power is transmitted to the various film drive points by hardened steel gears meshing smoothly into laminated bakelite gears. The gears run on grease-packed double-row ball bearings which are rigidly supported by studs locked into the mechanism center frame. The gear meshes require no lubrication other than an original film of lubricant as long as they are kept clean, for experience indicates that gear wear results primarily from the lapping action

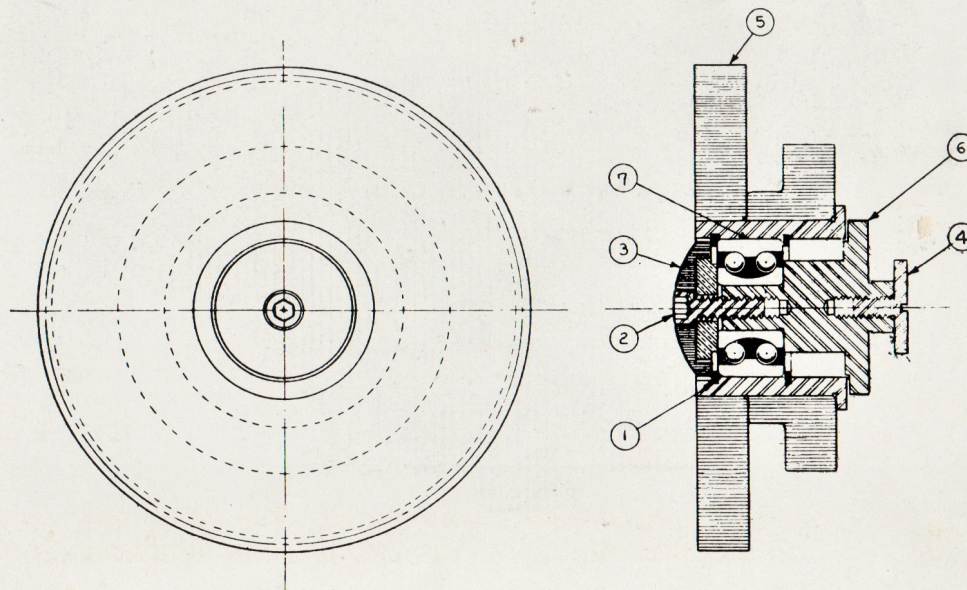


Fig. 4. Typical gear assembly

caused by dirt and grit brought in by frequent hand oiling or by poorly filtered lu-

the supporting stud which is locked in place in the center frame by the screw, Item 4.

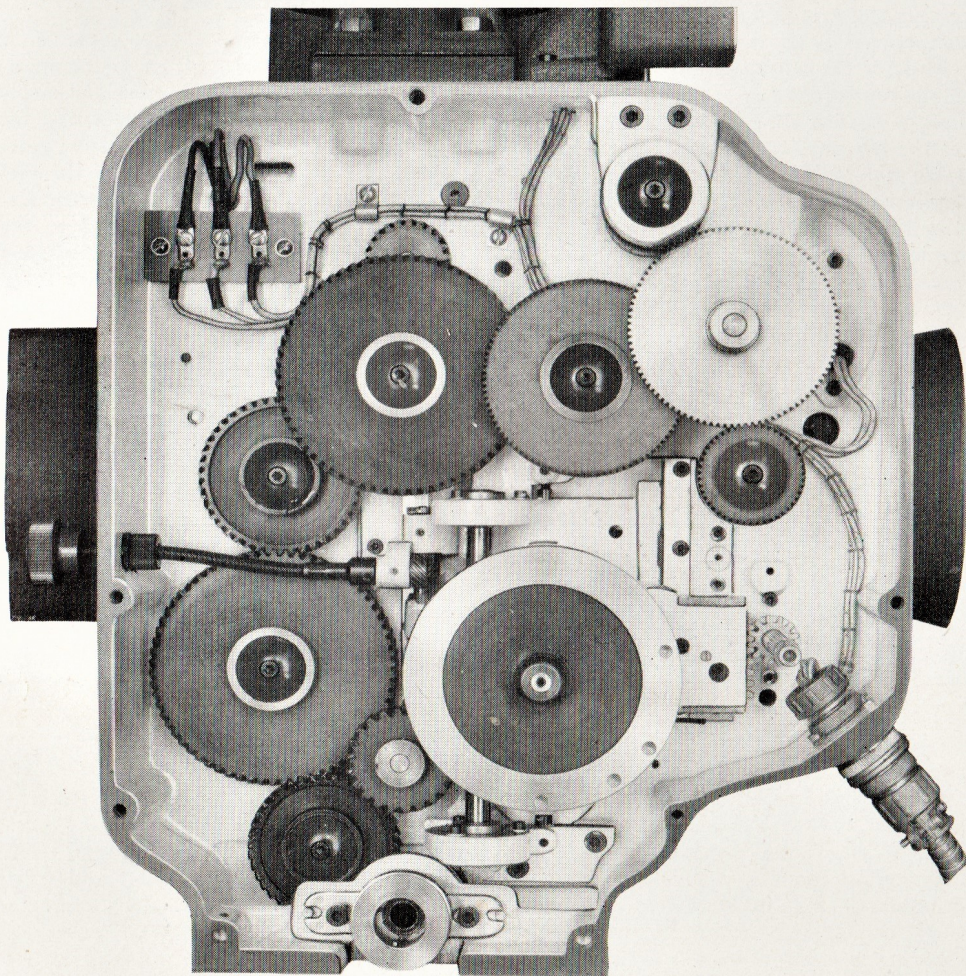


Fig. 5. Motiograph "AA" projector mechanism, drive side, cover removed

brication systems of the continuous or distributed type.

This is brought out in the diagram of a typical gear assembly. (Fig. 4). Item 6 is

Item 7 is the double-row, sealed ball bearing which supports the Item 5 gear assembly. These bearings are the lubricated-for-life type, and almost indefinite wear may

be expected. The bearings are held in place on the gear hubs by snap rings, Item 1. The gear and bearing assemblies are locked securely to their mounting studs by the reinforced decorative dust caps, Item 3, and the Allen cap screws, Item 2.

Figure 5 shows the simple and rugged gear train of the "AA" Projector. Power from the drive shaft at the bottom of the mechanism is transmitted by gear combinations to the ball bearing supported vertical

Both the upper and lower feed sprockets of the projector are driven by stub shafts carrying on their drive ends suitable gears to mesh into the main gear train at the required points. The lower such shaft is just above the main drive shaft, and it also carries the drive gear for the vertical shaft. The gear on the upper is above the upper large bakelite idler gear. This idler and those to the right of it transmit power to the shafts carrying the shutter rotors and to the shaft

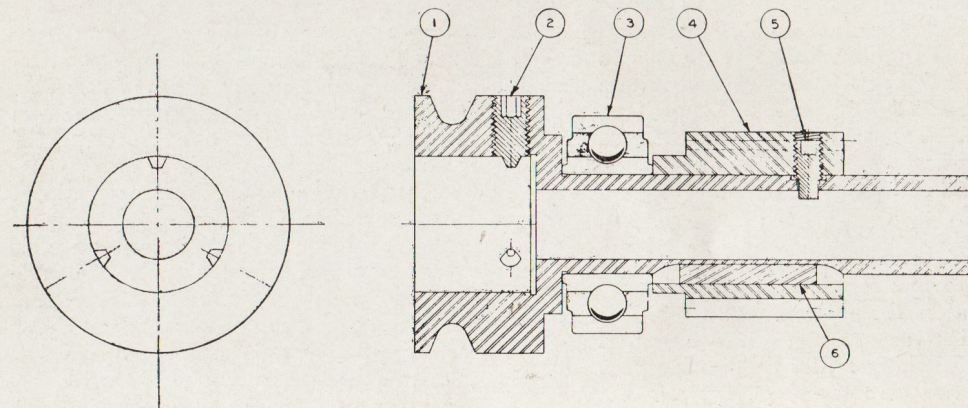


Fig. 6. Drive Shaft

shaft just back of the intermittent movement flywheel. This shaft passes through and is keyed to a wide, movable pinion which meshes with the drive pinion on the intermittent movement cam shaft, thus permitting the movement to be shifted vertically for picture framing. Furthermore, the position of the wide pinion with respect to its mating pinion on the movement is adjustable to provide a continuously variable shutter timing control which may be operated with the projector running. Since this control moves with the intermittent carriage, it is extended to the front of the mechanism housing by means of a flexible shaft.

of the blower and fire shutter actuator.

The main drive of the "AA" projector is made in the form of a socket shaft into which the soundhead drive unit may be clamped in order to eliminate the need for oiling of the sound reproducer's projector drive assembly, and to provide a more rugged construction at this critical point. Referring to diagram Figure 6, the tubular shaft and socket unit, Item 1, runs in the sealed ball bearing, Item 3, and in a similar bearing set into the center frame of the mechanism. The Item 3 bearing is seated in an auxiliary rib of the main housing by easily operated clamps, so that the entire drive unit may be quickly and simply re-

moved or replaced in operating position. The soundhead's drive unit is locked into the socket shaft by the set screws, Items 2 and 5, and the heavy-duty pinion, Item 4, is fixed on the tubular shaft by the Item 6 key. The large end of the shaft is provided with a belt groove for driving lower magazine take-ups when the projector is operated with certain older sound reproducers having no take-up drive facilities of their own. This drive construction eliminates the possibility of damage to projector gears due to poor alignment between the projector and soundhead. There are no long sleeve bearings to bind from inadequate lubrication, and since the drive shaft requires no additional lubrication during the long life of its sealed ball bearings, the risk of damage to soundhead optical components from excessive oiling and oil leakage is eliminated.

The Film Path

The exceptional roominess of the "AA" provides for threading simplicity. The film enters the projector from the upper magazine through a fire trap unit having four quenching rollers running on grease lubricated pivot bearings. Between both upper and lower rollers there is a long chute to aid in the quenching action. From the fire trap the film passes to the upper feed sprocket, upon which it is held in place by the combined action of the sprocket's pad roller and the hardened steel guide roller just above and to the right of the sprocket. The film is thus guided smoothly over the sprocket, which engages six full perforations, and there is thus no tendency for it to jerk or slap because of uneven hold-back tension from the magazine. This increases film life over that from the conventional four tooth engagement.

The film loops upward from the upper feed sprocket, and then passes down through the gate to the intermittent sprocket, around which it passes in a clockwise direction to form the lower film loop. For best

alignment and for proper engagement of the sprocket and film, the tension shoe assembly is made part of the intermittent unit itself. The leaving end of the lower film loop passes over the lower feed sprocket clockwise and the film then travels downward to the sound reproducer. Double pad rollers on this sprocket insure sufficient engagement between sprocket teeth and film perforations to block the pulsating film travel produced by the intermittent movement. The film is fed smoothly to the reproducer and the film motion stabilizing system thus does not have to cope with the irregularities produced by the intermittent action. Better reproduced sound quality inevitably results.

A distinguishing feature is that the film path below and to the right of the lower feed sprocket is completely clear of all obstructions, with the exception of the cast stripper for this sprocket. This allows plenty of space in this region for the possible eventual addition of such auxiliary equipment as double film attachments and control track pickup facilities. For the former, the stripper mounting boss is so located and designed as to permit the substitution of another double pad roller assembly for the stripper, so the bottom of the feed sprocket may be used to feed the separate sound track film to the sound reproducer, with the picture film going across the top of the sprocket and thence by an external chute to the picture film takeup magazine. There is likewise adequate clearance below the feed sprocket to accommodate the feed and guide rollers of a new double film type of sound reproducer requiring no external chute and no projector modifications.

The Film Gate

It will be noted that the film gate (see Figure 8) of the "AA" when opened forward, provides a full inch clearance between tracks and tension shoes, thus allowing really adequate finger room for threading and for routine cleaning of aperture,

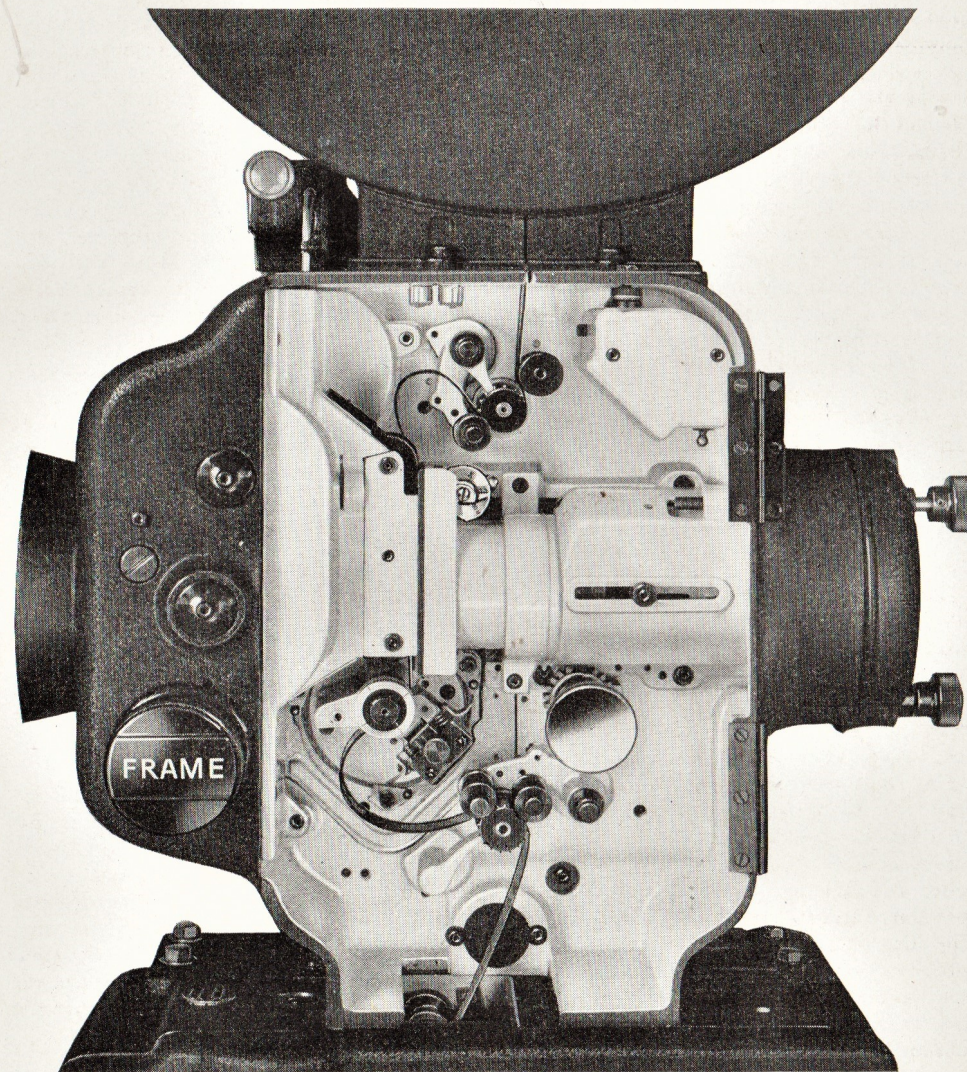


Fig. 7. Operating side showing film path; door removed

tracks, shoes and guide rollers. The two long film tension shoes extend the full length of the film tracks, and for perfect align-

ment they are combined into a single rigid unit of hardened steel. The film contacting surfaces are ground and polished. This unit

is held to the gate assembly by studs at the top and bottom which engage a unique gunlock mechanism within the gate body. The

film itself, and there is no chance for disturbance of either the alignment or of the tension adjustment.

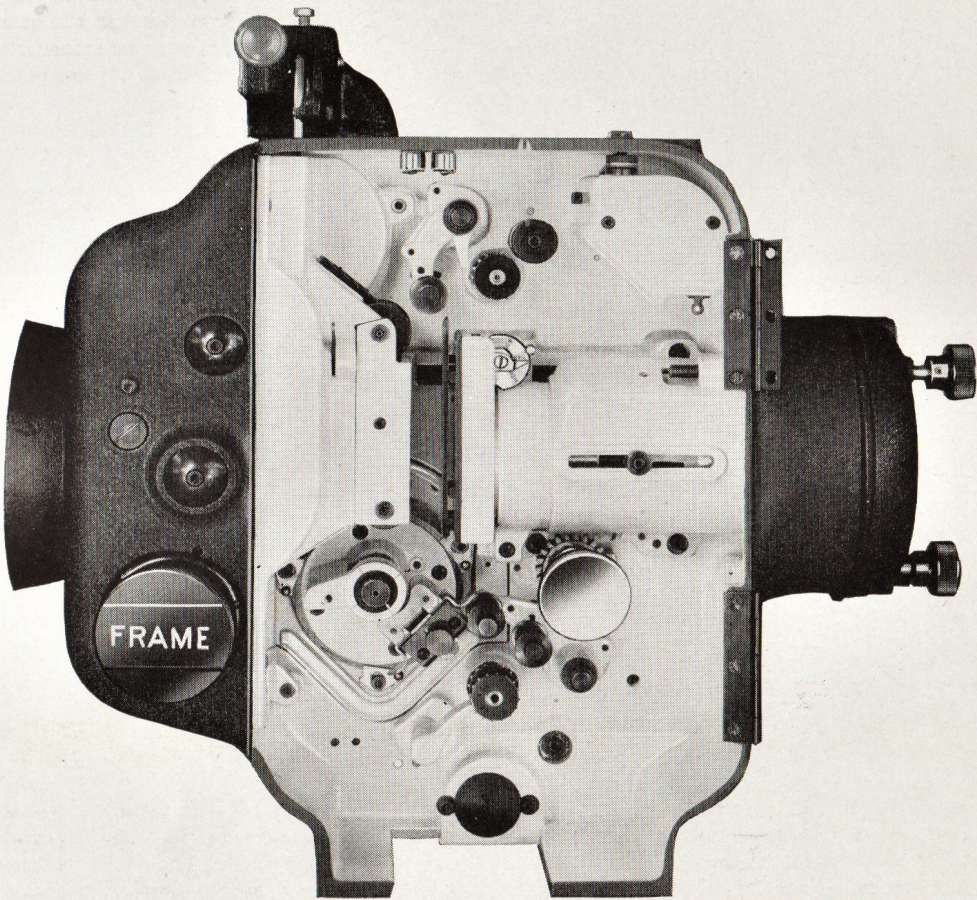


Fig. 8. Operating side, film gate open

studs snap into operating position as they enter their locating slots in the gate body face. They are instantly released by pulling out a small plunger near the top of the gate body. The shoe unit is therefore removable for routine cleaning almost as easily as the

Operation of the film gate is by a rack and pinion type control device just below the lens barrel. A quarter turn of its large control knob opens the gate, and another version of the gunlock mechanism within the control shaft automatically locks the

gate open as the knob is released. The gate closes and locks closed by simply pressing inward on this same knob to release the first locking device.

The diagrammatic view of the gate assembly (Figure 9) shows additional details. Item 1 is the base casting. This casting has an extension at the left to support the track

lens nearest the film plane to prevent stray light leakage at this location. Item 3 is the tension shoe unit proper. Shoe tension is applied by the semi-circular projections visible between the shoe runners and the gate body. These are at the ends of two transverse pressure bars within the body. Variable pressure is applied to the centers of these bars

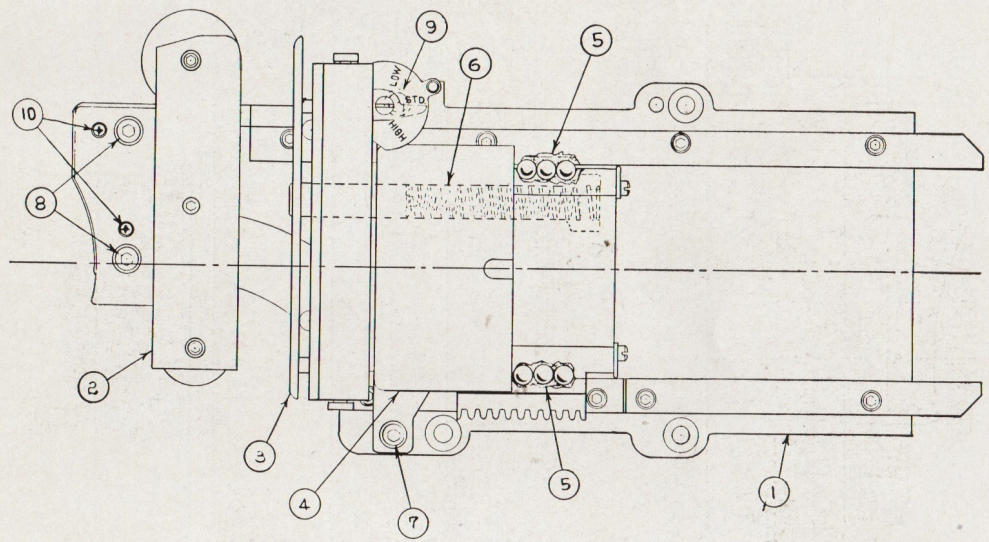


Fig. 9. Gate assembly

and aperture unit, Item 2, while the gate body moves in long V-rails on the steel balls indicated as Item 5. These same V-rails also support and guide the lens carriage. It is obvious, therefore, that all components concerned in the relationship between the film plane and the lens optical axis are part of a single major assembly which may be aligned with the utmost precision.

The spring, Item 6, automatically closes the gate when the operating control catch is released. Item 4 is a fixed light guard casting which covers the end of the projection

by flat springs on a vertical shaft whose mounting screws are visible at the top and bottom of the gate body. The degree of tension is determined by the cam-type tension control, Item 9. The pressure applied to the shoe unit in the "standard" position of this control is approximately 350 grams, and this value is satisfactory when films in average commercial condition are being run. The "low" position of the control reduces the pressure to about 225 grams to accommodate new, green film, and the "high" position increases the tension to around 675

grams to aid in flattening badly buckled older films. The control setting may be changed with the projector in operation.

placed after long use with full assurance that the optical alignment will not be impaired.

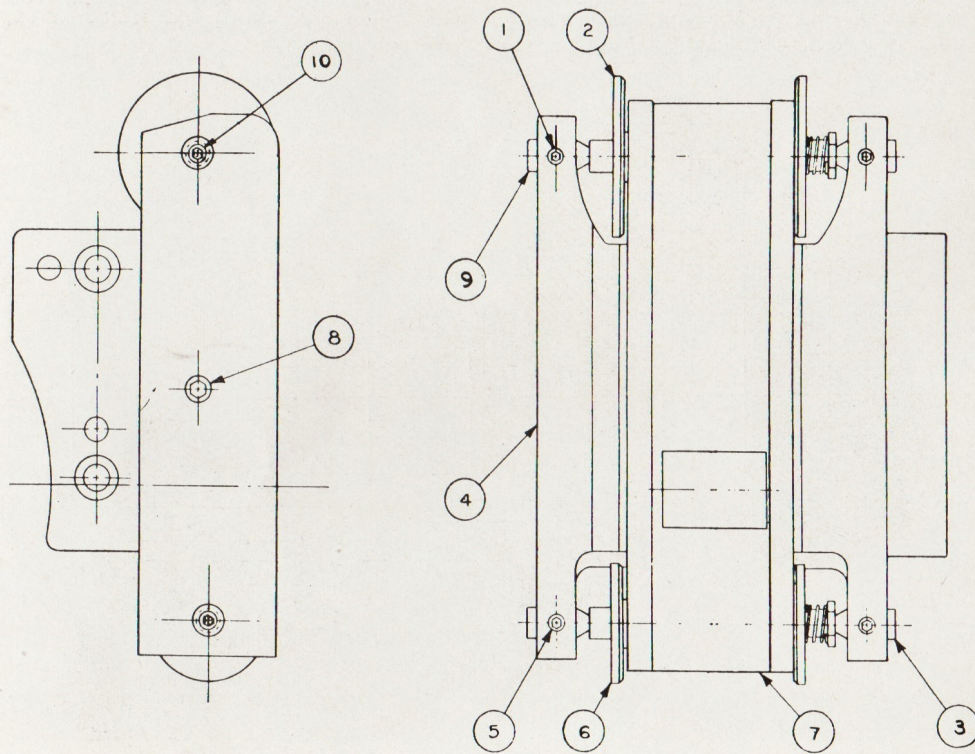


Fig. 10. Track assembly

Film Tracks and Aperture

The diagram of the track assembly (Figure 10), shows how the track support casting is fastened to the base of the gate and lens carriage unit. After accurate alignment with the optical axis is made, the casting is dowelled in place on the base so that it may be taken off and replaced without disturbing the alignment. The track and aperture unit is very accurately machined, and can be re-

The tracks and aperture of the "AA" are combined into one sturdily constructed unit of hardened and ground steel. This unit is Item 7. It is drawn securely against the support casting, Item 4, by the engagement between an anchoring stud on its rear surface and a long cone-point, socket head set screw, Item 8. The unit is thus very easily removable for inspection and cleaning without disturbing other projector components.

The lateral guiding of the film over the tracks is accomplished by the two guide roller assemblies, Items 2 and 6. Each has a fixed flange, or roller half, for the sound track side of the film and a movable flange under small spring tension for the opposite side, to accommodate films having various

ing film, and are fabricated from very tough and thoroughly hardened steel alloy to resist wear. They turn freely on hardened pivot-type bearings lubricated internally through small openings in the tips from grease reservoirs within the bodies of the bearings.

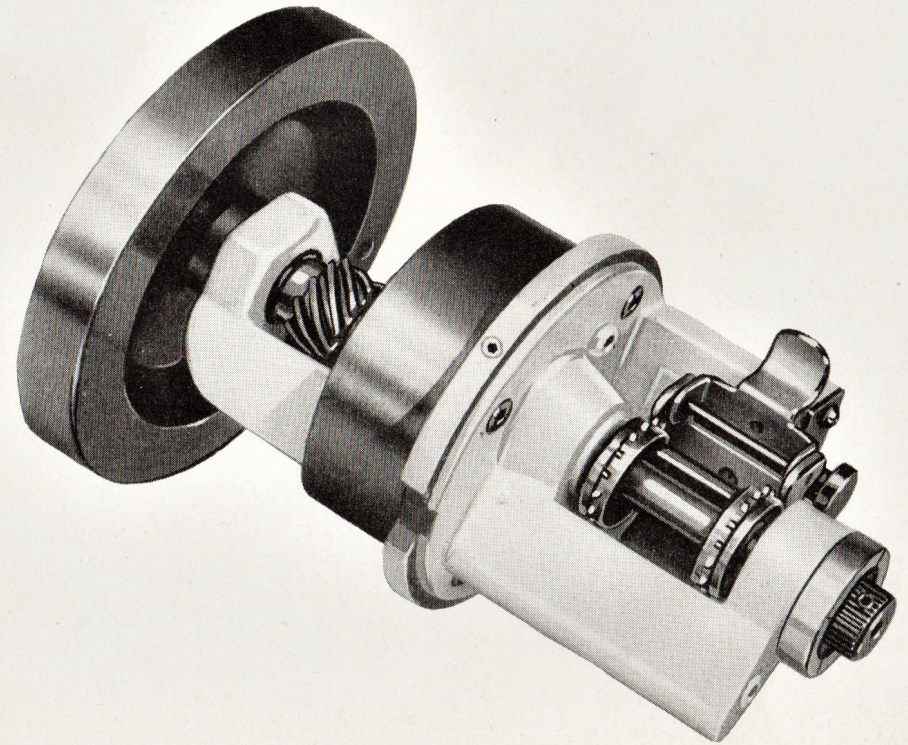


Fig. 11. Motiograph "AA" intermittent movement

degrees of shrinkage without producing film buckling or failure of the guiding action. The roller assemblies are relatively close to the aperture opening and are much more effective in eliminating film sideway than non-rotating, fixed types of lateral guides. The rollers are large in diameter so as to derive sufficient turning torque from the mov-

The Intermittent Movement

The intermittent movement (Figure 11) has well been called the heart of the projector mechanism. Exhaustive tests were made with many different types of movements, including some which were provided with complex gearing and auxiliary cams to decrease the pull-down time. While it

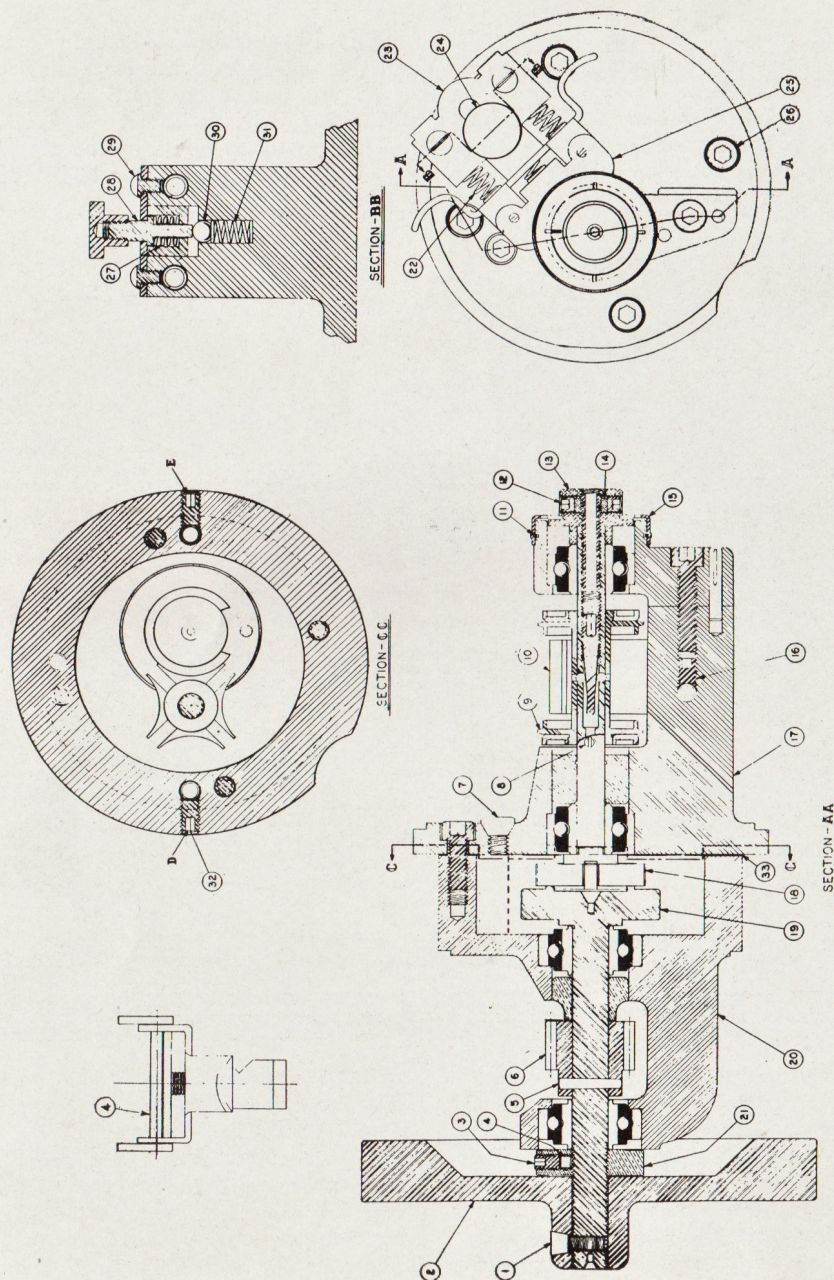


Fig. 12. Intermittent movement, sectional diagrams

was finally determined that the movement of the Model "AA" should be basically of the conventional 90 degree Geneva type, it nevertheless incorporates numerous original design features.

The tension shoe assembly for holding the film in place on the sprocket is mounted directly on the movement case. Outboard ball bearings for both the sprocket, or star shaft, and for the cam shaft are provided. The movement case design and the mounting arrangements in the projector are such as to permit the entire movement to be quickly and easily removed from the operating side of the machine without disturbing any other components except the movement balance wheel. The cam shaft is directly driven from the main projector gear train, and carries on its outboard end a balance wheel of sufficient diameter and weight to have adequate inertia to effectively equalize the pulsating torque requirements of the intermittent action.

The various sectional diagrams in Figure 12 show the intermittent movement and its components. Item 2 in Section AA is the balance wheel, locked firmly to the cam shaft by the cone-head, socket-type set screw, Item 1. Next in line from left to right is the cam shaft collar, Item 21. This is threaded to the shaft and can be locked in any particular position by the set screw and plug, Items 3 and 4. It provides means for loading the ball bearings to the exact degree necessary to remove all end and radial play while still permitting the shaft to turn freely with no danger of binding or freezing.

Shown next in Section AA is the heavy-duty drive pinion, Item 6, followed by a soft metal grease seal and the inner bearing. The two major movement housing castings, Items 20 and 17, are held firmly together, with the Item 33 gasket between, by the four socket head cap screws, Item 26 (Section A). Holes for these screws in Item 17 are somewhat larger than the screw diameters, and Item 17 is movably pinned to

Item 20 at a point just to the right of the upper screw hole shown in Section CC. The two set screws, D and E, set into the rim of Item 17, bear against pins fixed in Item 20 and extending into clearance holes in Item 17. It is thus possible accurately to adjust the clearance between the cam ring and star radius surfaces by means of the screws D and E after slightly loosening the main fastening screws, Item 26. The cam and star run in semi-fluid grease inserted through the filler plug, Item 7, to the level of the dashed line in Section AA.

The star shaft bearing and grease seal construction is similar to that of the cam shaft, with Item 13 being the threaded, locking collar to take up end and radial play in the bearings. A movable indicator cap, Item 15, is provided with engraved lines spaced 90 degrees. In conjunction with a single line on the locking collar, it may be set to provide a ready indication of the points where the cam drive pin just starts to engage a star slot, thus facilitating shutter timing.

Unique in the "AA" movement is the method used for anchoring the sprocket to the star shaft. The shaft is hollow as far back as the sprocket, and is provided with a threaded, tapered screw engaging two steel balls which it pushes outward through holes in the shaft wall to lock into matching, but smaller, holes in the sprocket body sleeve. Lateral and angular positioning of the sprocket on the shaft is provided, however, by the aligning stud, Item 8, which engages an accurately machined slot in the sprocket body. The tapered screw cannot be backed out far enough to drop the balls from their sockets because of the presence of the tubular threaded insert in the star shaft which mounts the Item 13 locking collar.

For very rapid removal of the sprocket for inspection, cleaning, reversal or replacement, it is merely necessary to back out the tapered screw, remove the locking collar, take off the outboard bearing, by re-

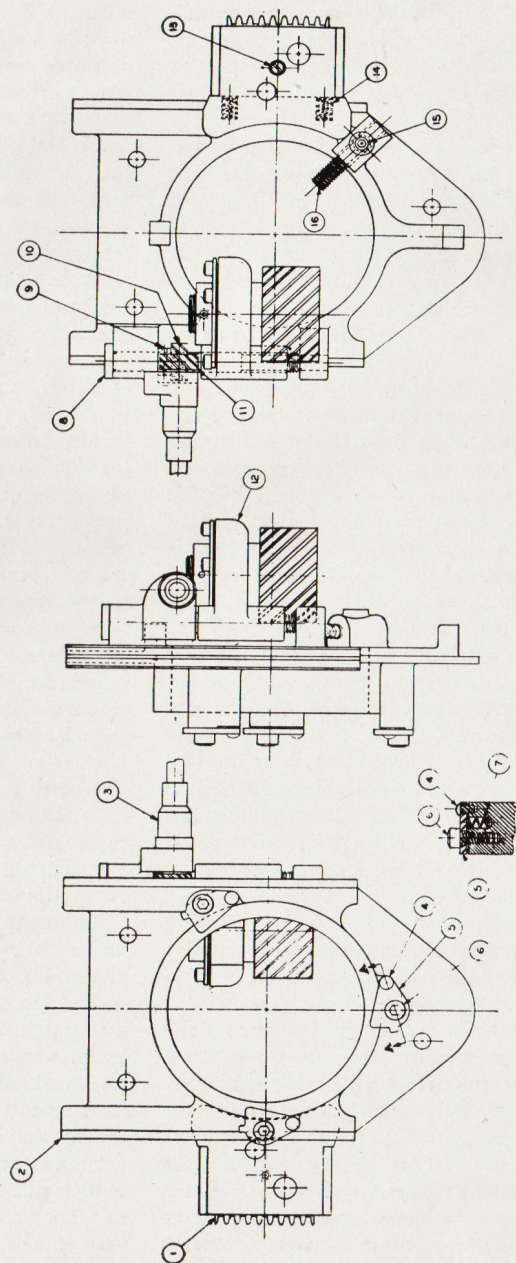


Fig. 13. Inner shifting frame

moving the single fastening screw which holds it on its locating dowels, release the stripper anchoring set screw, Item 16, at the bottom of the same hole, and slip out the stripper to release the sprocket. The whole operation can be performed in less than two minutes and since there is no need for removing the movement from the projector, there is no chance for disturbing the shutter timing.

The end view and Section BB, indicate the construction of the tension shoe assembly. Item 25 is the shoe proper, fabricated from tough alloy steel and thoroughly hardened, ground and polished. It is tensioned by a single center spring and is thus self-aligning and self-equalizing with respect to pressure on its two runners. Referring to the detail at the upper left, the shoe is held to its support plunger by the guide bars, Item 4. This view also shows the notch in the plunger visible as the blank white area just above the Item 30 latch ball in Section BB. The plunger is tensioned by the Item 22 springs. The tension shoe assembly is opened by pushing the finger grips away from the sprocket until the latch ball is pushed into the plunger groove by the Item 31 spring. It is released, and automatically closes by pressing the release button, Item 28, which pushes the latch ball out of the groove and allows the plunger to return to its closed position.

Framing

The diagrammatic view (Figure 13) shows how the inner shifting frame which mounts the intermittent movement is moved vertically in V-rails for picture framing. The movement is held in place by the clamps, Item 5, and these are tensioned so that they will stay in their open positions by the springs, Item 7, visible in Section AA. The adjustable stop, Item 16, bearing against the movement rear bearing bracket permits the movement to be rotated in its seat to produce the proper mesh between its drive

pinion and the wide pinion which is keyed to the vertical shaft. The wide pinion is mounted on the movable bracket, Item 12, which in turn is supported by the threaded shaft, Item 8. The flexible shaft, Item 3, from the shutter timing control via the small right angle gears, Items 10 and 11, turns the threaded shaft to move the wide pinion upward or downward and thus vary the angular relationship between the movement action and the shutter operation for fine shutter timing. The rack by which the shifting frame is moved for picture framing is Item 1. It is tensioned outward in its guides by the springs, Item 14, to take up all backlash between it and its associated pinion mounted on the through shaft carrying the large framing control knobs on either side of the projector housing. The tension springs obviously also exert braking pressure between the shifting frame and the left V-rail so as to prevent any tendency for the frame to creep in either direction, while still allowing for easy operation of the framing control. The control on the operating side is provided with an indicator dial to enable the projectionist to set the framing adjustment in the middle of its one and a quarter frame range before threading. This dial also permits him to see instantly in which direction to turn the control to correct mis-frames during operation without shifting the picture all the way up and down the screen.

Diagram 14, the shifting frame assembly, shows the hardened steel V-rails, Item 2, in place. The center top sectional view shows the relationship between the rails, the inner shifting frame, and the outer supporting frame which is solidly mounted to the center frame of the projector housing. As is evident from the plan view at the lower right, the left rail is fixed in position by the tightly fitting screws, Item 4. The right rail is likewise rigidly anchored by the screws, Item 6, which loosely fit the rail holes, thus allowing this rail to be moved to the left by

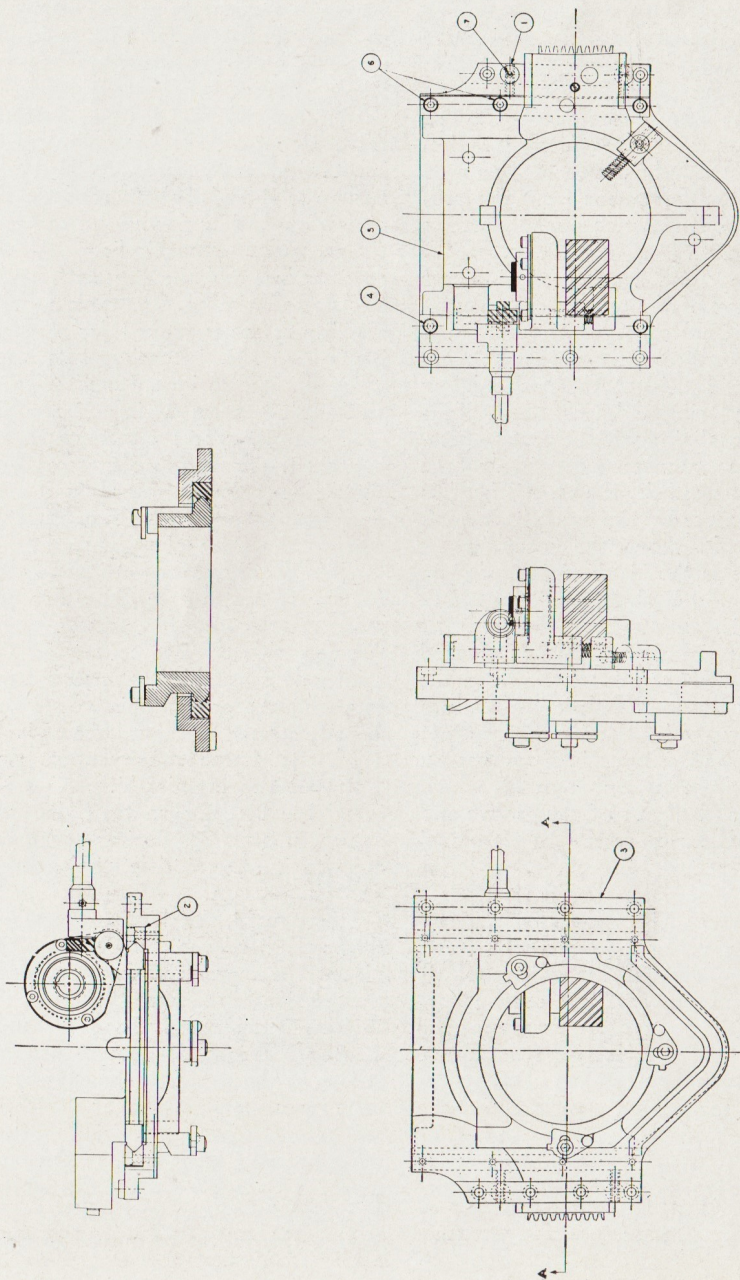


Fig. 14. Shifting frame assembly

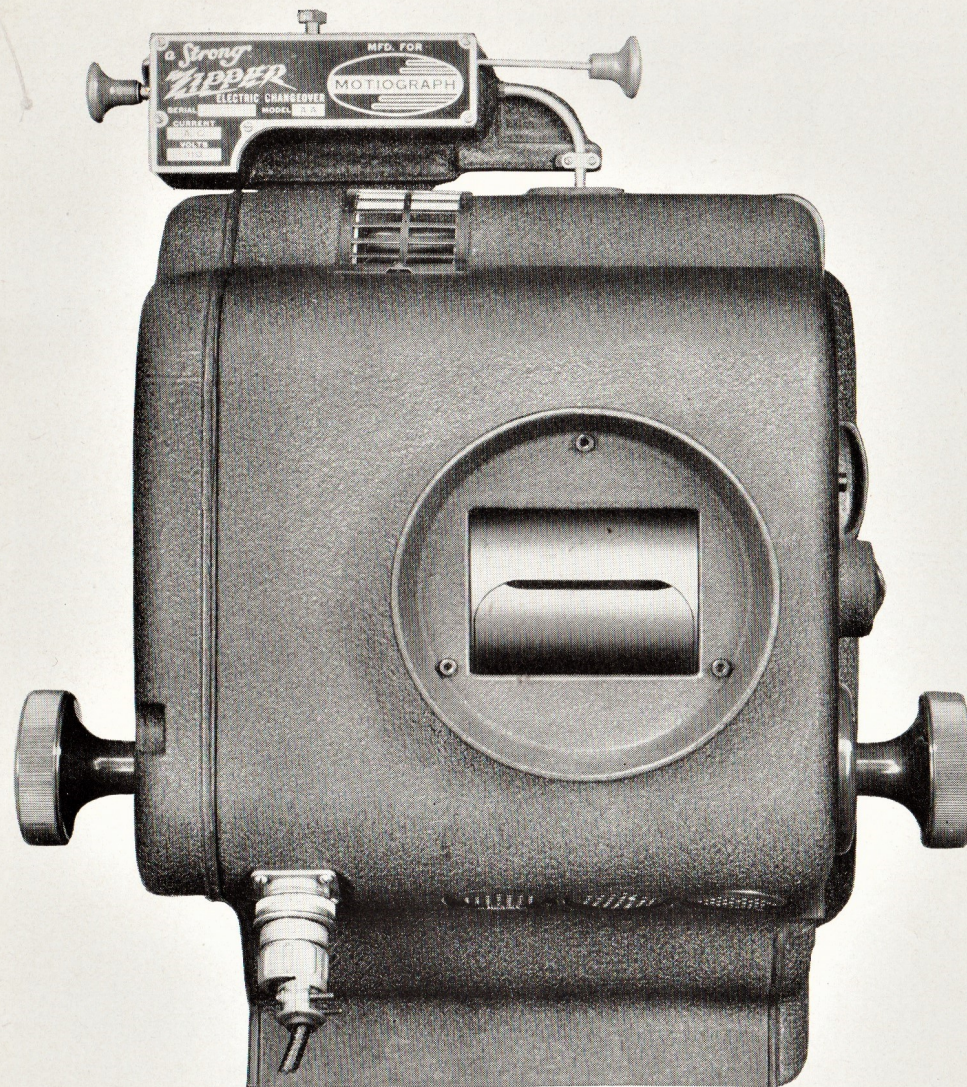


Fig. 15. Twin-rotor double rear shutter, nearly closed

means of the adjusting and lock screws, Items 1 and 7, to compensate for eventual rail wear.

The Shutter

The twin rotor double rear shutter of the Model "AA" features an entirely new de-

sign. It has been recognized that for best picture definition and maximum light efficiency, the shutter rotors should cut the light beam simultaneously from top and bottom as close as possible to the aperture and preferably in approximately the same vertical plane so as to preserve symmetry in the

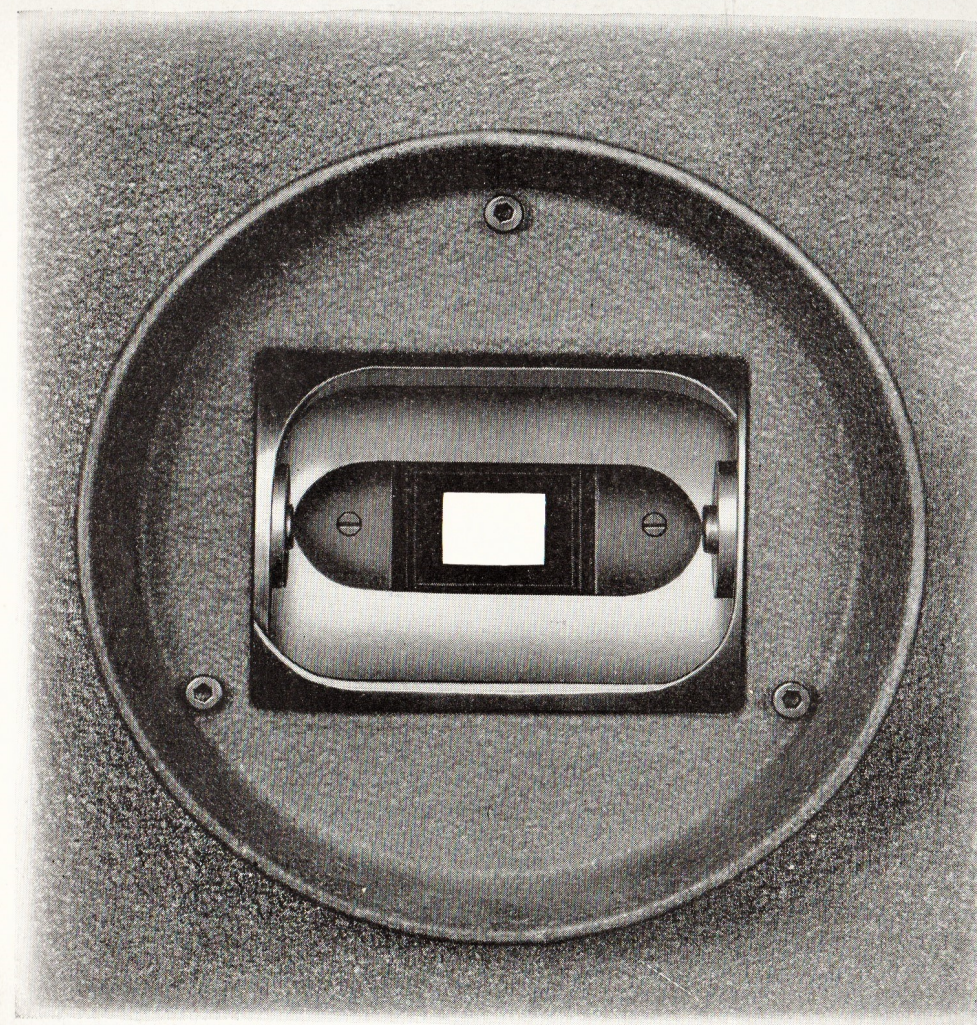


Fig. 16. Twin-rotor double rear shutter, partially open

efficiency, the shutter rotors should cut the light beam simultaneously from top and bottom as close as possible to the aperture and opening and closing actions. These objectives have been attained in the "AA" design by having the shutter consist of two con-

centrically mounted cylindrical rotors turning in opposite directions transversely to the light beam immediately in front of the picture aperture. The master or cutting blades of the rotors cut the light beam in planes less than one-eighth of an inch apart, and only two inches from the aperture. As the light is thus symmetrically interrupted at its narrowest possible diameter, the opening and closing actions are unusually rapid and smooth, with corresponding improvement in both picture definition and projector light efficiency.

The rotors turn in ball bearings, and have narrow balancing blades opposite the working blades and integral cooling fins to circulate cool air over their bearings and over the picture aperture. They are individually balanced dynamically so that the complete shutter operates with virtually no vibration. This is partly due to the fact that the shutter driving torque is adequately isolated from the pulsating torque at the intermittent movement drive points by the latter's relatively heavy balance wheel, and by the cushioning effect of the intervening gear meshes. Due to the basically high light ef-

iciency of the shutter design, it has been possible to make the working blades of the rotors of such angular width as to allow for a very liberal margin of safety in the matter of travel ghost effects due to lost motion between the shutter and intermittent.

In the design of the shutter, clearance has been allowed for the cone of light from the proposed f2.0 arc lamp optical systems using 16 inch reflectors. The shutter rotors are carefully machined from aluminum alloy castings, and are fully reinforced to prevent warping and breakage.

Fire Shutter and Ventilating System

Centrifugal actuators for fire shutters should turn at relatively high speeds for positive operation without excessive dimensions. The "AA" projector design combines the fire shutter actuator with a blower of really adequate capacity to properly cool the shutter and aperture. The combination blower and actuator is located in an enclosure above the shutter compartment of the projector. It draws clean room temperature air inward through vents in the projector housing under the shutter, under the

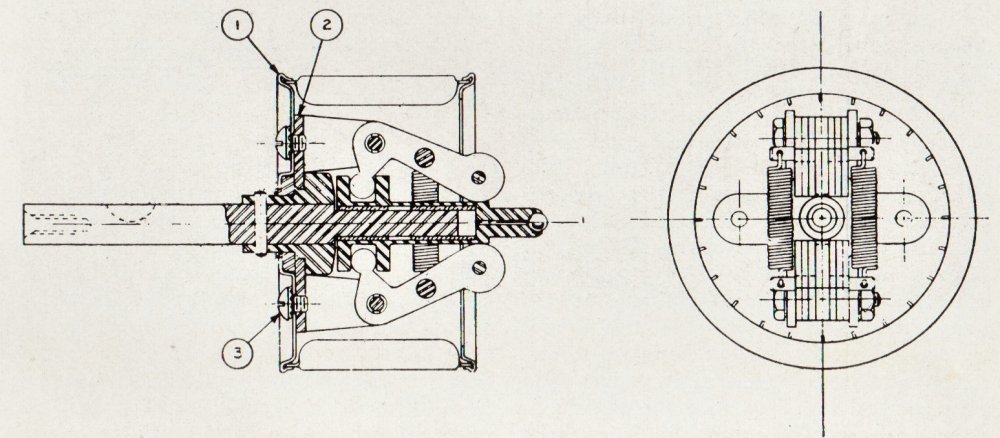


Fig. 17. Blower and fire shutter actuator

track and aperture unit, and upward over the shutter and across the aperture. The heated air is exhausted through a vent grill at the top of the mechanism. The shutter and aperture are thus located within a forced draft "chute" with the light opening being closed off as far as air currents are concerned by the currents produced by the rotating shutter. Although the flow of air in the chute is considerable, the air is not forced into or drawn out of the arc lamp, and thus no harmful carbon dust and arc vapors are drawn into the projector. Neither is there any necessity for a light-losing glass filter between the shutter and light source to prevent disturbance of the arc tail-flame.

The details of the combination blower and fire shutter actuator are shown in the diagram, Figure 17. Item 1 is the cylindrical impeller. Item 2 is the support bracket for the spring tensioned, weighted arms of the centrifugal fire shutter actuator which operates the shutter proper at a film speed of 55 feet per minute through a system of levers. The supporting shaft for the unit runs in two ball bearings, one in the blower housing and one in an auxiliary bracket beyond the shaft's drive gear, which meshes into the main projector gear train. Other constructional details are self-evident.

Lens Carriage

The lens carriage is designed to accommodate any make or model and virtually any focal length projection lens by using suitable cylindrical adapter sleeves. It includes several design features to facilitate accurate focusing and easy removal of the lens for inspection and cleaning.

Referring to the diagram, Figure 18, the fixed portion of the carriage is Item 4. It is rigidly attached by socket head cap screws to the tubular front extension of the main projector casting. The movable portion is the lens barrel proper, Item 5, which slides in the hardened steel V-rails of the gate assembly and is moved by the focusing control,

Item 10, which is provided with a finely threaded shaft, Item 16, engaging an extension lug on its under side. Backlash in the control is permanently prevented by the spring tensioned soft slug, Item 15, bearing on the threads.

The lens is supported within the barrel by three accurately machined full-length pads. Two of these are solid projections from the barrel casting — the one nearest the lens lock control being a separate, machined casting having a lug on its rear surface which extends through a slot in the barrel casting to engage the threaded shaft, Item 9, of the lock control, Item 18. This pad, or clamp, has a slight taper on the surface which contact the guide slot in the barrel, and therefore, as it is drawn forward by the lock control, moves inward to clamp the lens rigidly in place. It cannot throw the lens out of alignment with the barrel, since it is the third member of a three point support system where the alignment is determined by the other two fixed members.

Items 11, 12, and 13 constitute an adjustable stop for longitudinal positioning of the lens within the barrel, and Items 1, 2 and 3 make up an extractor unit for shorter lenses. Projection lenses are thus easily removable for cleaning, and may be removed and replaced without disturbance to the focus setting.

Sprocket Pad Rollers

The same general design is followed in both pad roller bracket assemblies of the "AA" projector. In the diagram, Figure 19, showing the double pad roller assembly for the lower feed sprocket, the bracket swings on the shaft, Item 1, which is locked into a boss on the projector center frame. The shaft is provided with a grease recess, and carries on its outer end a knurled finger rest, Item 4. It is also provided with a notched cam section fitting into a recess in the bracket hub. One long straight notch, in conjunction with the stud pointed stop

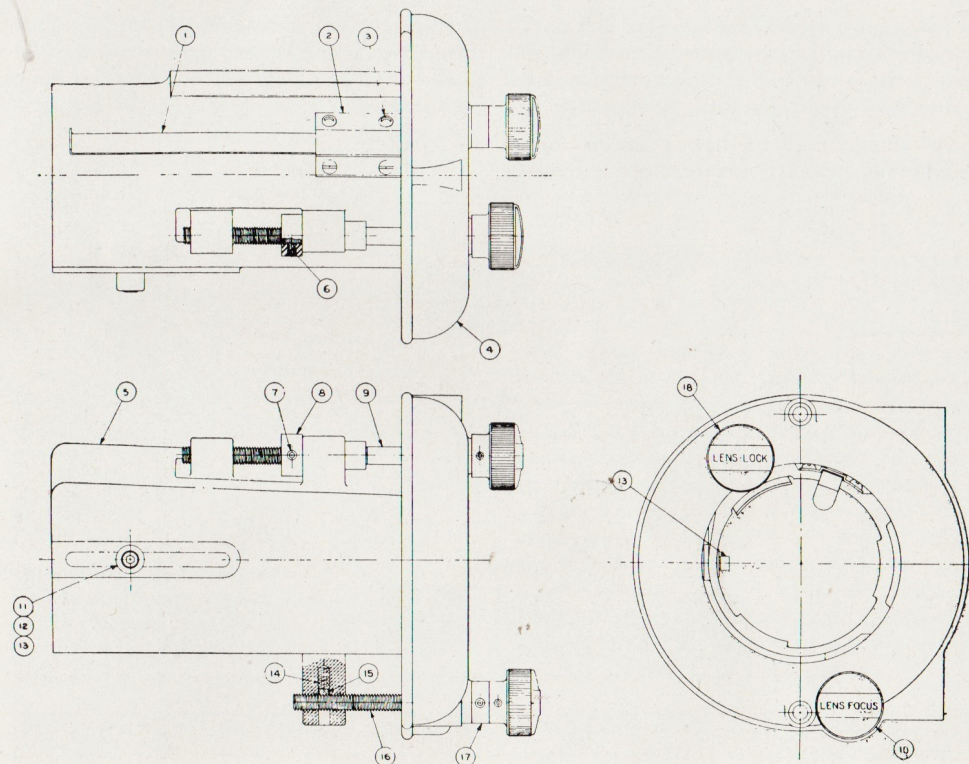


Fig. 18. Lens carriage

screw, Item 3, and locking screw, Item 5, limits the total travel of the bracket. Two V notches in conjunction with the steel ball, Item 6, and spring, Item 7, tension the bracket in its open and closed positions. The adjustable stop, Item 10, bearing against the center frame boss for the sprocket shaft, regulates the clearance between the outer roller and the sprocket. The inner roller's shaft has an eccentric mounting stud, thus permitting the clearance between this roller and the sprocket to be independently adjusted. Both roller shafts are hollow and

have small holes under the rollers to communicate with grease reservoirs in the rollers. Semi-annual greasing through the shafts is sufficient to insure adequate lubrication of the rollers.

Lighting and Wiring

The Model "AA" projector is provided with two auxiliary interior lights. The irregularly shaped structure in the upper right corner of the film compartment houses a lamp for general illumination of the projector interior, with an on-off toggle switch at

the lower edge of the housing. The flat contour of the housing mounts a glass shield to protect the lamp, and as an extra safeguard in the event of accidental lamp breakage.

picture aperture during film threading, and framing can be checked at any time prior to starting the machine merely by bending the upper film loop back over the framing

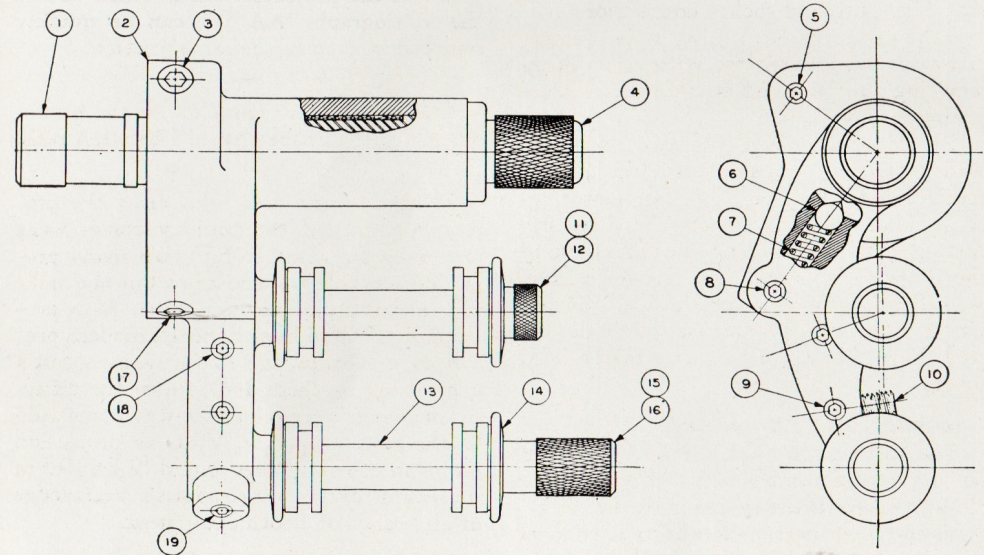


Fig. 19. Double pad roller

The second light is within the shutter enclosure below the secondary framing aperture. This aperture is slightly above and to the rear of the upper guide rollers. The lamp socket is carried by the plug-type support inserted from the drive side of the center frame. The framing aperture has a glass shield to prevent the entrance of dirt, and is equipped with two registry pins. The linear relationship between these pins, the secondary aperture, and the actual picture aperture is such that when the film is on the pins and is properly framed in the secondary aperture, it is likewise correctly framed at the picture aperture. There is thus no need to engage in awkward contortions to see the

aperture. This simple but eminently practical device eases the projectionist's work, and what is perhaps more important, enables him to present a smoother and better performance.

Both lights are controlled by the toggle switch previously mentioned. They are normally equipped with 115 volt lamps, but the sockets also accommodate certain low voltage lamps for service in localities where local regulations prohibit the use of standard voltage lamps within the projector. The asbestos and glass braid insulated interior wiring of the projector terminates in a multi-contact socket and plug unit located in the wall of the drive gear compartment.

Sufficient cabled lead wires are supplied attached to the plug to reach inside the projector pedestal or to wall junction boxes, thus insuring that exterior as well as interior projector wiring will be both orderly and safe. The plug and socket connections permit the projector mechanism to be quickly and easily demounted for sound reproducer servicing or for periodic projection room equipment overhaul.

The electrical changeover device is of generally standard construction, although the special model for the "AA" projector includes thermostatic protection for the operating coils and is arranged to make use of the projector's internal changeover wiring, as well as its built-in changeover shutter, which operates in an extra set of guides before the automatic fire shutter in the light path.

Combines All Features

The Motiograph Model "AA", while presenting a vast number of entirely new features, is nevertheless designed so that it affords complete interchangeability with older types of equipment. The base layout, the drive point location, speed and direction of rotation, and the magazine mounting facilities of the "AA" projector are similar to those of other currently available machines. It may therefore be used with any modern sound reproducer and with any make of upper magazine without changing the existent projector drive and without using mechanism mounting plates or special adapters of any kind.

Although production is just getting under way, the Model "AA" has already been hailed as the most outstanding piece of equipment in motion picture projection history. The machine produces the type of picture on the theatre screen that the industry has the right to expect in this highly advanced postwar engineering era.

Expertly engineered and constructed to precision requirements by skilled craftsmen,

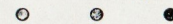
the "AA" marks a fitting culmination to the first half century of the projection of motion pictures.



When the projector lens is taken out of the Motiograph "AA," it can be quickly replaced in exactly the same position.



The intermittent sprocket on the Motiograph "AA" can be changed between reels.



Many an individual who visits the projection rooms of the country comes away somewhat surprised to find how many projectionists there are who know but one make or model of projection equipment. Most projectionists would like to operate modern projectors, arc lamps, and sound systems, but a good many of them don't know the different makes well enough to know which would be the best to operate. Visits to projection rooms in other theatres would be helpful in increasing every projectionist's knowledge of all brands of booth equipment.



"So your'e building nothing but open air theatres?"
"Sure, no overhead."



"You know, every time I come to this theatre I see that cat sitting in exactly the same place in the lobby."

"Well, someone burned a hole in the carpet, so we've trained the cat to sit over the hole."

THE SOUND TRACK

1001 W. Washington Boulevard
Chicago 7, Illinois

VOL. VI

NO. 4

KNOW YOUR MANUFACTURER

Just why is it important for the theatre owner to know the manufacturer of the products which he buys for his theatre?

The exhibitor who is contemplating the purchase of major booth equipment items is confronted with a host of perplexing problems. He must undertake the expenditure of a considerable sum of money, and in return he must obtain projectors or a sound system or whatever else he is buying that will not only give service over many years, but will also perform in so efficient a manner that he will be able to attract a satisfactory patronage. A mistake in a purchase of equipment may well prove sufficient to turn a profitable theatre venture into a loss.

There are a few exhibitors who are blessed with an exceptional knowledge of theatre equipment. They can tell almost at a glance whether a projector or a sound system is well engineered and constructed, and whether it will prove to be an economical purchase over the entire period of its expected life. While it is encouraging to find that there is an increasing desire on the part of owners and managers to obtain a better knowledge of booth equipment,

the fact nevertheless remains that most prospective buyers must guide themselves by other considerations as well.

One of the most vital of these factors which should be considered by every buyer is the name and reputation of the manufacturer. The intense competition which is characteristic of our American economic system quickly and automatically eliminates those products which do not meet the stern tests of economy, performance and durability. On the other hand, the manufacturer who can point to a record of turning out quality products over a long period of years affords the buyer the best possible insurance of making a wise purchase, regardless of his knowledge or lack of knowledge of technical details.

For that reason, Motiograph is justly proud of the fact that this year it is celebrating its golden anniversary, which stamps it as the oldest manufacturer of projection equipment in the field. It desires that theatre owners know not only its past history, but its present organization, so that the buyer of a Motiograph projector or sound system may have the feeling that he is well acquainted with the company with which he is doing business.

As we have mentioned on previous occasions, Motiograph was founded in 1896 by Mr. Alvah C. Roebuck, the co-founder of Sears, Roebuck and Company. Mr. Roebuck retained the ownership and direct operation of Motiograph until 1924, since which time, after a transition period, it has been under the control of the Matthews family.

During these fifty years of its existence, Motiograph has yet to produce an equipment model which did not measure up to the highest standards of theatre perform-

ance. The Model 1-A, first produced in 1908, is still capable of putting a satisfactory picture on the screen. It is a common occurrence to find Motiograph projectors that are twenty years old or more still giving good service day in and day out in theatres.

The present Motiograph company, incorporated under the laws of the State of Illinois, is what is known as a closed corporation. All of its capital stock is owned by but six individuals, and no preferred stock or bonds are issued or outstanding.

Motiograph, unlike so many companies in the theatre equipment field, is an absolutely independent enterprise. It is not owned nor is it affiliated with any other company in the theatre equipment industry, or in the field of motion picture production or theatre ownership. The individuals who own Motiograph are all of one family, and give their direct attention to the operation of the company. Not one of the officers or directors has any financial interest or association with any other manufacturers, dealers in theatre equipment, motion picture producing companies, or theatre chains.

This fact is important to purchasers of motion picture sound and projection equipment. It means that when they purchase Motiograph products from a Motiograph dealer, they are buying equipment which this independent dealer has selected as being the best — and not sound and projection equipment that he is forced to sell. Nor does the exhibitor who buys Motiograph projectors or a Motiograph-Mirrophonic sound system find himself compelled to purchase associated items of perhaps inferior quality together with the equipment.

Motiograph is licensed by the Electrical Research Products Division of the Western

Electric Company, Inc., to manufacture sound reproducing equipment under patents held by that company and its affiliates, and sometimes retains Western Electric to do research and development work on sound reproducing equipment. Apart from this association, there is no other connection between Motiograph and the Western Electric Company, Inc.

Since the termination of the war, Motiograph is again free to devote its entire facilities to the manufacture of theatre equipment for professional use only. Thus, the manufacture of sound reproducing systems, projectors, arc lamps and rectifiers is not a side line with Motiograph, but a one hundred percent effort.

It is the intention of the management of Motiograph to continue to maintain its unhampered independence, and to devote its greatly enlarged facilities to the production of high quality theatre equipment. In this way alone does Motiograph believe that it can continue to give exhibitors equipment which will equal or exceed the famous models of the past, and which they can purchase with full assurance and confidence.

• • •

When you buy a sound system, buy a "matched system"—not sound heads from one manufacturer, amplifiers from another, and loudspeakers from a third. You might save a few dollars, but you will never have good sound.

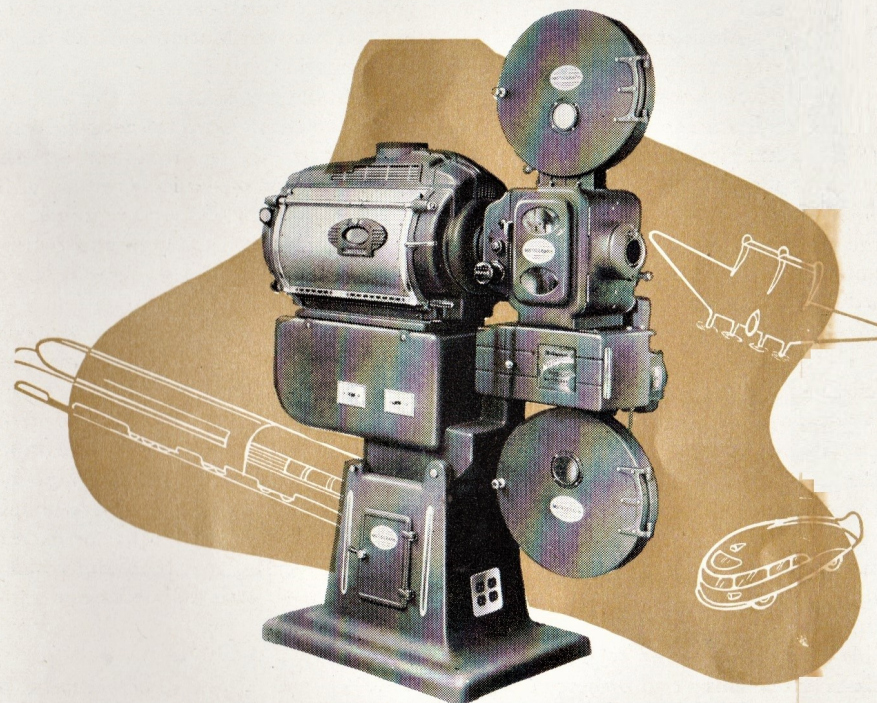
• • •

Noisy projector operation is a warning sign that serious trouble lies ahead. See your theatre equipment dealer about an overhaul before it is too late.

• • •

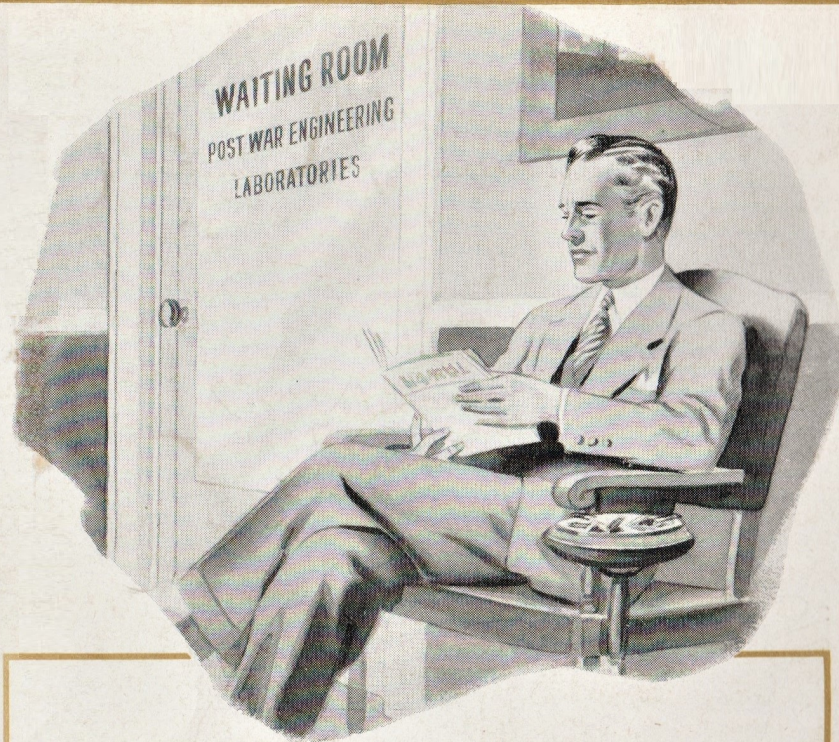
It seems rather peculiar to your editor that so few owners know anything about the equipment in their projection room when pictures can't be shown without it.

In advance of its times . . .



The new Motiograph MODEL "AA"
"The Golden Anniversary Projector"

MOTIOGRAPH
4451 W. LAKE STREET CHICAGO, ILLINOIS



NOW AREN'T YOU GLAD YOU WAITED!

We told you that when the war was over we could outfit your theatre with the finest of equipment and supplies.

Now we have everything . . . including

The startling new

MOTIOGRAPH MODEL "AA"

MOTIOGRAPH

4431 W. LAKE STREET

CHICAGO, ILLINOIS