Chapter I

THE ASSEMBLING MECHANISM

Single Distributor Keyboard and Escapement Mechanism

The purpose of the keyboard and the escapement mechanism is to release matrices from the magazine. This is accomplished by a series of parts which act upon each other when set in motion. To deal intelligently with a keyboard or escapement problem, a knowledge of the following parts and their motions is essential.

Keybutton *1*, Fig. 1, is depressed. Key lever *2*, pivoted on a rod, raises keybar *4*. Trigger *6*, notched in the upper end of the keybar and pivoted on a hinge rod, moves from under the end of cam yoke *7*. Cam *8* drops on revolving rubber roll *10*. (The cam has teeth part way around its outer surface to start it turning *instantly* on touching the revolving rubber roll.) As the cam revolves, yoke *7* raises keyrod *12* which pushes up on escapement *13*. As the escapement is rocked on the escapement bar, its front point is lowered, allowing matrix *14* to fall by gravity from magazine *15*. As matrix *14* is released, the next matrix slides forward, its upper ear banking against the rear point of the escapement. Keyrod *12* drops by gravity and spring *16* pulls escapement *13* back to normal position. As the escapement returns to position, its rear point is lowered and the matrix again slides forward, its lower lug or toe passing over the front point of the escapement. The upper matrix ear is then caught by the front point of the escapement as it rises to normal position, and the matrix will not be released until the key is struck again.

The Importance of Gravity. The operation of the keyboard and escapement parts depends largely upon gravity.

The *key lever* is balanced on a rod.

The *keybar* or *weight*, suspended at the rear end of the key lever, returns the key lever to its original position after the keybutton has been depressed.

The *cam* drops on the revolving rubber roll by gravity when the yoke is released by the trigger.

The *keyrod* falls by gravity after its upward stroke against the escapement.

The *matrices* and *spacebands* drop by gravity after being released.

Since these parts function properly only when they can drop to position without interference, it follows that they must be kept free from dirt, gummy substances, and burrs.

Mixer Keyboard and Escapement Mechanism

The keyrods on single distributor machines are mounted in a fixed frame; hence only one magazine at a time is in operating position. If the operator wishes to use matrices from another magazine, he must first shift the magazine into position over the keyrods. The keyboard and escapement mechanism on the mixer machines, however, enable the operator to use matrices from two adjacent maga-

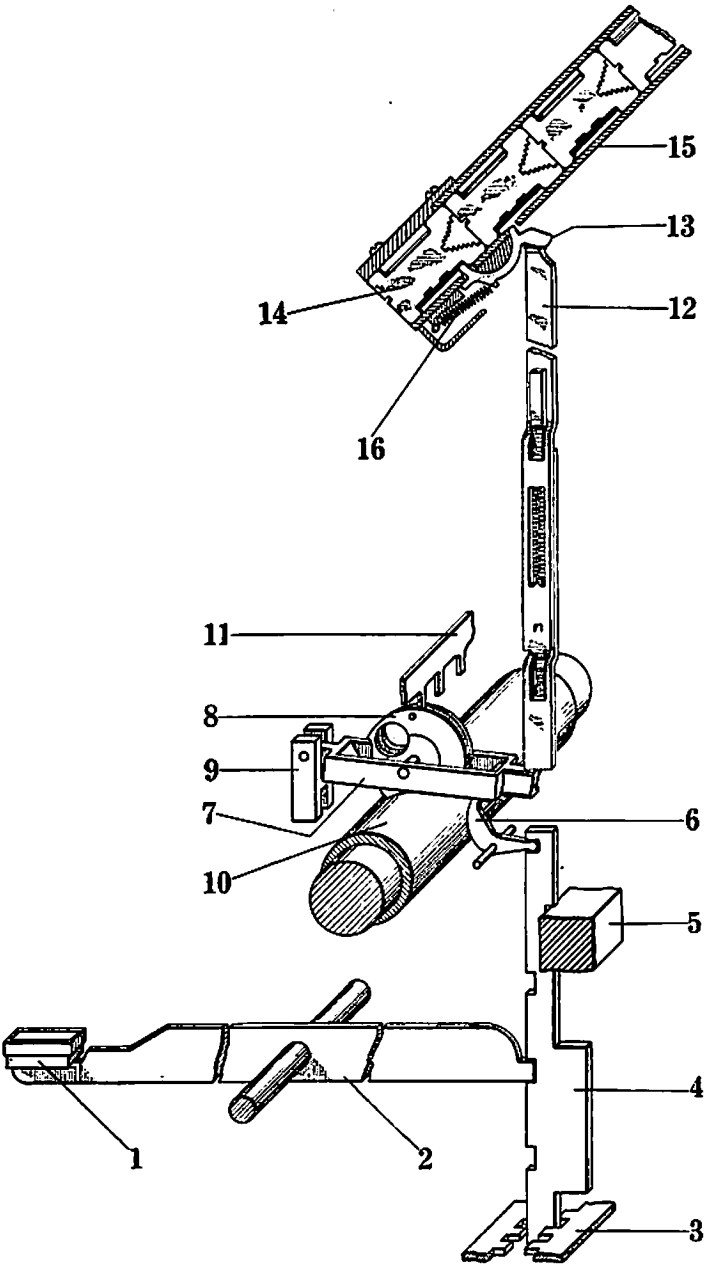


Fig. 1. Side View of the Keyboard and Escapement Mechanism Used on Intertype Single Distributor Machines. *1* Keybutton; *2* Key lever; *3* Keybar guide; *4* Keybar; *5* Keybar banking bar; *6* Trigger; *7* Cam yoke; *8* Keyboard cam; *9* Cam yoke bearing; *10* Rubber roll; *11* Keyboard cam stop strip; *12* Keyrod; *13* Escapement; *14* Matrix; *15* Magazine; *16* Escapement spring.

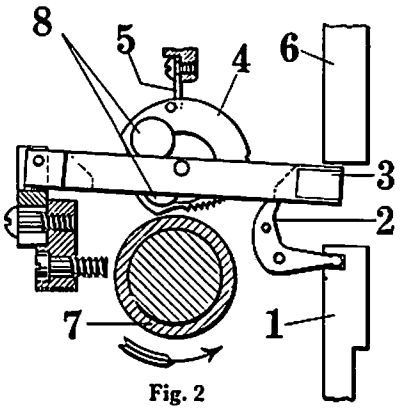


Fig. 2

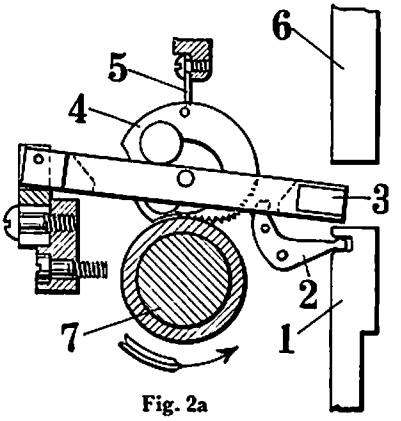


Fig. 2a

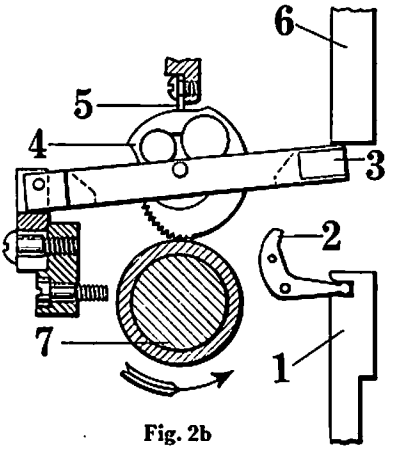


Fig. 2b

Fig. 2. View of the keyboard cam and other parts in normal position. *1* Keyboard keybar; *2* Keyboard cam yoke trigger; *3* Keyboard cam yoke; *4* Keyboard cam; *5* Keyboard cam stop strip; *6* Keyboard keyrod; *7* Keyboard cam rubber roll. Two holes are cut in the cam at *8* to make it heavy on one side. This, together with the teeth on the cam, insures instant action of the cam when it touches the revolving rubber roll *7*.

Fig. 2a. The trigger *2* has been tilted by keybar *1*. Cam yoke *3* has fallen from the trigger, permitting cam *4* to touch rubber roll *7*.

Fig. 2b. Cam *4* has been turned by roll *7* and has reached its highest radius. Cam yoke *3* has raised keyrod *6* to its highest stroke and the upper end of the keyrod is bearing against the escapement (not shown). When the cam completes its revolution, the parts will rest in the positions shown in Fig. 2.

zines without having to shift the magazines in any way. This is made possible by the use of a set of keyrods mounted in a tilting frame, which co-operates with two additional sets of rods, called escapement rods, mounted in fixed positions. The basic method of releasing matrices, however, is the same as that used on single distributor machines. The keyboard and escapement mechanism for both single distributor and mixer machines operates as described at the beginning of this chapter.

As shown in Fig. 3, two sets of escapement rods are mounted above the keyrods. The escapement rods *9* release matrices from upper magazine *15* and the escapement rods *10* release matrices from lower magazine *16*. Both sets of escapement rods are mounted in escapement rod frames *19*, which are fixed in position. The keyrods *8* are mounted in a frame which is operated by the keyrod frame shifting lever operating lever *18* through shifting lever *20*. The keyrod frame pivots on two lugs at its lower end. Since the upper part of the frame is free, the frame may be rocked back and forth by means of operating lever *18*. A rapid selection of magazines may therefore be made through the operating lever. When

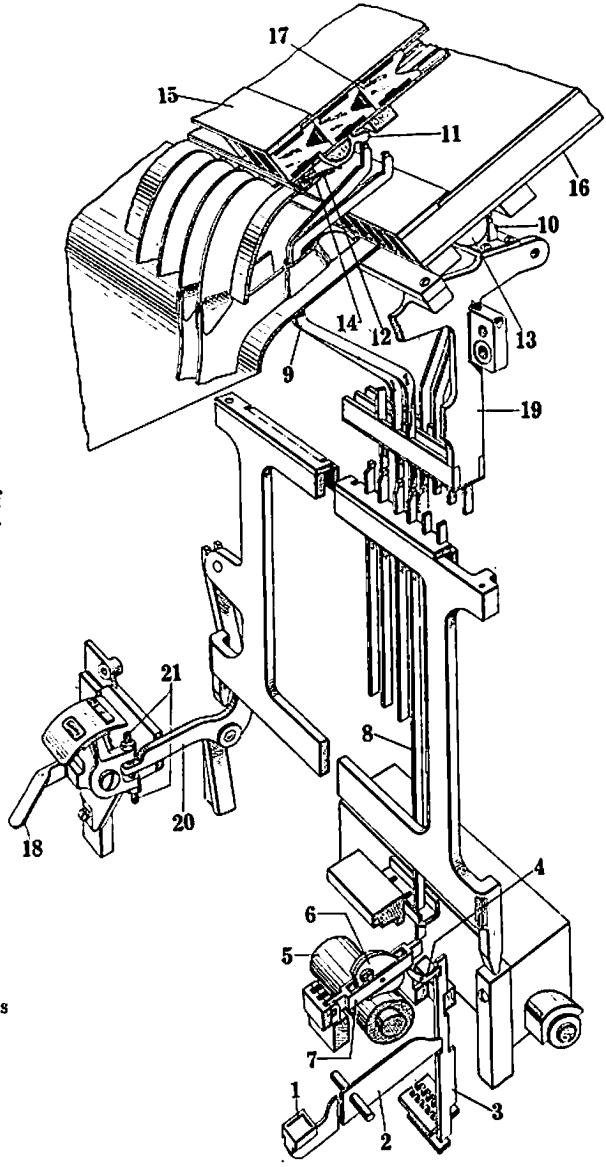


Fig. 3. Perspective View of the Mixer Keyboard and Escapement Mechanism.

1 Keybutton
2 Key lever
3 Keybar
4 Trigger
5 Rubber roll
6 Cam
7 Cam yoke
8 Keyrod
9 Upper escapement rod
10 Lower escapement rod
11 Upper magazine escapement
12 Upper magazine escapement spring
13 Lower magazine escapement bar
14 Upper magazine escapement spring cover
15 Upper magazine
16 Lower magazine
17 Upper magazine matrices
18 Keyrod frame shifting lever operating lever
19 Escapement rod frame
20 Keyrod frame shifting lever
21 Shifting lever adjusting screws

the lever is pulled upward, matrices are released from the upper magazine, and when it is depressed, matrices are released from the lower magazine. Two different sizes and faces of matrices are therefore ready for instant use on a machine equipped with the mixer keyboard and escapement mechanism.

The alignment of the keyrods *8*, Fig. 3, with the escapement rods *9* and *10* is controlled by two adjusting screws *21*, which bank against the outer end of shifting lever *20*. The screws *21* should be adjusted against shifting lever *20* so that the keyrods will register fully with both sets of escapement rods. The ends of the screws are rounded to provide a smooth bearing surface for the shifting lever.

Twin Channel Attachment

All main magazines have two lower case "e" channels. There is, however, only one keybutton and one keyrod for both channels. A special attachment is used to move the keyrod automatically from one "e" escapement to the other as each line is raised to the delivery slide. One assembled line contains "e" matrices from one channel and the next line contains "e" matrices from the other channel.

When the assembling elevator is raised, lever *1*, Fig. 4, causes cam *6* to turn one-sixth of a revolution. Keyrod lever *2* has a forked upper end which joins keyrod *3*. Each time the cam turns, the keyrod is moved alternately under escapements *4* and *5*. Spring *7* prevents lever *1* from slipping away from cam *6*. Operating lever *8* is slotted so that the keyrod *3* may be aligned with escapements *4* and *5*. The attachment can be thrown out of use by disconnecting lever *1* from cam *6*. This is necessary when only one of the "e" channels is being used. The bearings of the attachment should be oiled occasionally with clock oil.

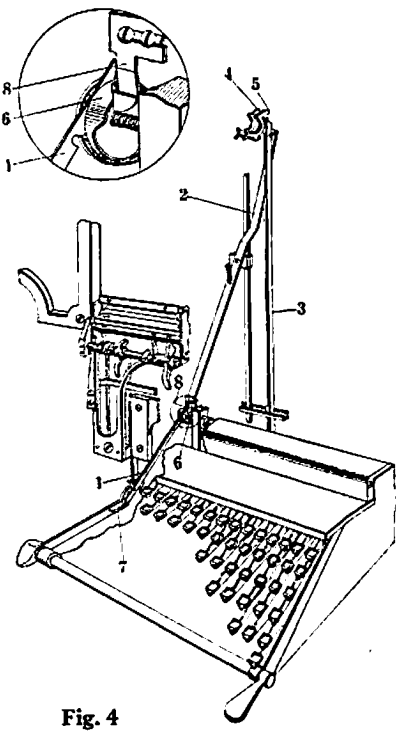


Fig. 4
Twin Channel Attachment

Rubber Rolls and Ferrule

The rubber rolls and shafts should be inspected at regular intervals to see if they are revolving steadily and if the rubber rolls are clean and fairly elastic. Remove the rolls from the machine occasionally and rub them with coarse sandpaper, then wash them with soapy water or high test gasoline. In putting a new rubber roll on the shaft, be careful not to crowd it. If it is more than one inch in diameter at any point, the keyboard cams directly above it will not clear the stop strip teeth. The two rolls must also be the same in diameter. If one is larger than

the other, matrices and spacebands will not arrive in the assembling elevator in their proper order.

A ferrule (collar) at each end of the roll is held in place by a spring. The ferrule prevents the roll from creeping beyond the end of the shaft and rubbing the cam yoke frame, which would slow the speed of the roll. The ferrule also keeps oil away from the roll in case too much has been applied to the shaft bearing.

Transposition and Non-Response of Matrices

A transposed matrix or spaceband is one which is misplaced in the assembled line. For example, the operator may depress keybuttons "b," "o" and "y" in the proper order for the word "boy," and get instead the arrangement "oby" in the assembling elevator. This is called a transposition.

The main cause of a transposition is a delay in the arrival of a matrix or spaceband in the assembling elevator. In other words, the transposed matrix or spaceband takes longer to reach the assembling elevator than the others do. This delay is usually caused by dirt, gum, wear or lack of lubrication in some part of the keyboard or escapement mechanism. If the cause of the transposition is not removed from the affected part, sooner or later the matrix will not respond at all. This simply means that the small amount of dirt or wear in the part, which merely slowed it at first, is now serious enough to stop the part altogether.

If the matrix responds slowly (transposes) or fails to respond at all, the trouble may be due to any one of several causes. The quickest way to locate it is

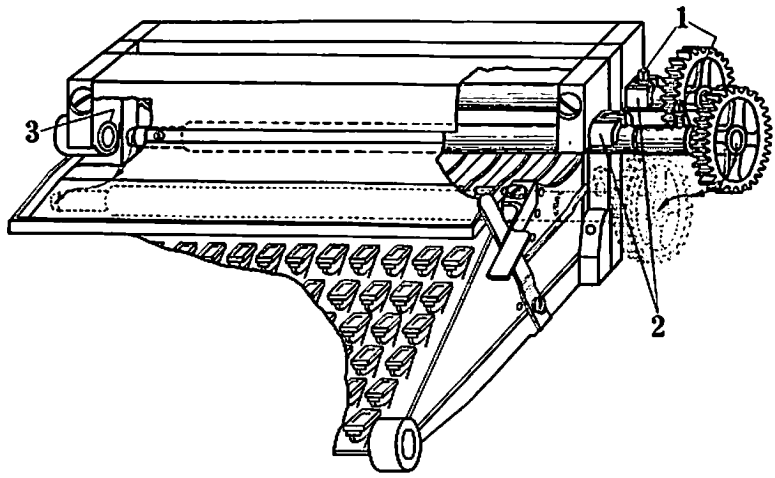


Fig. 5. Perspective View of the Keyboard, showing how to remove the keyboard rubber roll shafts. The lower half of the bearing seats *2* are cut away so that the rubber roll shafts may be lowered out of the bearings. A square-headed screw *1*, when tightened, holds the bushing and the rubber roll shaft in position. The left end of each shaft is rounded for easy entrance into the bearing *3* when the shaft is being replaced.

To remove the front rubber roll shaft, first remove the keyboard tray and the spaceband key and hinge rod. Loosen screw *1*, slide the shaft to the right until the shaft clears bearing *3*, then remove the shaft as indicated by the curved arrow. The rear rubber roll shaft is removed in the same way after the keybar shield, cam cover and keyboard driving belt are removed.

to see first whether the keyrod rises and falls when the keybutton is held down. If not, the keyboard cam probably does not revolve, for one of following reasons:

Rubber roll hard or glazed. Remove both rolls and rub them with coarse sandpaper, then wash them in soapy water or gasoline. The rolls may be so hard as to need replacing.

Rubber roll diameter too large. The roll should not be more than one inch in diameter at any point. When applying a new roll, do not crowd it so as to cause variations throughout its length.

Free end of cam yoke gummy or burred. Remove the cam and wipe the free end of the yoke with a cloth. The free end of the cam yoke may also be blurred at the point where it rests on the trigger. Remove such burrs with a small needle file or a strip of fine emery cloth.

Teeth of cam dull or rounded. This is likely to occur only on a machine that has been in use a long time. Touch up the teeth of the cam with a three-cornered needle file.

Cam pivot extremely dry. Use only *clock oil* on the keyboard cams. Apply a drop on each side of the cam pivot with a tooth pick or flattened wire dropper. Carefully remove excess oil from the cam with a clean rag.

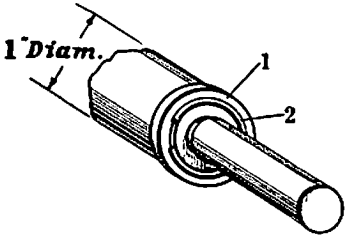


Fig. 6. Keyboard Cam Rubber Roll Ferrule. Ferrule *1*, held in place by spring *2*, prevents the rubber roll from creeping beyond the end of the shaft. The roll should always be one inch in diameter.

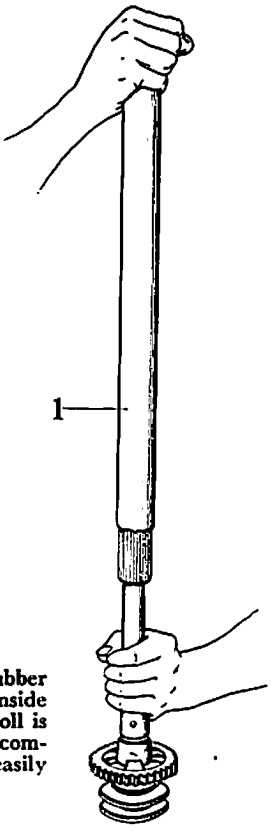


Fig. 6a. New Tube Method of Applying a Rubber Roll to the Shaft. The rubber roll is placed inside the tube *1*, which is closed at the top. As the roll is pushed on the shaft, the closed end of the tube compresses the air inside the roll, making it slip easily upon the shaft.

If none of the above causes are present and the keyrod does move up and down at the touch of the keybutton, the trouble is probably due to one of the following defects:

Groove cut in rubber roll by cam. A roll can be patched with a good piece from an old roll. Cut off the grooved part and apply the patch. The rubber roll patch should be at least six inches long, because a smaller patch will be twisted out of position by the action of the cams. This device is recommended only as an emergency measure. The old roll should be replaced with a new one as soon as possible for best keyboard results.

Keyrod spring disconnected or weak in tension. Loosen the two rear screws in the upper keyrod guide, push back the guide strip, and lift out the keyrod. Weakened springs should be replaced with new ones.

Assembler entrance partition out of alignment with magazine channel. Bend the partition back into place with a pair of duck-bill pliers.

Accumulation of dirt and grit in escapement bearing. Remove the escapement as described on page 16. Rub it on a piece of fine emery cloth and polish it with graphite.

Escapement spring disconnected or weak in tension. If the spring is weak, replace it with a new one.

Oil or gummy dirt in magazine channel or on matrices. Wipe off the matrix lugs with a clean cloth or rub them with a matrix eraser. If oil has fouled the channels of the magazine, it may be necessary to run out the matrices and clean the magazine as described on page 17. *Oil must never be used on any part of the magazine.* Note also that if too much oil is used on the assembler bearings, assembling elevator, front and back mold wipers, or distributor bearings, the matrices will carry the excess oil into the magazines. Use oil sparingly on these and all other parts of the machine.

Lower lugs of matrix burred. If a tight line is sent in, the lower lugs of the last matrix will be burred by the right-hand vise jaw. Also, if the assembling elevator is raised with too much force, matrices will be jarred above the rest of the line. The toes of these matrices will be burred as the line passes into the delivery channel. Avoid both of these practices, since they decrease the speed and the efficiency of the operator.

Keeper rod binding against magazine escapement, because of a kink in the rod. Replace the rod if it is badly bent.

Keyrods not aligned fully with escapements. Uncertain matrix delivery results in this case. Loosen the two front screws in the upper keyrod guide, adjust the guide sidewise, then tighten screws.

The above causes and remedies apply to both non-response and transposition of matrices and spacebands. Following are some additional causes of transpositions which are *not* related to non-response:

Worn assembler star wheel can cause transpositions. When the front and back corners of the prongs are worn 1/32″ or more, apply a new star wheel.

Star wheel too weak in tension to throw matrices to an upright position in the assembling elevator. The tension of the spring can be increased by turning a knurled knob at the back of the star wheel shaft. The knob can be reached for adjustment through the space above the assembling elevator.

Slow machine speed of less than 6½ revolutions per minute may be the cause of transpositions.

Uncertain speed of matrix delivery belt. See that the pulley bearings are free and oiled. If there is too much slack in the belt, adjust the idler pulley by means of the nut in back of the pulley stud.

Assembler entrance cover cushion may be worn from long use. Replace the part with a new one.

Upper edge of small assembler cover may extend farther in than the lower edge of the large cover, so as to trip matrices as they pass. This is easily fitted for correct position.

Assembler chute plate out of adjustment. The assembler chute plate is adjustable and should be positioned about one-quarter of an inch from the matrix delivery belt. The chute plate directs matrices to the star wheel, and as the wheel turns the matrix to an upright position, the plate acts on the top of it to help it to assume this position.

Some attention should be given to assembler entrance guide No. 1 next to the chute spring. This guide should be adjusted so that the thickest matrix in the font will just pass under it without hesitancy. Correct adjustment of this guide will do much to prevent matrices from bounding out of the assembler.

Double or Continuous Response of Matrices

If a keybutton stays down after having been depressed, matrices will continue to drop. Sometimes two matrices will respond when only one is wanted. This is caused by the presence of dirt, gummy substances or bits of type metal between

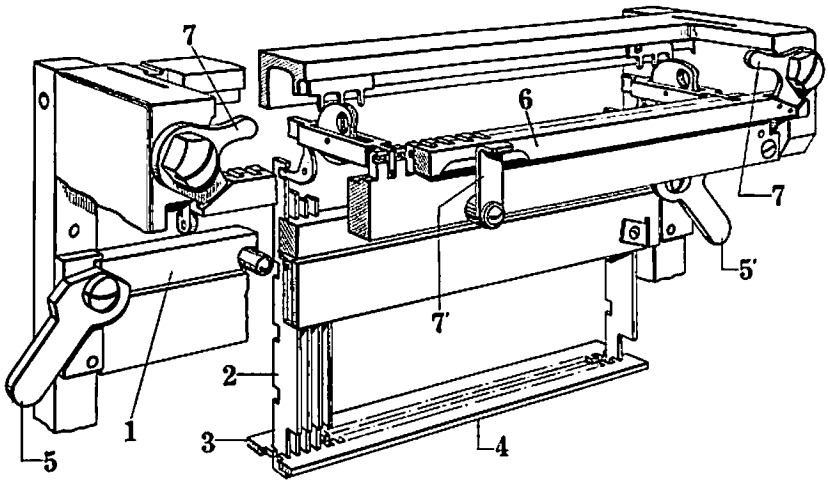


Fig. 7. Showing new style removable keybar banking bar *1* and removable cam yoke locking bar *6*, making the keybars and cam yokes easily accessible for cleaning. Dirt or gum between the keybars, guides and banking bar, or between the free end of the cam yoke and its slot in the guide plate will cause double or continuous response of matrices. The keybar banking bar may be removed by moving away latches *5* and *5'* at each end of the bar. The cam yoke locking bar may be swung back from the cam yoke bearings simply by moving latches *7* and *7'* away from the bar.

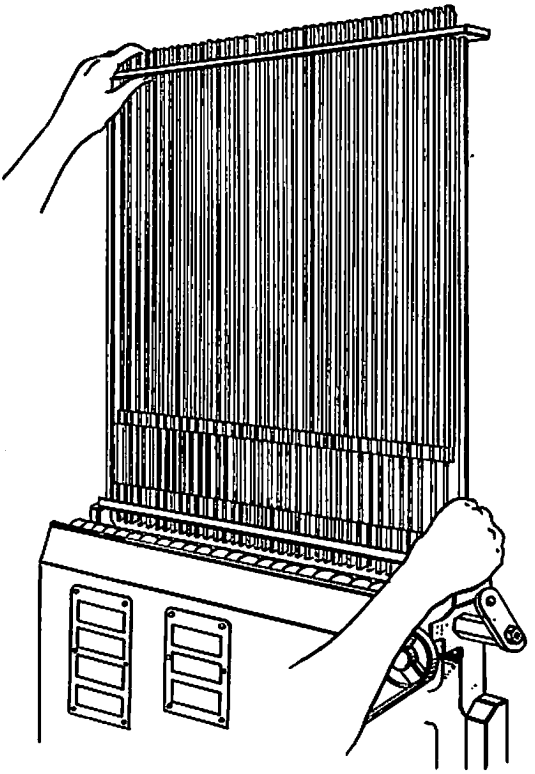


Fig. 8. The Intertype Unit Keyrod Frame, showing the easy method of removal. The frame and keyrods can be removed as a unit simply by taking out the two front screws in the upper keyrod guide and disconnecting the spaceband keyrod. Any single keyrod can be removed from the frame by taking out the two rear screws in the upper keyrod guide and pushing back the guide strip.

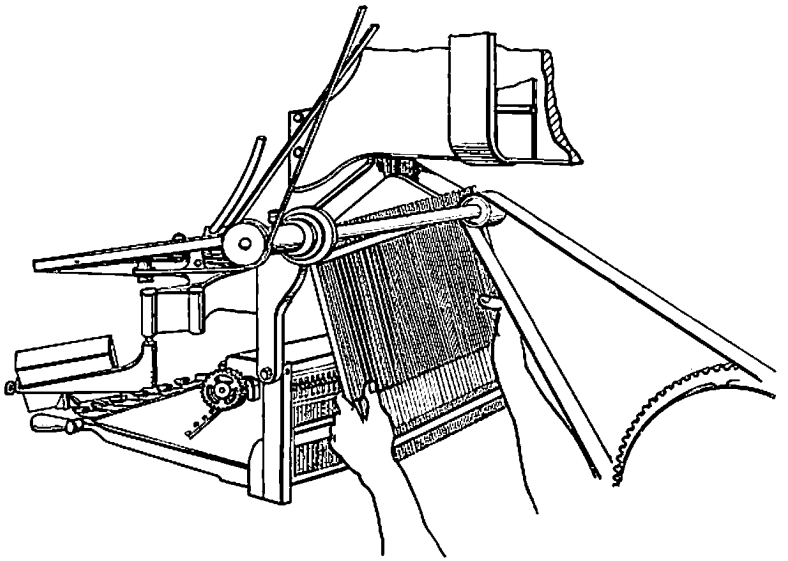


Fig. 9. Removal of the Mixer Keyrod Frame

the keybar 2 Fig. 7, and the guides *3* and *4*, or between the keybar *2* and the banking bar *1*. Remove the banking bar and clean the keybars with gasoline. Sometimes a key lever will be held down by a chip of metal or paper between the lever and its slot in the keyboard top plate.

If the keybutton continues to stay down, remove its cam. Wipe the free end of the cam yoke with a cloth and clean the slot into which it fits with a cloth wrapped around a thin piece of wood. If trouble with double letters continues, the keyboard should be removed from the machine and cleaned thoroughly as directed below.

Keyboard Maintenance

The keyboard should be removed from the machine and cleaned once or twice a year. In removing the keyboard, the following method should be used:

Tilt back the magazines. Take out the two front screws in the upper keyrod guide and remove the assembled frame. Remove the cam yoke frame covers, the keyboard driving belt, and the copy tray and hooks. Take out the end screws in both cam yoke frames and lift them off. Detach the assembling elevator counterbalance spring. Disconnect the lever link from the assembling elevator. Drive out the taper pin in the assembling elevator handle and pull out the shaft. Remove the screw holding the right side of the keyboard to the post on the intermediate bracket, and *loosen* the two screws in the keyboard base. Sit down and support the keyboard with the knees. Take out the keyboard base screws and lift off the keyboard.

Place the keyboard on a bench with its front end facing you. Remove the keeper strip on the right side of the keyboard and take out the fulcrum rods on which the key levers are pivoted. (If you are unfamiliar with the layout of the keybuttons, make a rough chart of the layout before proceeding.) Take out the key levers and the spaceband key lever. Turn the keyboard around and raise its rear end with blocks of wood. Remove the keybar locking bar and banking bar. Lift out the keybars.

Wash all the parts in high-test gasoline with a stiff fibre brush. Wash the keyboard frame, especially the slots in the top and back plates. Dry all the parts with compressed air or a soft cloth. If any part is rusted, remove the rust with metal polish. Rub the keybars on a graphite board and shake the excess graphite off each one. Smooth the fulcrum rods with a piece of fine emery cloth and polish them with graphite.

To assemble the keyboard, reverse the order of dismantling. When replacing the key levers, work upward. Replace the bottom row first and run a fulcrum rod through the holes. Return the next rows in the same manner.

Remove the keyboard cams from the frames. Wash them in gasoline. Wash the rubber rolls in soapy water or gasoline. Wash the cam yoke frames, especially the bearings and the slots in the guide plates. Dry the parts thoroughly. Apply a drop of clock oil to each cam pivot between the cam wheel and the yoke. Use nothing but *clock oil* on the cams and remove all excess oil with a clean rag. *There is no substitute.* Return the cams to the frames, making sure that the spaceband cam (marked SBD) is in its proper place. Pass a 1/16″ locking wire

through the upper holes in the triggers. Return the keyboard and its parts to the machine by reversing the order of removal. When the cam yoke frames have been screwed in place, pull out the upper locking wires. *Do not remove the lower wires;* they serve as pivots for the triggers.

The care required by a side magazine unit keyboard is the same as for the main keyboard. It should be cleaned whenever the main keyboard is being overhauled.

Keyrods and Frames

The keyrods are mounted between the keyboard and the magazine. There are ninety keyrods in the standard machine and a short keyrod for the spacebands. The spaceband key lever is attached to the spaceband keyrod with a small pin.

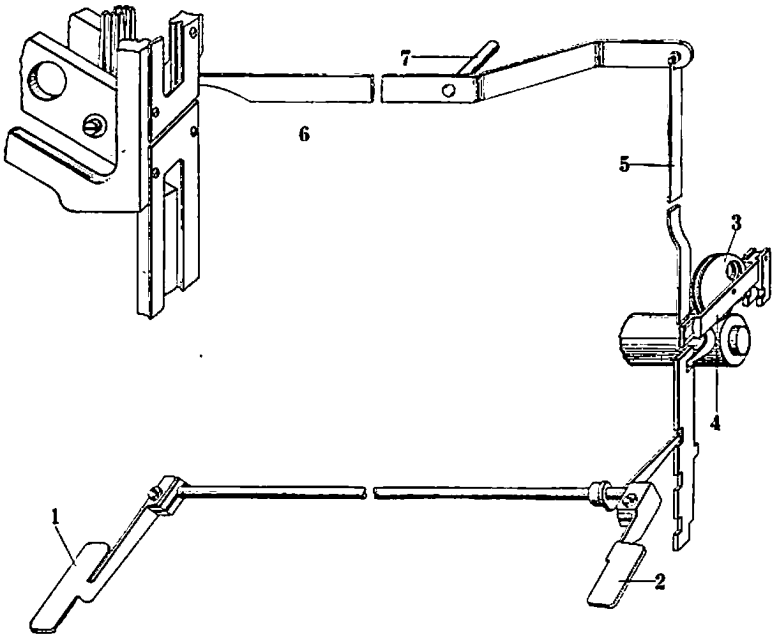
All of the keyrods can be removed as a unit by taking out the two front screws in the upper keyrod guide, disconnecting the spaceband keyrod, and lifting out the assembled frame (Fig. 8). Any single keyrod can be removed from the frame by taking out the two rear screws in the upper keyrod guide and pushing back the guide strip. This frame is the same for equipments A, B, C, D, H and X. When replacing a frame on any of the above models, adjust it sidewise so that the keyrods align directly with the escapements. The front screw holes in the upper keyrod guide are slotted for this purpose.

Removing Mixer Keyrod Frame. Equipment F and G keyrods are mounted in a frame to which is attached a shifting mechanism. To remove the frame, disconnect the keyrod frame shifting lever, disconnect and remove the spaceband keyrod, and remove the rear cam yoke frame. Then the keyrod frame can be pulled out and lowered at the back of the keyboard (Fig. 9). As soon as the frame has been replaced, the rear cam yoke frame can be returned to position. Before removing the cam yoke frame, pass a locking wire through the upper trigger hole in the end of the frame in order to lock the triggers so that they will fit properly into the keybar notches when the cam yoke frame is replaced. Remove the trigger locking wire when the frame is in position.

The Intertype unit keyrod frame is a great convenience for the man who takes care of the machine. The simplicity and ease with which it is removed encourages a periodical cleaning of this important part.

Keyboard Keyrod Overmotion Spring. A spring is mounted in all Intertype keyrods in order to cushion their stroke when they have reached their highest point. The keyrod, as shown in Fig. 10, consists of two sliding parts held together by a spring. If a matrix hangs above the front point of the escapement, the upward stroke of the keyrod will be yielding and no damage will be done to the keyboard cam or rubber roll. Keyboard keyrod springs should not be interchanged with escapement springs. The keyrod spring tension is much greater than that of the escapement spring. If a keyrod spring is used on an escapement, matrices will not respond and a groove will be cut in the rubber roll by the cam. An escapement spring likewise should not be used in a keyrod, because it does not have enough tension to overcome the weight of the keyrod.

Fig. 10



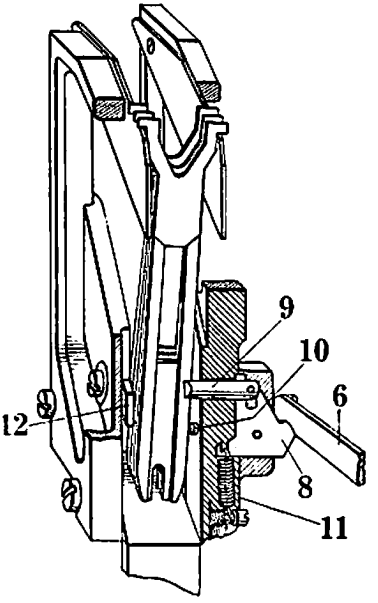


Fig. 11. Perspective View of the Spaceband Releasing Mechanism, with a detail view of the spaceband box.

Assembling of Spacebands

Spacebands serve two main purposes on the Intertype: they produce spacing between word groups and they spread out each matrix line to the desired length before casting takes place. Spacebands differ from matrices in size and shape, so they are stored in a separate magazine, called the spaceband box, above the assembling elevator. As the spacebands are released from the box they drop through a chute into the assembling elevator, where they rest between the word groups until the complete line is assembled.

When the spaceband key *1* or *2*, Fig. 11, is depressed, the action of the spaceband cam *3* is the same as that of the other keyboard cams. Cam yoke *4* raises keyrod *5*, which is attached to key lever *6*. The key lever, pivoted on bushing *7*, depresses pawl *8* (detail illustration). Plunger *9*, against which the first spaceband has been resting, withdraws into the back plate of the spaceband box. The first spaceband slides forward and stops against banking pin *10*, which holds the spaceband directly in front of releasing plunger *9*. The pressure of lever *6* on pawl *8* is now released by the action of the keyboard parts, and spring *11* pulls pawl *8* back to normal position. Plunger *9* pushes the spaceband away from banking pin *10* toward the front plate of the spaceband box and the spaceband drops by gravity into the spaceband chute, which leads to the assembling elevator. Note that the spaceband is released at the end of its keyboard cam action instead of at the beginning as in the case of the matrices.

Spaceband Box Maintenance

Spacebands will hesitate in delivery if dirt or gum accumulates in the spaceband box or if the spacebands are badly damaged. Gummy substances on the floor of the spaceband box will prevent spacebands from sliding forward easily. Wrap a cloth around the end of a stick and clean the bottom of the box with gasoline or benzol. If the rivet in the long wedge of the spaceband is loose or if the sleeve binds on the wedge, replace the spaceband or make the necessary repairs. After a long period of use the top rails and angular guide block in the upper part of the spaceband box may become notched. Remove such notches with a stone.

Adjustment of Releasing Plunger. When the releasing plunger *9*, Fig. 11, makes its back stroke, it must clear the back plate. To check this adjustment, depress the spaceband key and turn the rubber roll slowly by hand. When keyrod *5* reaches its highest point, see if the plunger clears the back plate. If it does not, a groove may be worn in the rubber roll under the spaceband cam. Replace the roll if it is badly grooved. If the roll is in good condition, adjust key lever *6* down slightly towards pawl *8*.

Retaining Block. If more than one spaceband responds at a time, the retaining block *12*, Fig. 11, is probably out of adjustment. Depress the spaceband key and turn the rubber roll shaft slowly by hand until the releasing plunger has made its full back stroke and the first spaceband has fallen against the banking pin. Loosen the retaining block screw, adjust the block until it covers about one-half of the second spaceband, then tighten the screw.

Spaceband Box Top Rails. The top rails must fit snugly against the front and

back plates, so that spacebands will slide easily into the box. If the rails are twisted or kinked, remove the box from the machine and replace the rails.

Spaceband Box Removal. The Intertype spaceband box is removed very easily. Take the spacebands out of the box. Tie the spaceband lever pawl up against the lever, so that the spring will not drop out when the box is removed. Turn out the large screw in the back plate of the spaceband box and lift the box off the machine. Be careful not to twist the top rails when removing the box.

Care of Spacebands. Spacebands should be polished with graphite every eight-hour run, to remove oxide stains from the sleeves and to insure smooth action of the sleeve on the wedge. It is best to rub the spacebands on a smooth pine board sprinkled with graphite. Shake the excess graphite off the spacebands after polishing them. Dixon's No. 635 dry graphite has proved very satisfactory for use on spacebands.

Always return spacebands to the machine with the short sleeves facing the spaceband chute. The side walls of the matrices will be damaged if the sleeves face the left.

The Magazine

The magazine consists of two brass or aluminum plates, *1*, Fig. 12, held together by screws passing through partitions *2*. Channels are cut in the inner surface of both plates to guide the matrices and to hold them in position. Each channel is cut to suit the width of the particular matrix that runs in it. At the top of the magazine the space between the channels is milled away so that each channel is V-shaped at its upper end. This insures easy entrance of matrices into the magazine. A number of steel cross bars *3*, Fig. 12, reinforce the magazine plates and one of the bars holds the magazine in the proper position in the magazine frame with respect to the channel entrance and the assembler entrance. A shutter *4* is placed at the top of the magazine to prevent matrices from sliding out and to prevent dust and dirt from entering the magazine when it is not in operating position. The shutter is always closed over any magazine not in use, and when a magazine is moved to operating position, two cams and two levers automatically open its shutter.

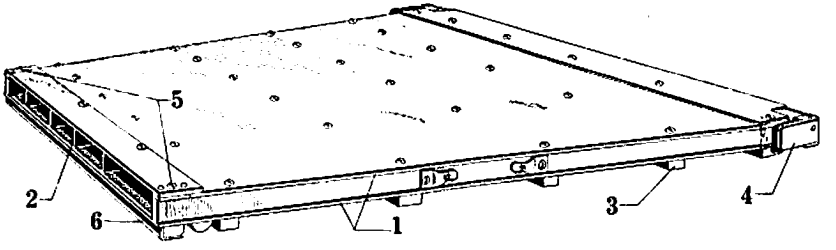


Fig. 12. View of the Magazine

A brass main magazine filled with 8 point matrices weighs about seventy-three pounds; an empty brass magazine weighs about fifty-five pounds. The aluminum magazines are approximately 40 per cent lighter than brass ones. They are made of a specially processed aluminum which is highly resistive to corrosion. The magazines are dull black in color and require little care in keeping up their

good appearance. The use of aluminum magazines is distinctly advantageous in offices where magazines are changed frequently during the day.

The Intertype escapement mechanism is part of the magazine itself. The mechanism consists of an escapement *1*, Fig. 13, and a spring *2*, which returns the escapement to normal position after it has been rocked by keyrod *3*. The same style escapement is used in main, split and side magazines. Escapements are made in six thicknesses (.037″ to .087″) to suit the different widths of matrices.

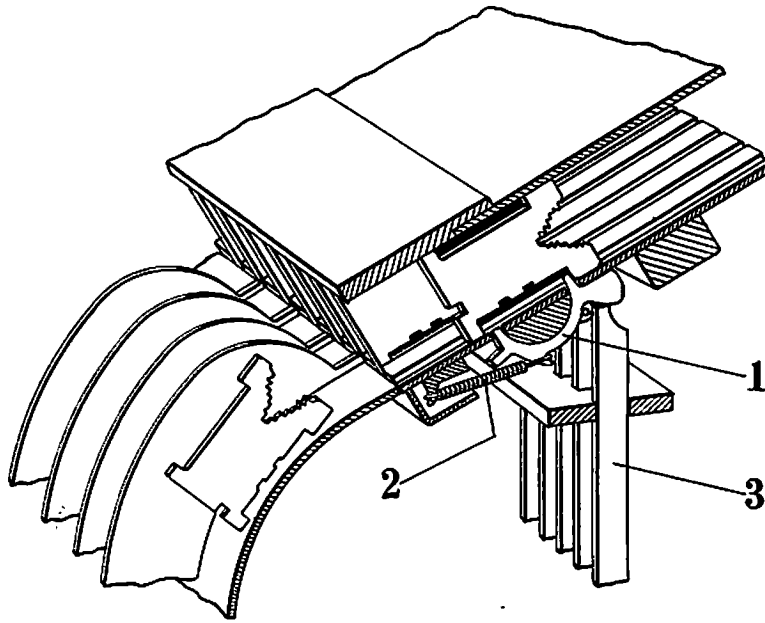


Fig. 13. Showing the Intertype Escapement Mechanism

Removal and Application of Escapements. To remove an escapement for cleaning or replacement, turn out the two escapement cover screws *5*, Fig. 12, and remove the escapement spring cover *6*. Turn the magazine over, depress all the escapements with a magazine brush handle and pull out the escapement locking rod. Remove the escapement, rub it on a piece of fine emery cloth, and polish it with graphite. Return the escapement, the locking rod and the escapement spring cover to position.

When applying a new escapement, select one of the proper thickness for the channel. Put it in place and rock it by hand to see if it works freely. Both the front and the back point of the escapement must clear the bottom of the magazine channel as the escapement is rocked back and forth. If the escapement locking rod is bent or kinked, the escapements will not work freely. Replace the rod if it is bent.

If some of the heavier matrices, such as the em quad, capital M or W, drop into the assembling elevator when they are not wanted, the escapement springs for those matrices are probably weak in tension. This rarely happens except in

cases where the magazine has been in use for a long time. The application of new escapement springs will usually correct this condition. If the spring tension is all right, the escapement may be sticking or its front point may be worn. Remove the escapement and polish it. If its front point is badly worn, replace the escapement.

Care of Magazines and Matrices

Ordinarily the only parts of the matrices that require cleaning are the lugs. If they are fouled with oil or gum, wipe them with a clean cloth. Place the matrices edgewise on a matrix tray or type galley and polish the lugs with a matrix eraser or an electrotyper's polishing square. Burrs on the lugs of matrices should be removed with a fine file.

To clean a magazine, remove the escapement cover and the escapement spring cover and turn the magazine over. Block up the shutter with a few slugs. Run a dry magazine brush through each section of the magazine a few times to remove dirt and dust. Soak the brush in high test gasoline or benzol and go over each section again. Be sure to remove the small spots of gum and dirt left in the channels by the lugs of the matrices. Next hold a light at one end of the magazine to see if any hairs from the brush have caught in the partitions or escape-

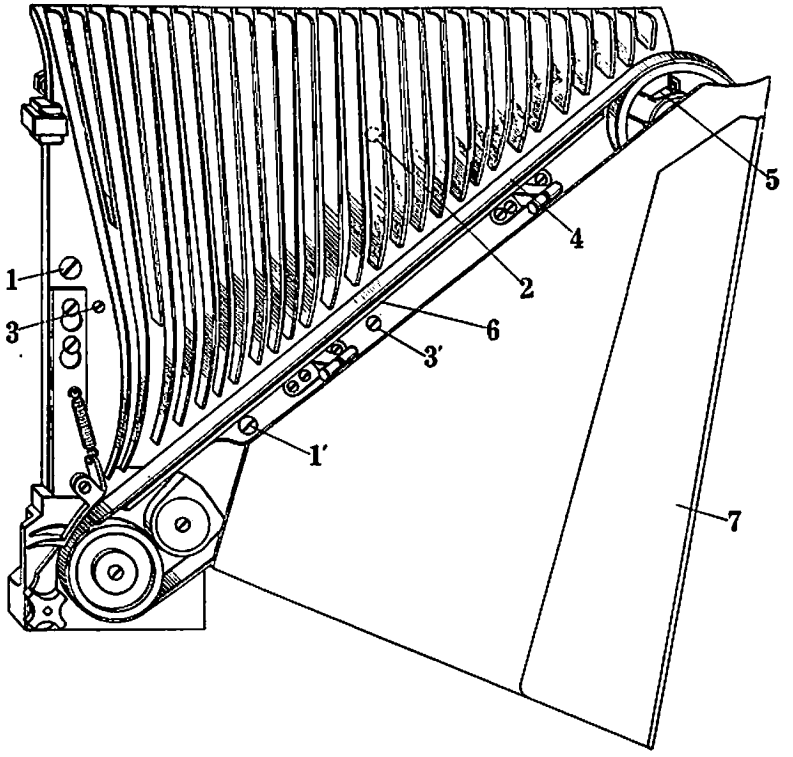


Fig. 14. The Single Distributor Assembler Entrance

ments. Remove the hairs with a matrix hook. *Never take a magazine apart.* Great skill and special equipment are needed to reassemble it properly.

Special attention should be given to the escapements. Soak a small stiff brush in gasoline and clean the channels around the escapements. Work the escapements back and forth by hand while using the brush. Return the escapement cover and the escapement spring cover to position and remove the slugs from beneath the shutter.

Single Distributor Assembler Entrance

The purpose of the assembler entrance is to guide matrices from the magazine to the matrix delivery belt, which carries them to a common point in the assembler proper. The entrance for Equipments A, B, C, D and H consists of a plate and a number of guides of different length. The guides are made with lugs which fit into slots in the plate. Locking rods passing through holes in the lugs at the back of the plate hold the guides in position. As the matrices are released from the magazine, they slide down the face of the assembler entrance plate between the guides, which prevent the matrices from twisting out of position. The matrices fall upon the matrix delivery belt, which carries them to the assembler proper.

Adjustment of Assembler Entrance. The top edge of the assembler entrance should be positioned approximately 1/32" below the channels in the lower plate of the magazine. Loosen screws *1*, *1'* and *2*, Fig. 14; screw *2* can be loosened by passing a screw driver between the keyrods in back of the assembler entrance plate. Turn adjusting screws *3* and *3'* until the required adjustment is obtained, then tighten screws *1*, *1'* and *2*. One adjustment of the assembler entrance is all that is required. When the entrance is properly aligned with one main magazine, it will align correctly with the other magazines.

Adjustment of Matrix Delivery Belt. The matrix delivery belt *4*, Fig. 14, should be kept fairly tight. Loosen the nut *5* in back of the pulley stud, move the stud up in its slot, then tighten the nut. See that the matrix delivery belt supporting plate *6* does not drag the belt.

A cover cushion *7* is fastened to the top of the assembler entrance cover to provide a yielding banking point for matrices as they leave the magazine. The plate should be replaced when its surface becomes excessively dented by the matrices.

Mixer Assembler Entrance

The assembler entrance for F and G machines consists of an upper and a lower assembler entrance converging to a common point. The upper assembler entrance *1*, Fig. 15, is pivoted at its lower end on a hinge pin *2* and a stud screw *3*. The upper entrance guides *4* are split at their lower ends and straddle the lower assembler entrance guides *5*. The upper entrance can be swung away from the lower entrance as shown in Fig. 15, making the parts of the lower entrance easily accessible. When the upper entrance is returned to normal position, two latches *6* and *6'* lock the entrance in place. The operation of the escapement rods *7* and *7'* has been described on page 3. Both sets of escapement rods are mounted between fixed frames *8* and *8'*. The lower escapement rods *7'* release matrices