Linotype Instruction Book

General Principles

THERE are a few general principles used in the Linotype machine that should be mentioned at the beginning. The Linotype is an automatic power-driven machine. With the exception of the touch of the finger on the keyboard and the starting of the assembled line to the casting mechanism, all the functions of the machine are performed automatically. The various motions in proper sequence required for the justification of the line of matrices, the casting of the slug, and the distribution of the matrices to the magazine are performed by the action of cams. Most of these cams are mounted on a single main cam shaft, and all the functions above mentioned are performed in one revolution of this cam shaft.

In the second place, with the exception of the keyboard cams and a few others, the cams upon the machine are very large, and all of the motions of the machine are made as slow as possible. This feature is very important in the matter of wear on the machine. Some Linotypes have been in constant use for nearly thirty years.

The third principle is the use of springs to cause the *positive* motion of the parts, the cams returning the moving parts to their original position. This principle makes it possible to use what are called "automatics," which are devices arranged so that if anything goes wrong the machine will stop or the spring will expand without breaking any of the parts to which it is attached. This principle is used throughout the machine wherever possible.

DIVISION OF MECHANISM

The mechanism of the Linotype machine may be divided into three general divisions.

First is the assembling of the matrices and spacebands, which is started by the touch of the finger of the operator upon the keyboard. This part of the mechanism is shown in general form in Fig. 1. Beginning with the touch of a finger upon a keybutton, the action of the keyboard cam moves the keyboard rod connected with the escapement in the magazine, and a matrix is released and falls by gravity upon a constantly running belt which delivers the matrix into the "assembler."

The second great division of the Linotype mechanism is the casting mechanism, which is shown in diagrammatic form in Fig. 33. This part of

the Linotype mechanism includes means for justifying the line of matrices by means of double wedges called "spacebands;" for bringing the mold against the justified line; bringing a crucible, or pot, of molten metal, having a suitable "mouthpiece," against the mold; pressing the "mouthpiece" against the mold and the mold against the line of matrices with great force, so as to make a tight joint; a pumping mechanism for delivering the molten metal into the mold and against the matrices; a mechanism for returning the crucible to its original position; for withdrawing the mold from the line of matrices, revolving the mold, during which action a knife trims the bottom of the slug and finally brings it opposite a pair of knives; means for ejecting the slug from the mold, passing it through the knives by which the slug is trimmed, and depositing the slug in a galley.

The third division of the Linotype mechanism, as shown in Fig. 97, comprises means for unlocking the line of matrices and spacebands; passing the line to an intermediate channel in which the line of matrices is separated from the spacebands; means for depositing the spacebands in their magazine; means for transferring the line of matrices to the upper part of the machine; means for passing the line of matrices along a mechanism called the "distributor bar," which distinguishes the different characters and allows them to fall by gravity at their proper places into the upper end of the magazine, from the lower end of which the matrices are released by the escapement.

As previously stated, the original Linotype machine has been developed, and a large number of changes and additions have been made to it, to meet the demands of the art which economic conditions constantly bring about. There are, basically, but two models of the Linotype, the single distributor and the plural distributor machine, each adapted to specific requirements of the business. In the figures and explanations given in this volume all the different styles of mechanism used will be illustrated and explained, and the particular models in which any mechanism is used will be noted, so far as possible.

I. The Keyboard

THE Linotype keyboard carries ninety keys, arranged in six rows of fifteen keys each. Each button is attached to the end of a lever. Each row of fifteen key levers is pivoted upon a round rod, which is supported by the sides of the keyboard and two supports inside. The key lever is shown in Fig. 1. For the sake of convenience, the keybuttons are arranged in three colors, the black, at the left hand of the operator, being the characters of the lower case; the blue buttons in the center, the points, figures and special characters; and the white at the right the caps. These buttons are sometimes made of a larger size than usual, so that they may contain two, and even three, characters. A somewhat different style of keybutton is used for some of the different languages set on the Linotype.

The key levers are of six different lengths, but all of them are pivoted upon the round rods at the center of the distance from the keybutton to the end of the lever. The key lever is reduced in size at the opposite end from the keybutton so that a lug or projection fits into a notch in the keyboard bars, as shown in Fig. 1. This keyboard bar *C* answers two purposes. By its weight it returns the key lever after the finger is removed from the keybutton. Also, at the upper end of this keyboard bar, there is a notch into which the rounded end of the trigger *D*, shown in Fig. 1, registers. This is also shown in Figs. 2, 3, 4, and 5.

Referring again to Fig. 2, when the keybutton is touched and the keyboard bar *C* has risen, revolving backward the trigger *D*, it allows the keyboard cam yoke *O*, carrying the keyboard cam *E*, to drop upon the keyboard rubber rolls *P*. This is shown in Figs. 3, 4, and 5. The keyboard cam *E* has teeth in part of its circumference, and when these teeth come in contact with the rubber roll *P*, *E* is caused to revolve, which carries upward the cam yoke *O*, which is pivoted at one end, and the other end of the cam yoke *O*, coming up under the reed *F*, causes the reed to rise vertically. The first part of this action is shown in Fig. 4, and the second part of the action is shown in Fig. 3. It will be plain that if the operator has removed his finger from the keybutton, and the keyboard bar *C* has returned the trigger to its place, as shown in Fig. 5, when the keyboard cam is lowered, on account of the shape of cam *E*, the keyboard yoke *O* will rest upon the trigger *D*, as shown in Fig. 5; or, in other words, it will be again in normal position. The keyboard cam *E*, on account of its momentum, will revolve until the pin *G* in said cam comes against the stop *R*. Cam *E* remains motionless until the keybutton is again touched.

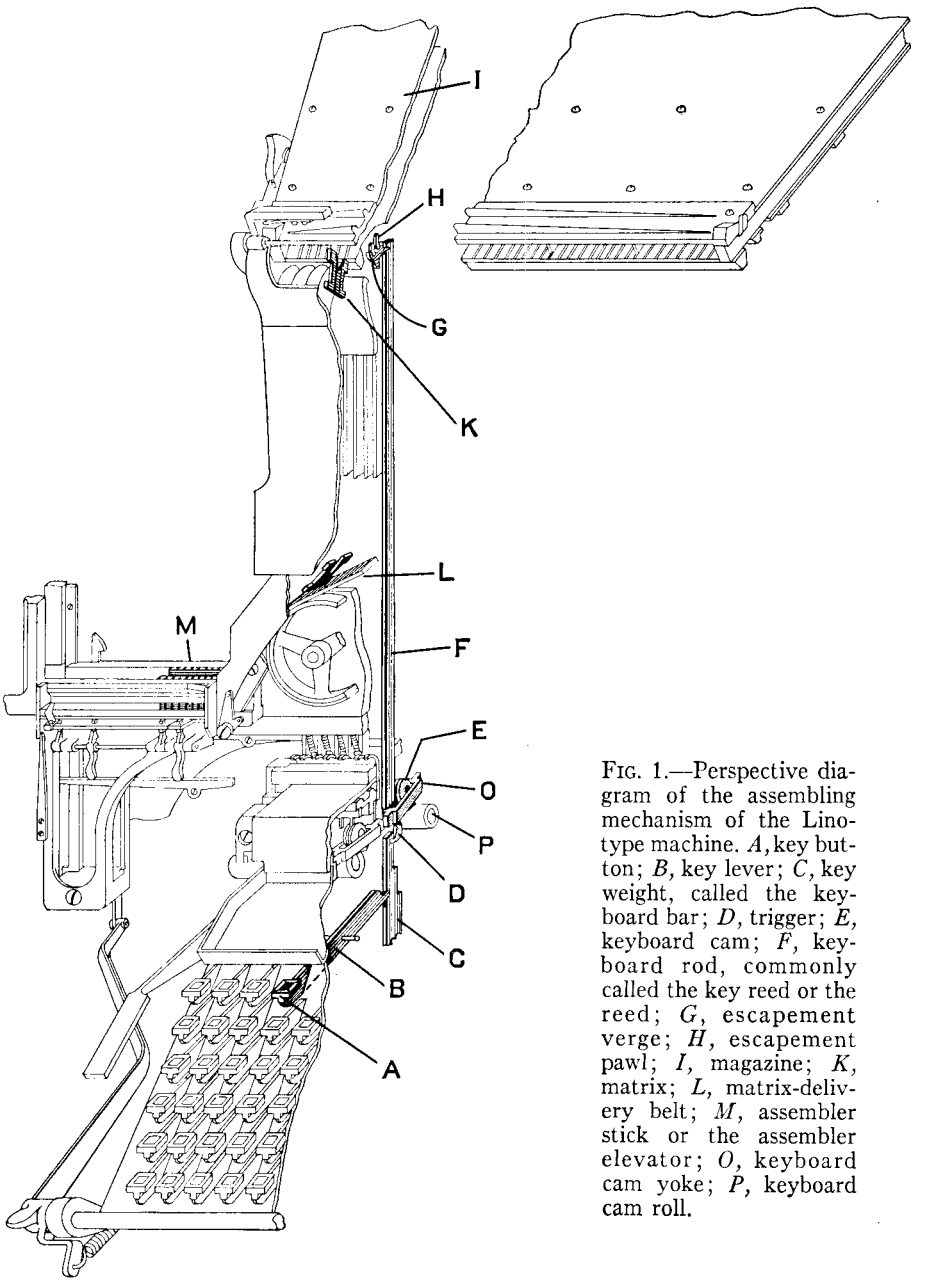


FIG. 1.—Perspective diagram of the assembling mechanism of the Linotype machine. *A*, key button; *B*, key lever; *C*, key weight, called the keyboard bar; *D*, trigger; *E*, keyboard cam; *F*, keyboard rod, commonly called the key reed or the reed; *G*, escapement verge; *H*, escapement pawl; *I*, magazine; *K*, matrix; *L*, matrix-delivery belt; *M*, assembler stick or the assembler elevator; *O*, keyboard cam yoke; *P*, keyboard cam roll.

The sequence of operations thus far described is: the touch of the keybutton with the finger; the raising of the keyboard bar *C*; the tripping of the trigger *D*; the fall of the keyboard cam yoke, bringing the keyboard cam upon the rapidly revolving rubber roll; the revolution of the keyboard cam, causing the keyboard yoke to rise, lifting the keyrod which operates the escapement for the matrix, which will now be described and explained in detail.

When the keybutton is depressed by the finger the keyboard bar *C* is raised and the trigger *D* is caused to revolve through a small arc, so

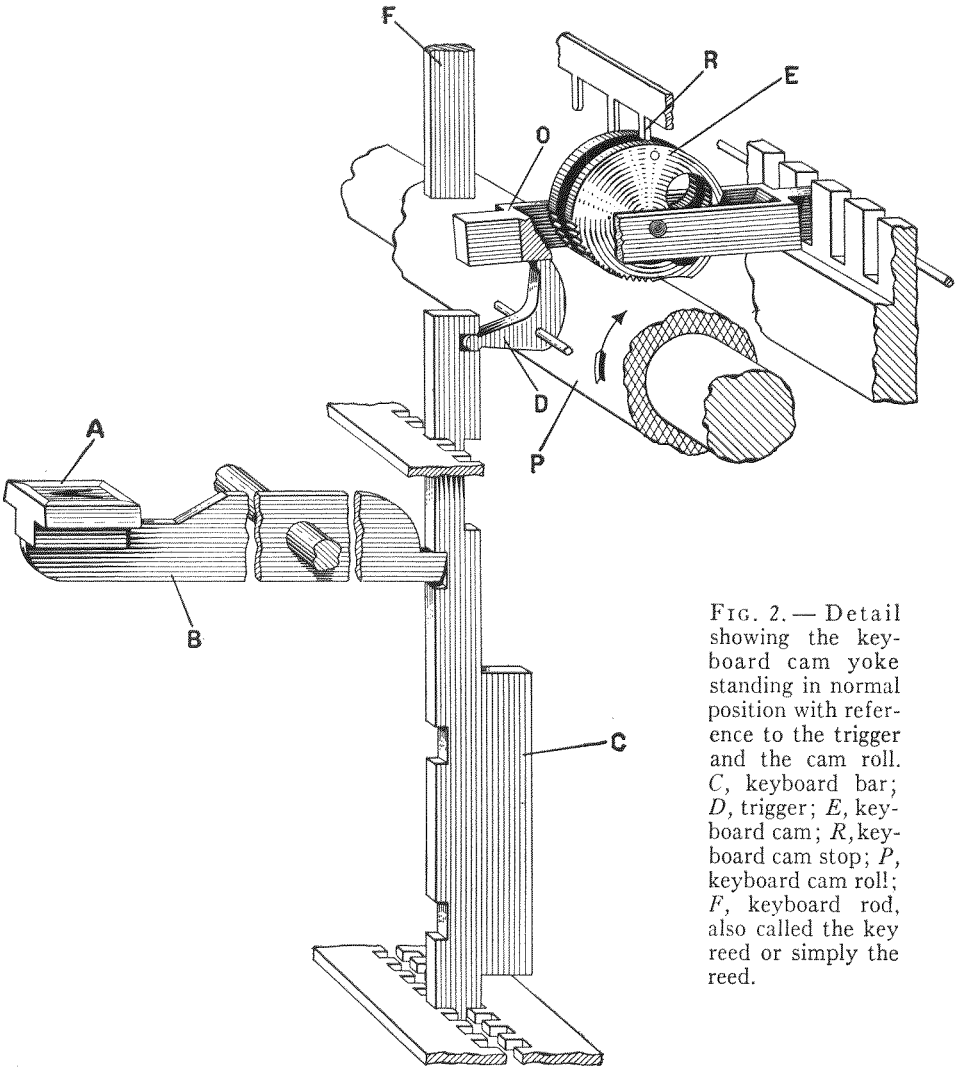


FIG. 2. — Detail showing the keyboard cam yoke standing in normal position with reference to the trigger and the cam roll. *C*, keyboard bar; *D*, trigger; *E*, keyboard cam; *R*, keyboard cam stop; *P*, keyboard cam roll; *F*, keyboard rod, also called the key reed or simply the reed.

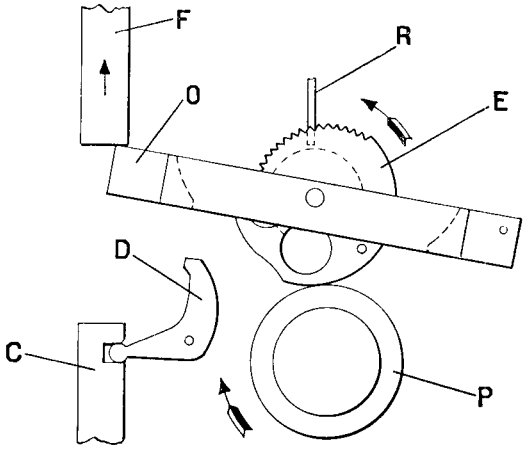


FIG. 3.—Diagram of the keyboard parts, showing the keyboard cam *E* revolved by the keyboard cam roll *P*, so as to raise the keyboard cam yoke *O* to its highest position, thereby raising the keyboard rod *F* to its highest position. This figure also shows the trigger *D* returned to its normal position by the gravity of the keyboard bar *C*.

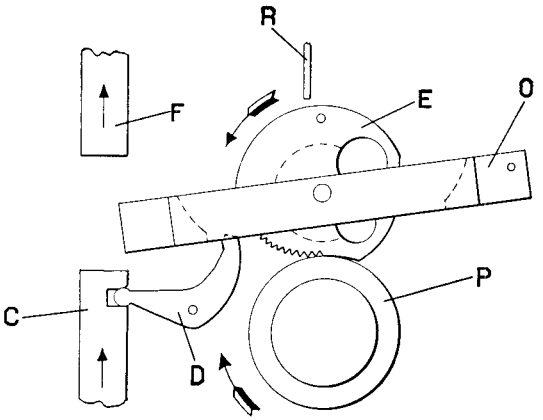


FIG. 4.—Further detail of keyboard parts, showing the keyboard cam yoke *O* released by the trigger *D* and fallen down upon the keyboard cam roll *P*. The revolution of the keyboard cam roll shown by the arrow, carrying upward the keyboard cam yoke *O*.

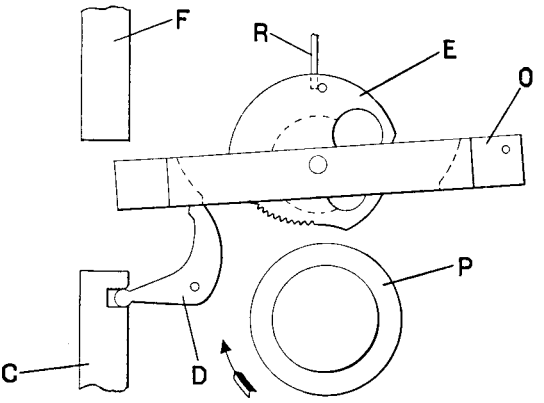


FIG. 5.—View of keyboard parts when back in normal position. *C*, keyboard key bar; *E*, keyboard cam; *F*, keyboard rod; *O*, keyboard cam yoke; *P*, keyboard cam roll; *R*, keyboard cam stop.

that the other end of said trigger gets out from under the lip of keyboard cam yoke *O*, allowing the cam yoke *O* to fall. When the finger is taken away from the keybutton, the weight of the keyboard bar *C* brings both the key lever and the trigger back into normal position, at which time the projecting part of the keyboard weight *C* rests at the bottom upon a guide which limits its downward motion. These keyboard bars or weights have a guide at the top and bottom, and their vertical movement is about one-

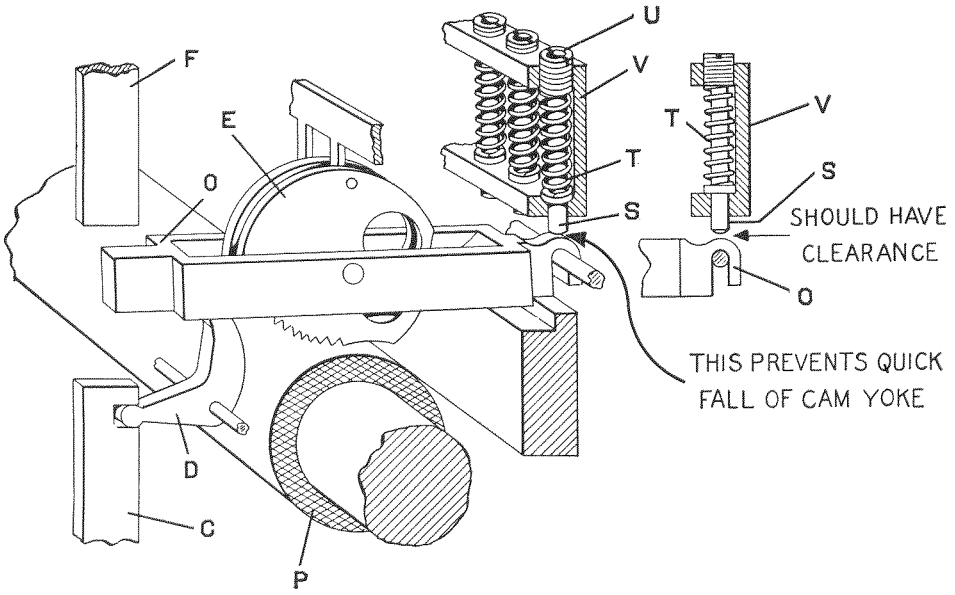


FIG. 6.—Arrangement used on the later keyboards, and is a further detail of keyboard parts. *C*, keyboard bar; *D*, trigger; *E*, keyboard cam; *O*, keyboard cam yoke; *P*, cam roll; *S*, plunger operated by the spring *T*; *U*, screw bushing for adjusting the tension of the spring *T*; *V*, frame in which the plungers and springs are mounted.

A small view shown at right indicates clearance between the plunger *S* and the cam yoke *O*. This clearance should be about the thickness of an ordinary visiting card, or about ten thousandths of an inch. If the plunger *S* rests upon the cam yoke *O*, the fall of the cam yoke when released by the trigger will be retarded, causing transpositions. This is not the case when the proper clearance exists.

eighth of an inch. The weight of the keyboard bar is small, so that the work required of the operator in depressing the keybutton with his finger will be as easy as possible. In the first machines springs were used to return the key levers instead of these weights. It was found, however, that these springs varied in tension so that the touch of one key was harder than another, whereas the weights make the work of the operator's fingers practically even. These keyboard bars or weights are so light that if any dust or dirt gets into the guides the key lever and trigger may not

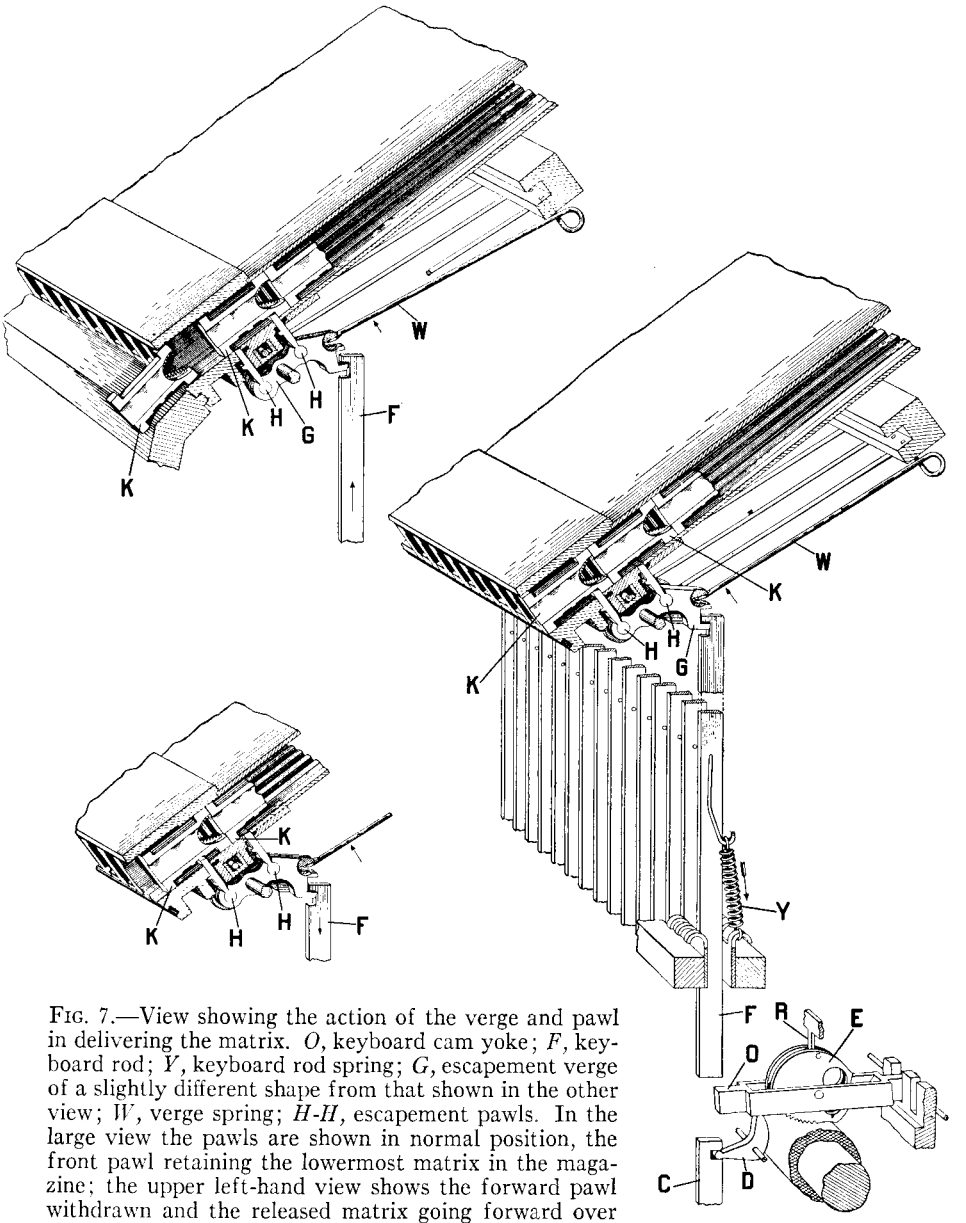


FIG. 7.—View showing the action of the verge and pawl in delivering the matrix. *O*, keyboard cam yoke; *F*, keyboard rod; *Y*, keyboard rod spring; *G*, escapement verge of a slightly different shape from that shown in the other view; *W*, verge spring; *H-H*, escapement pawls. In the large view the pawls are shown in normal position, the front pawl retaining the lowermost matrix in the magazine; the upper left-hand view shows the forward pawl withdrawn and the released matrix going forward over the assembler front.

The lower left-hand view shows the matrices in the act of sliding, the front pawl *H* having come up again and the back pawl *H* having been lowered. It is manifest that when the ear of the forward matrix shown in this view comes against the pawl, the line of matrices in the channel will be stopped and they will come to rest in the position as shown in the large view.

be returned. This could be remedied by making the weights heavier, but this would mean more work every time the operator touched the key. It is necessary, therefore, that these guides should be kept clean and free from oil or gum of any kind, in order that the keyboard may work properly. This matter will be referred to later.

The keyboard and escapement mechanisms differ slightly in different models.

The construction of the keyboard cam yoke and reed, as used in the Model 8 Linotype, is shown in Fig. 10. In this construction one end of the

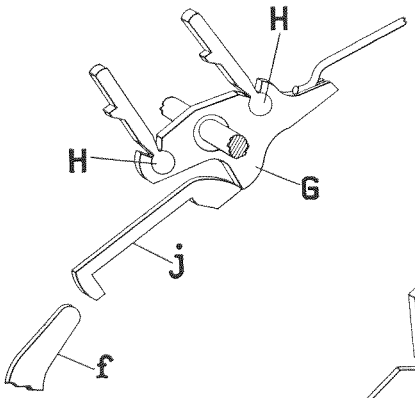


FIG. 8.—Diagram of the escapement verge pawls and plunger as used in the Model 8 Linotype.

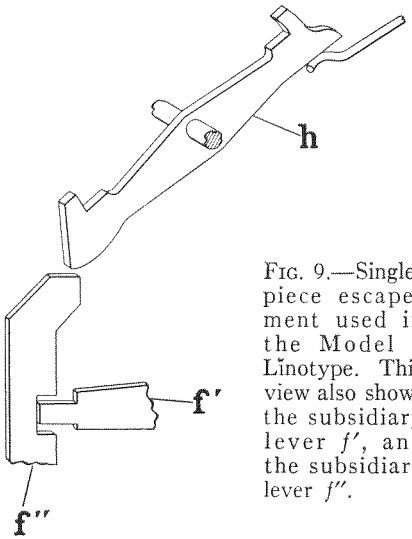


FIG. 9.—Single-piece escapement used in the Model 9 Linotype. This view also shows the subsidiary lever *f'*, and the subsidiary lever *f''*.

keyboard cam yoke has an open slot in it, the top of the slot resting upon the rod, forming a pivot for the keyboard cam yoke. Just above the pivot rod on the keyboard cam yoke there is a frame which contains a series of springs *T* and plunger *S*. The end of the plunger *S* rests just above the cam yoke. By touch of the finger, the keyboard cam yoke is released by the trigger in exactly the same way as previously shown. The action of the keyboard cam, lifting the cam yoke, lifts the keyboard rod, which does not carry any springs, but pushes up an intermediate lever *f*, as shown in Fig. 10. While the cam yoke is revolving upon the rubber roll, the rear end of the keyboard cam yoke rises a little and pivots against the spring plunger. The spring *T* is strong enough to hold the cam yoke in position, unless there is some serious interference with the action of the escapement. In this case the spring plunger *S* rises, the keyreed *F* stops its upward motion, and the keyboard cam roll revolves until it comes back into

normal position. This spring plunger and spring form an "automatic" to prevent breakage when, for any cause, the normal action of the escapement is prevented.

The keyreed *F*, as shown in Fig. 7, has mounted upon it a hook at its upper end and a spring *Y*. The tension of the spring *Y*, pulling down on the hook, tends to pull the keyrod *F* in a downward direction, as shown by

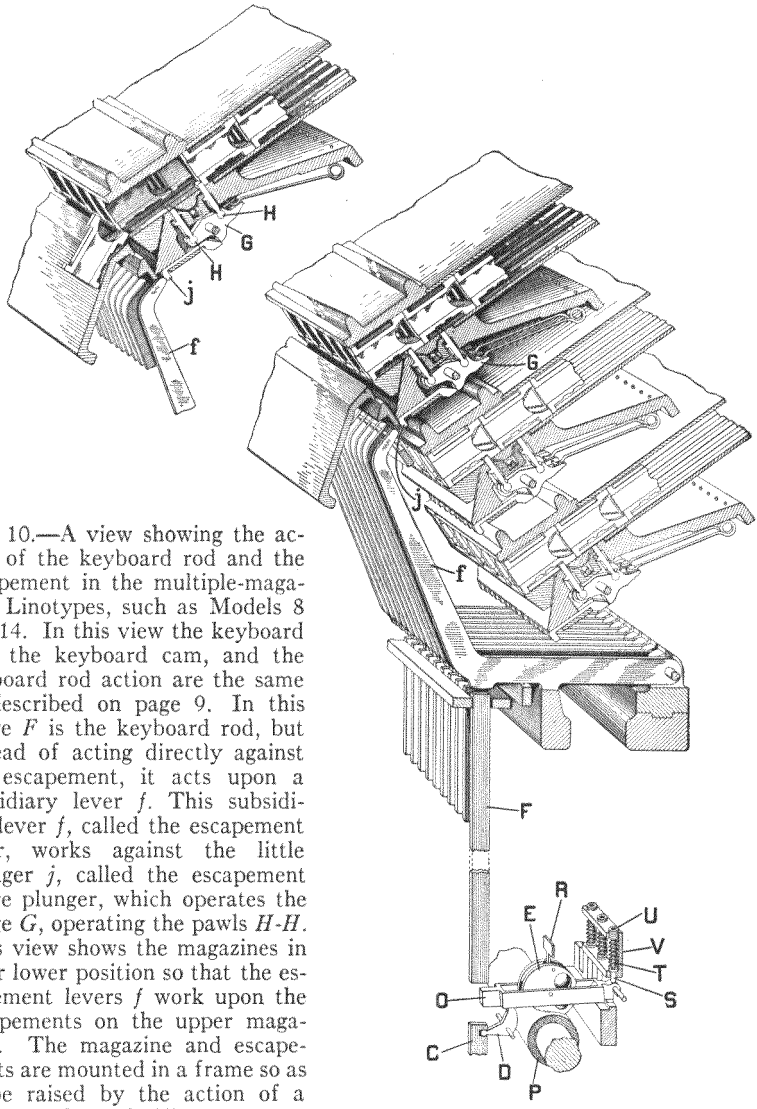


FIG. 10.—A view showing the action of the keyboard rod and the escapement in the multiple-magazine Linotypes, such as Models 8 and 14. In this view the keyboard roll, the keyboard cam, and the keyboard rod action are the same as described on page 9. In this figure *F* is the keyboard rod, but instead of acting directly against the escapement, it acts upon a subsidiary lever *f*. This subsidiary lever *f*, called the escapement lever, works against the little plunger *j*, called the escapement verge plunger, which operates the verge *G*, operating the pawls *H-H*. This view shows the magazines in their lower position so that the escapement levers *f* work upon the escapements on the upper magazine. The magazine and escapements are mounted in a frame so as to be raised by the action of a screw, as shown in Fig. 128, so as to bring any one of the three magazines into position, so that the levers *f* can work upon the corresponding plungers *j* and work upon the escapements, as described.

the arrow. At the top of the reed *F* there is a notch that engages with a part of the verge *G*. The verge *G* carries two pawls, *H* and *H*. These pawls have a shoulder. In the normal position of the reed, the shoulder of the front pawl banks against the lower part of the magazine while the other pawl is withdrawn so that it is just even with the bottom of the channel inside of the magazine. The pull of the spring *Y* on the reed *F*

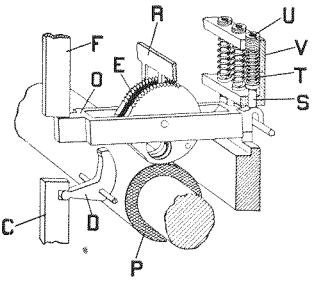


FIG. 11.—View of the keyboard cam yoke at its highest position, showing the spring *T* compressed and a little clearance in the hook at the back-end of the keyboard cam yoke. This clearance is called the overthrow and provides for wear or interference with the action of the keyboard cam *E*.

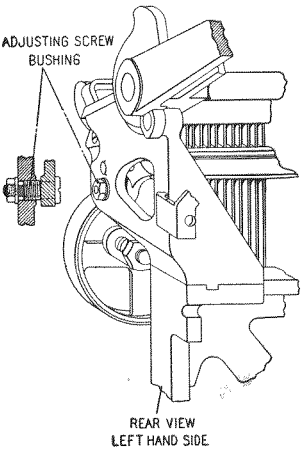


FIG. 12.—Diagram showing the adjusting screw and bushing for adjusting the key rod upper guide on the Model 3 and Model 5 Linotypes.

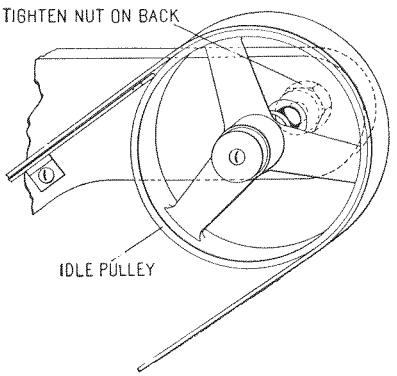


FIG. 13.—View of the idle pulley for the matrix delivery belt, showing the adjustment thereof for the purpose of tightening the belt when it gets loose. The spindle of the idle pulley is held in position by two nuts on the back of the assembler entrance in a slot, and by unlocking these nuts the pulley can be adjusted until the belt is of the right tension.

through the verge *G* comes against the shoulder of the pawl. When the keybutton is touched by the finger and the keyreed is raised, as shown in Fig. 1, and previously described, the verge *G* is pushed upward by the spring *W*, the tension of which is in the direction indicated by the arrow. This lowers the front pawl, allowing the lowest matrix in the line of

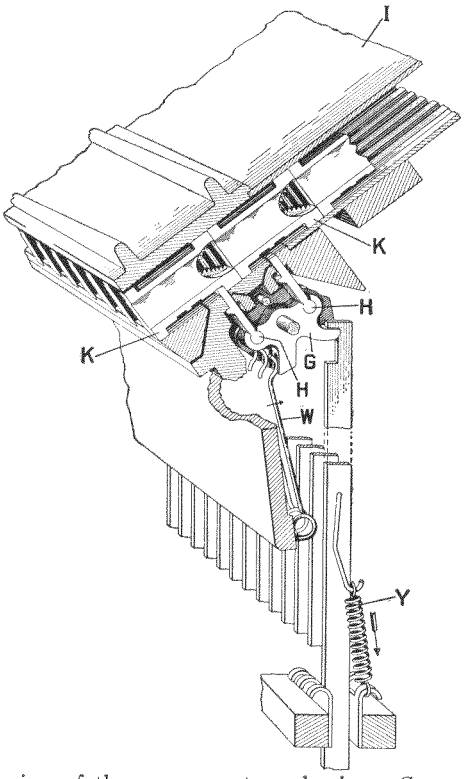


FIG. 14.—Enlarged view of the escapement mechanism. *G*, escapement verge; *H*, escapement pawl; *I*, magazine; *K-K*, matrices in the magazine; *W*, verge spring; *Y*, keyboard rod spring. This form is used in the Model 5 Linotype.

matrices to slide forward and out of the magazine. The second in the line of matrices follows and is caught by the rear pawl, as shown in Fig. 7. In Fig. 7 is shown the rear pawl coming up and the front pawl going down, illustrating clearly the action of the escapement in permitting the lowermost matrix to escape and retaining the others.

It will be noted that in the device explained above, the spring *Y* is much stronger than the spring *W*, the spring *Y* overcoming the tension of the spring *W* when the reed is in normal position. The use of one spring pulling against another is not common in mechanism, and is used here so that in case of any accident, the action being caused by springs will not cause breakage of the parts.

In the Model 8 Linotype the key reed *F* does not work against the escapement directly, but through an intermediate lever *F*, called the escapement lever, as shown in Fig. 10, and a small sliding plunger *j*, called the

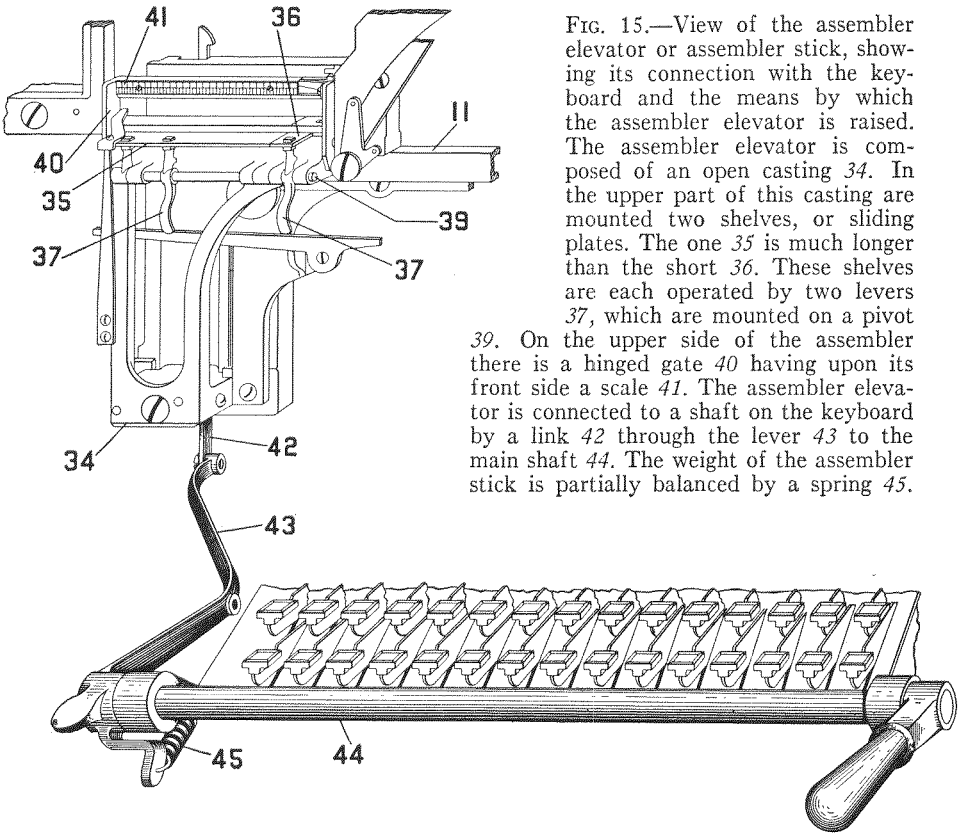
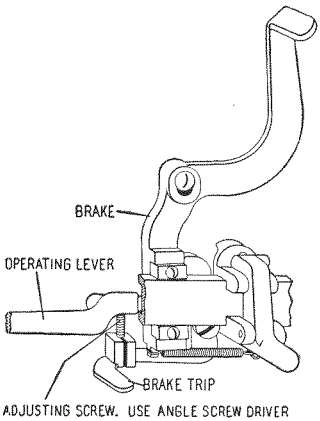


FIG. 15.—View of the assembler elevator or assembler stick, showing its connection with the keyboard and the means by which the assembler elevator is raised. The assembler elevator is composed of an open casting *34*. In the upper part of this casting are mounted two shelves, or sliding plates. The one *35* is much longer than the short *36*. These shelves are each operated by two levers *37*, which are mounted on a pivot *39*. On the upper side of the assembler there is a hinged gate *40* having upon its front side a scale *41*. The assembler elevator is connected to a shaft on the keyboard by a link *42* through the lever *43* to the main shaft *44*. The weight of the assembler stick is partially balanced by a spring *45*.

FIG. 16.—View of the brake trip on the assembler slide and the screws for adjusting same so that the assembler slide will be permitted to go freely to the left while the line is being assembled, and will be prevented from going backward until the line is sent up to be transferred to the first elevator, at which time the spring returns the assembler slide to its primary position.

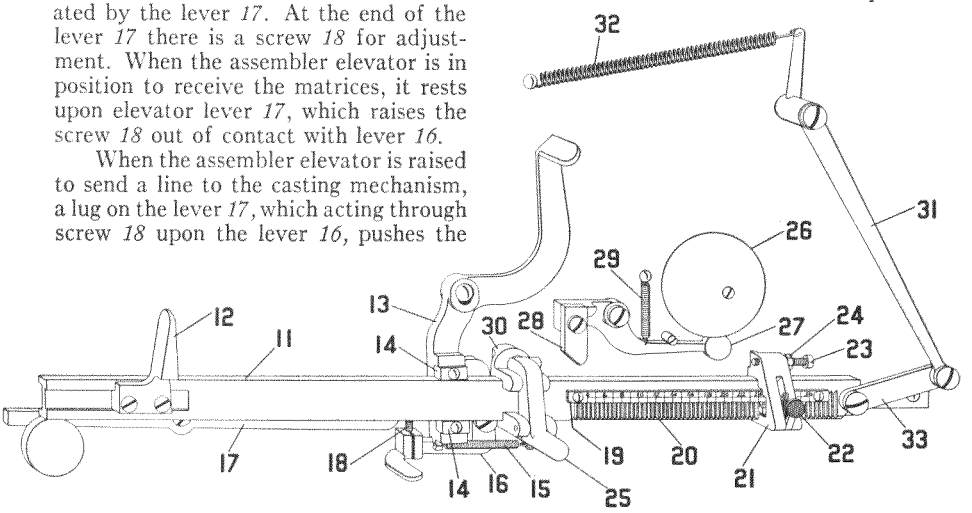


escapement verge plunger, as shown in Fig. 10. This sliding plunger acts against the escapement, causing the front escapement pawl to be lowered and the rear escapement pawl to rise, releasing the matrix. When the key

FIG. 17.—Enlarged view of the assembler slide *11* and the assembler slide finger *12*. This view also shows the locking mechanism, which consists of a lever *13*, two hardened blocks *14*, and a spring *15*. The spring *15* is fastened to the lower part of the lever *13*, and tends to bind the blocks *14* upon the assembler slide *11*. As the matrices are assembled by the star wheel against the finger *12*, the assembler slide is moved along, the blocks *14* yielding slightly and allowing the slide to travel in a forward direction, but preventing its backward motion.

Mounted on the face plate of the machine is a lever *16* which trips the lever *13* so as to allow the assembler slide to have a backward motion. This lever is operated by the lever *17*. At the end of the lever *17* there is a screw *18* for adjustment. When the assembler elevator is in position to receive the matrices, it rests upon elevator lever *17*, which raises the screw *18* out of contact with lever *16*.

When the assembler elevator is raised to send a line to the casting mechanism, a lug on the lever *17*, which acting through screw *18* upon the lever *16*, pushes the



lever *13* forward a short distance so that the blocks *14* do not press against the assembler slide. This allows the assembler slide to return to the right in readiness to receive the next line of matrices as they are assembled from the keyboard.

On the right-hand side of the assembler slide there is a scale *19*, and teeth are cut in the assembler slide immediately below the place where the scale is mounted. These teeth *20* are one nonpareil or 6 points apart. Mounted on the assembler slide is a block *21*, called the assembler slide clamp. This block has several teeth in it, and the block is so mounted as to form a stop for the left-hand or forward motion of the assembler slide. By pressing a little handle *22* the block *21* is unlocked and can be set at any point on the scale *19*. Mounted in the top of the block *21* is a screw *23* with a lock nut *24*. This screw is adapted to strike against a lever *25*. This forms a stop for the motion of the assembler slide. By the pressure of the finger this lever *25* can be moved out of the way of the screw *23* as to allow a further motion of the assembler slide to the left.

Mounted on the main frame of the machine is a bell *26*, with a lever *27*, and a trip dog *28*. In passing under the trip dog *28* the block *21* pulls the lever *27* downward a short distance, and when the block *21* passes under the trip dog *28* depressing the right hand of lever *27* which rises through the action of the spring *29*, striking the bell and sounding the alarm, which indicates to the operator that the screw *23* and the block *21* are nearly against the stop.

30 is a guide for the assembler slide and a mounting for the lever *25*.

At the extreme right of the assembler slide is a lever, *31*, which is connected to the main frame of the machine by a spring *32*, and to the assembler slide by a link *33*. The spring *32*, acting through the lever *31* and link *33*, resists the left-hand, or forward, motion of the assembler slide, but when the locking blocks *14* are tripped, as previously described, the spring *32* returns the assembler slide to its normal position in front of the star wheel to receive the succeeding line.

rod *F* goes down, following the cam yoke, the escapement lever goes back and the spring causes the escapement to return to normal position. It will be noted that the action of this spring is exactly contrary in direction to the action of the spring *W* in Fig. 7. The matrix is released by the escapement pawls in the manner shown in Fig. 7, exactly, as there described.

Fig. 14 shows a view of the form of escapement mechanism used in the Model 5 Linotype, of which there is a very large number in use. There is no difference between the action of this mechanism and that described in Fig. 7 except that the position of the spring *W*, instead of being at the rear of the escapement, is on the front side. The action of this spring has exactly the same effect as that described in Fig. 7.

ASSEMBLER BELT

The matrices when released by the escapement fall down a vertical plate called the "assembler front" or assembler entrance upon a belt which is partially shown in Fig. 1 and in a number of other figures. The matrices are prevented from twisting by vertical partitions called the "assembler entrance partitions." When the matrix falls upon the belt it is carried rapidly forward and down toward the assembler stick or assembler elevator. As it passes into the assembler stick it runs over a wheel, made of fiber, having four projections upon it. This is known as the "star wheel," and later will be more fully described. The action of the star wheel is to place the matrix in a vertical position in the assembler stick, as shown in Fig. 1.

ASSEMBLING ELEVATOR

The assembling elevator is shown in Fig. 1 and Fig. 18. This part is also known to operators as "the assembler," "the assembler stick," "the assembler elevator," and "the stick." The latter names come from the fact that this part answers the same purpose as the compositor's "stick" in hand composition. The assembling elevator is an open casting, having rails upon which the ears of the matrices may rest, and below which the long wedges of the spacebands may hang.

ASSEMBLER SLIDE

Mounted on the face plate is the assembler slide, as shown in Fig. 19. This slide is constantly pulled to the right of the operator as he faces the machine, or toward the star wheel, by spring *32*, Fig. 17. On this slide is mounted a finger, against which the line of matrices presses as the line is being assembled. Mounted on the slide, as shown at *30*, Fig. 17, is a

detent, or lock, commonly called "the assembler slide brake." This lock, or brake, allows the assembler slide to move, under a slight tension, toward the left of the operator, or away from the star wheel, but prevents its returning to the right until the brake is tripped, when the assembler elevator goes up. The star wheel presses the line of assembled matrices against the finger on the assembler slide and the assembler slide moves along, holding the line of matrices compactly together, so that the operator may read the line and judge its length. When the assembling elevator goes up to send the line to the casting mechanism the elevator trips the

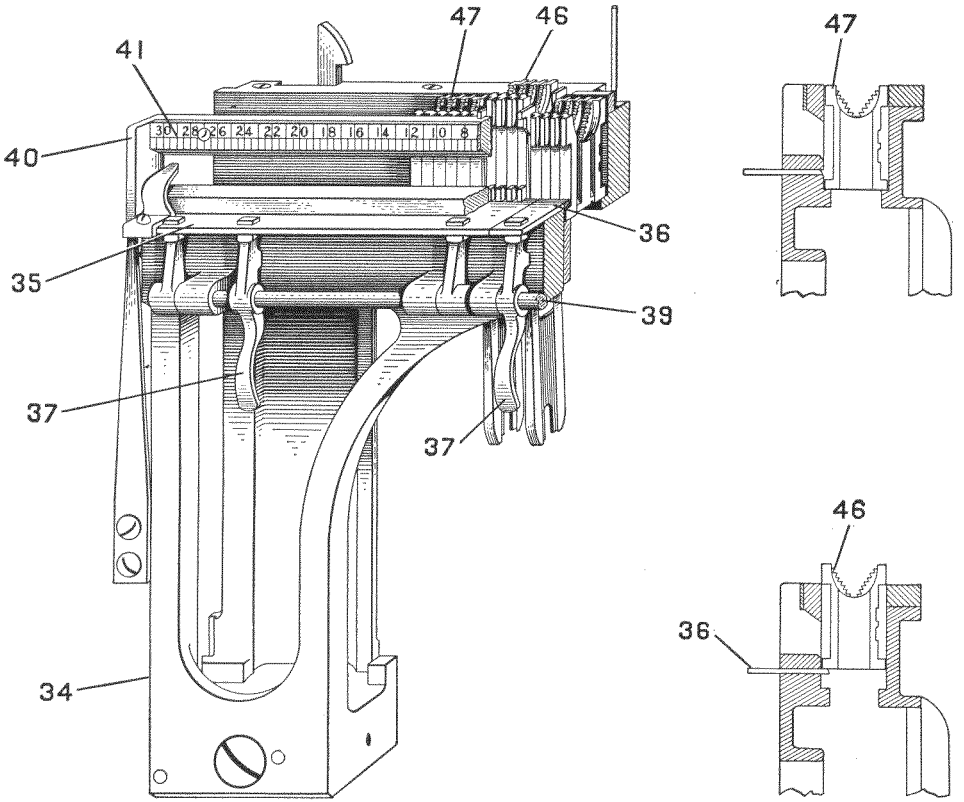


FIG. 18.—Enlarged view of the assembler stick, having a portion of it cut away so as to show the matrices at two different positions in the matter of alignment. The long shelf *35* and the short shelf *36* may be operated by the fingers through the levers *37*. When pushed inward these shelves catch the descending ears of the matrices and sustain the matrices at a higher level than in the ordinary assembling. In the figure the matrices shown at *46* are in the raised, or italic, position, and the matrices shown at *47* are in the lower, or roman, position. These two positions are shown in two smaller sectional views, one matrix being shown at *46* in the italic, or raised, position, resting upon the shelf *36*, and the other matrix in the lower, or roman, position at *47*. The raised or italic position is also called the auxiliary position, and the lower position, the regular.

lever *16*, as shown in Fig. 17, which releases the lock, or detent, and the spring *32* causes the assembler slide to return very quickly to the right to a position directly in front of the star wheel, ready for matrices of the next line when the assembler has been lowered to normal position to receive them; when the action is repeated.

ALARM MECHANISM

Mounted on the face plate is a small bell with a trip hammer, tripped by an adjustable lug or clamp on the assembler slide. This lug is called the assembler slide clamp. This adjustable lug is set for different lengths of line, so as to trip the lever and ring the bell a short time before the end of the line is reached, to warn the operator that he must use a hyphen in dividing a word, or decide upon the end of a word, if the line comes in this way. The same lug that rings the bell comes against a bracket on the assembler and forms a positive stop for the slide when it has moved over the full length of the line. All these parts are shown in Fig. 17. Slightly different forms of the mechanism shown in Fig. 17 are used in the different models but their function is the same in all.

TWO-LETTER ATTACHMENT

The first matrices used in the Linotype machine had but one character stamped upon them. In 1898 there were two characters stamped upon the matrix, and a corresponding arrangement made in the assembling elevator and the mold to assemble and cast the matrices at either one of two different levels, so as to bring at will either character into position to appear upon the slug. This permitted the use of italics or black letter, together with a roman font of the same size. Up to the time this device was placed upon the machine it was not practical to use the machine for book work and a large class of printing that required more than the ninety characters on the keyboard.

The different levels in the assembling elevator are obtained by the use of two sliding shelves, or rails, a short one and a long one. These shelves are so mounted that they can be slid forward into the assembler elevator or withdrawn from this inside position. In this way they form a shiftable rail on one side of the assembling elevator. When these shelves are thrown in, the matrices, instead of falling upon the regular fixed rails of the assembler, fall upon this shiftable rail, which brings the lower or auxiliary character upon the matrix in line with the upper character of the matrices that are assembled upon the regular rail. The object of having two of these rails, one long and one short, is that if the operator, after assembling a word or phrase in the upper position, wishes the succeeding matrices to be in the lower position, he can withdraw the short rail, leaving the long rail in position to sustain the matrices already in the upper position. It is also possible for the operator to change a single matrix or a word by hand from the upper to the lower position, or vice versa.

When the line of matrices and spacebands is assembled, the assembling elevator is raised about five inches by depressing a handle, or lever. As the elevator goes up it carries the line of assembled matrices between two fingers, one of them long and one of them considerably shorter, and they are commonly known as the "long finger" and "short finger." When the assembling elevator reaches the top of its slide it trips a mechanism that closes and grasps the line of matrices between the long and short fingers and then transfers it through the delivery channel to the casting mechanism where the slug is cast. The line of assembled matrices and spacebands is shown in Fig. 19. This mechanism will be fully described later.

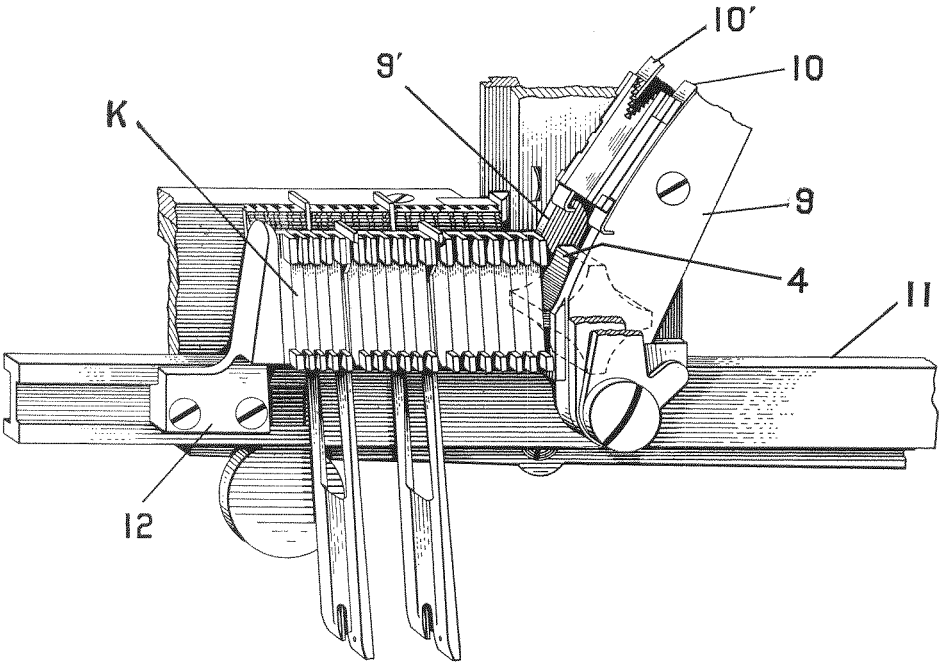


FIG. 19.—View showing a part of the assembler block and part of the assembler elevator or assembler stick. The front part of the assembling elevator is cut away so as to show the assembler slide *11*, and the finger on the assembler slide *12*. The matrices assemble against this finger *12*.