the upper end of the starting lever banks against screw *26* in link *27*. The link is attached by a pin to the lower end of the vertical starting lever *28*. Backward movement of the link swings the vertical starting lever on its shaft. This causes the lug *29* on the lever to move the automatic stopping pawl in the delivery and elevator transfer cam off the upper stopping lever, permitting the clutch to operate and the cams to revolve. When the ejector lever *30* moves forward, the parts of the stick attachment are returned to normal position. The ejector lever is connected with reset lever *32* through link *31*. The reset lever is fastened on crank *13*. When the ejector lever moves forward, therefore, crank *13* is turned in a clockwise direction by link *31* and lever *32*. This movement causes the end of the operating crank to move toggle link *14* toward the back of the machine. The upper and lower latch links *15* and *16* are thereby moved back past the center of their pivot, permitting spring *33* to pull latch *17* back to position over stud *19*. This reconnects the outside auxiliary lever *20* with the first-elevator lever. Therefore, the first elevator will rise to transfer position if the machine is operated in the conventional way, because its movements will be imparted by the outside lever *20* and cam surface *23*. In other words, a machine equipped with the stick attachment is instantly available for special display composition or for regular keyboard composition simply by transferring operations from the keyboard to the casting mechanism.

Adjustments. The alignment of the first-elevator jaw with the delivery channel is controlled, as on the regular machine, by an adjusting screw *34*, Fig. 96, in the first-elevator auxiliary lever *18*. Loosen the first-elevator auxiliary lever connecting screw, adjust screw *34*, then tighten the connecting screw. Turning the adjusting screw in will raise the first-elevator slide and jaw; backing the screw off will have the opposite effect. The 5/8″ and 7/8″ settings of the first-elevator lever link eyebolts should be checked before setting the first-elevator auxiliary lever adjusting screw. The procedure for setting the eyebolts is described on page 49.

Screw *26*, Fig. 96, in the starting link *27* controls the stroke of lug *29* with respect to the automatic stopping pawl in the delivery and elevator transfer cam. When the stick attachment operating lever is pulled all the way out, the stopping pawl should be moved approximately 1/64″ clear of the upper stopping lever. Adjusting screw *26* will increase or decrease the stroke of lug *29* on the vertical starting lever and will have a corresponding effect upon the movement of the stopping pawl with respect to the upper stopping lever. Tighten the lock nut on the adjusting screw when the setting is correct.

Vise Jaw Odd Measure Device

Intertype Corporation has developed an odd measure device for newspapers which have changed from the conventional 6 point column rule to a 4 point rule. The vise jaw odd measure device makes it possible to set the measure, automatically, for casting double-column slugs 24 ems plus 4 points in length. Slugs of this length are required, of course, because the width of the double column is reduced 2 points by the use of 4 point column rules.

The device automatically reduces the vise jaw setting 2 points on double-column work when the vise jaw indicator rod em scale is set on 24½ ems. When

changing from the single-column measure of 12 ems to double-column measure of 24 ems plus 4 points, the operator has merely to turn the vise adjusting knob in the usual way.

If desired, a cam block can be provided for setting both 18 ems plus 4 points for three-column work and 24 ems plus 4 points for double-column work. The vise jaw odd measure device is applied only to non-quadding machines. The device is not required on quadding machines, because the quadding vise closing attachment is provided with an adjustable knob for obtaining odd vise jaw settings.

The mechanism of the odd measure device, as shown in Fig. 97, is extremely simple in construction and operation. It consists chiefly of a cam *U-4431* on the vise frame and a stop plate *U-4432*. The plate is pivoted on the left vise jaw block and is interposed between the jaw and screw *W-1073*. The plate *U-4432* has two different thicknesses, *A* and *B*, *B* being 2 points thicker than *A*.

When lines of even and half-em lengths are being set, the stop plate *U-4432* rests on pin *W-338*. This positions thickness *A* of the plate between the jaw and screw *W-1073*, as shown in illustration. The thickness of the plate at this point locates the left vise jaw in its regular positions for even and half-em lengths.

When 24 ems plus 4 point lines are to be set, the vise jaw indicator rod em scale is set on 24½ ems. This advances plate *U-4432* and the left vise jaw until the plate rides up on the high point of cam *U-4431*. As the plate is raised by the cam, thickness *B* moves up between screw *W-1073* and the vise jaw, moving the jaw forward an additional 2 points. This reduces the space between the vise jaws to 24 ems plus 4 points. The operation of the device is the same when setting 18 ems plus 4 point lines, in which case the indicator rod em scale is set on 18½ ems. Intertype Corporation, of course, will supply liners for casting slugs of 18 ems plus 4 points and 24 ems plus 4 points in length.

The vise jaw odd measure device can be made inoperative simply by pulling cam *U-4431* out slightly and turning it a quarter turn to the right. Plate *U-4432* will then rest on its stop pin *W-338* with thickness *A* always in position, providing all of the regular measures in even and half-em increments.

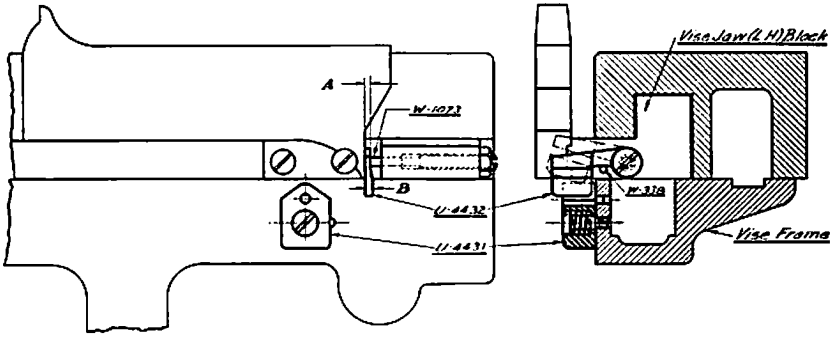

Fig. 97. The Intertype Vise Jaw Odd Measure Device provides the special double and the three-column measures required by newspapers which have reduced the width of their column rules. The device automatically reduces the vise jaw measure at the proper settings and can be made inoperative simply by reversing a cam block.

Double-Acting Mold Attachment

A double-acting mold attachment is available for casting slugs alternately in two opposite molds. This attachment is of great advantage in work requiring extensive recasting, such as blank slugs for leading, rules, borders, titles, dates, etc. The double-acting mold attachment consists simply of a special mold turning segment (S-256), which is fastened to the mold turning cam in place of the regular long segment. The special segment, like the regular short segment, turns the mold disk only one-quarter of a revolution.

In equipping the machine, it is necessary only to set two opposite molds for the same size slug and to apply the special segment. As the machine revolves, the slugs are cast in one mold and then in the other by intervals. Since two molds are being used, neither mold overheats excessively and the quality of the slug is thereby improved. In some cases, all four of the molds on the disk are set for the same size slug and by revolving the mold disk one-quarter of a revolution from time to time, the opposite pair of molds is brought into operation. This arrangement provides ideal conditions for work which is to be recast extensively.

Automatic Repeat Casting Attachment

A repeat casting attachment (U-2900, assembled) can be supplied for casting automatically any required number of duplicate slugs up to a maximum of 6 from the same line of matrices. The device is operated whenever a line is carried into the first-elevator jaw by the delivery slide. The slide operates linkage connected with the starting and stopping lever connecting rod, causing the rod to be held out in the starting position. After the first slug has been cast, the first elevator rises to transfer position as usual but is prevented from rising to the full height by a stop on the operating lever. The line is therefore retained in the first-elevator jaw and the machine continues to operate because the starting and stopping mechanism is held out in the starting position.

If the repeat casting attachment is equipped to produce only two duplicate slugs, the first elevator will disengage the starting and stopping lever as it descends the second time to casting position. At the same time, the stop which prevented the full ascent of the first elevator to transfer position will be moved out of position. When the elevator rises to transfer the second time, therefore, it ascends all the way and the line is transferred in the usual way. As the machine returns to normal position, it stops automatically because the starting and stopping connecting rod has been left in its regular position.

The repeat casting attachment can be furnished with parts necessary for casting any desired number of duplicate slugs up to a maximum of 6. Variations in the number of slugs to be cast entails only the application of a ratchet wheel with a suitable number of actuating surfaces.

Pot Crucible Mouthpiece Wiper

An automatic pot crucible mouthpiece wiper is available for machines equipped principally for headletter and display work. The wiper is mounted at the front of the pot jacket and is actuated by a lever pivoted on a special driving

shaft bearing. The lever is provided with a cam roll, which is held in contact with the pot pump cam by a compression spring. After the slug has been cast and while the mold disk is forward at ejecting position, the wiper is moved across the mouthpiece to the right and then to the left, effectively removing any metal accumulations from the mouthpiece. The constant cleanliness of the mouthpiece insures an accurate lock-up and fewer interruptions while the machine is in operation. The wiper is easily adjusted. Its maintenance and removal have been simplified by locating all renewable parts in accessible positions.

Intertype Automatic Quadding and Centering Device

In the history of the line composing machine, probably no single development has facilitated composition, speeded up production and reduced the costs of printing as much as the Intertype universal automatic quadding and centering device, commonly known as the autospacer. Prior to the introduction of this device, the composition of white space constituted one of the most intricate and time-consuming processes in line composition. To center a line, for example, quads had to be assembled, counted and distributed on each side of the line; spacebands had to be inserted in the proper positions; in cases where there was an insufficient number of quads of a kind, the duplex rail had to be manipulated and very often, the width of a particular face necessitated the location and insertion of quads and spacebands of special thickness. The process of quadding to the left or to the right was equally inefficient and lengthy before the advent of the quadding and centering device. In addition to assembling the necessary quads and spacebands, the line had to be transposed whenever quadding to the right was desired. The variable lengths of quadded lines, moreover, entailed additional operations and, in some cases, even held up the composition of succeeding lines until the quadded line had been cast and distributed.

These were only a few of the considerations leading to the development of the automatic quadding and centering device. In modern typography, the increasing proportion of white space has made the automatic quadding and centering device indispensable to all types of printing establishments. Users of the device, depending upon the class of work done, report seemingly incredible savings in time and expense. The composition of title pages, menus, listings, stationery, tickets, headings, programs, display, catalogs, classified and many other kinds of printing done by line composition has shown a saving of from 10 to 75 per cent in time. It is not too much to say that the Intertype automatic quadding and centering device has revolutionized line composition and made profitable a phase of printing which for years was responsible for the greatest loss of money, time and effort in the production of printed matter.

Two Basic Characteristics of Quadding Machines

In its most fundamental aspect, a quadding machine differs from a non-quadding machine in two broad respects:

1. The quadding machine is provided with automatically movable vise jaws.
2. Its justification mechanism is designed not only to produce fully justified

composition, but also to operate auxiliary mechanism related to the quadding of lines.

In addition to these factors, several parts of the machine require alteration to suit the various operations of quadding and centering. The chief parts which require changing are those related to the assembling and the delivery of the line. The assembling elevator, delivery slide, first-elevator jaw and other parts come under this category. Before describing the vise jaw and justification mechanism, therefore, it is necessary to indicate some of the most important changes in the smaller parts of the machine.

The Assembler Slide. The assembler slide applied to quadding machines is provided with a red pointer, which registers with a stationary scale. The pointer and scale arrangement is shown in Fig. 98. The purpose of the stationary scale is to show the operator at a glance how much a line of any particular measure lacks of being full. When setting fully justified lines on a quadding machine, it is essential, of course, to know how much shorter the lines are than the measure

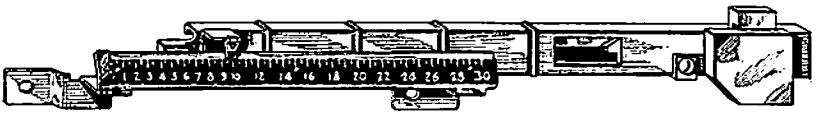

Fig. 98. The Quadder Assembler Slide is provided with a pointer and a stationary scale which enable the operator to determine instantly the length of the assembled line. In setting justified composition, the length of the line is an important factor, because justified lines must be assembled to within the limit of expansion for which the line spread device is set.

to which they are to be justified. By this means, the operator determines whether a line contains a sufficient number of spacebands to justify it to the measure or whether the line requires additional filling out with spaces to decrease the amount of justification required. As on a non-quadding machine, fully justified lines on a quadding machine must contain a sufficient number of spacebands to expand the line to the measure being set. Depending upon the measure, therefore, the assembled lines should be filled to within 1 to 3 ems of the full measure, exactly as is done on a regular machine. The assembler slide pointer and scale provide a positive means of determining the amount of slack in the line, provided that the setting of the assembler slide finger is accurate. The adjustment of the finger should be checked periodically and reset as the star wheel wears.

A line spread device is provided on the quadding and centering device to regulate the amount of justification required in lines of various lengths and also to control the quadding function of the machine. The operation of this device is described in connection with the justification and quadding mechanism on pages 167, 168, 171, 173 and 175.

The Assembling Elevator. The assembling elevator gate and back rail are provided with friction rails *A* and *B*, Fig. 99. These rails are urged forward by coil springs and are located properly to contact matrices as they are assembled in the elevator. The purpose of the friction rails is to hold the matrices upright in the assembling elevator while the line is being raised to the delivery slide and carried into the delivery channel. On a quadding machine, the delivery slide

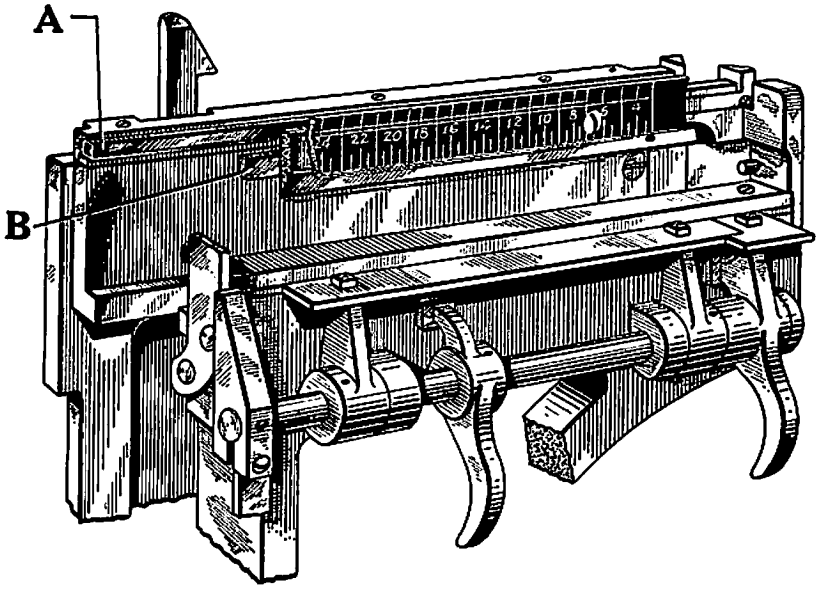

Fig. 99. The Assembling Elevator is provided with friction rails *A* and *B* to hold the matrices upright while the line is being raised to the delivery slide.

long finger always remains at the longest measure (30 or 42 ems) in normal position. This change was made because the length of lines on quadded and centered work always varies. Unlike a non-quadding machine, it is necessary on a quadding machine to send in only the type to be cast. With this wide variation in length of lines, therefore, it is desirable to locate the long finger in a constant position where it does not require setting. Since the long finger is not in position to support the left end of the line on measures shorter than 30 ems, therefore, another means was developed to fulfill the same function. The friction rails in the assembling elevator serve this purpose. The rails contact matrices assembled both in normal and auxiliary position and hold them upright as they are raised to the delivery slide. The rails are set to hold the matrix line more tightly on the left end than on the right in the assembling elevator.

The Delivery Slide. The delivery slide for quadding machines is shown in Fig. 100. As stated previously, the delivery slide long finger always remains at the longest measure in normal position. This is achieved by a detent release arrangement, which not only locates the long finger in its constant position but also permits the finger to adjust itself to lines of all lengths as they are received by the delivery slide. Detent *1* is pivoted on a screw in the long finger block *2*. A ball and spring arrangement above detent *1* urges the detent down with respect to detent rod *3*. When the delivery slide is in normal position, the detent is held up out of engagement with rod *3* by release *6*, which is fastened to the transfer channel. When the matrix line is raised in the assembling elevator to the delivery slide, the slide is released and the short finger *4* carries the line forward until the line comes into contact with the long finger *5*. As the delivery slide be-

gins to enter the delivery channel with the line, detent *1* drops off release *6* and engages the proper notch in rod *3*, locking the matrix line positively between the delivery slide long and short fingers. This insures positive delivery of the line of matrices and spacebands to the casting mechanism, no matter what the length of the line is. As the delivery slide returns to normal position, detent *1* rides up on the inclined surface of release *6*, holding the long finger *5* at the full measure setting (30 or 42 ems) and at the same time, permitting rod *3* to move back to position with the short finger *4*.

A spring *7* is riveted to the delivery slide long finger to hold matrices upright when "waiting" lines are carried into the delivery channel. The long finger has

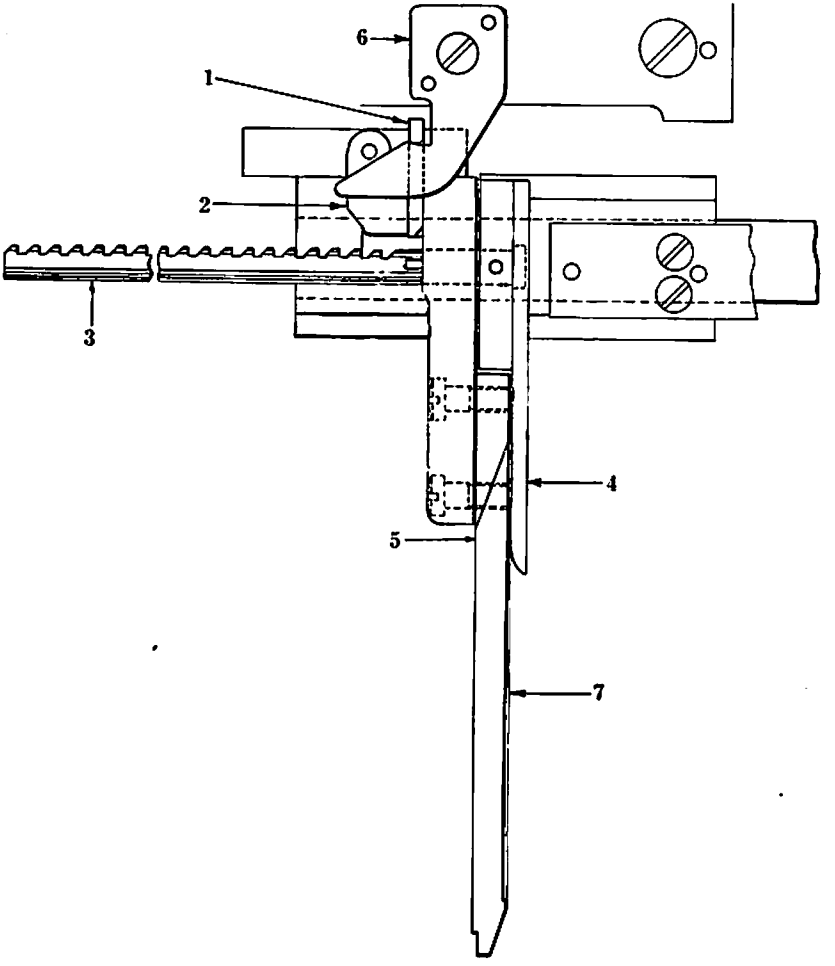

Fig. 100. The Delivery Slide designed for the quadding and centering device adjusts itself automatically to any length of line sent in to the casting mechanism. The long finger always remains at the full measure setting in normal position, making it unnecessary to adjust the finger when the measure is changed. In this illustration, the short finger *4* has moved to the left against the long finger *5*.

a slight amount of overmotion when this occurs and the spring is required to hold the matrices upright, especially when the line is very short. It is important that the spring be so formed that when compressed by the matrices it will lie flat against the long finger. If the spring becomes buckled or extends too far to the right, the matrix at the right end of the line might be pushed out of the first-elevator jaw as the first elevator descends to the vise cap. The quadding delivery slide long finger block is designed to permit the long and short fingers to move together more closely, thereby insuring positive control of short lines or even of a single matrix.

The First-Elevator Jaw. A friction rail *C*, Fig. 101, is provided in the first-elevator back jaw to hold the matrices squarely in the jaw while the line is being carried between the vise jaws. The rail is urged forward by coil springs and is set to exert more pressure on the right of the line than on the left. The reason for this is that the line stop provides positive support at the left of the line. The only attention required by the friction rails in the first-elevator jaw and the assembling elevator is an occasional inspection to make sure that they are straight and working freely. Friction rail *C* was formerly applied to the first-elevator front jaw.

The improved first-elevator jaw line stop is also shown in Fig. 101. This line stop is operated automatically and does not require setting when the measure is changed. As lines of various lengths are carried into the first-elevator jaw, the line stop is moved to the left by the line until the last matrix is inside the first-elevator jaw detents. A formed lug on the line stop registers with a recess in the left-hand vise jaw and prevents the stop from overthrowing to the left. When the line is transferred from the first elevator to the second elevator, a pawl fastened to the elevator transfer slide engages the projecting lug on the line stop and draws the stop and the matrix line to the right. As the elevator transfer lever reaches the end of its stroke, friction plunger *A* drops in front of projection *B* on the line stop, preventing the stop from overthrowing to the right. The line stop, therefore, is always returned to the extreme right position in the first-elevator jaw and is adjusted automatically to any length of line sent in to the casting mechanism.

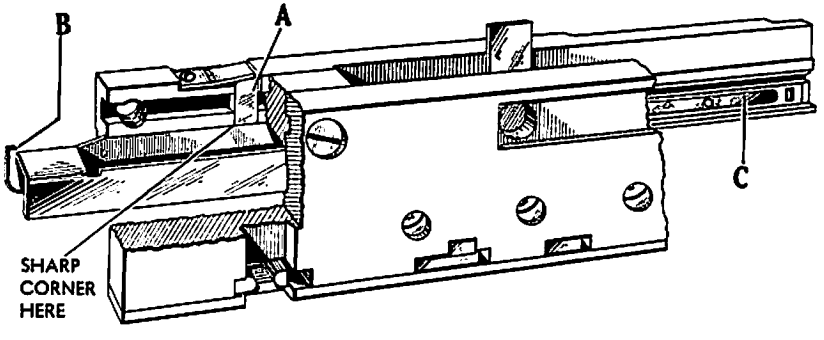

Fig. 101. The First-Elevator Jaw is provided with a friction rail *C*, which holds the line of matrices squarely in the jaw while the line is being delivered to the casting mechanism. This illustration also shows the automatic line stop used with the quadding and centering device. The stop is automatically adjusted to any length of line and does not require any attention on the part of the operator.

It is essential that the line stop be handled with care and lubricated with dry graphite from time to time to keep it working freely. The friction plunger *A* is provided with one square corner, as indicated in the illustration. If the plunger is removed at any time in order to remove the line stop from the first-elevator jaw, it is important to replace the plunger with the square corner facing projection *B* on the line stop.

Movement of the Vise Jaws

One of the basic requirements for automatic quadding and centering, as stated previously, is that the vise jaws move automatically with respect to the matrix line when it is delivered to the casting mechanism. On a non-quadding machine, the vise jaws occupy stationary positions once they are set for the desired measure. Most of the quadding and centering done on such machines, therefore, necessitates the assembling of quads or blank matrices, which provide the blank space or quadding at the required positions on the slug and also fill out the line so that it will justify to the full measure and cast. On a quadding machine, however, the automatic movement of the vise jaws eleminates the necessity of assembling quads for lines which are to be centered or quadded to the left or to the right. Depending upon the setting of a simple operating lever, the vise jaws close automatically against the line of matrices and spacebands, moving the matrix line to the required position with respect to the mold and at the same time, closing the front of the mold at the positions where the quadding or blank space is to appear. Needless to say, each vise jaw is long enough to close the mold opening completely, whether the vise jaws are operating separately, as they do when quadding to the left and to the right, or whether the vise jaws are operating together, as they do when centering. This basic feature of the quadding and centering device—automatic movement of the vise jaws—has done more to revolutionize the process of line composition than any other single device applied to slug casting machines since their inception.

Vise Jaw Mechanism

The complete vise jaw operating mechanism is shown in Fig. 102. This mechanism may be regarded from the standpoint of two major assemblies:

1. **The Vise Jaw Assembly,** consisting of parts suitable for engaging the vise jaws separately or together with the right-hand vise jaw rack.

2. **The Operating Assembly,** which imparts movement to the right-hand vise jaw rack and cushions the stroke of the vise jaws as they close against the matrix line.

Engagement of Vise Jaws with Rack

The quadding and centering device provides three completely automatic features of composition to the operator. In addition to making it possible to set fully justified composition, the device provides for automatic quadding on the left or right and equal quadding on both sides with the line of type in the center. These three automatic features of quadding, as stated previously, are obtained by engaging the vise jaws with the right-hand vise jaw rack, which forms a con-

necting link between the vise jaws and the operating mechanism. Depending upon the setting of a control operating lever, the vise jaws are engaged separately or together with the rack. As lines are assembled and delivered to the casting mechanism, they are justified to the full measure, quadded to the left or to the right or centered, according to the relative engagement of the vise jaws with the rack.

The engagement of the vise jaws *2* and *3*, Fig. 102, with the right-hand vise jaw rack *1* is accomplished by a bolt *5* for the right vise jaw and a gear *6* for the left vise jaw. Both the bolt and the gear are operated by lever *4*, which is located at the right end of the vise cap within easy reach of the operator. The bolt *5* is

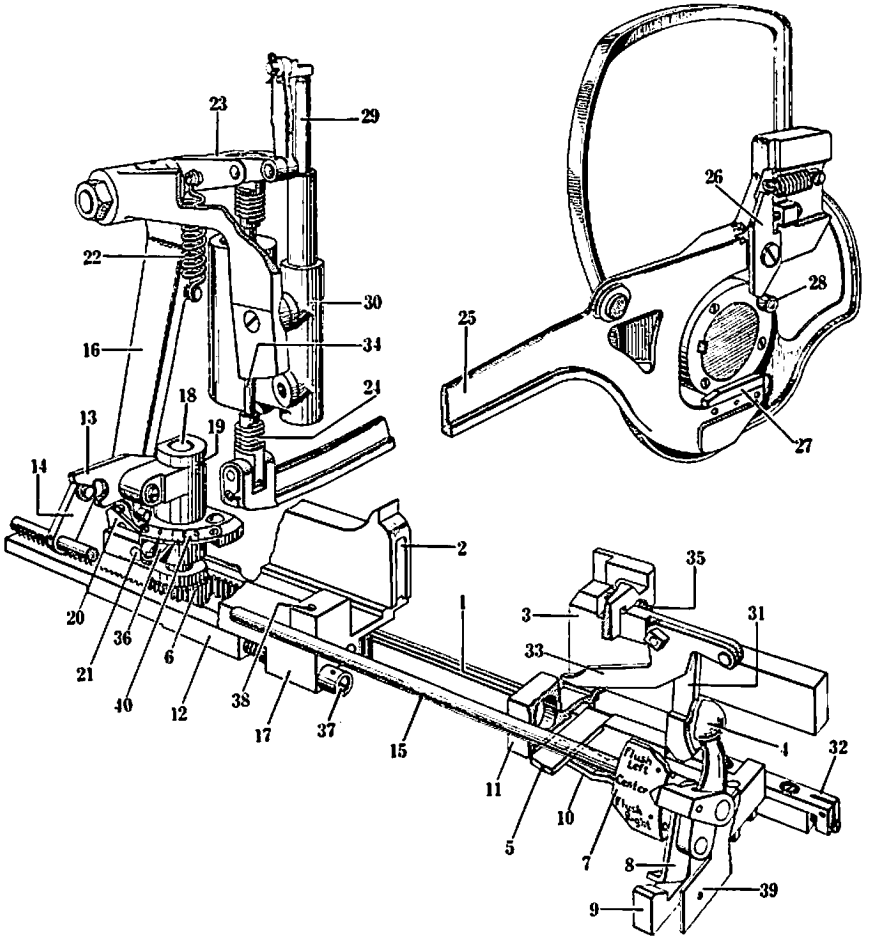

Fig. 102. Perspective View of the Complete Vise Jaw Operating Mechanism provided in the Intertype quadding and centering device. This illustration shows the means provided for the engagement of the vise jaws with the right-hand vise jaw rack and the mechanism which imparts movement to the vise jaws through their connection with the rack.

connected with lever *10*, which is fastened pivotally to the base of the right-hand vise jaw block *11*. As lever *4* is moved to the various positions on indicator plate *7*, shoe *8* moves slide *9* forward and backward. These movements swing lever *10* through a small arc, causing bolt *5* to enter or to withdraw from a slot in rack *1*. The engagement and disengagement of the left vise jaw *2* with respect to rack *1* is controlled by the same movements of lever *4*. As the lever is moved to the various positions on indicator plate *7*, gear *6* is raised or lowered with respect to the main rack *1* and the left vise jaw rack *12* by lever *13*, arm *14* and rod *15*. Depending upon the setting of the operating lever, therefore, the vise jaws are engaged separately or together with the right-hand vise jaw rack. The engagement of the vise jaws at the various settings is described below.

Flush Left. When operating lever *4*, Fig. 102, is at the flush left position, bolt *5* is moved into engagement with rack *1* and gear *6* is lifted out of engagement with the main rack *1* by lever *13* and related parts. In this position, therefore, only the right vise jaw *3* is engaged with the right-hand vise jaw rack *1*. Consequently, when the vise jaw lever *16* pulls rack *1* to the left to make its operating stroke, the left vise jaw *2* remains in normal position and the right vise jaw *3* is moved to the left with the matrix line until the line is tight between the two jaws. If the line is short enough to be quadded, the right vise jaw remains in position and is locked for casting; if the line is long enough to be justified, the upward movement of the spacebands spreads out the matrix line and moves the right vise jaw back to normal position against its stop screw *35*.

Center. When the operating lever *4* is placed at center position, bolt *5* remains in engagement with rack *1* and, in addition, gear *6* is pushed down between the main rack *1* and the left vise jaw rack *12*. Rack *12* is fastened to the left vise jaw block *17* and gear *6* is fastened to a shaft *18* which is free to revolve in bearing *19*. The engagement of bolt *5* with rack *1*, and gear *6* with racks *1* and *12*, therefore, connects both vise jaws with the main rack *1*. When the rack makes its operating stroke to the left, therefore, the right vise jaw *3* will move to the left because it is positively engaged with the rack through bolt *5*. In addition, the teeth in rack *1*, meshing with the teeth of gear *6*, turn the gear in a counter-clockwise direction. This movement is transmitted to the left vise jaw rack *12* on the opposite side of gear *6*, causing the rack and the jaw *2* to move toward the right. Consequently, both vise jaws move an equal distance, centering the matrix line exactly on the measure being set and quadding the remainder of the slug on each side of the line. When the main rack *1* makes its return stroke, the vise jaws are returned to normal position by movements in the reverse directions to those described.

Flush Right. When the operating lever *4* is placed at flush right position, bolt *5* is withdrawn from the slot in rack *1* and gear *6* remains in engagement with the main rack *1* and the left vise jaw rack *12*. In this setting, therefore, only the left vise jaw *2* is engaged with rack *1*. Consequently, when the rack makes its operating stroke to the left, the right vise jaw *3* remains in normal position and the left vise jaw *2* is moved to the right by gear *6* and rack *12* until the matrix line is clamped between the vise jaws. The line, therefore, casts flush at the right end of the column and quads at the left.

Vise Jaw Operating Mechanism

The automatic movements of the vise jaws, as previously described, are promoted by the right-hand vise jaw rack. Depending upon their relative engagement with the rack, the vise jaws close against the matrix line when the rack makes its operating stroke to the left, and move back to normal position when the rack makes its return stroke to the right. The operating and return movements of the right-hand vise jaw rack are controlled by a series of operating levers on the left side of the machine. The operating mechanism is actuated by a roll on the first-elevator cam and imparts movement to the rack through a vise jaw lever fastened to the face plate and the left-hand vise locking stud.

The right vise jaw rack *1*, Fig. 102, is connected with the vise jaw lever *16* through a link *20*. The link is provided with a hole into which a pointed stud *21* on the rack fits. This method of connection is provided, of course, to facilitate the opening and closing of the vise frame. Whenever the frame is opened, make sure that the stud *21* is connected with the link *20* when the frame is returned to position. If the vise frame is opened with the machine at casting position, there will be tension on lever *16* and it will be necessary to hold the lever to the right while closing the vise frame to connect the link and the stud. In any event, *always make sure that the parts are connected when the vise frame is closed.*

The vise jaw lever *16* is connected with safety lever *23* by spring *22*, which provides overmotion in case the return of the vise jaw lever is obstructed. The safety lever *23* is connected with operating lever *25* by spring *24*. The operating lever is pivoted on a stud which fits into a bearing on the mold gear arm. At the back end of the operating lever are fastened two shoes *26* and *27*, against which roll *28* bears during the revolution of the cams.

As the first elevator is descending to the vise cap with the matrix line, roll *28*, Fig. 102, on the first-elevator cam contacts the upper shoe *26* on operating lever *25*. This depresses the front end of the operating lever, causing spring *24* to stretch and to exert downward tension on the safety lever *23* and the vise jaw lever *16*. The two levers, however, are held in position against the tension of the spring at this time by latch *31*, which rests normally in front of a stop *32* fastened to the rack *1*. As soon as the first elevator seats on the vise cap, however, the first-elevator jaw banks on lever *33*, causing latch *31* to rise out of engagement with stop *32*, thereby freeing the rack *1*. The tension of spring *24* then causes lever *16* to swing to the left, pulling the vise jaw rack *1* to the left to make its operating stroke. As the rack and the vise jaws reach the end of their operating stroke, the movement of the parts is cushioned by a plunger *29* and an oil cylinder *30*. The plunger works in a close-fitting sleeve and cushions the vise jaws as they close together by compression set up within the oil cylinder. A detail view of the plunger and oil cylinder arrangement is shown in Fig. 105.

As the first elevator rises to transfer position, the rack and the vise jaws are returned to normal position. Roll *28*, Fig. 102, banks against shoe *27* on operating lever *25*. This action raises the front end of the operating lever, causing a rod *34* inside spring *24* to raise safety lever *23*. The vise jaw lever *16* is thereby swung to the right, causing the rack *1* and the vise jaws to return to position. The rack is returned far enough to the right to permit latch *31* to engage stop *32*.

Vise Jaw Operating Mechanism Adjustments

Several of the parts of the vise jaw operating mechanism shown in Fig. 102 are adjustable to obtain the settings required for efficient quadding and centering. These adjustments are made correctly when the machines are assembled at the factory, but the variable amount of wear to which the parts are subject over a period of years may necessitate occasional readjustment in order to bring the parts back to their original positions. All of the adjustments to be made in connection with the vise jaws and operating mechanism are described in the following sections under their respective headings.

Right-hand Vise Jaw Adjustment. As on a non-quadding machine, the quadding vise jaws *2* and *3*, Fig. 102, should be adjusted so that the first and last characters in type lines of fully justified composition are flush at each end with the body of the slug. In addition, the centering feature of the quadding device requires that the left vise jaw *2* be adjusted with respect to its rack *12* to center the type on the slug. Once these basic adjustments are made, of course, the operation of the vise jaws is completely automatic and no further change will have to be made in the adjustment except when the parts wear after long periods of use.

The position of the type with respect to each end of the slug is separately adjustable. The right-hand vise jaw *3*, Fig. 102, is adjusted by means of screw *35*. The jaw rests against this screw in normal position and is moved back against the screw when setting fully justified composition. To adjust the jaw, place a 30-em mold in operating position, set the vise jaw em scale and the assembler slide scale on 30 ems, make sure that operating lever *4* is at flush left position and place the line spread indicator arm *36* on 3½. Lock the spaceband lever pawl latch, assemble a line of matrices and spacebands long enough to justify to 30 ems and send the line over to the casting mechanism. After each adjustment of screw *35*, recast the line to observe the position of the last character at the right end of the slug. Tighten the lock nut on the screw securely when the adjustment is correct.

Left-hand Vise Jaw Adjustment. The position of the character at the extreme left of the slug is governed by the normal position of the left vise jaw 2, Fig. 102. The left vise jaw is adjusted by means of the large knurled knob on the vise closing attachment, Fig. 103. Turning the knob causes the vise closing block to advance or to retract the left vise jaw with respect to the matrix line. Turning the knob clockwise moves the jaw further to the left. Screw *A* must first be loosened before the large knurled knob can be turned. When the knob has been turned sufficiently to line up the character at the extreme left of the slug, tighten screw *A*. Next, loosen set screw *B* and turn collar *C* until the zero on the collar coincides with the zero on the vise closing bracket, then tighten set screw *B*. Once these proper settings have been established, uneven measures from minus 2 to plus 3 points can then be obtained by loosening screw *A* and turning the large knurled knob. This device is particularly advantageous in newspaper offices, which require odd linear measurements other than the even and half-em measures provided on the conventional vise closing attachment.

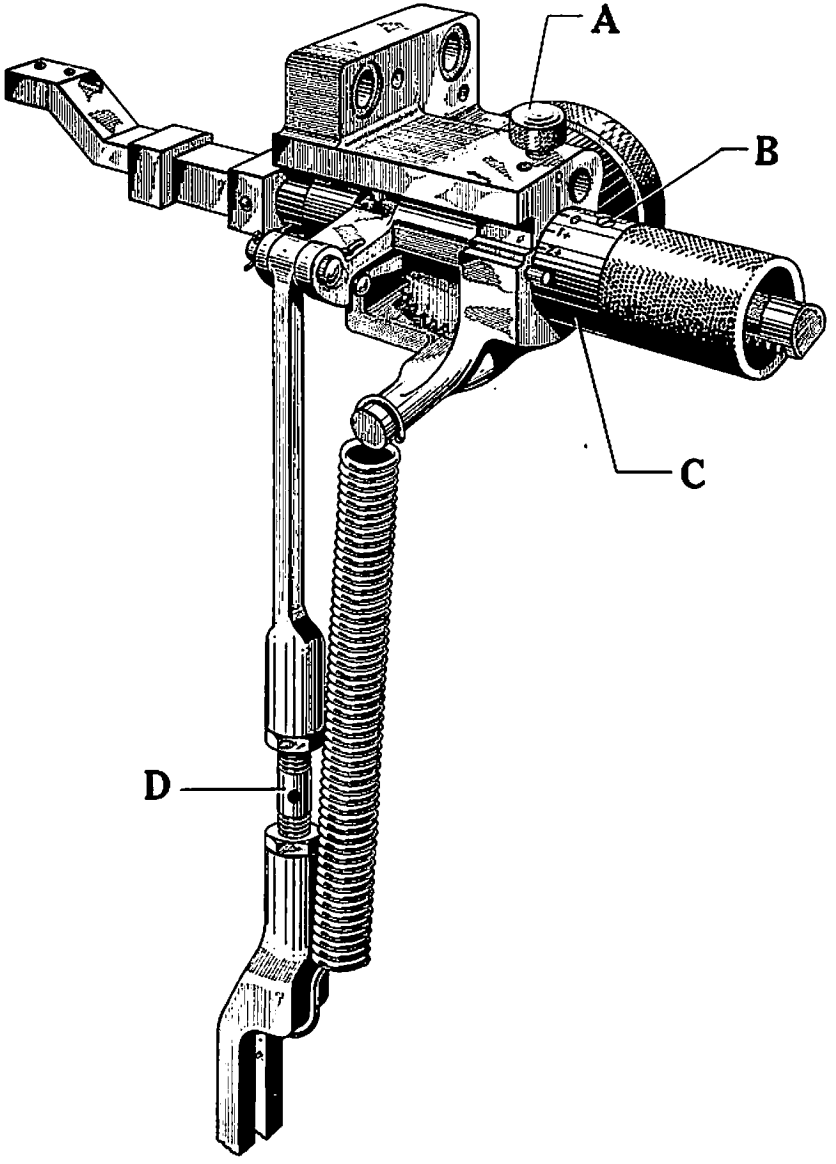

Fig. 103. The Vise Closing Attachment used with the quadding and centering device not only closes and opens the left-hand vise jaw but also operates auxiliary mechanism inside the vise frame. The position of the type with respect to the extreme left end of the slug body is adjusted by means of the large knurled knob. The knob also provides odd vise jaw settings from minus 2 to plus 3 points.

Centering Adjustment. The adjustment for centering, as mentioned previously, is made by adjusting the left vise jaw rack *12*, Fig. 102, with respect to the left vise jaw 2. The adjusting screw *37* is held in the left vise jaw block by two collars. When the screw is turned, the threaded end of the screw causes rack *12* to move to the left or to the right. In adjusting the screw for centering, place a 30-em mold in operating position, set the vise jaw em scale on 30 ems, set lever *4* at center position and place the line spread indicator *36* on 0. Lock the spaceband lever pawl latch, assemble one vertical rule matrix and send it in to the casting mechanism. If two slugs are cast and placed back to back, the position of the two rules with respect to each other will indicate the error from center. If the centering adjustment is made properly, the two rules will coincide exactly. To readjust the centering adjusting screw, place lever *4* on flush left position and move the left vise jaw *2* against the right vise jaw *3*. When the left vise jaw is in this position, set screw *38* is directly under a hole drilled in the top of the vise cap to the right of the first-elevator vise automatic stop. The set screw can be loosened with a small screwdriver. The adjusting screw *37* can be reached with a screwdriver inserted under the slot in the vise cap cover plate *39* fastened to the right end of the vise cap. If a light is held on the inside of the vise frame directly in front of the two jaws and the left vise jaw is moved back until the head of the centering adjusting screw is under the hole in the top of the vise cap, it will be easier to see whether the screwdriver is in the slot of the screw. Turning the adjusting screw clockwise moves the center line further to the left. Tighten set screw *38* after each adjustment, push the left vise jaw all the way back to the left against its stop, set lever *4* on center and cast two slugs to observe the position of the rules, as previously described. When the rules coincide, the centering adjustment is correct and the set screw should be tightened securely.

Vise Jaw Automatic Adjustable Release Latch. When the first elevator is descending to the vise cap with the matrix line, the operating lever *25*, Fig. 102, pulls downward on spring *24*. This action builds up tension on lever *16* and rack *1*, but the parts do not move at this time because latch *31* is resting in front of stop *32* on rack *1*. Just before the first elevator seats on the vise cap, however, the first-elevator jaw banks on lever *33*, raising latch *31* from in front of stop *32* and permitting lever *16* to pull rack *1* to the left through action of spring *24*.

The arrangement of the release device is shown clearly in Fig. 104. To set the device, place the first-elevator alignment stop bar in *normal* position and turn the machine forward by hand until the first elevator seats on the vise cap and before the mold disk moves forward. Lift the first elevator and place a .093" feeler gauge on the stop bar where the adjustable screw in the first-elevator head banks. With the elevator resting on the gauge, loosen fulcrum block screw *B*, Fig. 104, move block *A* slowly to the left or to the right until the latch just releases the right vise jaw rack, then tighten screw *B*.The purpose in releasing the rack before the first elevator has made its complete downstroke is to produce a wiping action between the vise jaws and the two end matrices in the line. The downward movement of the matrices against the vise jaws prevents metal from building up on the jaws. No further adjustments are necessary on the device. When the alignment stop bar is moved to the *headletter* (H. L.) and *high* align-

ment positions, a pivot block, working in a slot in the fulcrum block, automatically raises the release lever to the proper height, as shown.

Vise Jaw Rack Release Stop. The latest rack release stops *C*, Fig. 104, have been changed to facilitate adjustment. After the right-hand vise jaw has been set so that the type line is flush with the end of the slug body, the stop *C* should be adjusted so that the release latch disengages freely. Before placing the vise jaw rack in the machine, tighten the release stop screws just enough to hold the stop firmly on the rack but with sufficient freedom to permit the stop to move lengthwise when the adjusting screw *D* is turned. The adjusting screw can be reached through the right end of the vise cap after the rack is replaced. When the release latch is in normal position in front of stop *C*, there should be from .005″ to .010″ clearance between the right-hand vise jaw and its stop screw. When the adjustment is completed, remove the vise jaw rack from the machine and tighten the release stop screws securely. If there is excessive clearance between the right-hand

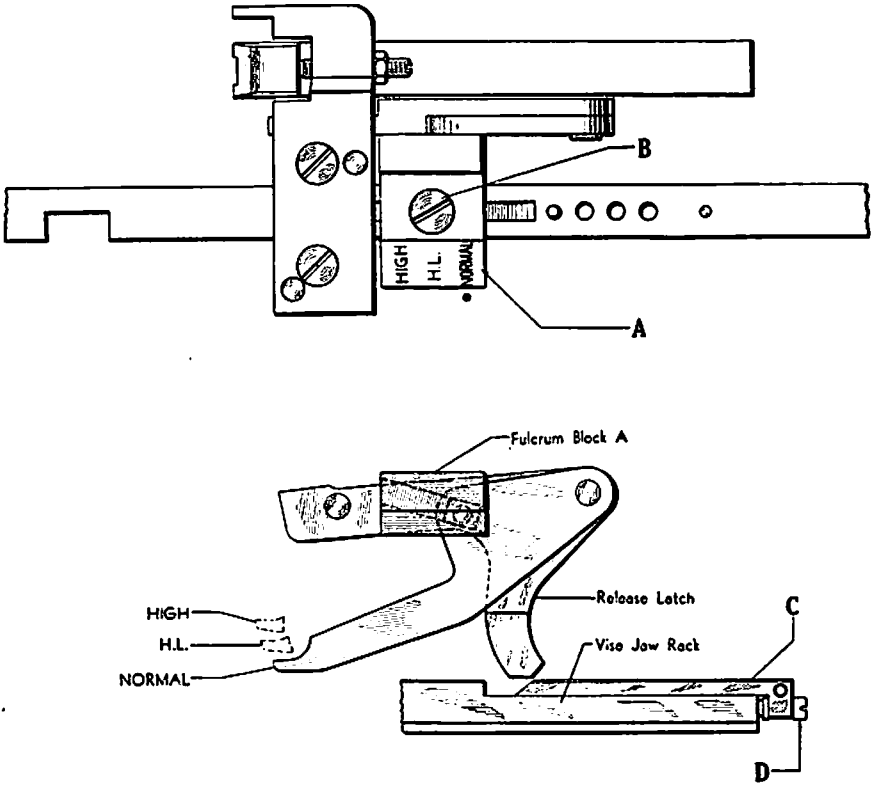

Fig. 104. The Vise Jaw Automatic Adjustable Release is operated when the first elevator descends to the vise cap. The release determines the precise moment when the right-hand vise jaw rack makes its operating stroke and closes the vise jaws against the matrix line. The release is adjusted by means of the fulcrum block *A*, which automatically sets the release to the various positions of the first-elevator alignment stop bar for headletter and high alignment work.