The second upward movement of the justification block is controlled by the justification lever and the vise closing lever, which lift the vise justification block on both sides. The position of the block during second justification, as stated previously, is regulated by screw *10*, Fig. 54, which passes through a beveled notch in the upper end of brace *9*. The screw permits the justification block to rise just high enough to assume a horizontal position. After the matrix line has been aligned vertically and facewise, the vise closing lever *12* rises, permitting screw *20* to close the left-hand vise jaw *3*. The lever continues its upward movement and raises the right end of the justification block *4* until the block assumes a horizontal position, as permitted by screw *10*. Then the justification lever *11* and the vise closing lever *12* rise together, raising the justification block on a horizontal plane as shown in Fig. 58.

The force of the second justification stroke is exerted against the spaceband at the extreme right of the line first and then successively against the others. If the matrix line has been left fairly loose after first justification, the spacebands will be driven up a uniform distance at the end of the second justification stroke. In some instances, however, the length of the matrix line is so close to the measure being set that the line is practically justified after the first justification stroke. The force of the second justification stroke in these cases will be exerted against only one or two of the spacebands at the right of the line. It is important to note, however, that the position of the justification block during its second upward movement is horizontal. The block does not begin to rise until the vise closing lever has raised the low end of the block level with the high end.

The purpose of the vise closing attachment, as stated previously, is to open and close the left-hand vise jaw during justification and after the cast. The movement of the jaw in relation to the matrix line is highly important. Between first and second justification, a slight amount of freedom between the vise jaws and the matrix line is necessary so that the matrices can be aligned vertically

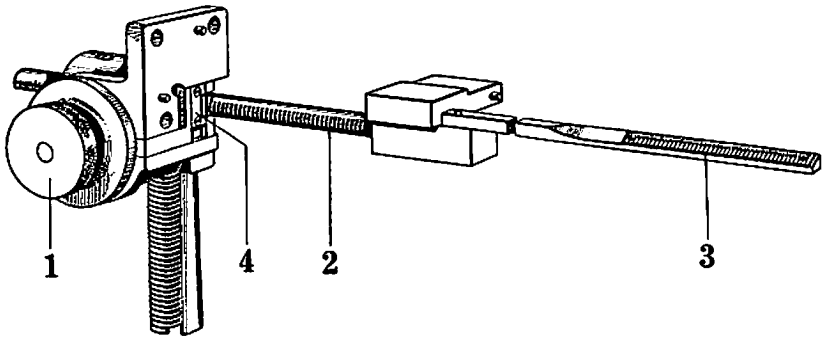

Fig. 59. The Vise Adjusting Mechanism. The distance between the vise jaws is set by pulling out the vise adjusting knob *1*, and turning the knob in the desired direction. The knob is connected with a pinion *7*, Fig. 58, which meshes with notches in rack *2* (this figure). As the knob is turned, the position of the left vise jaw is changed and the measure is indicated by scale *3*, which registers with a banking plate at the right of the vise cap. When the knob is released, a compression spring causes detent *4* to enter the proper notches in rack *2*, locking the setting of the left-hand jaw.

and facewise. Similarly, after the cast the sidewise pressure of the vise jaws against the matrix line must be released so that the first elevator can lift the line from between the jaws without friction. Besides performing these functions, the vise closing attachment also closes the left-hand vise jaw to the exact length of line to be cast. After the first elevator has positioned the matrix line between the vise jaws and the mold disk has moved forward to within .010″ of the line, the vise closing lever rises, permitting the vise closing screw to close the left-hand vise jaw. The vise closing screw *4* is shown in this position in Fig. 56. Immediately following the closing of the jaw, the line is justified for the first time. The justification lever is then depressed by its cam and the vise justification block *3*, Fig. 57, is lowered. At this time the vise closing screw *4* is opened by the vise closing lever and rod, permitting the left-hand vise jaw *2* to withdraw slightly from the matrix line. This provides sufficient freedom so that the matrices can be aligned vertically and facewise in relation to the mold. Directly following facewise alignment, the vise closing lever rises, permitting the vise closing screw *4*, Fig. 58, to close the left-hand vise jaw *2*. Second justification then takes place, the justification block *3* rising on a horizontal plane. After the slug has been cast and just before the first elevator begins to raise the matrix line from between the vise jaws, the vise closing lever descends, permitting the left-hand vise jaw to move away slightly from the matrix line. This movement enables the first elevator to lift line freely from between the vise jaws.

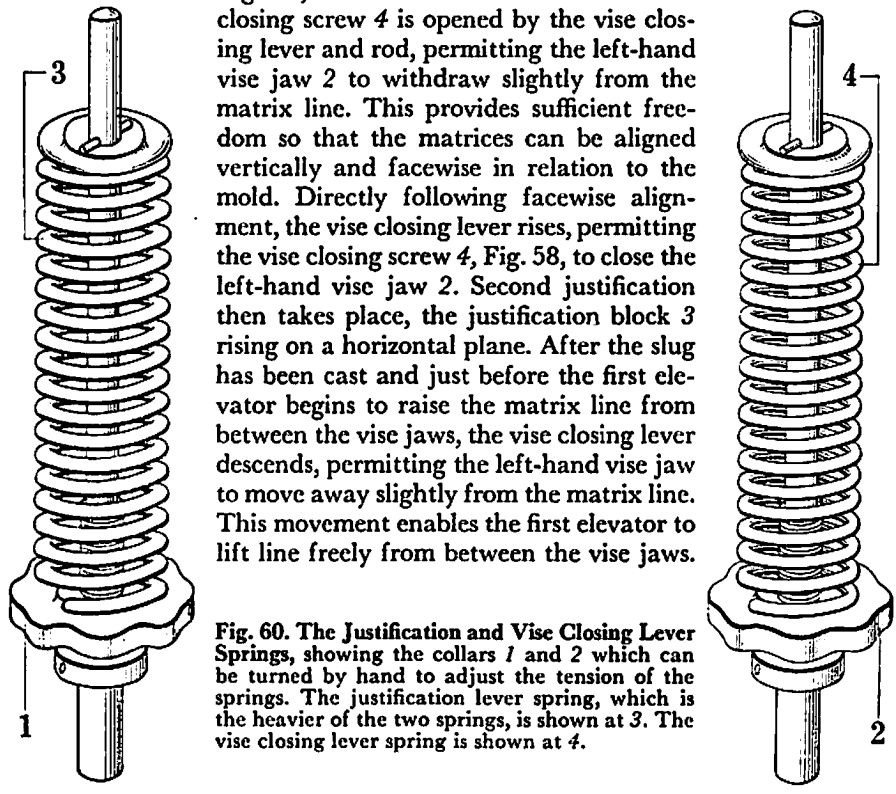

Fig. 60. The Justification and Vise Closing Lever Springs, showing the collars *1* and *2* which can be turned by hand to adjust the tension of the springs. The justification lever spring, which is the heavier of the two springs, is shown at *3*. The vise closing lever spring is shown at *4*.

Adjustment of Vise Jaws. The vise jaws should be adjusted so that the type line will be flush at each end with the body of the slug. Each jaw is separately adjustable. The right-hand jaw *1*, Fig. 58, is adjusted by means of screw *5* and the left-hand jaw *2* by means of screw *6*. To adjust the jaws, place a 30-em mold in operating position and set the vise jaw em scale and the assembler slide scale on 30 ems. Lock the spaceband lever pawl latch, assemble a line of matrices and spacebands and send the line over to the casting mechanism. Cast a slug after each adjustment of the jaws to observe the position of the type line in relation to the ends of the slug. The right-hand or constant jaw should be adjusted first.

Justification Springs. The justification springs can be adjusted for tension by means of adjusting collars *1* and *2*, Fig. 60. The collars can be turned by hand to secure more or less tension on the springs. When the springs have been adjusted to suit the average range of work done on the machine, readjustment will rarely be necessary. In general, a long matrix line containing seven or eight spacebands should be spread out fully between the vise jaws at the end of the first justification stroke. Stop the machine at this point, grasp a spaceband at each end of the line and try to pull them upward. If they cannot be moved easily, the spring tension may be regarded as correct.

To remove the justification or the vise closing spring, insert a rod in the hole in the bottom of the sleeve and through the spring rod. It may be necessary to turn the collars on the springs and to depress the levers in order to align the holes in the sleeves with the holes in the rods. Turn the machine forward until the cam rolls on the levers are directly under the deepest depressions in the cams. The levers can then be raised and the assembled springs and rods can be lifted from the machine. Be careful not to transpose the springs when replacing them, because matrix lines will not be justified properly. The heavier spring belongs under the justification lever *11*, Fig. 54. The vise closing spring is made from the lighter wire.

Maintenance. The parts of the justification and vise closing mechanism should be cleaned and lubricated regularly in order to keep them working freely. The face of the vise jaws should be cleaned each day to remove any small metal or oxide adhesions. The vise justification rods *5* and *6*, Fig. 54, should be cleaned with gasoline when dirt and gum begin to accumulate. A light film of oil on the rods is beneficial. There are four oil holes in the justification and vise closing levers which should be oiled weekly. Two of the holes provide oil for the justification and vise closing lever shaft *13*, Fig. 54, and the other two lubricate the top of the rods in springs *14* and *15*. Oil holes are provided for the cam rolls *16* and *18* and for the vise closing screw *20*. These parts should be oiled weekly. The surfaces of the justification cam *17* and the vise closing cam *19* should be kept clean at all times. Spacebands should be polished with dry graphite every eight hour run. It is essential that the wedges of the spacebands operate freely in the spaceband sleeves in order to obtain smooth and uniform justification.

The Pump Stop

The purpose of the pump stop is to prevent the pot pump plunger from making its casting stroke when the matrix line is too short to justify or when the space between the vise jaws is not completely filled. The pump stop consists mainly of the pump stop lever *1*, Fig. 61, which is moved under a block *2* fastened to the pot pump lever *3*. The pump stop lever *1* is pivoted on a stud *4*. The beveled end of the lever rests directly above a collar *5* fastened to the operating rod *6*. The lower end of the operating rod is inserted in a slot in the justification lever *8*. In the normal operation of the machine, the justification lever raises the justification block *9* until the matrix line is spread out tightly between the vise jaws by the spacebands. The friction of the spacebands then stops the upward movement of the justification block *9* and the justification lever *8*. Since the jus-

tification lever does not make a full upstroke when the line is properly justified, the lever does not contact the collar *7* on rod *6*. Under these circumstances, lever *1* is not operated and the pot pump lever *3* is permitted to depress the plunger for the cast.

When the matrix line does not contain enough spacebands to justify it completely, however, the justification lever *8* makes a full upstroke. The lever contacts collar *7* on rod *6*, raising the upper collar *5* against the beveled end of lever *1*. The opposite end of the lever moves under block *2* and prevents the pot pump lever *3* from descending while the depression in the pot pump cam is passing under roll *10*. When the justification lever *8* descends, collar *5* lowers out of engagement with lever *1* and spring *11* returns the lever to normal position. At the

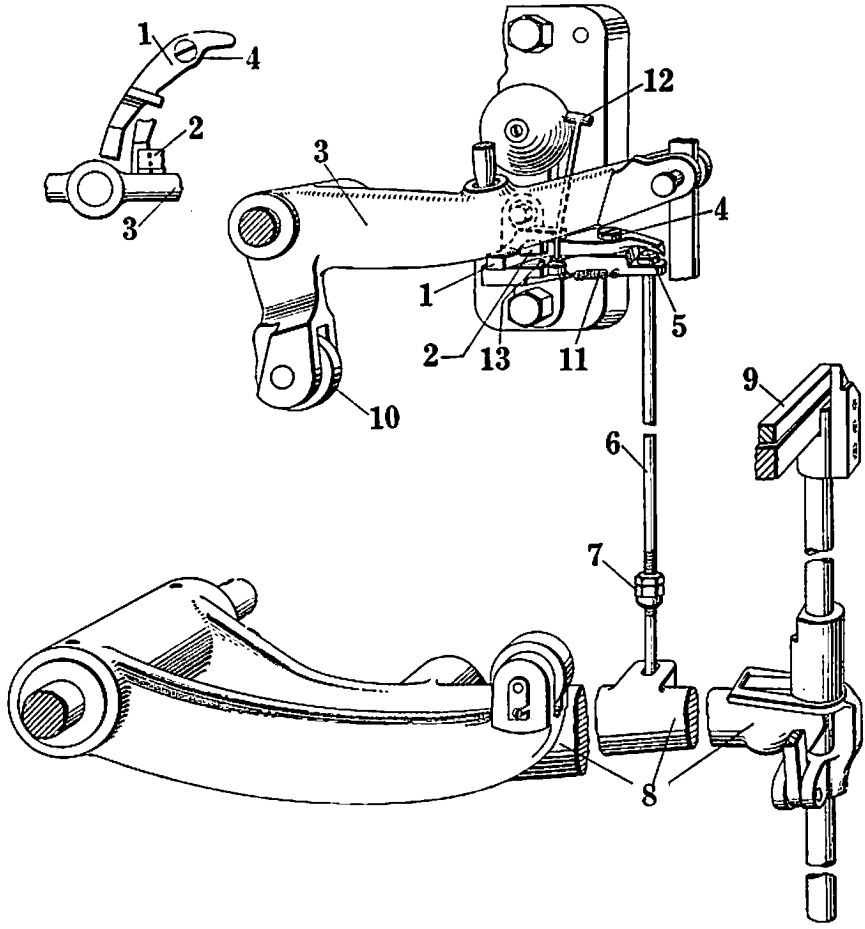

Fig. 61. Perspective View of the Intertype Pump Stop. This device prevents the pot pump lever *3* from making a casting stroke when the matrix line is too short to justify or when the space between the vise jaws is not completely filled. The operation of the device is controlled by the upstroke of the justification lever *8*. The height to which the lever rises determines whether lever *1* will be moved under block *2*.

same time, hammer *12* strikes the bell, informing the operator that the machine has not cast.

Adjustment of Pump Stop. To check the adjustment of the pump stop, disconnect the pot pump plunger, open the vise jaws and turn the machine forward until the justification lever *8*, Fig. 61, makes its second upward stroke. Stop the machine and observe the position of stop lever *1*. The lever should be positioned under block *2* within 1/32″ of the stop pin *13*. The lever should not touch the pin. Turn collar *7* until this adjustment is obtained, then tighten the check nut against the collar.

Blank Line Justification Wedge

The purpose of the blank line justification wedge is to render the pump stop inoperative so that blank slugs can be cast in the mold. The wedge *1*, Fig. 62, is fastened to a collar on the first vise justification rod *4*. In the left-hand vise jaw

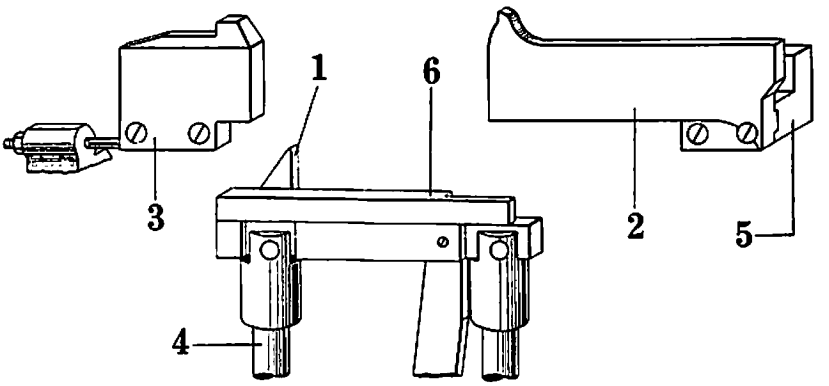

Fig. 62. The Blank Line Justification Wedge, which locks the vise jaws tightly together when blank slugs are being cast. The wedge also obstructs the upstroke of the justification lever sufficiently to render the pump stop inoperative.

block *5* there is a square opening (not shown) which has a beveled edge corresponding to the angle of the wedge. The opening registers with the wedge during justification if the left-hand vise jaw *2* is in contact with the right-hand jaw *3*. When the justification block *6* rises, the wedge enters the opening in the left-hand vise jaw block, holding the vise jaws tightly together. At the same time, the wedge restricts the upstroke of the justification lever sufficiently to render the pump stop inoperative. Any desired number of blank slugs can be cast, therefore, simply by sliding the left-hand vise jaw against the right-hand jaw and holding out the starting and stopping lever.

Vise Jaw Manual Closing Attachment

The latest right-hand vise jaws are equipped with a manual closing attachment, which makes it possible to cast lines of matrices without spacebands or lines of matrices and spacebands which ordinarily would be too loose to cast. The attachment consists principally of a slide *3*, Fig. 63, which operates in a slot

in the right-hand vise jaw block *2*. Knob *4* is pinned to slide *3* and projects at the right side of the vise cap. When the knob is pushed in as far as it will go, spring *5* compresses and holds the right-hand vise jaw *1* firmly against the matrix line. At the same time, slide *3* is moved in far enough to engage the justification wedge *6* when it rises during first and second justification. The pump stop, as described previously, is operated when the justification lever makes a complete upstroke. Since slide *3* engages wedge *6*, however, the vise justification mechanism and the

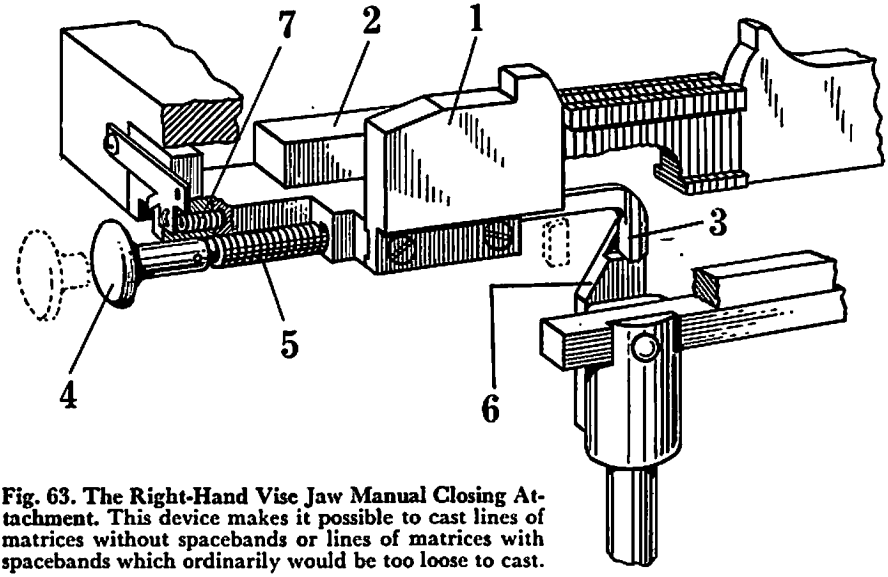

Fig. 63. The Right-Hand Vise Jaw Manual Closing Attachment. This device makes it possible to cast lines of matrices without spacebands or lines of matrices with spacebands which ordinarily would be too loose to cast.

justification lever are prevented from rising all the way. Consequently, the pump stop is not operated and the line is cast. When the pressure on knob *4* is released, spring *5* retracts slide *3* and spring *7* returns the right-hand vise jaw *1* to normal position.

The movement of the right-hand vise jaw *1* is limited by the vise locking screw, which passes through the slot in the vise jaw block 2. The maximum inward movement of the jaw is 1½ ems. *When casting lines of matrices without spacebands, therefore, the assembled lines must be set within one em of the measure indicated on the assembler slide scale.* If this provision is observed, the lines will be of the proper length to cast. When casting lines of matrices with spacebands, the assembled lines should likewise be set within one em of the measure indicated on the assembler slide scale. Also, when using the attachment, knob *4* should not be pushed in until the first elevator has descended to the vise cap. There are no adjustments to be made on the device.

The Metal Pot

The metal pot consists basically of three parts: the pot jacket, the pot crucible and the pot jacket cover. The pot jacket *1*, Fig. 64, is a square-shaped casting

which is open at the top and the bottom until fully assembled. Extending downward and forming part of the jacket casting are two legs, which support and pivot the assembled pot on the vise frame shaft. At the base of each leg there are four adjusting screws, by means of which the pot mouthpiece is aligned accurately with the mold. The pot crucible *2* is supported within the pot jacket by three lugs. The crucible contains the molten type metal from which the slugs are cast. The space between the pot jacket and the crucible is filled with asbestos packing, which is paste-like in composition when it is first applied but which later becomes hard. The purpose of the packing is to keep the heat concentrated around the crucible. The pot jacket cover *3* is fastened to the top of the jacket with four screws. The cover is equipped with a small lid through which pigs of type metal can be fed into the crucible. The pot lever *4* is pivoted at its upper end on a shaft which passes through lugs on the pot jacket casting. The lever is connected to the jacket at its lower end by an adjustable eyebolt and a compression spring *5*. The spring provides pressure when the pot is moved forward against the back of the mold. The pot cam roll *6* follows the contour of the pot cam *7*, which promotes the forward movements of the pot.

In the pot crucible there is a circular well leading to an opening in the throat

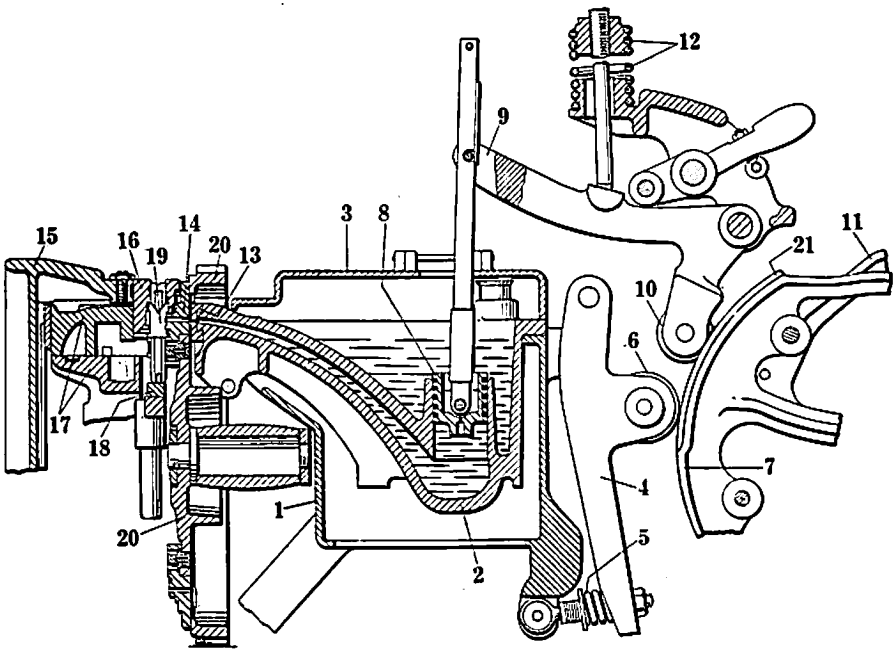

Fig. 64. Sectional View of the Main Parts of the Casting Mechanism in position preparatory to the casting of the slug. *14* **Mold;** *15* **First elevator;** *16* **First-elevator jaw; 17 Vise cap; 18 Vise Justification block;** *19* **Line of matrices and spacebands;** *20* **Mold disk. The line of matrices and spacebands** *19* **has been justified and aligned in relation to the mold** *14*. **The metal pot has been moved forward by the long pot cam shoe** *21*, **locking the mouthpiece** *13* **tightly against the back of the mold** *14*. **As the cams continue to revolve, roll** *10* **will drop into a depression in the pot pump cam** *11*. **Plunger** *8* **will then descend and force molten metal into the mold against the line of matrices, thereby forming the slug.**

of the crucible casting. The pot pump plunger *8* is inserted in the well and is fastened by a pin to the pot pump lever *9*. At the proper time in the revolution of the machine, the pot pump cam roll *10* drops into a depression in the pot pump cam *11*, permitting spring *12* to depress lever *9* and plunger *8*. The plunger then forces molten metal upward in the throat of the crucible through openings in the mouthpiece *13* into the mold *14*.

Detail views of the pot crucible, the mouthpiece and the plunger are shown in Fig. 65. The crucible *1* and the plunger at the right of the illustration are shown partly in cross-section. The lower part of the plunger *2* has been broken away to show one of the intake holes *3* in the crucible well. There are two of these holes in the well, each hole directly opposite the other. The purpose of the intake holes is to permit a fresh supply of type metal to flow into the well and

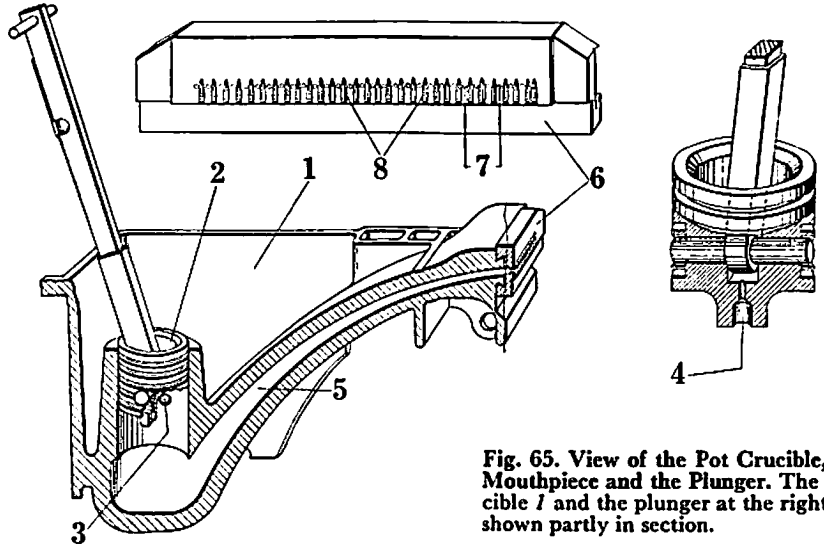

Fig. 65. View of the Pot Crucible, the Mouthpiece and the Plunger. The crucible *1* and the plunger at the right are shown partly in section.

under the plunger after each cast. The bottom of the plunger rests just above the holes when the machine is in normal position. When the pot moves forward in preparation for the cast the plunger covers the intake holes, thus preventing the metal from escaping when the plunger descends in the well. A small hole *4* is drilled in the base of the plunger to permit a slight amount of type metal to escape when the plunger makes its downstroke. This hole relieves the pressure under the plunger after the mold has been filled and permits the plunger to make an overstroke. The purpose of this action is to prevent the formation of incrustations in the crucible well when short slugs are being cast for an extended length of time. The throat of the crucible is shown at *5*. The molten metal is driven upwards through the throat and out of the mouthpiece *6*. The mouthpiece is fastened at the front of the crucible casting. Small holes or jets *7* are drilled through the mouthpiece for the passage of the type metal. The vents *8* are milled in the mouthpiece between the jets. The purpose of the vents is to

allow the air to escape when the molten metal is forced into the mold. While a certain amount of the air escapes between the matrices, some of it is forced back toward the base of the slug. The vents allow the air to escape and a small amount of type metal with it. The metal forms sprues on the base of the slug, which are trimmed off by the back knife.

The Metal Pot and Related Mechanisms

The metal pot *1*, Fig. 66, is supported and pivoted at the front on the pot legs *2*, which form part of the jacket casting. Adjusting screws *3*, passing through the bottom of the legs, bank against the pot leg bushings *4*, which are mounted on

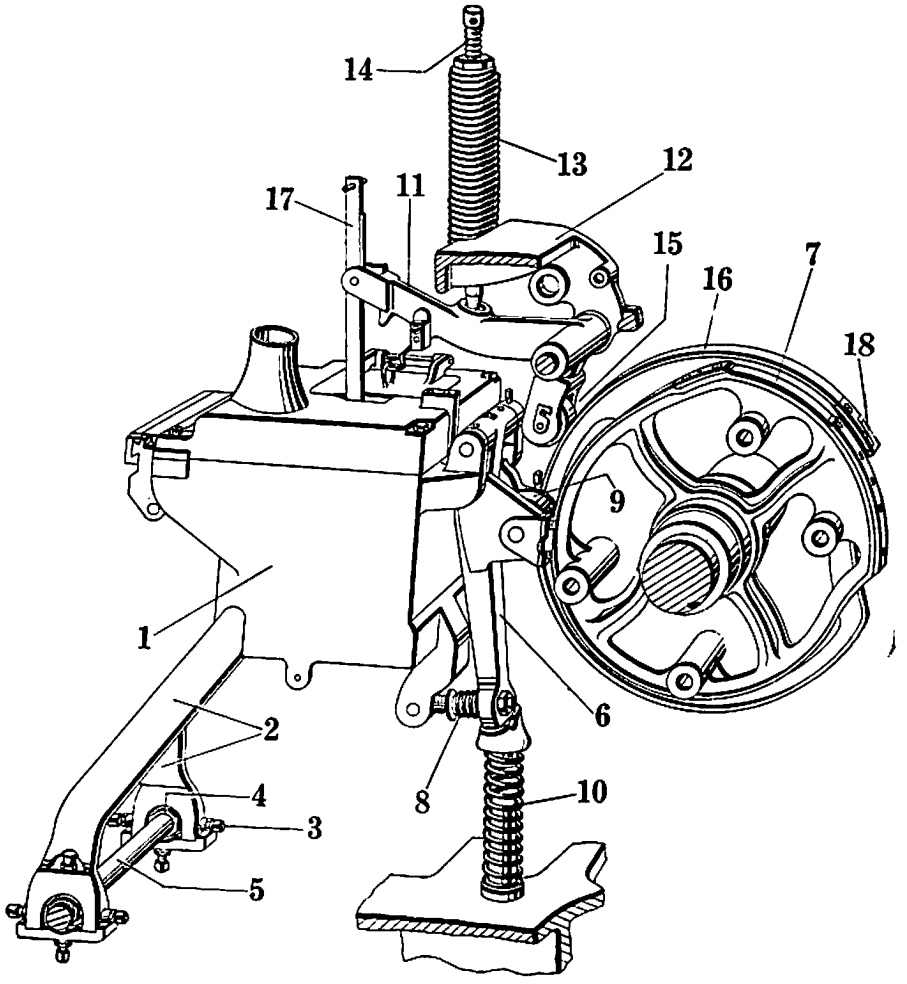

Fig. 66. Perspective View of the Metal Pot, the Pot Pump Mechanism and Related Parts in Assembly

the vise frame shaft *5*. This shaft is inserted in bearings in the machine base and serves also as a support for the vise frame. The pot lever *6* is interposed between the metal pot and the pot cam *7*. The lever is pivoted at its upper end on a shaft passing through lugs on the pot jacket casting. The lever is connected to the jacket at its lower end by an eyebolt and a compression spring *8*. When cam *7* moves the pot mouthpiece forward against the back of the mold through roll *9* on the pot lever, the forward pressure exerted on the pot is applied through spring *8*. The spring imparts a yielding pressure during the lock-up and also permits sufficient overmotion in case the full forward movement of the pot is obstructed. The pot balancing spring *10* relieves the pot cam of part of the weight of the pot.

The pot pump mechanism controls the movements of the pot pump plunger. The pot pump lever *11*, Fig. 66, is pivoted on a shaft in the pot pump bracket *12*. The pot pump spring *13*, mounted on the bracket, continually exerts a downward pressure on lever *11* through spring rod *14*. The pot pump cam roll *15*, which rides on the pot pump cam *16*, controls the upward and downward movements of lever *11*. The pot pump plunger rod *17* is fastened to lever *11* by a pin and follows the upward and downward movements of the lever. The plunger, as previously described, rests in the crucible well and forces the molten metal into the mold when the pot pump lever *11* descends.

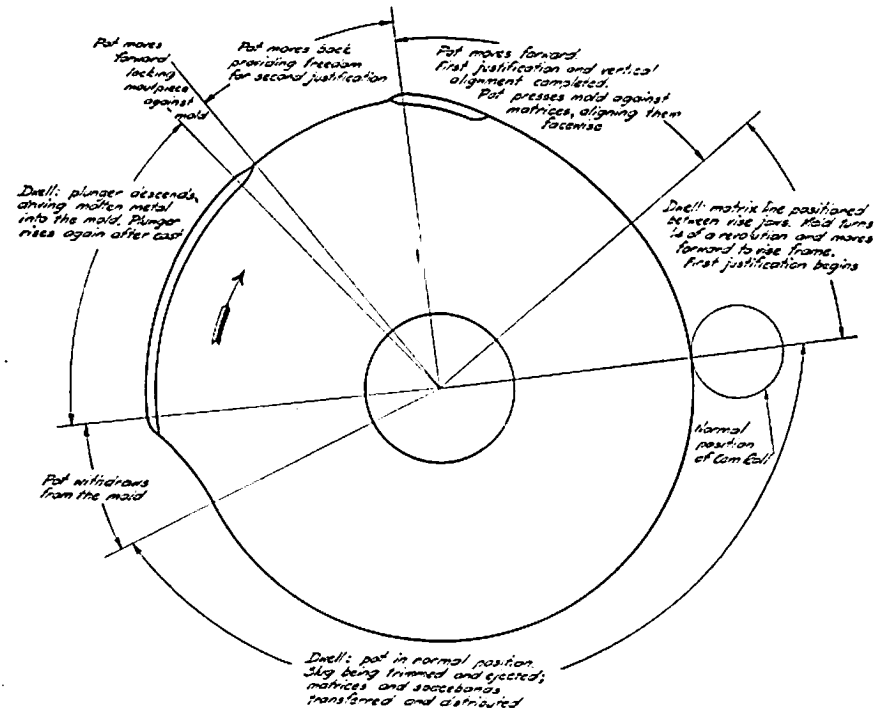

Fig. 66a. The Pot Cam, showing the surfaces of the cam which promote the main movements of the metal pot

Movements of Metal Pot and Pot Pump Plunger

The metal pot, through its connection with the pot cam, makes four movements during one revolution of the cams. After first justification has taken place and the matrix line has been aligned vertically, the metal pot advances and pushes the mold against the matrix line, aligning the matrices facewise in relation to the mold. The pot and the mold disk then recede, providing freedom for second justification of the matrix line. The mold advances against the aligned and justified matrix line and then the pot locks against the back of the mold. The pot pump cam roll drops into a depression in the pot pump cam, causing the plunger to descend in the crucible well. Molten metal is thereby forced into the mold against the line of matrices and spacebands. The plunger rises and the pot withdraws from the back of the mold to normal position. A quick-drop latch *18*, Fig. 66, is applied to the pot pump cam *16* just in front of the casting depression in the cam. The latch can be unhooked from its pawl in order to provide a sudden drop for the pot pump lever. The plunger makes its casting stroke quickly when the latch is in use, forcing the molten metal into the mold with greater pressure. The quick-drop latch is used chiefly to cast large display type, when it is desirable to obtain a quick flow of type metal into mold under more pressure.

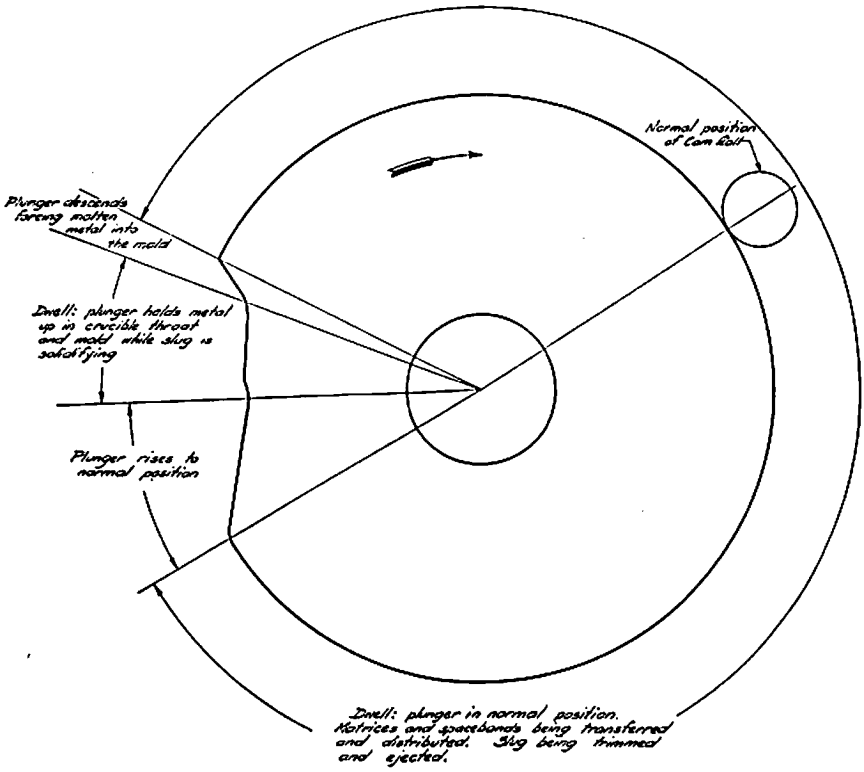

Fig. 66b. The Pot Pump Cam, showing the surfaces of the cam which promote the main movements of the pot pump mechanism

The Lock-Up

The relationship between the pot crucible mouthpiece and the mold is one of the most important settings on the machine. Proper operation of the machine depends, to a great extent, upon the condition of the lock-up. Each time the mouthpiece locks against the back of the mold, it should meet the mold squarely and in the correct relationship for height. The parts of the casting mechanism which are involved in the lock-up are accurately manufactured and are set correctly when the machine is assembled. The first-elevator jaw, the mold and the mouthpiece are in the proper positions, but improper use or faulty maintenance of these parts may disturb their relationship. The vise cap supports these mechanisms at casting position and provides a positive bearing surface for the lock-up. As a general rule, the vise cap, the first-elevator jaw and the mold may be regarded as positive factors in the lock-up. Usually, it is necessary only to adjust the metal pot so that the mouthpiece will be square in relation to the mold or to stone the mouthpiece in order to restore it to its original true surface.

Adjusting the Lock-Up. The relationship between the pot crucible mouthpiece and the mold is controlled by four adjusting screws at the bottom of each pot leg *5*, Fig. 67. The screws pass through the legs and bank against the pot leg bushings *6*, which are mounted on the vise frame shaft *7*. The mouthpiece can be adjusted in two directions by means of these screws. The upper screw *1* in each pot leg raises or lowers the mouthpiece with respect to the mold. The front and back screws *2* and *3* in each leg, position either end of the mouthpiece closer to or further away from the mold and are used to obtain a square relationship between the parts.

The mouthpiece is adjusted for height by means of the upper screw *1* in each pot leg. Disconnect the pot pump plunger and turn the machine forward until the first elevator descends to the vise cap and before the mold disk moves forward. Remove the mold cap and liners from the mold in casting position and close the vise frame. Pull the mold disk forward until the mold disk locking studs enter the stud block bushings on the vise frame, then push the disk back. Be careful not to turn the disk while pushing it back—the object in pulling it forward is to place the mold in the position it would assume when the pot locks up against it. Next, pull the pot forward by hand until the mouthpiece is almost in contact with the mold body and place a block of suitable size between the pot jacket casting and the pot pump cam roll to hold the pot forward.

Open the vise frame and observe the relationship between the mold body and the jets or holes in the mouthpiece. The lower edge of all the jets should be slightly above the mold body. Loosen the lock nuts on screws *1* and *4*, Fig. 67. Turning screw *1* in will raise the mouthpiece and backing the screw off will have the opposite effect. If the pot is to be raised, screw *4* must be backed off first. After the adjustment is obtained, turn in screw *4* until it banks against bushing *6* and tighten the lock nuts. Replace the liners and the mold cap and cast a few slugs. The position of the mouthpiece jets can be verified by the circular marks on the base of the slug. The jet marks should show full on the slug with about .005″ space between the edge of the marks and the smooth side of the slug. *The*

adjusting screws should not be jammed against the bushings—they need only be turned until the play between the parts is taken up.

To determine whether the mouthpiece is square with respect to the mold, disconnect the pot pump plunger and run the machine ahead until the first elevator seats on the vise cap. Open the vise frame to second position, depress the mold cam lever handle, disconnect and remove the ejector lever link and pull the mold disk and slide forward until the disk is out of engagement with the mold disk pinion. Clean the back of the mold and the mouthpiece thoroughly. If there are any metal adhesions on the parts, scrape them off with a brass rule

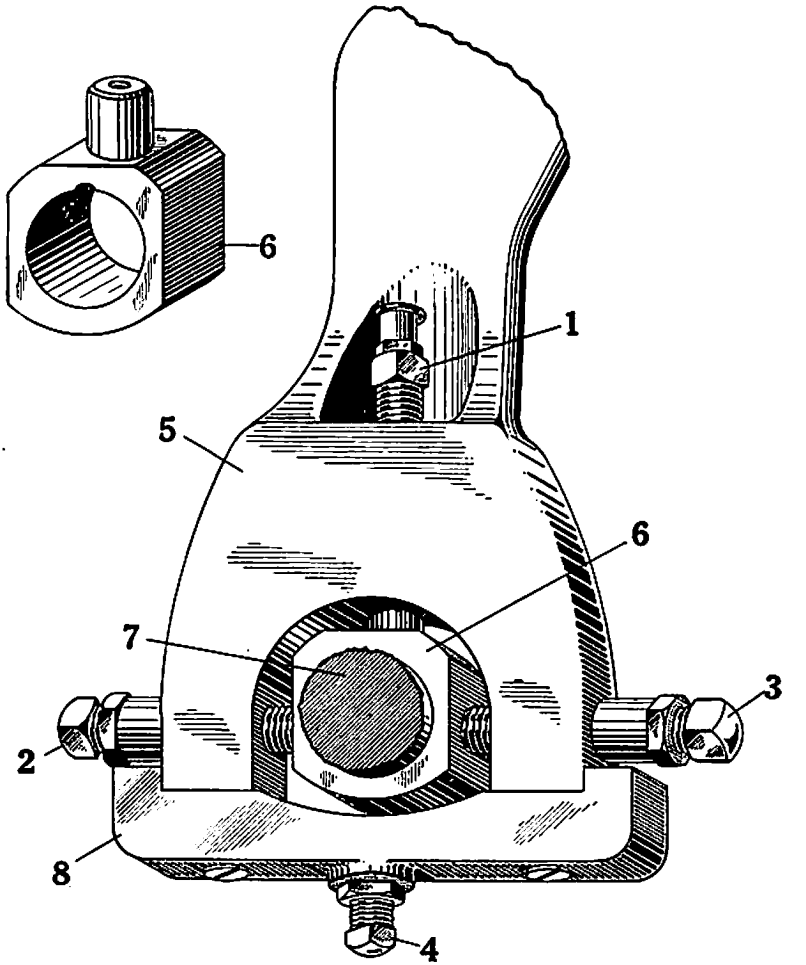

Fig. 67. Showing the Pot Leg Adjusting Screws, by means of which the mouthpiece is aligned with the mold. This view also shows the oil cup applied to the upper adjusting screw *1*. A hole drilled through the screw conducts the oil to a hole in the shank of bushing *6*. A groove is machined in the bushing to distribute the oil, thereby insuring lubrication for the entire bearing surface of the bushing.

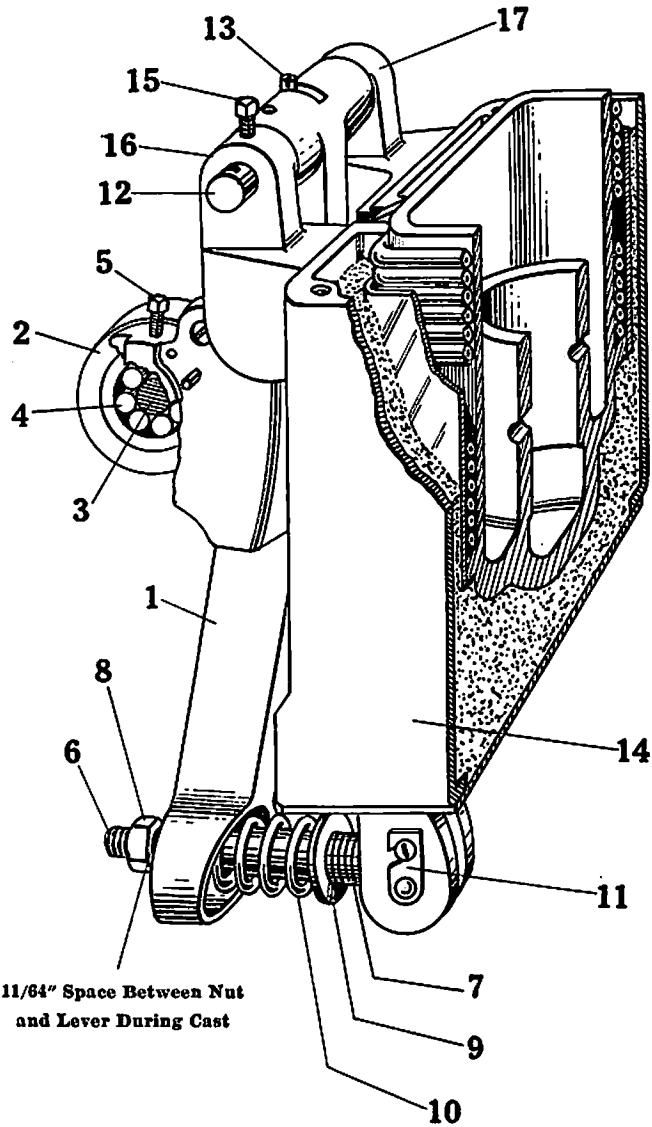

Fig. 68. View of the Pot Lever, showing its relation to the pot jacket. The lever *1* is pivoted at the top on a shaft *12* passing through lugs *16* and *17* on the pot jacket casting *14*. The lever is connected to the pot jacket at its lower end by an eyebolt *6* and a compression spring *10*. When the pot cam moves the pot forward and locks the mouthpiece against the mold, a yielding pressure is applied through spring *10*.

and go over the surfaces with a clean cloth. Apply a thin coat of red lead or Prussian blue to the back of the mold with a small wad of cloth. Push the mold disk back into engagement with the pinion, making sure that they are properly timed. Lock the vise frame, then pull the mold disk forward until the mold disk locking studs enter the stud block bushings. Turn the machine forward by hand until the pot cam roll is on the short pot cam shoe. Turn the machine forward and back it a few times so that the cam roll will pass back and forth over the shoe, then back the machine until the pot leaves the mold. Open the vise frame, pull the mold disk and slide forward and observe the impression on the mouthpiece and on the back of the mold. If the red lead is distributed in spots along the entire length of the mouthpiece, it is an indication that the mouthpiece needs to be trued with an Arkansas stone. A film of light machine oil should be applied to the stone before using it. If the mouthpiece shows an impression at one end only, the front and back pot leg adjusting screws probably require adjustment.

Either end of the mouthpiece can be moved closer to or further away from the mold by means of screws *2* and *3,* Fig. 67, in each pot leg. If the left side of the mouthpiece is to be moved closer to the mold, the left pot leg should be moved forward by backing off the rear screw *3* and turning in the front screw *2* an equal amount. The screws should be adjusted by not more than half a turn each time. Tighten the lock nuts after each adjustment to prevent the screws from working loose. The effect of each adjustment can be observed by taking a red lead impression of the lock-up as previously described. If the lock-up produces a red lead impression along the entire length of the mouthpiece at the top or the bottom only, it is an indication that the mouthpiece and the mold are parallel but that the full front surface of the mouthpiece is not perfectly flush with the mold during the lock-up. The mouthpiece can be brought flush with the mold by turning both front or back pot leg adjusting screws an equal amount. Turning in the front screws will bring the bottom of the mouthpiece closer to the mold. Turning in the back screws will bring the top of the mouthpiece closer to the mold. Before turning in either pair of screws, the opposite pair must be backed off first and at the end of the adjustment, all of the screws must be banking *lightly* against the bushings so that there is no play between the parts. When the adjustment is completed, the mouthpiece should show a full impression along the entire length of its raised surface. If this result cannot be obtained completely by means of the adjusting screws, it is an indication that the surface of the mouthpiece is not true. This condition can be corrected by stoning the mouthpiece as previously described.

Pot Lever Eyebolt Adjustment. When the pot cam moves the metal pot forward to lock the mouthpiece against the back of the mold, the pressure is applied through the pot lever spring *10,* Fig. 68. The spring is strong enough to lock the mouthpiece tightly against the back of the mold and at the same time, it permits sufficient overmotion in case the full forward movement of the pot is obstructed. The spring is mounted on an eyebolt *6* between a large banking washer *9* and the pot lever *1*. When the pot moves forward for the second time and locks tightly against the back of the mold, there should be approximately 11/64″ space between nut *8* and lever *1* for spring *10* to exert the proper pres-

sure. This adjustment is obtained with spacing washers *7,* by means of which the compression of spring *10* can be varied. Adding washers to the eyebolt will provide more pressure during the lock-up and will increase the space between lever *1* and nut *8*. Approximately six washers are used with molds of American height (.875″). It may be necessary, however, to add or to remove one washer to obtain the 11/64″ dimension during the lock-up. A sleeve is interposed between nut *8* and banking washer *9* to insure a constant distance between the two parts. The nut should always be turned up tightly against the sleeve.

Removal of Parts and Maintenance

Cleaning the Plunger and Well. The production of good slugs is dependent, to a great extent, upon the faithful performance of a few simple duties. Cleaning the plunger and the crucible well is one of them. The importance of cleaning these parts once a day cannot be emphasized too much. The plunger must fit the crucible well snugly, but at the same time, it must be perfectly free to move. After several hours of operation, a dross coating forms in the well and, to some extent, on the plunger. If this film is not removed, the casting stroke of the plunger will be shortened and will therefore be less forceful. For this reason, the plunger should be removed from the well every morning and cleaned thoroughly with the wire brush provided for the purpose. Various types of brushes and scrapers are supplied for cleaning the crucible well. If a wire brush is used, it should always be turned clockwise to prevent the wires from breaking off in the well. After scraping the well, the two intake holes *3,* Fig. 65, should be opened with the pointed end of the pot mouthpiece wiper or similar tool. When the parts have been cleaned in this manner, the dross which has been loosened floats to the top of the molten type metal and should be removed with a dross spoon or a small skimmer.

Before the plunger is replaced in the well, it should be immersed in the type metal for a few minutes to permit it to reach the temperature of the type metal. If the plunger is inserted immediately in position, it may expand rapidly and stick in the well. When this happens, it is necessary to remove the molten type metal from the pot with a ladle until the plunger and well are exposed. A small amount of oil or tallow should then be placed around the plunger. Close the pot cover lid, fasten a wrench to the plunger rod and turn the plunger back and forth, working the plunger upward at the same time. It may be necessary to tap the plunger rod a few times with a light hammer to start it moving.

Pot Lever Removal and Lubrication. The pot lever *1,* Fig. 68, should be removed from the machine once every four or five months so that the pot cam roll *2* can be cleaned and lubricated. To remove the lever, pull the pot forward by hand and place a block of suitable size between the pot jacket casting and the pot pump cam roll. Remove the pot balancing spring *10,* Fig. 66. Remove screw *13,* Fig. 68, loosen set screw *15* and remove the pot lever shaft *12*. Loosen the screw in the hinge pin *11*. While supporting the pot lever at its lower end, withdraw the hinge pin and lower the lever out of the machine. Loosen set screw *5* and remove pin *3*. This will release the cam roll *2*, the nine anti-friction rolls *4* and two washers. All of the parts of the cam roll should be cleaned thoroughly

in gasoline and dried. Two cam wipers are attached to the pot lever to keep the surfaces of the pot cam and the pot pump cam clean. If the wiping surface of the felt is hardened or worn, the felts should be renewed. Run a wire through the two oil holes and the slot at the top of the pot lever, then clean the finished surfaces of the lever with a stiff brush soaked in gasoline.

To reassemble the pot cam roll, place it on a flat surface, insert one of the washers and stand pin *3* upright in position. Coat each of the anti-friction rolls with a mixture of graphite and grease and place them in position around the pin. Fill up any remaining space inside the cam roll with the graphite grease. Replace the other washer, press it in position and remove the excess grease from the roll. Withdraw the cam roll pin *3*, place the assembled cam roll in position and run the pin through the lever and roll. The grease will hold the anti-friction rolls in position while this is being done. Tighten the set screw *5* securely. In returning the lever to the pot, reverse the order of removal. When the lever is in position, make sure that it has equal clearance between the mold cam and driving gear and the pot pump cam. The assembled lever can be adjusted sidewise after set screw *15* is loosened. A convenient oil cup has recently been applied to the pot lever to facilitate the oiling of the pot cam roll. The cup is fully accessible and can be filled with oil without removing the pot lever. This new oiling arrangement insures constant lubrication for the cam roll and anti-friction rolls.

Removing the Wedge Mouthpiece and Cleaning the Crucible Throat. After a metal pot has been in use for an extended period of time, it may be necessary to remove the mouthpiece and to clean the throat of the pot crucible. Accumulation of dross and oxide can generally be attributed to one of three conditions in the type metal: poor composition, excessively high temperature or consistently low level of metal in the crucible. The presence of foreign substances in the crucible throat is objectionable, of course, because they obstruct the free passage of type metal into the mold. These accumulations can be loosened with a throat cleaner and removed after the mouthpiece is taken off the crucible. The basic cause of the dross or oxide accumulation, however, should be ascertained and corrected to prevent a recurrence of the condition. A special pot crucible mouthpiece remover (U-1370, assembled) is made to facilitate the removal of the mouthpiece. The remover forces the mouthpiece off the crucible by screw pressure, thereby preventing the damage sometimes occasioned by the more commonly used drift (U-1018) and hammer. Proper use of the drift and hammer requires considerable skill and should be attempted only by those who have had experience in removing mouthpieces by this method. In the absence of such experience, it is advisable to use the special remover, which will force the mouthpiece off the crucible without danger of burring the mouthpiece or causing damage to the crucible.

The mouthpiece is removed while the metal pot is heated and the type metal is molten. To remove the mouthpiece, run the machine ahead until the first elevator seats on the vise cap and stop the machine before the mold disk moves forward. Open the vise frame and lower it to second position. Disconnect the pot pump plunger, depress the mold cam lever handle and remove the ejector lever link. Pull the mold disk slide forward until the ejector slide can be reached, then pull the ejector slide forward until an ejector blade passes through the

mold. The object in doing this is to prevent the mold disk from turning while handling it. Grasp the mold disk slide firmly, pull it forward slowly and lift the assembled mechanism out of the machine. Remove the left-hand vise locking stud from the mold gear arm to provide space for the use of the pot mouthpiece drift. Place a wedge-shaped block of wood of suitable size between the pot jacket and the machine column to absorb the shock when the mouthpiece is being driven off. Draw a straight score or scratch line across the top of the mouthpiece and the crucible so that the mouthpiece will be accurately located when it is replaced. The line should be drawn directly above the jet at the extreme right of the mouthpiece. When the mouthpiece is placed in position so that the score lines coincide, the two end jets will be wholly inside the mold cavity formed for

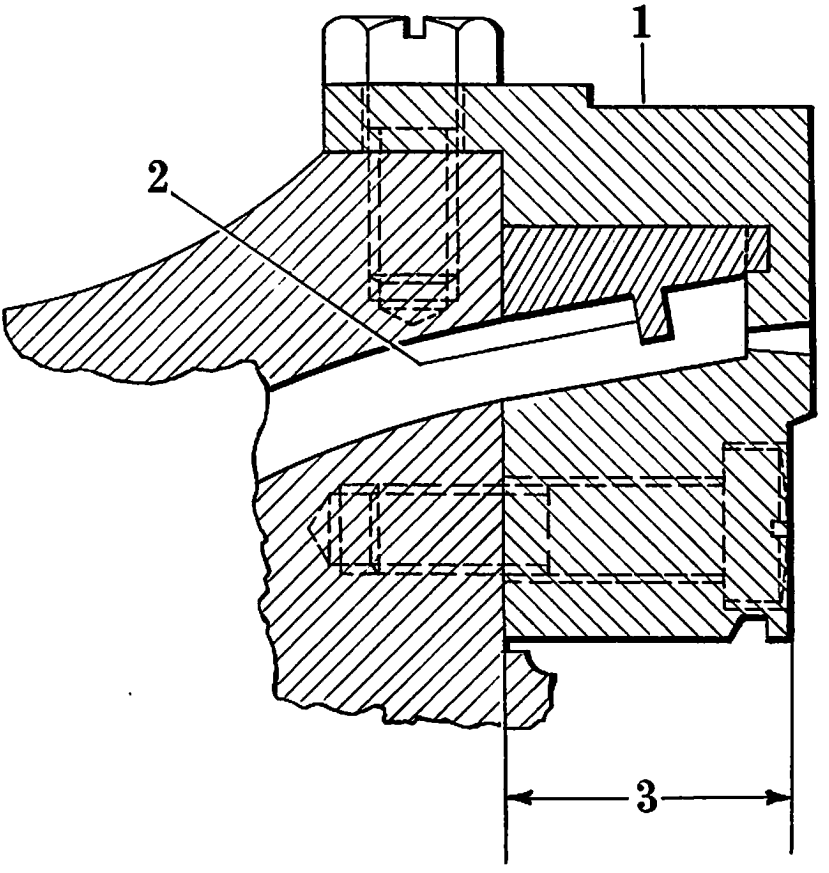

Fig. 69. The Baffle Mouthpiece. This new type of mouthpiece is designed to mix the type metal before it enters the mold and to facilitate the escape of air from the mold as the cast occurs. A baffle 2 is accurately located at the back of the mouthpiece to achieve these results. As the type metal is forced upward through the crucible throat into the mouthpiece, it meets the baffle and is agitated and deflected under pressure to the mouthpiece jets. The agitation mixes the metal thoroughly and breaks up any hard particles or dross. The baffle mouthpiece is fastened to the crucible with screws, making it easier to adjust the mouthpiece sidewise and to remove it.