General Maintenance

With a reasonable amount of care and maintenance, the electric pot will operate without interruption. Due to the widely varying conditions under which electrical equipment is used, however, a few difficulties may arise which can be located and corrected by some simple tests.

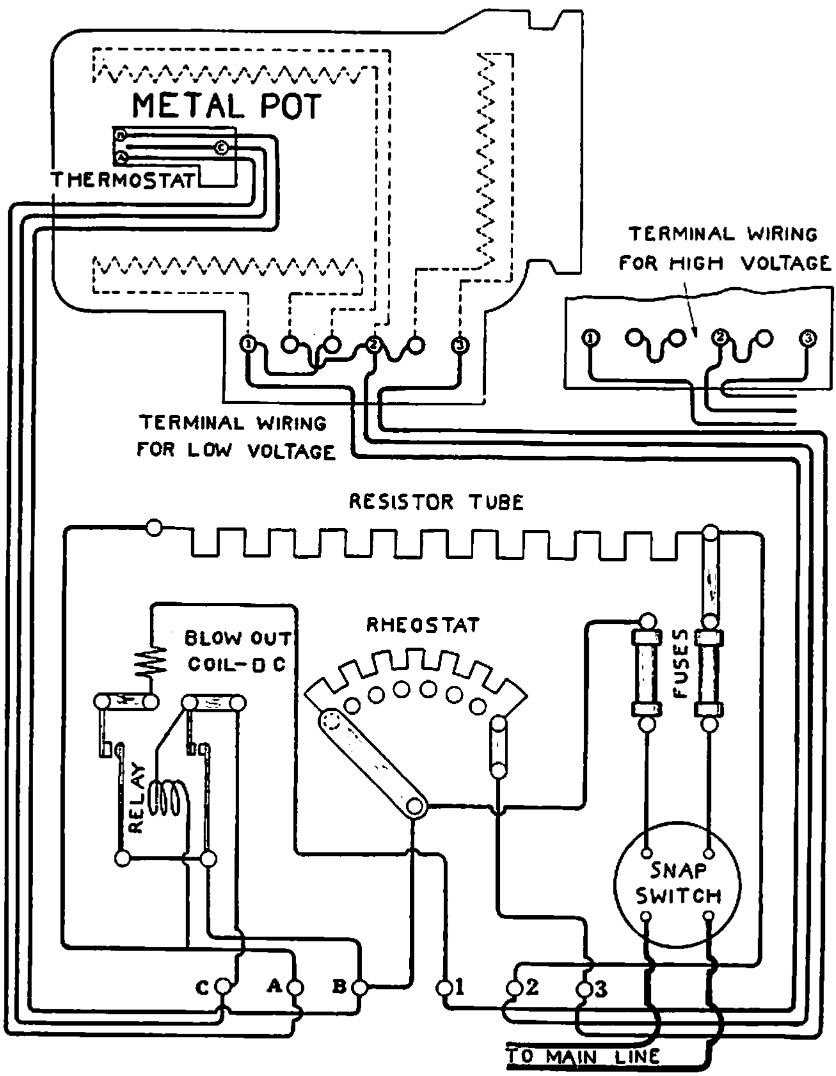


Fig. 78. Direct Current Pot Wiring Diagram, showing the terminal wiring for high and low voltage installations. The heaters are connected in series for high voltage and in parallel or multiple for low voltage. The same side heaters are used for low voltage as for high voltage, the only difference being in the method of connecting them. A different throat heater is required for high and low voltage installations.

The Fuses. To examine the fuses, remove them from the control box and test them with a lamp. If the fuses keep blowing, some part of the electric circuit is probably grounded or short circuited. The electrical connections will have to be tested under these conditions in order to locate and remedy the defect. In the case of fuses with removable links, make sure that the links are not shriveled and that the link caps are tight.

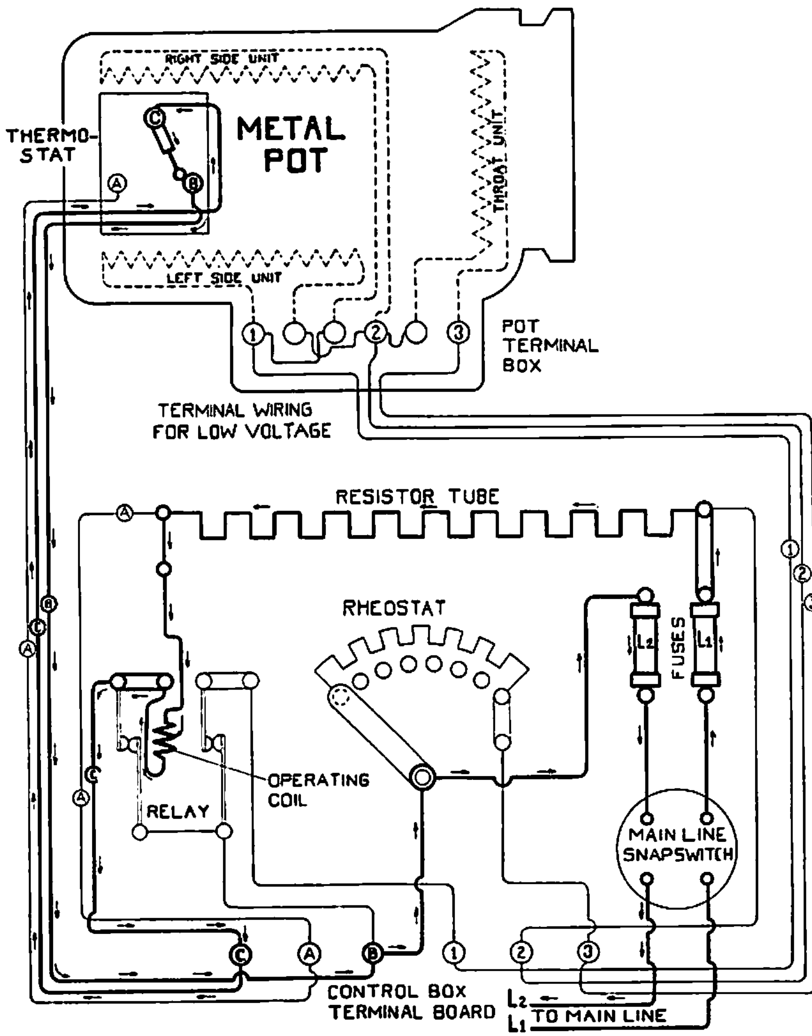


Fig. 79. Alternating Current Pot Wiring Diagram, showing the position of the thermostat contact arm and the relay when the circuit is closed. As the type metal approaches its minimum temperature, the thermostat contact arm touches the *B* terminal in the thermostat. This action energizes the relay operating coil, causing the relay to close and to complete the circuit indicated in heavy outline. The current then flows through the two side heaters and raises the temperature of the type metal. The direction of the current is shown by the arrows.

Testing the Heaters. If a heater is removed from the pot and is not replaced properly, it may burn out in the course of operation. When any of the three heaters is defective, there is generally sufficient indication to show which one is at fault. If the throat heater is burned out, the mouthpiece and crucible throat will be cold and it will be impossible for the type metal to pass through the mouthpiece. If either of the two side heaters is defective, the type metal nearest the defective heater will remain frozen long after the metal on the other side has melted. In an emergency, it is possible to operate a pot with one good side heater on 100 to 125 volt circuits, but the defective heater should be replaced as soon as possible to insure proper casting conditions. A defective heater must be replaced immediately on 200 to 250 volt circuits.

An *open* heater is one in which a wire has been broken, making it impossible for the current to flow through and to complete the circuit. If a heater burns out or becomes open and it is difficult to determine which one is defective, turn off the main line snap switch and remove the terminal box cover at the left side of the pot. Disconnect terminal No. 1 (numbered 1 to 6 from left to right). Turn on the main line switch, make sure that the relay is closed, then tap the terminal with the disconnected wire. If the wire produces a spark, the left side heater is not *open*. Connect terminal No. 1 and repeat the same operation with terminal No. 3 to determine whether the right side heater is all right. The same test on terminal No. 5 will indicate whether or not the throat heater is *open*. The heaters can also be tested for open circuits with a lamp in series. The equipment consists simply of an ordinary incandescent lamp, a lamp socket, an attachment plug and a convenient length of cord, as shown in Fig. 77. Disconnect the inter-connecting wires on the heaters under test and connect the two bare lamp cord wires to two different terminals of the heaters. If the lamp lights, it indicates that the heaters are not *open*.

A *grounded* heater is one in which the insulation is loosened from a wire, causing contact with a metallic cable covering. The heaters must be removed from the pot in order to test them for grounds. Place the heaters on a board or any other non-conductive material. Place one wire of the test lamp against the outside sheath of the heater and the other wire on one of the terminals. If the lamp lights, the heater is grounded. If the lamp does not light, the heater is all right. Note that in the test for *open* circuits the lamp *should* light on a good heater, and in the test for *grounds* the lamp *should not* light on a good heater. Sometimes the mica washer at the terminals of the heater are loosened or broken by improper handling, causing a ground in the heater.

The frame of the machine should be grounded for efficient operation. This can be done easily by making a wire connection from the machine to a gas or water pipe.

Removal and Replacement of Heaters. The three pot heaters, as mentioned previously, are placed around the crucible and are held in contact with the crucible casting by a number of covers. The heaters can be removed and replaced easily because they are located in very accessible positions. To remove the throat heater, remove the terminal box cover on the left side of the pot and remove the clamp over the two terminals of the heater. Loosen the two square head screws under the throat of the pot and remove the shield directly under the mouthpiece.

The throat heater can now be removed with a pair of pliers and a new one placed in position. Before replacing the heater cover, make sure that the two set screws under the throat of the pot are turned in sufficiently to hold the throat heater up close to the crucible throat and the mouthpiece. Replace the heater shield and fill the space between the heater cover and the shield with asbestos, being careful that none of the asbestos is left in contact with the heater.

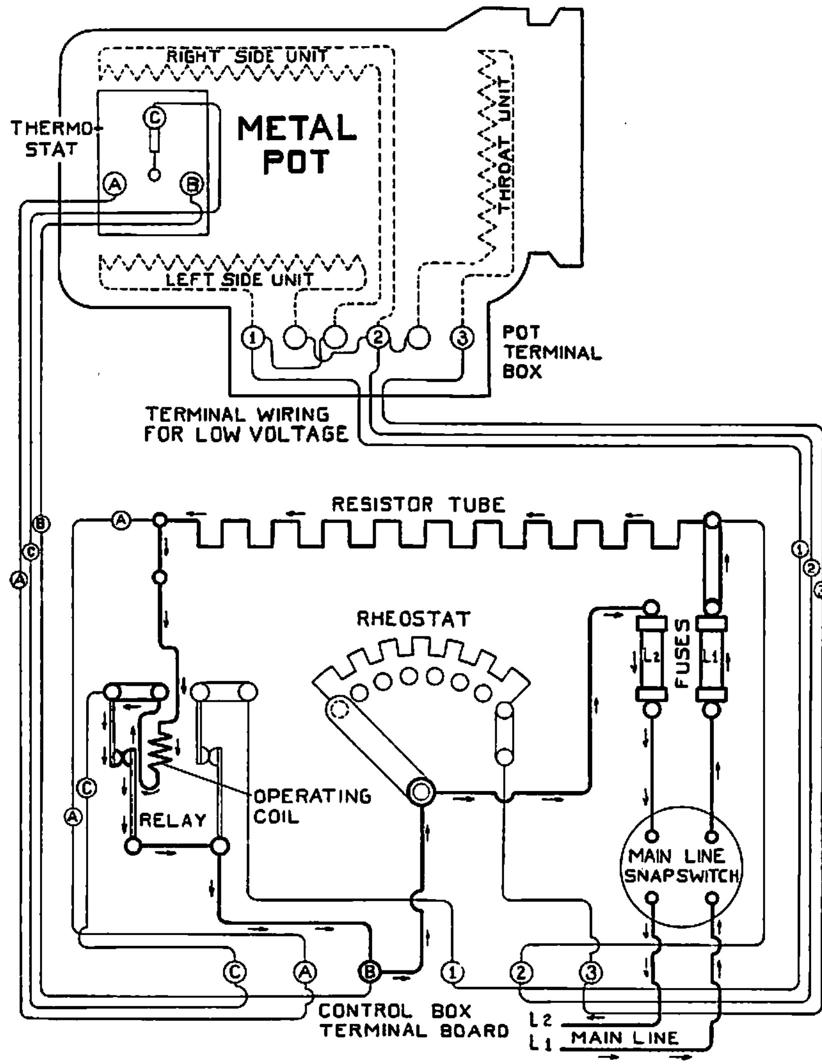


Fig. 79a. Alternating Current Maintaining Circuit. As the temperature of the type metal rises, the contact arm in the thermostat is moved away from the *B* terminal by an expanding rod in the type metal. The original closing circuit shown in Fig. 79 is thereby broken. The relay is still held in a closed position, however, because the relay operating coil is energized by the current. The path of the current is shown by the arrows.

To remove either of the side units, it is necessary first to remove the pot cover, which is fastened to the pot jacket with four screws. If the metal is frozen, the thermostat frame can be separated from the base by removing the four holding screws and the two frame screws, then the base can be separated from the thermostat stem by taking out the two flathead screws. This will permit the pot cover to be raised and the heaters can be removed freely after the terminal clamps are taken off.

Removing and Packing the Electric Pot

To remove the electric pot from the machine, take out the plunger and ladle as much type metal as possible from the crucible. Shut off the pot current by turning the main line snap switch and disconnect and remove the thermostat. Remove the terminal box cover, disconnect the three wires leading through the cable from the control box, unscrew the cable connector nut and lower the cable. Run the machine ahead until the first elevator seats on the vise cap and before the mold disk moves forward. Push in the starting and stopping lever and turn off the motor. Lower the vise frame to second position, depress the mold cam lever handle, remove the ejector lever link and remove the mold disk slide from the machine. Remove the mold disk shield, which is fastened to the face plate frame directly above the mold disk, and remove the pump stop bracket. Remove the two caps at the base of the pot legs and loosen the two front pot leg adjusting screws. Remove the pot lever, replace the pot lever shaft and tighten the set screw so that the shaft will not slip. Place a belt around the pot lever shaft. One person should lift and support the pot at the back while another lifts the pot legs off the bushings. When the legs are free, the pot should be lowered at the back while the legs are raised in the front and then the pot can be lifted out over the vise frame. The pot should be held high enough during removal so that it will not bump against any part of the vise mechanism.

Packing the Electric Pot. The space between the pot jacket and the crucible heater covers must be packed as solidly as possible with asbestos to insure proper heat insulation for the crucible. Voids in the packing cause loss of heat and impair the efficiency of the pot. The asbestos can be ordered in any quantity desired from Intertype Corporation. The asbestos is always used dry in the case of the electric pot. Remove the pot cover, turn the pot upside down and fill the space around the sides, back and throat of the crucible with the asbestos. Fill the space at the bottom of the crucible and replace the pot jacket bottom plate. Turn the pot right side up and stuff a cloth or piece of waste in the crucible well to prevent the entrance of asbestos. Fill up any remaining space between the jacket and the crucible heater covers and press the asbestos tightly in position with a stick of wood. Moisten a small quantity of asbestos and pack it in the openings around the mouthpiece. *Asbestos must be kept away from actual contact with the heaters.* If the asbestos touches a heater, the heat cannot be dissipated and the heater is likely to burn out. To return the assembled pot to the machine, reverse the procedure of removal. A lock-up impression should be taken after the pot is in the machine to make certain that the mouthpiece is parallel with respect to the mold.

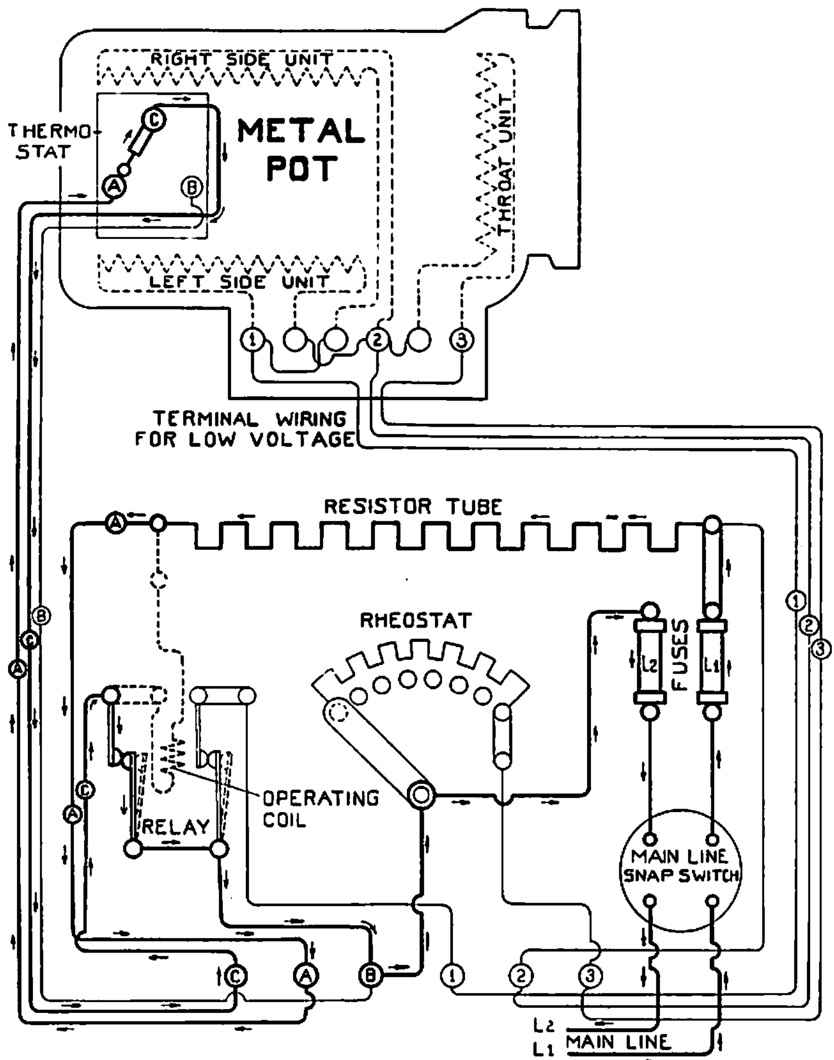


Fig. 79b. Alternating Current Opening Circuit. The maintaining circuit shown in Fig. 79a has kept the relay closed and the side heaters have raised the type metal to its proper temperature. As soon as the type metal reaches the maximum temperature for which the thermostat is set, the thermostat contact arm touches the *A* terminal. This action by-passes the current passing through the relay operating coil and the relay is thereby permitted to open. When the relay contact tips separate from the contact screws (as shown in dotted lines), the circuit is broken and the current will not flow through the *A, B* or *C* wires until the thermostat contact arm touches the *B* terminal again.

New Style Bulb-Type Thermostat

Intertype Corporation has adopted a new thermostat, known as the bulb-type thermostat, for the control of the side heaters on the electric pot. The bulb-type thermostat offers a new and exceedingly sensitive method of controlling the temperature of the type metal. The chief change is the use of a bulb and bellows assembly, which is filled with an operating liquid responsive to fluctuations in heat. The expansion and contraction of the liquid produces corresponding changes in the bellows, which operates a contact in the thermostat and causes current to flow or to cease flowing through the two side heaters. The most important feature of the thermostat is its quick and positive movements in closing and opening the circuit. The bulb-type thermostat and its control box, due to the direct line connection of the thermostat, have been simplified to a remarkable degree. The wiring system and the control box mechanism especially reflect this change. The bulb-type thermostat is supplied for either direct or alternating current and can be applied with the necessary parts to any outstanding electric pot.

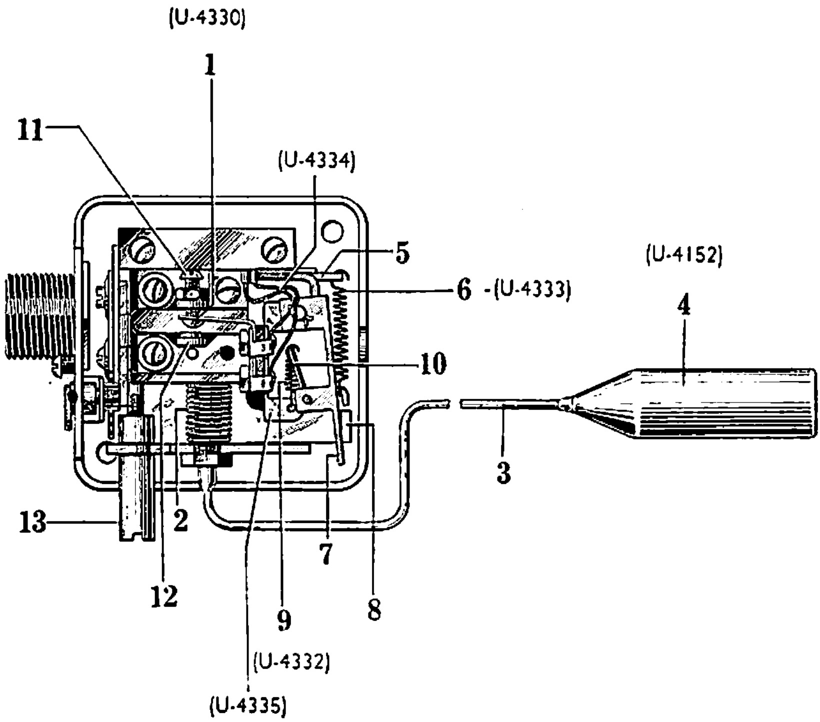


Fig. 80. **The New Style Bulb Type Thermostat is operated by a bellows *2*, which lengthens and shortens as the temperature of the type metal rises and falls. The lengthening and shortening of the bellows is caused by an operating liquid in the bulb *4* and tube *3*. The expansion and contraction of the liquid and bellows moves the contact *1* between points *11* and *12* by the series of arms and springs shown. The contact thereby closes and opens the circuit, causing current to flow or to cease flowing through the two pot side heaters.**

The bulb-type thermostat is shown in Fig. 80. The closing and opening of the circuit is controlled by contact *1*, which is operated by the expansion and contraction of bellows *2*. The bellows is attached to a capillary tube *3*, on the other end of which is a bulb *4*, which is immersed in the type metal. As stated previously, the bulb, tube and bellows assembly is filled with an operating liquid sensitive to changes in temperature. As the temperature of the type metal rises, the liquid in the bulb expands and causes the bellows *2* to increase in length. As the type metal cools, the operating liquid contracts and permits the bellows to undergo a similar contraction in length. The expansion and contraction of bellows *2* operates the contact *1* in the thermostat. With a rise in temperature, the bellows lengthens and raises lever *5*. The lever causes spring *6* to pull arm *7* toward stop *8*. This movement causes the fulcrum of yoke *10* to move past the

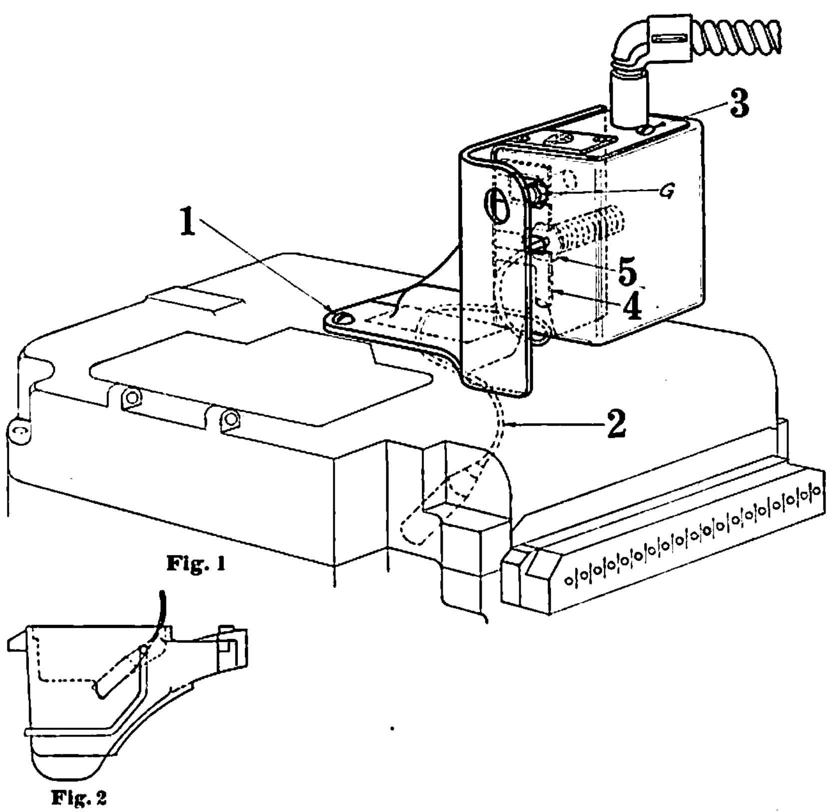


Fig. 81. Showing how the bulb-type thermostat is mounted on the pot cover and how the bulb is located in the pot crucible. The thermostat is attached to a bracket which is fastened to the top of the pot cover. The bulb passes through the hole in the pot cover occupied formerly by the lever type thermostat stem. The capillary tube is bent so that the bulb is immersed as deeply as possible in the crucible, as shown in the detail drawing. The thermostat can be removed when the type metal is molten or frozen, as described in the text.

center of spring *9* and causes contact *1* to snap open against the adjustable screw *11*. The circuit is thereby broken and current ceases to flow through the two side heaters. With a decrease in the temperature of the type metal, bellows *2* shortens and permits lever *5* to move arm *7* to the left. This causes the fulcrum of yoke *10* to move to the left past the center of spring *9* and contact *1* snaps closed against the stationary contact *12*, completing the circuit and causing the current to flow through the two side heaters. Note that both movements of the thermostat contact are caused by spring action, which operates the parts in a quick and positive manner.

Adjustments. The temperature of the type metal is set by means of adjusting screw *13*, Fig. 80. Turning the screw clockwise will lower the temperature of the type metal; turning the screw counter-clockwise will raise the temperature. The adjusting screw should be turned by small degrees and should never be forced. There is a small scale and indicator on top of the thermostat which moves as the adjusting screw is turned. The adjusting screw has a certain amount of lost motion and no change will occur in the temperature of the type metal unless the indicator actually moves. Each number on the indicator scale represents a difference of approximately 8 to 10 degrees in temperature. The total range of the thermostat is from 475 degrees Fahrenheit to 575 degrees. With the indicator set between 4 and 6 on the scale, the temperature of the type metal should be about right. When thermostats are applied to machines at the factory, they are adjusted approximately for 540 degrees and require no further adjustment. However, if a different temperature is required, a reliable thermometer should be used to determine the exactness of the setting.

Screw *11*, Fig. 80, should be set so that there is approximately 1/32″ clearance between the movable contact *1* and screw *11* when contact *1* is touching contact *12*. This setting is made when the thermostat is assembled and need not be changed unless the contact points wear.

Maintenance. As in the case of the lever type thermostat, the contact points on the bulb-type thermostat should be clean and smooth to insure the proper flow of current. The contacts are made of coin silver and will rarely require cleaning. If it is necessary to dress the contacts, use a piece of fine-grained emery cloth which will not remove too much metal or score the points. Proper operation of the thermostat depends largely on the relative strength of springs *6* and *9*. If these springs become weak for any reason, they should be replaced with new ones.

Removal of Thermostat. The new style thermostat, like the lever type, can be removed while the metal is molten or frozen. If the metal is molten, it is necessary simply to remove the two screws *1*, Fig. 81, and lift the assembled thermostat and bracket off the pot cover. If the metal is frozen, the bulb and bellows assembly *2* must be freed first from the thermostat. Loosen screw *3* and remove the thermostat cover. This uncovers the bellows, which is held in a slot in flange *4* by nut *5*. Loosen the nut and remove the two screws *1*. The assembled thermostat and bracket can now be freed from the bellows and lifted out of the way. Once these parts are removed, the pot cover can be taken off without disturbing the position of the bulb in the type metal. The detail drawing shows how the bulb is positioned in the pot crucible.

The Control Box

The control box apparatus for the bulb-type thermostat has been simplified greatly. Many of the parts previously used with the lever type thermostat have been eliminated, resulting in an extremely compact assembly and a clearly defined wiring system. The chief parts which have been removed from the control box are the resistor and relay mechanism. These parts are no longer necessary, because the thermostat is connected directly with the line wires carrying the current. The only parts used in the new control box are a rheostat, a snap switch,

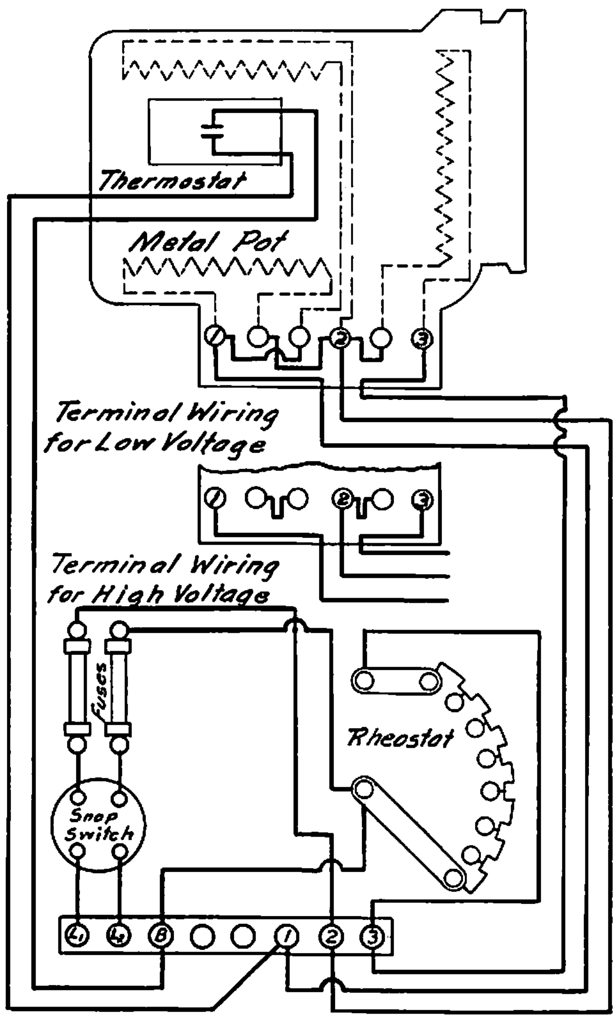


Fig. 82. Pot Wiring Diagram for Bulb-Type Thermostat. The wiring system is identical for both A.C. and D.C. installations. Terminal wiring for high and low voltages is also shown.

a fuse block and a terminal board, as indicated in the wiring diagram, Fig. 82. These parts fulfil the same functions they had formerly in the lever type assembly. The rheostat is used to raise or to lower the heat of the crucible throat and mouthpiece by turning the rheostat knob outside the control box. As in the case of the lever type control box, manipulation of the rheostat has no effect upon the operation of the side heaters—the rheostat is entirely independent of the thermostat. The snap switch is used to turn the current on and off. The fuse block contains clips suitable for holding the fuses and terminals for making the necessary connections. Intertype Corporation recommends the use of the non-renewable fuses in the control box, because link fuses may cause unintentional resistance. The terminal board consists of the usual insulating plates, screws and nuts for making the main connections between the thermostat and the other parts of the assembly. For direct current installations, an Alnico magnet is provided in the thermostat to deflect the arc and prevent welding of contacts. (The capacitor formerly used on D.C. installations is not needed.) *When the D.C. thermostat is in operation, the arc formed by the separation of the thermostat contacts must move away from the terminal screws.* If the arc moves toward the terminal screws, *reverse the thermostat connections B and 1,* Fig. 82. This condition is highly important and should be checked carefully.

Replacement Parts

Some of the part numbers for the bulb-type thermostat are illustrated in Fig. 80. The names of these parts are as follows:

U-4152	Pot (G.E.) thermostat pot bulb and bellows, assembled.
U-4330	Pot (G.E.) thermostat movable contact tip, assembled, bulb construction.
U-4331	Pot (G.E.) thermostat stationary contact tip, assembled, bulb construction.
U-4332	Pot (G.E.) thermostat spring, short, bulb construction.
U-4333	Pot (G.E.) thermostat spring, long, bulb construction.
U-4334	Pot (G.E.) thermostat shunt, assembled, bulb construction.
U-4335	Pot (G.E.) thermostat movable contact bracket, assembled, bulb construction.
U-4336	Pot (G.E.) thermostat stationary block, bulb construction.

When ordering these parts, the above parts numbers and names should be specified.

Pot Gasoline Burner

For those localities where neither gas nor electricity is available, Intertype Corporation supplies gasoline burner equipment for the metal pot. The gasoline burner (U-2000, assembled) is easily installed and operates satisfactorily from the standpoint of uniform temperature control. The parts of the gasoline burner are illustrated and listed with specifications in the Intertype Parts and Supplies Catalogue. Detailed instructions concerning the installation and operation of the equipment are included with orders.

The Type Metal

The quality of slug produced by the Intertype machine is dependent, to a great extent, upon the condition of the type metal used in the metal pot. A properly balanced and clean grade of type metal can be maintained by the conscientious performance of a few simple duties. If a reasonable amount of care is exercised in the use and remelting of the metal, the slugs will be more close-grained and the face will improve in sharpness of character. Troubles with slugs and faulty operation of the casting mechanism can be traced, in most instances, to the use of an inferior grade of type metal or to improper methods of remelting and purifying the metal.

Composition of the Type Metal. Type metal is composed of three metals—lead, antimony and tin—each of which serves a definite purpose in the formation of slugs. The approximate proportion of the metals is 85 per cent lead, 11 per cent antimony and 4 per cent tin. Lead constitutes the largest part of the type metal because it has a low melting point. Lead alone is too soft, however, so antimony and tin are added to compensate for this deficiency. Antimony lends hardness to the lead and has the added advantage of making the lead more fluid when it is in a molten state. The antimony expands just as the slug solidifies and reproduces the face with more exactness and clarity. Tin provides both strength and fluidity to the type metal and by helping the lead and antimony to combine more closely, the body of the slug is improved. The tin also is responsible for the smoothness and evenness of the characters on the face of the slug. Deficiencies in the proportion of the three metals will affect the slug considerably. If the amount of antimony is decreased, the slug will be too soft for extended press use and if the amount of tin is insufficient, the slug will be hollow and the face less sharp. A sample of type metal should be sent every three months to the metal manufacturers for analysis. The sample should be made up of small vent and jet trimmings gathered every day for a week so that the specimen will be representative of the metal stock. The metal manufacturers will furnish a report which will be of use in toning the metal and restoring it to its proper composition. No attempt should be made to tone the metal without such a report.

Melting the Metal. The metal should be melted as slowly as possible to avoid overheating any portion of the stock. As the metal begins to melt, the heat should be increased gradually until the temperature reaches approximately 600 degrees Fahrenheit. A reliable thermometer should be used to determine the temperature. If a thermometer is not available, a piece of newspaper can be used for a rough test. The end of the paper should be held in the type metal for about five seconds and should be light brown in color when it is withdrawn. *The molten metal should be stirred thoroughly* in order to mix the lead, antimony and tin and to prevent the last two metals from rising to the surface with the dross. Much of the antimony and tin are skimmed off with the dross precisely because the molten metal is not agitated sufficiently. It is essential that a quantity of Fluxor be mixed with the type metal when the stirring is begun. Fluxor is a special chemical preparation designed to clean and to purify the type metal. It separates the dross from the metal, breaks up oxide accumulations and mixes the ingredients of the type metal to closer uniformity. By combining the lead, antimony and tin more closely, Fluxor prevents much of these valuable ingredients from being removed with the dross. Fluxor can be obtained from Intertype Corporation or any of its agencies. When the dross on the surface of the type metal has been reduced as nearly as possible to powder form, skim it off and deposit it in a drum or any other convenient receptacle. The skimming operation should be continued until the surface of the molten metal is clear and mirror-like. When dross has been removed, the molten metal should be poured into the molds as rapidly as possible to prevent its ingredients from separating before the job is completed.

Contamination of the Metal. Next to dirt and improper methods of melting the metal, the most frequent cause of contamination is the introduction of copper, brass and zinc into the type metal. Copper hardens the type metal and clogs the mouthpiece jets. Trimmings from stereotype and electrotype material are frequently mixed with slug trimmings and are a common source of trouble. Zinc is probably the worst metal that can be introduced into line-casting stock and should be kept isolated in a separate container. Foundry type, brass rules and etchings must never be used in the type metal. When one considers that these contaminating metals have a bad effect not only upon the quality of the slug but also upon the operation of the machine, it is logical to assume that a reasonable amount of care in the use and maintenance of the type metal will be amply repaid in time and effort later on.

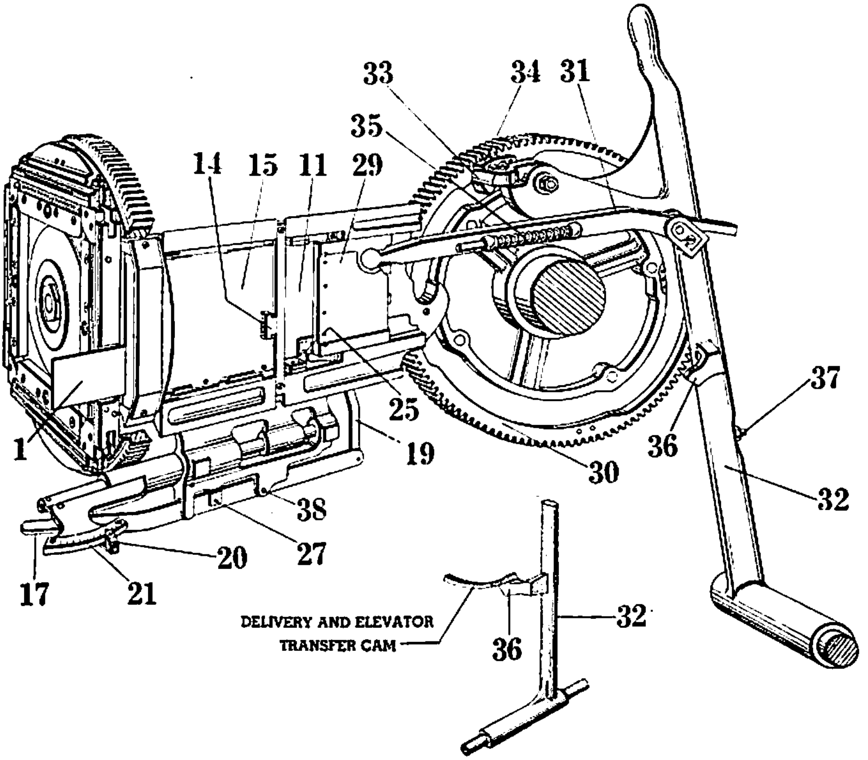


Fig. 83. Perspective View of the Universal Ejector and Related Parts in Assembly. The small detail drawing shows the part of the delivery and elevator transfer cam which returns the ejector lever and other mechanisms to normal position.

The Intertype Universal Ejector

Up to this point, we have followed the movements of the machine leading to the casting of the slug. Directly after the cast, the pot backs away from the mold and the mold withdraws the slug from the matrix line. The mold disk is then turned three-quarters of a revolution, carrying the slug in the mold past the back knife to ejecting position. These actions have been described in the sections dealing with the movements of the mold disk, mold disk slide and metal pot. During the three-quarter turn of the mold disk, the base of the slug is trimmed to type height by the back knife. When the mold disk completes its three-quarter revolution, the mold turning cam shoe stops the disk in position so that the mold disk locking studs are directly in line with the stud block bushings on the vise frame. The mold cam lever, as described previously, is then caused by the contour of the mold cam to move the mold disk forward through its connection with the mold disk slide. The mold disk locking studs enter the bushings on the vise frame and it is this action which locates the slug in the mold accurately with respect to the ejecting mechanism and the knife block. The mold is supported at ejecting position by two stationary banking blocks and one adjustable block. The stationary blocks furnish a support for the assembled mold and the adjustable one supports the mold cap.

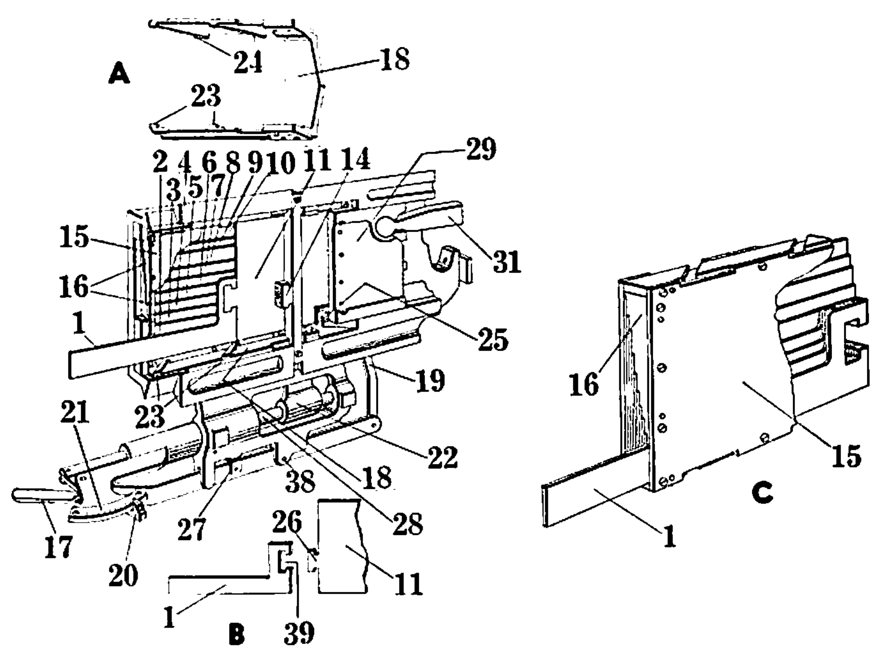


Fig. 84. Detail Views of the Ejecting Mechanism, showing how the parts are related and the means provided for their engagement and movement. The ejector blade magazine accommodates any selection of twelve blades. The operator can change instantly from one blade to another simply by depressing lever *17* and moving lever *20* to the number on em scale *21* corresponding to the size of the ejector blade desired.

Ejector Blade Operating Mechanism. The main parts of the ejecting mechanism are mounted in a recess on the right side of the mold disk slide casting. The mechanism consists principally of the ejector blades, which are contained within a movable magazine, the ejector blade holder and slide, the ejector lever and link and mechanism suitable for locating, shifting and selecting the blades. The chief parts of the ejector operating mechanism are shown in Fig. 83. The ejector blades *1* are contained within the ejector blade magazine *15*. The magazine contains an assortment of twelve blades, each blade being of a different height to correspond with the various lengths of slugs cast on the machine. The ejector blade holder *11*, fastened to the ejector slide *29*, moves the ejector blade forward to eject the slug and withdraws the blade after ejection through cam action. The ejector slide is connected to the ejector lever *32* through link *31*. The forward movement of the ejector lever and consequently, the forward motions of the ejector slide and blade, are promoted by the ejector cam *34*, which is fastened on one side of the mold cam and driving gear *30*. The ejector cam engages the ejector lever pawl *33* at the proper time in the operation of the machine and pulls the lever forward, causing the ejector blade *1* to push the slug out of the mold between the trimming knives and into the galley. As the ejector blade approaches the end of its forward stroke, a buffer rod *35* on link *31* banks against the machine column and cushions the movement of the parts through the compression spring. This prevents the ejecting mechanism from overthrowing beyond the movement imparted by cam *34* and pawl *33*. After the slug has been ejected, the ejector blade and the mechanisms connected with it are returned to normal position by part of the delivery and elevator transfer cam. The cam engages a lug *36* on the ejector lever *32* and moves the mechanisms back to normal position. This action is illustrated in the small detail drawing, Fig. 83.

Ejector Blade Shifting and Selecting Mechanism. In addition to operating mechanism described previously, additional mechanism is provided to locate, shift and select the ejector blades to correspond with changes in the length of slugs being cast. The purpose o. the ejector locating lever *17*, Fig. 84, is to fix the position of the ejector blade holder *11* when the ejector blade is being changed. The engagement of the holder with each of the twelve blades is accomplished by the use of a T-shaped projection on the holder, which registers with T-slots in the ejector blades. The projection *26* on the holder and the T-slot *39* in one of the blades is shown in the detail drawing *B*. In order that the holder will engage freely with the blades, it is essential, of course, that the T-shaped projection on the holder be accurately aligned with the T-slots in the blades before the ejector blade magazine is moved. The locating lever *17* serves this purpose. The lever is pivoted on a fulcrum screw *38* and a locating plunger *19* is attached to the rear end of the lever. When the lever is depressed, the plunger is raised and its upper end enters a lock *25* in the holder *11*. This action fixes the holder accurately in position for the shifting of the ejector blade magazine.

The movement of the ejector blade magazine is controlled by a series of levers and links operated by shifter lever *20*, Fig. 84. After the locating lever is depressed, the shifter lever is swung through a small arc until the pointer on the lever registers with the number on the em scale *21* corresponding with the size of the blade desired. The movement of the shifter lever is transferred to rod *28*, on which is pinned the ejector shifter fork *22*. The fork operates the slide bars *18* in which the ejector blade magazine *15* is mounted. The slide bars are provided with diagonal guides *23* and *24* (detail drawing *A*), which fit into grooves in the top and bottom bars of the magazine. As the fork *22* moves the slide bars *18* forward and backward, therefore, the ejector blade magazine *15* is moved at right angles to the mold disk slide. When the pointer on the shifter lever *20* registers with the size of ejector blade desired, the T-shaped projection *26* on the holder *11* will be in engagement with the T-slot *39* of the particular blade selected. No other blade will be engaged by the holder at this time because the distance between the ejector blade keeper *14* and another keeper below (not shown) is just sufficient to accommodate the thickness of one blade at a time. The keepers also serve to keep the T-slots of the ejector blades in uniform alignment. The arrangement of the ejector blades in the magazine is indicated in the detail drawing *C* and in the main drawing by the numbers beginning with *1*. A locking plunger *27* attached to the locating lever *17* locks the setting of the ejector blade after the change has been made. The plunger engages with notches in the shifter rod *28* and prevents the ejector blade magazine from moving inadvertently. After changing an ejector blade, always move the shifter lever *20* slightly to make sure that the plunger is locked in position. No change in the size of the ejector blade can be made unless the locking plunger is withdrawn by depressing locating lever *17*. *No attempt should be made to change the ejector blade when the machine is in motion.* A stepped guide *16* is inserted at the front of the ejector blade magazine to guide each blade when it is moved out of the magazine to eject the slug. If any change is made in the original combination of ejector blades in the magazine, a new guide must be inserted with the necessary changes in the height of the steps.

Adjustments. When the machine is in normal position, the holder lock *25*, Fig. 83, should rest directly above the plunger *19* so that the plunger will enter the lock easily and without friction. The position of the lock is determined by screw *37* in the ejector lever *32*. The screw banks against a sleeve on the justification and vise closing lever shaft and fixes the normal position of the ejector lever. Since the ejector blade holder *11* is connected with the ejector lever through link *31*, adjustment of screw *37* will naturally affect the normal position of holder lock *25*. When the plunger *19* enters the lock smoothly at normal position, tighten the lock nut on the adjusting screw. In making this adjustment, it is necessary to back the machine and to push the ejector lever forward in order to reach the adjusting screw more easily.

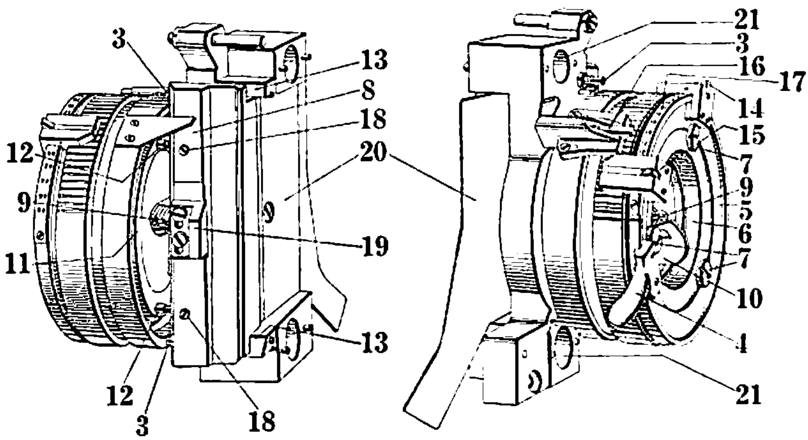
The forward stroke of the ejector blade is controlled by an adjusting screw in pawl *33*, Fig. 83. Raising the pawl with respect to the ejector cam *34* will shorten the stroke of the blade and lowering the pawl will cause the blade to move further forward. The adjustment of the pawl depends upon the type of galley with which the machine is equipped. In the case of the inside galley, set the pawl so that the ejector blade advances 1/32″ beyond the inside edge of the galley. In the case of the outside galley, the front edge of the ejector blade should clear the knife block casting at the top of the slug chute by 1/32″. The position of the ejector blade at precisely this moment can be observed by stopping the machine when the ejector blade has made its full forward stroke and looking through the galley chute at the blade. An extension light is needed to see the position of the blade clearly.

Removing the Ejector Mechanism. It is necessary or desirable at times to remove the ejecting mechanism from the mold disk slide to insert new blades or to clean and lubricate the moving parts. Place the smallest ejector blade in operating position. Run the machine ahead until the first elevator seats on the vise cap and before the mold disk moves forward, push in the starting and stopping lever and shut off the power. Lower the vise frame to second position, depress the mold cam lever and remove the ejector lever link. Pull the mold disk slide forward sufficiently so that the rear mold disk stud nut can be removed. This nut has a left-hand screw thread. *The front mold disk stud nut should never be removed.* This nut is accurately aligned at the factory and it is difficult to replace the nut in its proper running condition if it is removed. Remove the mold disk guide and lift the disk carefully off the mold disk slide arm. Wrap a cloth around the back knife to avoid injury, lift the mold disk slide out of the machine and place it on a bench. Remove the ejector slide shield, the mold disk scraper, the front guide and cap, the holder guide and the ejector blade right and left-hand keepers. The left-hand keeper is fastened with a screw passing through the mold disk slide casting from the left. The ejector blade magazine can now be removed from the slide bars. Clean the ejector blades and the magazine with high test gasoline. Wipe the moving parts of the ejector shifting mechanism thoroughly, making sure that all gummy substances are removed. Lubricate the moving parts with a light film of oil and reverse the procedure of removal to assemble the parts.

Removing the Ejector Lever Pawl. Back the machine by hand until the ejector lever can be moved forward. Remove the pawl screw nut and disconnect the spring from the pawl. Push the ejector lever forward until the pawl screw is opposite the groove in the mold cam and driving gear and turn the screw out of its bearing. The plate on the pawl which the ejector cam contacts should be renewed if its lower edge has been rounded so much that the pawl cannot be adjusted. The replacement of the pawl spring can be simplified by inserting a piece of string through the loop of the spring to hold it in position until the fastening screw is returned.

Removing the Ejector Lever. With the machine in normal position, remove the ejector lever link and loosen the first-elevator auxiliary lever set screw. Drive the shaft on which the ejector lever is pivoted toward the metal pot side of the machine until the shaft is clear of the ejector lever. The lever can then be lifted upward and out of the machine. It is necessary to maneuver the lever while raising it so that the long bearing at the lower end of the lever will clear the machine parts. If the cam shaft is turned so that the long gap in the delivery and elevator transfer cam is placed properly in position, the removal of the lever will be facilitated.

The ejector lever is provided with a handle which is sometimes used to force a slug out of the mold. While this procedure may be justified under certain conditions, it is usually advisable to raise the ejector lever pawl off the cam and to permit the machine to come to normal position, when the slug can be removed by taking off the mold cap. When the machine fails to eject the slug, it is usually due to an abnormal cause, which is only aggravated by trying to pound the slug



Rear View

Front View

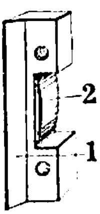


Fig. 85. The Intertype Universal Knife Block, illustrated in front and rear views with a detail view of the left-hand knife. Changes from one point size to another are made simply by raising detent *16* (front view) and rotating dial *5* by means of handle *4* until the detent registers with the desired notch in the dial. The detent should be released so that it will enter the notch and lock the setting of the knife.

out of the mold. The ejector blade placed in position may be of the improper size for the mold cavity, in which case the left-hand liner will be damaged by forcing the ejector lever forward. Also, if the setting of the knife block has been neglected, an undue strain will be put on the knives by forcing the slug between them. Since no more time or effort is required to follow the correct procedure, the operator should permit the machine to return to normal position without ejecting the slug. The cause of the trouble can then be ascertained and corrected without any damage occurring to the machine.

The Intertype Universal Knife Block

As the slug is ejected from the mold it passes between two parallel knives, which trim the sides of the slug accurately to point size. The slug continues to move forward between a spring plate and a bracket and then slides down a chute. The slug finally comes to rest face upward in the outside galley at the front of the vise frame. In the case of the inside galley, the slugs are delivered on end.

The knife block consists, in general, of a left-hand knife, a right-hand knife and mechanism suitable for shifting the right-hand knife in a sidewise direction. The left-hand knife *1*, Fig. 85, is fastened to the vise frame by two square head screws, which pass through the vise frame from the front and thread into the base of the knife. Since the left-hand knife trims the constant or smooth side of the slug, it occupies a stationary position once it is set properly. A small flat spring *2* is interposed between the left-hand knife and the mold disk locking stud