

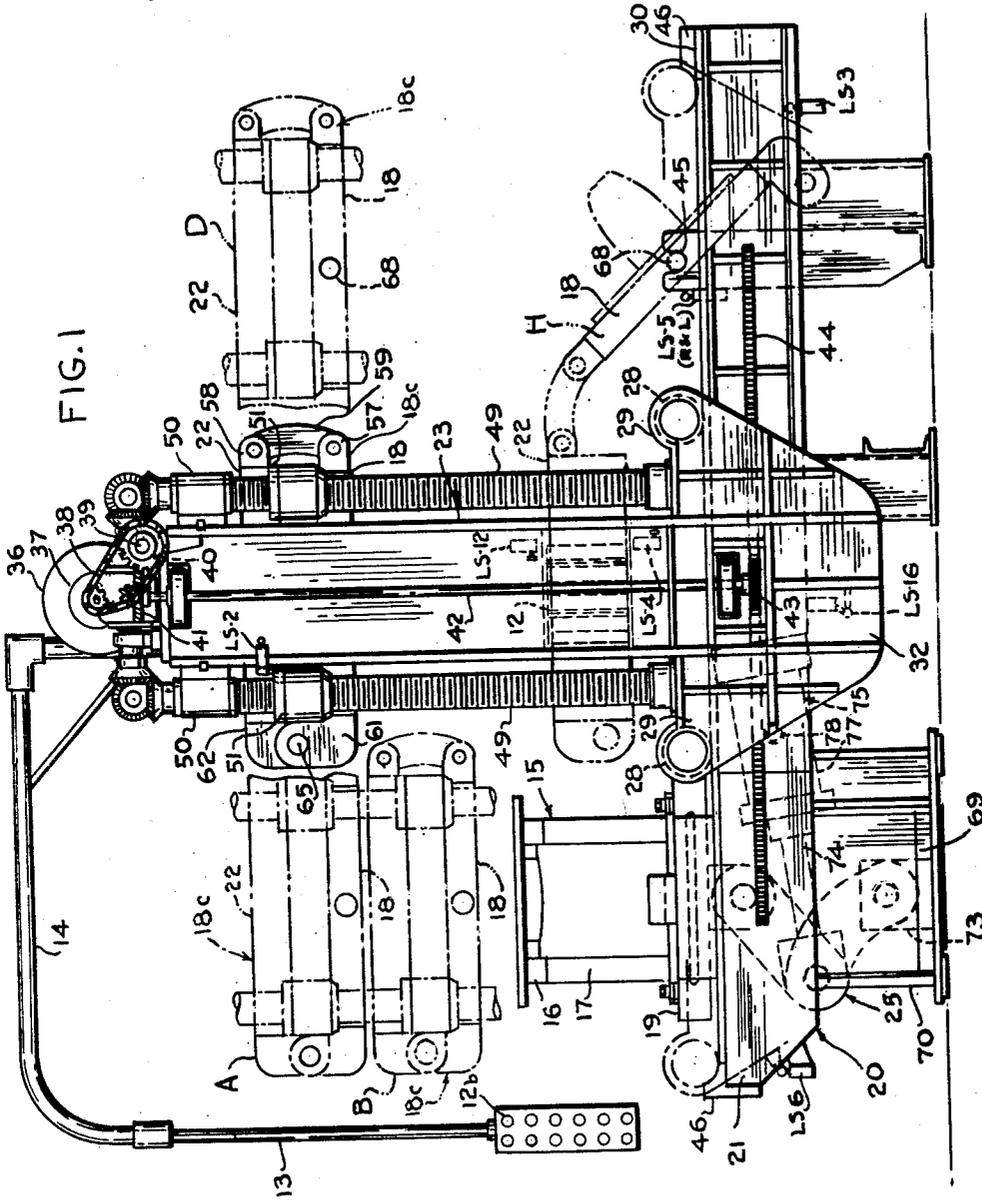
July 14, 1964

J. F. CAMPBELL ET AL.
DIE SPOTTING OR LIKE PRESS

3,140,513

Filed July 19, 1961

7 Sheets-Sheet 1



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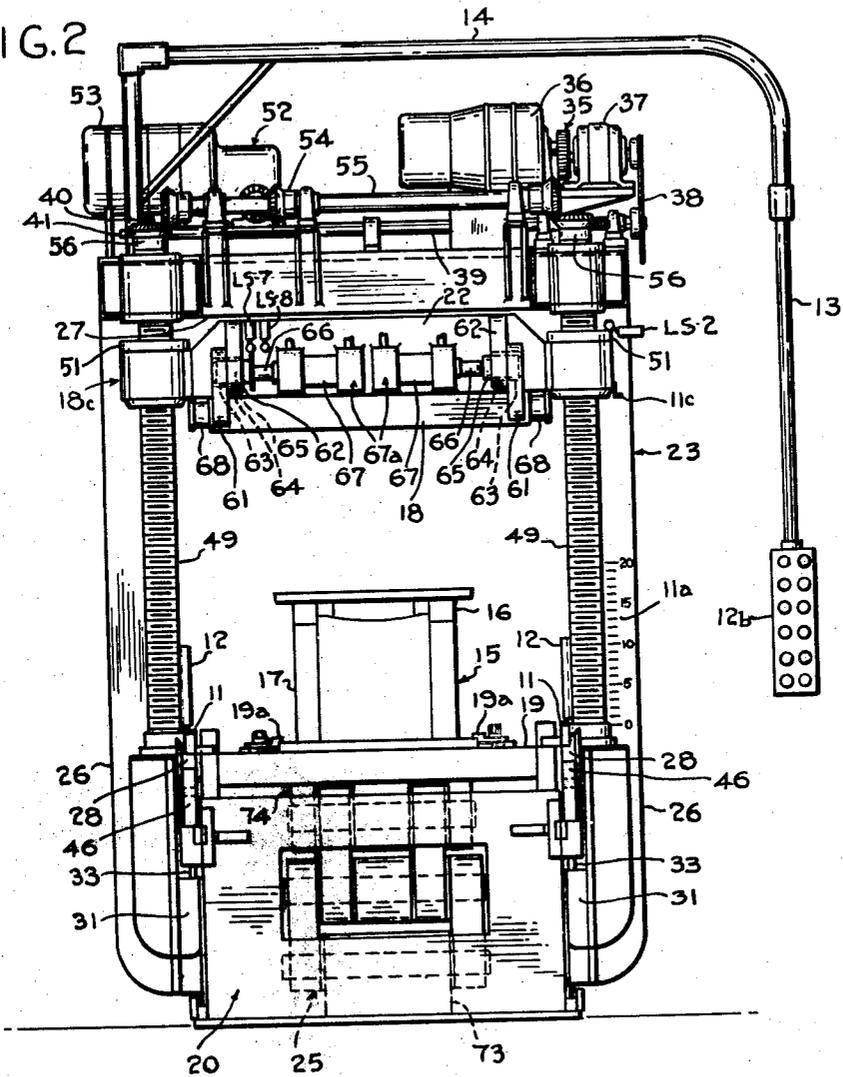
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FIG. 2



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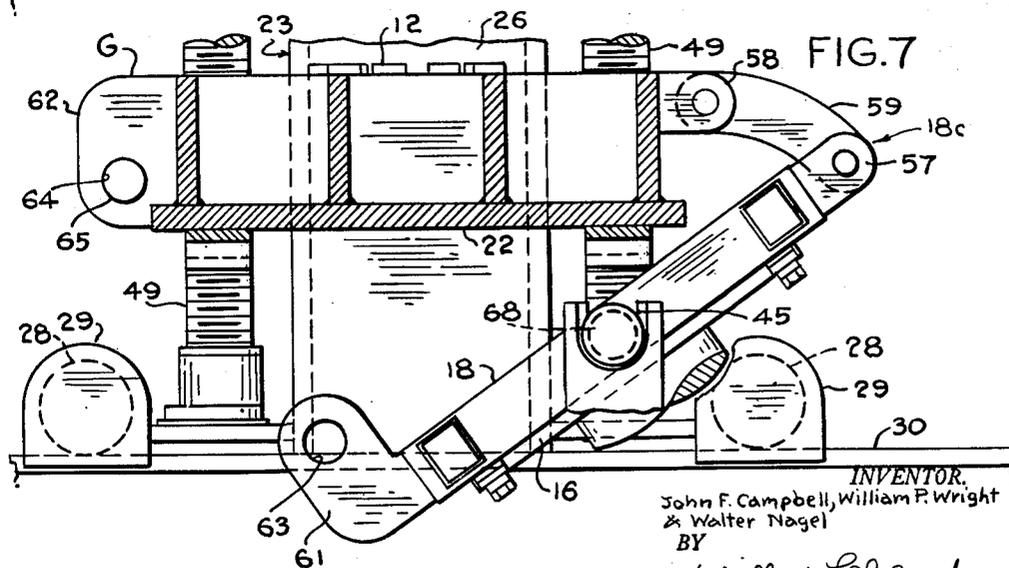
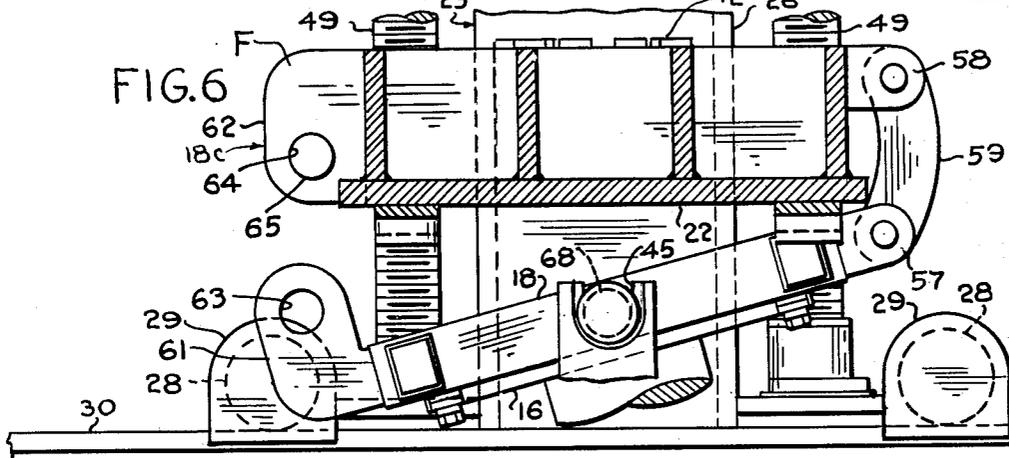
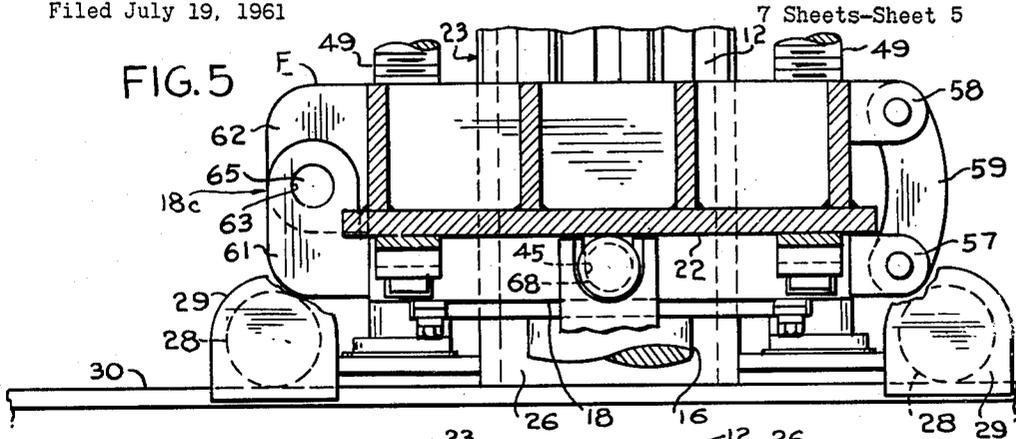
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FIG. 8

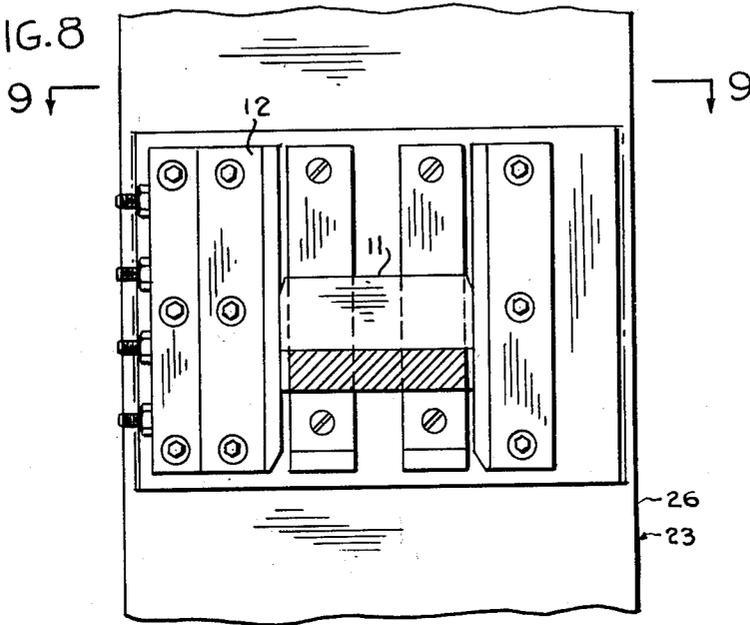
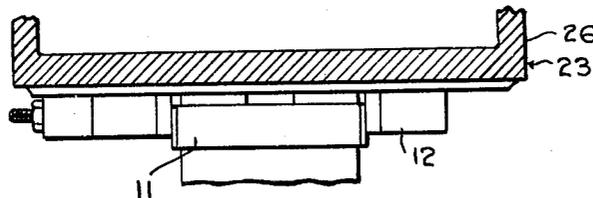


FIG. 9



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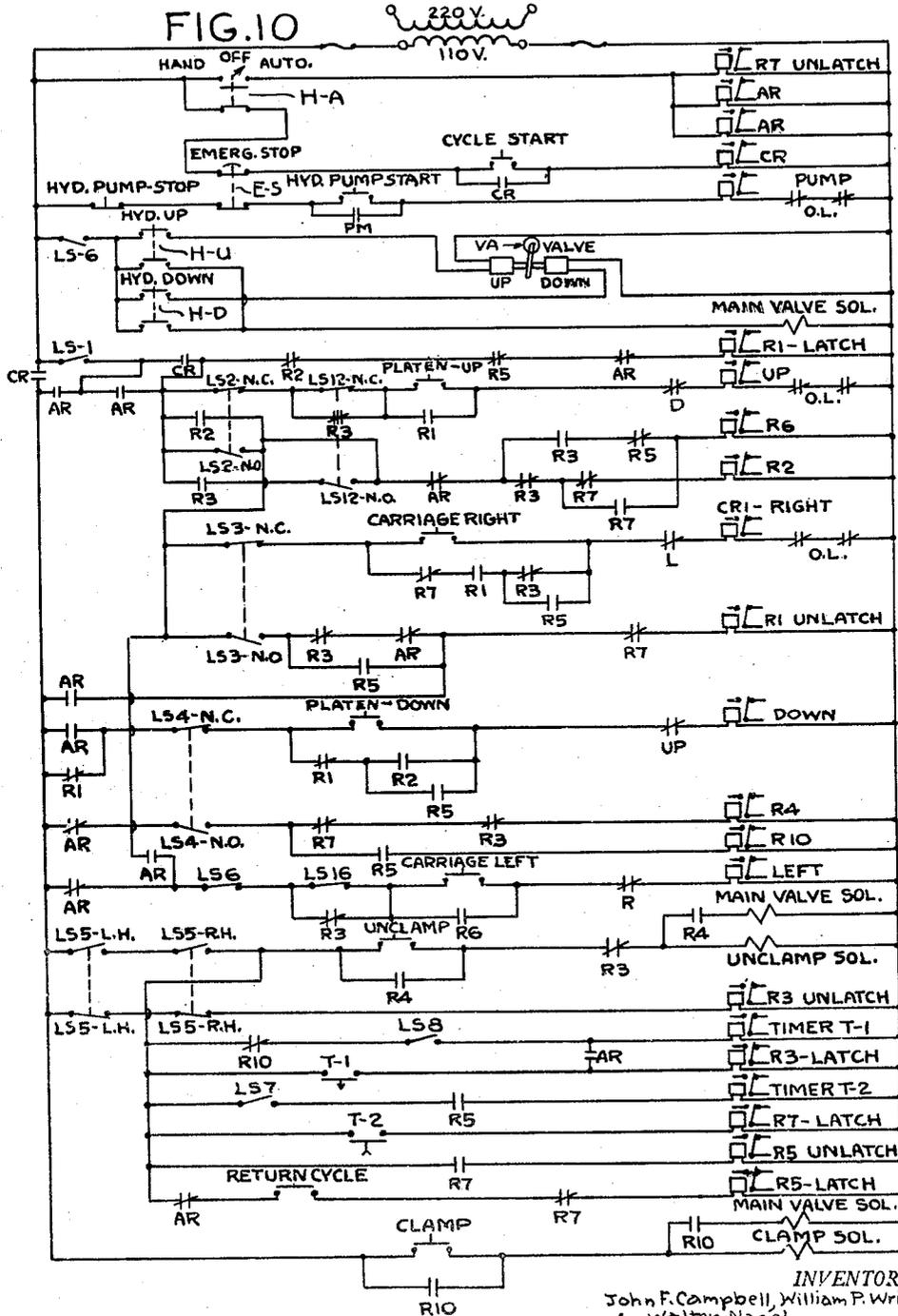
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3,140,513

DIE SPOTTING OR LIKE PRESS

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This invention relates to presses, and in particular relates to a die spotting or like press.

In the past, die spotting or like operations generally have been accomplished by mounting top and bottom mating sections of the die between vertically relatively movable press platens. Presses available for this purpose, however, require removal of the mating die sections from the press after each die-registering movement of the platens, as for mounting the die sections on a work bench for checking, grinding, or other corrective steps. Repeated removal and remounting of the die sections was tedious and time consuming, and accordingly uneconomical and otherwise unsatisfactory. Because certain inspection and grinding steps were required to be done at a point or points remote from the machine the effective space required for the entire operation was substantial.

One object of the present invention is to provide a die spotting or like press having improved means for relatively moving the die sections between mating relationship and a condition in which the die sections are presented at remote points to have the mating portions thereof conveniently exposed for further work thereon, all without necessitating removal of the die sections from the press.

Another object of the invention is to provide a press of the character described which is automatic for requisite cycles of operation and/or selectively operable through various individual movements of the die supporting means.

Another object of the invention is to provide a press of the character described which is readily adjustable to accommodate dies of various sizes, and wherein the platens are self-aligning to eliminate the usual necessity for dies thereon to have registering dowel pins.

Still another object of the invention is to provide a press of the character described having improved means for applying heavy force to urge the die sections into registering relationship, and likewise for applying reversely effective heavy force to urge the die sections apart, as when an article formed in the die tends to bind the die sections together.

A further object of the invention is to provide a press of the character described including vertically relatively movable die-supporting platens, and improved means for moving one of the platens to an inverted position at a point remote from the other platen, to facilitate checking or remedial work on die sections supported on the platens.

These and other objects of the invention will be manifest from the following brief description and the accompanying drawings.

Of the accompanying drawings:

FIGURE 1 is a side elevation of a die-spotting press embodying the features of the invention, and illustrating the same in condition for affixing a two-part die thereon for a die-spotting or like operation.

FIGURE 2 is an end view of the press as viewed from the left of FIGURE 1.

FIGURE 3 is an end elevation of the press as viewed from the right of FIGURE 1, but with die-supporting platens in superposed pressure-applying position at the left end of the press, and with the die sections secured to the platens.

FIGURE 4 is an enlarged fragmentary cross-section of

2

the press, taken substantially on the line 4-4 of FIGURE 3.

FIGURES 5, 6 and 7 are fragmentary cross-sections, corresponding to the upper portion of FIGURE 4, but illustrating movements of the top platen member at the right-hand end of the press, and by which the top platen is moved to the inverted position H thereof, shown in chain-dotted lines in FIGURE 1.

FIGURE 8 is a fragmentary cross-sectional view, taken substantially on the line 8-8 of FIGURE 3, illustrating guide means for aligning the bottom platen with the top platen to register the die sections in complementary relationship.

FIGURE 9 is a fragmentary cross-section taken substantially on the line 9-9 of FIGURE 8.

FIGURE 10 is a schematic wiring diagram of the electrical system for operation of the press.

General Description of the Press

Referring generally to FIGURES 1 to 9, the numeral 15 designates an article-forming die, including mating top and bottom sections 16 and 17, adapted to be secured to relatively movable, top and bottom platens 18 and 19 respectively. Bottom platen 19 is vertically movably supported on one end of an elongated supporting frame 20, between laterally spaced side rails 21, 21 thereof. Top platen 18 is releasably affixed on a platen support 22 vertically movably supported on an upright carriage 23, which is longitudinally, shiftably supported on the side rails 21. In other words, when the carriage 23 is vertically aligned with bottom platen 19, as shown at position B in FIGURE 1, the top platen 18 and its support 22 are vertically movable as a unit on the carriage, to fixed positions with respect to the bottom platen, and the bottom platen is also vertically movable toward and from the fixed top platen, as by means of a hydraulically operated toggle mechanism 25, to be described later. The arrangement is such that the top platen 18, carried by its support 22 on carriage 23, is movable through a series of positions, with respect to the bottom platen 19, including full and chain-dotted positions A to H, indicated correspondingly in FIGURES 1 to 7.

The Carriage

Referring particularly to FIGURES 1, 2 and 3, the carriage 23 includes opposite upright side members 26, 26 and a top cross-head 27, and is supported on frame 20 to move horizontally thereon, as by means of longitudinally spaced pairs of rollers 28, 28, on transverse extensions 29 of the side members, these rollers being adapted to roll on tracks 30 affixed on the upper edges of the frame side rails 21. Tilting action of the carriage on the frame is prevented by inturned portions 31, on downward extensions 32 of the carriage side members, engaging under longitudinal guide strips 33, 33 on said side rails 21.

For moving the carriage on the fixed frame 20, power means 35 is provided on the cross-head 27, the same including a reversible electric motor 36 which, through a gear reducer 37 and a chain drive 38, rotates a horizontal shaft 39 journaled on the cross-head. Gears 40 on shaft 39 in turn mesh with gears 41 on the upper ends of vertical shafts 42 journaled on the opposite side members 26, for rotating pinions 43 keyed on the lower ends of said shafts, so that meshing engagement of the pinions with racks 44 extending horizontally on the side rails 21 of the frame 20 will move the carriage along the tracks 30. Limit switches LS-6 and LS-3 are arranged at the left and right hand ends of the frame, as shown in FIGURE 1, respectively to stop travel of the carriage in alignment with the lower platen 19, or in alignment with laterally spaced trunnion bearings 45, which are affixed on

the frame 20, for purposes to be described later (see corresponding positions A and D in FIGURE 1). In these extreme positions of movement of the carriage, corresponding rollers 28 will be in engagement with stops 46, 46 at the respective ends of the frame rails or sides 21.

The Top Platen Member

Again referring particularly to FIGURES 1, 2 and 3, the top platen 18 and its support 22 are vertically movably mounted on carriage 23 by means of laterally oppositely disposed pairs of vertical screw shafts 49, 49, rotatably mounted between the side-member extensions 29 and bearings 50, 56 on the upper ends of the side members, the four screw shafts being received through threaded bushings 51 non-rotatably affixed in the corresponding corners of the platen support 22. Rotation of the screw shafts 49 in unison in either of opposite directions is effective to raise and lower the platen member 19 on the carriage. These screw shafts also serve as guide means for said vertical movement of the platen member in parallelism to the horizontal.

Power means 52 is provided on the carriage cross-head 27 for driving the four screw shafts 49 in unison, the same including a reversible electric motor 53 which through suitable bevel gear means 54, 54 drive a pair of horizontal shafts 55, suitably journaled on the cross-head. Bevel gear means 56, 56 at opposite ends of each shaft 55 drive the respective vertical screw shafts 49. The arrangement is such that operation of the motor 53 may be electrically controlled, in a manner to be described later, to raise and lower the platen member 19 from and toward positions corresponding to positions A to H indicated in FIGURES 1 to 7, which will be described in greater detail in connection with the operation of the machine.

The top platen member 18 may be releasably clamped on the platen support 22 to be swung from and toward the same for purposes to be described. Accordingly, the platen 18 and its support 22 may have, at the right-hand sides thereof, cooperating pairs of lugs or bifurcations 57, 57 and 58, 58, respectively, between which laterally spaced links 59, 59 are pivotally connected, so that the lower platen may be swung, as for example from the clamped position indicated at A in FIGURE 1, to the chain-dotted line position indicated at H in FIGURE 1. For locking the platen in clamped relation to the platen support 22, the left side of the platen member may have cooperating pairs of lugs 61, 61 and 62, 62, respectively on platen 18 and its support 22. In the clamped position, aligned apertures 63 and 64 in the cooperating lugs 61 and 62, respectively, may have a cylindrical locking pin 65 received therethrough, the pin being affixed on the end of a plunger rod 66 of an electrically controlled hydraulic cylinder 67 on the platen support. That is, one such hydraulic cylinder 67 is provided for each pair of cooperating lugs 61 and 62 (see FIGURE 2).

On laterally opposite sides of the platen 18 may be a pair of trunnions 68 adapted to be supportingly engageable in the bearings 45, when the carriage has been moved to position D, and when the locked platen member has been moved downwardly on the carriage for that purpose. In the last mentioned trunnion-engaged position, the locking mechanism 67a is operable in a manner to be described later, to release the same so that the carriage 23 and the top platen support 22 thereon may be variously moved as described above to tilt the top platen from position E of FIGURE 5, through positions F and G of FIGURES 6 and 7, to the angularly inverted position H of the platen shown in chain-dotted lines in FIGURE 1. Electrical control means for automatic and/or manual operation through these movements will be described in connection with the wiring diagram of FIGURE 10.

The Lower Platen

For vertically moving the lower platen 19 in parallel-

ism, the same may be mounted on the upper end of laterally spaced movable support means 69, 69 which are vertically slidably guided in fixed slide means 70 on the frame 21. For vertically moving the platen in said slide means, the toggle mechanism 25 is connected between a fixed lug 73 on the frame, or in the lower portion of the frame, and lug means 74 affixed on the underside of the platen 19. The toggle mechanism is operable from a collapsed position thereof shown in FIGURE 1 to a fully extended or pressure-applying position shown in FIGURE 3, as by means of a plunger shaft 74 of a hydraulic ram 75 connected to the intermediate pivot point 76 of the toggle mechanism. The cylinder 77 of the hydraulic ram is pivoted to the frame at 78 to be swingable with movement of the toggle mechanism. Accordingly, the hydraulic ram 75 is operable through an electrically controlled valve VA (see FIGURE 10), and while the carriage is stopped at the left of this pass, to move the lower platen 19 from and toward a relative position shown in full lines in FIGURES 1 and 2, to the pressure-applying position shown in FIGURES 3 and 4. During this upward movement of platen 19, guide ears 11, 11 on laterally opposite sides thereof engaged within channel-shaped, vertically extending guides 12, 12 affixed on the carriage side members 26, and thereby self-operatively to align platen 14 laterally and transversely with respect to top platen 16. This structure eliminates the usual necessity for having dowel pins on the die sections to assure accurate complementary registry of the same. Conversely, in the lowered position of platen 19, the ears 11 thereon are disengaged from the guides 12 to permit transverse movement of the carriage 23.

Other means than the hydraulic ram 75 and toggle mechanism 25 may be utilized to apply requisite strong operating force to the lower platen 19, in either direction. As an example, hydraulic rams or separate series of hydraulic rams may be utilized for moving the platen 19 to pressure-applying position and to retracting position, respectively.

Operation of the Press

Operation of the press for spotting the sectional die or mold 15 will be understood by the following description in connection with the wiring diagram of FIGURE 10 and the drawings generally:

Setting up for Cycle of Operation of Press

In setting up the machine or press for a cycle of operation, the operator first closes the "Start" switch to operate the pump (not shown) for the hydraulic ram 75, and sets selector switch H-A on "Hand" or manual operating position (see FIGURE 10). "Hydraulic-Down" switch H-D is now closed to make sure that the toggle-operating ram 75 has been operated through valve VA, to move lower platen 19 to its low or retracted position (see FIGURE 1). Now switch LS-1 is closed to set a series of associated electrical circuits in condition for further selective press movement. The "Platen-Up" switch may now be closed to move top platen member 18c, including support 22, upward on carriage 23 from pre-selected position B, until it is stopped in position A on carriage 23 (FIGURE 1), by operation of a vertically adjustable switch LS-2 for any predetermined limit of such upward movement as required (see full-line position of LS-2 in FIGURE 1). "Carriage-Right" switch is next closed to move carriage 23, with the upper platen member 18c thereon, from position A to the right, to centered position A₁, of the carriage, shown in FIGURE 1, thereby to leave the bottom platen free and unobstructed.

Mounting Die on Press

With the carriage retained in said A₁-position, the assembled two-part sectional die 15 is loaded on the lower platen 19, as shown in full lines at the left of FIGURE 1, and the lower section 17 of the die is clamped onto platen 19, as by means of clamps 19a. Now the "Carriage-

5

Left" switch is held to move the carriage 23 back to position the top platen above die 15, where it is automatically stopped by engagement of a portion of the carriage with switch LS-6 on frame 20. The operator now closes the "Hydraulic-Up" switch, and thereby through a valve VA to operate the ram 75 and toggle mechanism 72, to urge the bottom platen 19 to its upward limit of movement. The "Platen-Down" switch now may be held closed as necessary to move top platen member 18c downwardly on the carriage until platen 18 rests on the top die section 17, or until a predetermined dimension corresponding to the exact height of the die 15 is indicated, by a pointer 11c affixed to top platen member 18c, on a scale 11a provided on one carriage side member 26. In this position, indicated at C in FIGURES 3 and 4, the top die section 16 is affixed on the upper platen 18 by means of clamps 18a. Now hydraulic-down switch H-D is closed to lower the bottom platen, which closes switch LS-1. The die-mounting cycle of operation is now complete, and the press is in condition either for an automatic cycle of operation, or for manually controlled operation thereof.

Carriage-Right Cycle of Automatic Operation of Press

To start a Carriage-Right cycle of automatic operation of the press, the operator now sets selector switch H-A on automatic or "Auto," thereby de-energizing latching relays AR and R7, and energizing "Carriage-Right" relay CR-1, and also energizing latching relay R1, by which latching mechanism 67a of platen member 18c remains locked to retain the upper platen 18 in superposed clamped relation on top platen support 22. Top platen member 18c, with male die section 16 thereon now travels up the carriage 23 until it engages switch LS-2, to open an LS-2 N.C. contact and stop upward travel of the top platen member in position A, shown in FIGURE 1, in which the male die section 16 clears the female die section 17. Simultaneously the N.O. contact of switch LS-2 closes and energizes relay R2, which locks itself in by one set of its contacts. When LS-2 N.O. closes as described, the carriage 23 starts to travel to the right, through the circuit containing LS-3 and contact R1, until the carriage engages and opens right-hand limit switch LS-3 N.C., to stop the right-hand movement of the carriage in position D of FIGURE 1. At the same time that LS-3 N.C. opens, LS-3 N.O. closes to de-energize latching relay R1, while relay R2 remains energized through closed LS-2 N.O. The N.C. contacts of relay R1, being now open, the top platen member 18c travels down until it engages switch LS-4 to open the same and stop said downward travel in position E of the top platen member in which the trunnions 68 thereon will be cradled in the upwardly presented bearing slots 45 (see FIGURE 5). At the same time the LS-4 N.O. contacts close energizing R4 through relay contacts R7 and R3. Upon the trunnions 68 coming to rest in the bearing slots 45, platen 18 will engage switches LS5-L and LS5-R, to close N.O. contacts of the same to the platen-unclamping circuit for unclamping platen 18 through contact R4. The LS5-L N.C. and LS5-R N.C. contacts are thereby opened to disconnect the R3 "Unlatch" or unclamping circuit. When unclamping has been accomplished, a switch LS-8 N.O. will be closed to energize timer T-1. After a pre-set time the timer T-1 will energize the R7 latching relay, by which one contact R7 energizes unlatching relay R5 and one set of R7 contacts deenergizes the R2 relay. Timer T-1 also energizes latch relay R3.

Now that relay R2 is de-energized and relay R5 is operated for unlatching the locking mechanism 67a, and relays R1 and R3 are energized, switch LS-4 causes top platen support 22 to travel up the carriage from position E until the platen support engages switch LS-12, whereby LS-12 N.C., opens and stops the upward travel of the platen support at a predetermined height as shown in position F of FIGURE 6. At the same time LS-12 N.O. closes to energize relay R-6 through contacts R3-R5, to

6

cause the carriage to travel to the left, until it engages a switch LS-16 previously rendered effective through contact R3 to open switch LS-16, to stop left-hand travel of the carriage in position H of FIGURE 1, in which the links 59 between top platen 18 and platen support 22 will have caused the platen to tilt on the trunnions 68, through the G-position of FIGURE 7, to the H-position of FIGURE 1, wherein the top platen has been inverted to present the male portion 16 of die 15 upwardly at a convenient working angle. In this position an operator may prepare the die part 16 of a subsequent die-spotting operation in known manner, while die 17 is being likewise prepared at the other end of the press.

Carriage-Left Cycle of Automatic Operation of Press

After preparation or treatment of the die sections 16 and 17 as described above (FIGURE 1), the operator closes return cycle switch R-C, which energizes latch relay R5 through contact R7. Relay contacts R5 open the latch relay circuit and also drop out relay R6, to cause the carriage to travel to the right until it comes in contact with switch LS-3. The contacts of LS-3 N.C. thereby open to stop right-hand travel in position F (FIGURE 6), while switch LS-3 N.O. closes to de-energize the unlatching relay R1, and through contacts R1 and R5, thereby closes the platen-down circuit, and causes the top platen support 22 to travel down the carriage until it engages switch LS-4. This causes the LS-4 N.C. contacts to open and stop this down travel of platen support 22, in superposed relation to top platen 18, which will then have been tilted back to its original E-position on the trunnion bearings 45 (FIGURE 5). Simultaneously, the LS-4 N.O. contacts close, energizing R-10 relay through contact R-5. Contact R-10 is thereby made effective, through ram 75 and toggle mechanism 72, to lock the top platen and its support 22 in clamped condition. After fully locked clamping has been accomplished, a plunger engages and closes switch LS-7 N.O. and energizes timer T-2 through contacts R5. After a pre-set time, timer T-1 energizes latch relay R7, and through contacts R7 opens latch relay circuit R5, while contacts R7 also energize unlatch relay R5 and stop operation of timer T-2. Contacts R5 also de-energize relay R10, and open the "Platen-Down" circuit and the "Carriage-Right" circuit and also energize latching relay R1, which closes the Platen-Up circuit to cause the top platen member 18 to travel up the carriage. In this movement, switches LS5-R and LS5-R N.C., close the energized unlatching relay R3, and the platen member 18c continues to travel up until switch LS2 is engaged, thereby to open contact LS2 N.C. and stop the upward travel. At the same time contact LS-2 N.O. closes and energizes relay R6 to cause carriage 23 to travel to the left until it engages switch LS-6, which stops left-hand travel of the carriage with the top die section 16 in position A (FIGURE 1), directly over bottom die section 17. This ends the automatic operation, and the operator now sets selector switch H-A in the "Hand" position.

At this point, the two die sections 16 and 17 may be clamped together to test the accuracy of article-forming surfaces thereof by various known methods, such as by means of forming an article of suitable checking material in the die, and subsequently checking the formed article. Such clamping of the die sections is accomplished as previously described, namely by closing the hydraulic-up switch H-U, and thereby through valve VA to operate ram 75 and toggle 72, to urge bottom platen 19 to the positive upward limit of movement thereof. Now "Platen-Down" switch is momentarily held closed as necessary to move the upper platen member down the carriage until the upper die section 16 is complementally engaged with the lower die section 17 to form the article (not shown). This movement may also be checked by the position of pointer 11 with respect to scale 11a (see FIGURE 2). Upon allowing the article to harden the

ram and toggle are reversely operated, as described above, forcibly to separate the bottom die section from the top die section, after which the press may be set to repeat the aforesaid automatic operation and return the lower die section to the H position thereof shown at the right of FIGURE 1.

Accordingly, the top and bottom die sections 16 and 17 again will be presented freely upwardly at the right-hand and left-hand ends of the press, respectively, whereby an operator or operators may conveniently work on the respective die sections to check the same and the test article made therein, and may correct the dies as necessary. The automatic cycles of operation, through the various positions B to H and return, may be repeated as often as necessary to condition the die for use in continuous production in another machine, without the necessity for removing the die sections from the respective platens at any time during the testing or checking cycles of operation of the press. Any modifications, such as grinding operations, which may be required in the two die sections likewise may be accomplished simultaneously while the top die section is in the H-position of FIGURE 1.

The press can be stopped at any time during the right and left cycles of automatic operation, by means of the emergency stop switch E-S. By depressing Cycle-Start switch C-S, the press will continue the automatic cycles from the points where they were stopped. If the operator should, for any reason, be required to reverse the direction of a particular operation, from that which the corresponding position of the cycle dictates, he may do so by setting the selector H-A switch for "Hand" or manual control.

Manual or "Hand" Operation of Press

Any of the various movements of the press, accomplished as described for automatic operation, may be accomplished individually by means of the respective manually operable switches for "Hydraulic-Up," "Hydraulic-Down," "Platen-Up," "Platen-Down," "Carriage-Right," "Carriage-Left," "Clamp" and "Unclamp." These switches, as well as the switches for "Emergency Stop" (E-S), "Cycle Start" (C-S), "Selector" (H-A), and "Return Cycle," may be located in a control box 12 on the lower end of a downturned extension 13 of an arm 14 pivoted on the cross-head 27 of the carriage. The arrangement is such that the control box may be moved in a wide arc around the carriage 23 for maximum convenience to the operator during various phases of operation of the press.

The clamping mechanism, however, cannot unlock, except under safe conditions. That is, the upper platen 18 and platen support 22 therefor must be fully supported in superposed relation by the trunnions 68 resting in the bearing recesses 45, whereby the safety switches LS5-R and LS5-L will be held open, as previously described. There is also a safety feature in the hydraulic ram 75, in that it cannot be operated to move the lower platen 19 either up or down unless the carriage 23 is in the extreme left-hand position of FIGURE 1 to close switch LS-6.

Modifications of the invention may be resorted to without departing from the spirit thereof or the scope of the appended claims.

What is claimed is:

1. A press for registering die or like mating parts, comprising relatively movable platens adapted to have the mating parts secured thereto, means for relatively moving one said platen between a closed mating-part position and an open spaced-apart position with reference to the other platen, means operable transversely to move said one platen relatively from and toward an offset position with reference to said other platen, and means operable upon said transverse movement to shift said one platen toward and from inversely tilted condition in the offset position and means operable upon said transverse movement to

shift said one platen toward and from inversely tilted condition in the offset position.

2. A press, comprising relatively movable platen members, means for axially relatively moving one of said members between open and closed position with respect to an axis of the press, and means for retracting one said member radially of said axis to an inverted position thereof substantially spaced from the other member.

3. A press comprising relatively movable platen members, pressure-applying means for relatively moving said platen members axially toward and from each other, one said platen member including a platen support and a tiltable platen having hinged connection thereto to swing from and toward a clamped position on the support, releasable means for locking said tiltable platen against swinging movement on said support thereof, means for moving said one platen member away from the other in transverse direction angularly of the direction of said axial movement, means operable during said transverse movement of said one platen member to release said releasable means, and guide means operable by transverse movement of said one platen member upon release of said releasable means to swing said tiltable platen thereon to a predetermined inverted angular position with respect to said platen support.

4. A press as set forth in claim 3, said guide means including relatively fixed bearing means, and trunnions on said tiltable platen engageable in said bearing means pivotally to support the tiltable platen, whereby said transverse movement of the platen support is effective through said hinged connection to tilt the tiltable platen to said inverted position thereof on said bearing means.

5. A press as set forth in claim 4, wherein said hinged and pivotal connections permit compound movement of the platen support, a plurality of angularly disposed directions which determine the angle of said tiltable platen on said bearing means in different angular directions which determine the angle of said tiltable platen on said bearing means.

6. A press as set forth in claim 5, wherein said platen members are vertically relatively moved by said pressure-applying means, said means for moving said one platen member including a horizontally movable carriage on which said platen support is vertically movable and means for vertically moving said platen support on said carriage thereby to provide said compound movement of the platen support thereby to provide said compound movement of the platen support.

7. A press comprising an elongated supporting frame, a carriage, means for mounting said carriage for horizontal movement on said frame, carriage power means for moving said carriage horizontally on the frame, a bottom platen member, means for vertically movably mounting said bottom platen member with respect to said frame, a top platen member, means for vertically movably mounting said top platen member on said carriage, top-platen power means for selectively moving said top platen to different positions of vertical movement on said carriage, said carriage being movable by said carriage power means toward and from a position of alignment with said bottom platen member in which said top platen member is movable by said top platen power means to a fixed position over said bottom platen member, and bottom platen power means operable to urge the bottom platen toward and from pressure-applying relationship to said top platen member in said fixed position of the same, said top platen member including a platen support and a platen in swivable connection therewith to swing from and toward clamped position on the support, and wherein is included releasable means for locking said platen in said clamped position on said support, cooperative pivotal means on said frame at a point remote from said bottom platen and on said swivable platen adapted to be interengageable by movement of the carriage and vertical movement of the top platen member thereon to provide pivotal support

9

for said swingable platen, whereby upon release of said releasable locking means and predetermined further said horizontal movement of the carriage coordinated with vertical movement of the platen support thereon said swingable platen is swingable on the platen support to a predetermined inverted angular position on said pivotal means.

8. A press as set forth in claim 7, said pivotal means including trunnions on said swingable platen in spaced relation to the swingable connection thereof with said platen support and bearing means inwardly engageable by said trunnions by lowering said top platen member on said carriage means inwardly engageable by said trunnions by lowering said top platen member on said carriage.

9. A press as set forth in claim 8, said swingable connection including link means pivotally connected to said swingable platen and to said platen support therefor.

10. A press as set forth in claim 9, including means for self-centeringly guiding said trunnions into said bearing means.

11. A press as set forth in claim 7, said frame having laterally spaced tracks and said carriage having thereon spaced roller means engaging said tracks for rolling support of the carriage for said horizontal movement thereof, and interengaging means on said frame and carriage for anchoring the carriage against upward movement with operation of said bottom-platen power means.

12. A press as set forth in claim 7, including means for restraining said carriage against vertical movement with respect to said frame with operation of said bottom-platen power means.

13. A press as set forth in claim 7, said means for vertically movably mounting said top platen including a plurality of upright screw shafts rotatably mounted on said carriage and threaded through portions of said platen support, said top platen power means being reversibly operable to rotate said screw shafts to move the platen support vertically thereon.

14. A press as set forth in claim 7, said carriage power means including rack means affixed on said frame, and driven gear means on said carriage meshing with said rack means, said carriage power means being reversible to move the carriage horizontally in either direction through rotation of said gear means against said rack means.

15. A press as set forth in claim 7, said means for vertically movably mounting said top platen including a plurality of upright screw shafts rotatably mounted on said carriage and threaded through portions of said platen support, said top platen power means being reversibly operable to rotate said screw shafts to move the platen support vertically thereon, said carriage power means including rack means affixed on said frame, and driven gear means on said carriage meshing with said rack means, said carriage power means being reversible to move the carriage horizontally in either direction through rotation of said gear means against said rack means.

16. A press as set forth in claim 7, said bottom platen power means including a toggle mechanism connected between a fixed anchor point and said bottom platen member and to hydraulic ram having plunger means connected to said toggle mechanism to extend and collapse the same.

17. A press as set forth in claim 3, said releasable means including cooperating portions on said platen support and on the platen thereof provided with openings in alignment in the clamped position of the platen, and reciprocal means operable from and toward locking engagement through said aligned openings.

18. A press as set forth in claim 3, said releasable means including cooperating portions on said platen support and on the platen thereof provided with aligned openings, at least one fluid pressure operated plunger device having a plunger extension reciprocable from and toward locking engagement through said aligned openings.

10

19. A press as set forth in claim 7, said carriage power means and top platen power means being electrically operable in an electrical circuit means progressively initiating successive said movements of said carriage and said top platen member to move said swingable platen toward and from said predetermined angle thereof.

20. A press, comprising an elongated supporting frame, a carriage, means for mounting said carriage for horizontal movement on said frame, carriage power means for moving said carriage horizontally on the frame, a bottom platen member, means for vertically movably mounting said bottom platen member on said frame, a top platen member, means for vertically movably mounting said top platen member on said carriage, top-platen power means for selectively moving said top platen member to different positions of vertical movement on said carriage, said carriage being movable by said carriage power means toward and from a position of alignment with said bottom platen member in which said top platen member is movable by said top platen power means to a fixed position over said bottom platen member, and bottom platen power means operable to urge the bottom platen toward and from pressure-applying relationship to said top platen members in said fixed position of the same, said top platen member including a platen support and a top platen swingably connected thereon to swing from and toward clamped position on the support, and wherein is included releasable means for locking said platen against swinging on said support, pivotal means on said frame at a point remote from said bottom platen and on said swingable top platen adapted to be interengageable by movement of the carriage and the top platen member thereon to provide pivotal support for said top platen, whereby upon release of said releasable means and predetermined further said horizontal movement of the carriage and vertical movement of the platen support thereon said top platen is swingable on the platen support to a pivot the top platen on said pivotal means to a predetermined angle, said carriage power means and top platen power means being electrically operable in an electrical circuit means progressively initiating successive said movements of said carriage and said top platen member to move said swingable platen toward and from said predetermined angle thereof, said electrical circuit means being automatically operable from a position of predetermined cooperation of the top platen member to position of the same in which the swingable top platen is at said predetermined angle thereof.

21. A press as set forth in claim 20, said electrical circuit means being automatically reversely operable from the position for said predetermined angle of the swingable top platen back to said position of predetermined cooperation of the top platen member.

22. A press as set forth in claim 21, said electrical circuit means including electrical means adjustable for selectively controlling given portions of said movements of the top platen member and carriage.

23. A press as set forth in claim 22, including an arm pivoted on said carriage and having a downward extension adapted to be swung with the arm in an arc around the carriage, a manual control device provided on said arm extension having switch means connected in said electrical circuit means for selectively controlling the operation of the press.

24. A press as set forth in claim 20, including an arm pivoted on said carriage and having a downward extension adapted to be swung with the arm in an arc around the carriage, a manual control device provided on said arm extension having switch means connected in said electrical circuit means for selectively controlling the operation of the press.

25. A press as set forth in claim 7, guide means being provided on said bottom platen member and on said carriage to be interengageable when said bottom platen member is relatively moved toward said top member in said

11

position of alignment of the carriage, and thereby to maintain the bottom platen member in centered alignment with said top platen member.

26. A press as set forth in claim 7, guide means being provided on said bottom platen member and on said carriage to be interengageable when said bottom platen member is relatively moved toward said top member in said position of alignment of the carriage, and thereby to maintain the bottom platen member in centered alignment with said top platen member, said guide means including

12
channel portions on said carriage and ears on said bottom platen member vertically slidable in said channel portions.

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