Oct. 22, 1935. F. J. RODE ET AL 2,018,576

SHEET METAL PRESS

Filed Dec. 14, 1934 2 Sheets-Sheet 1

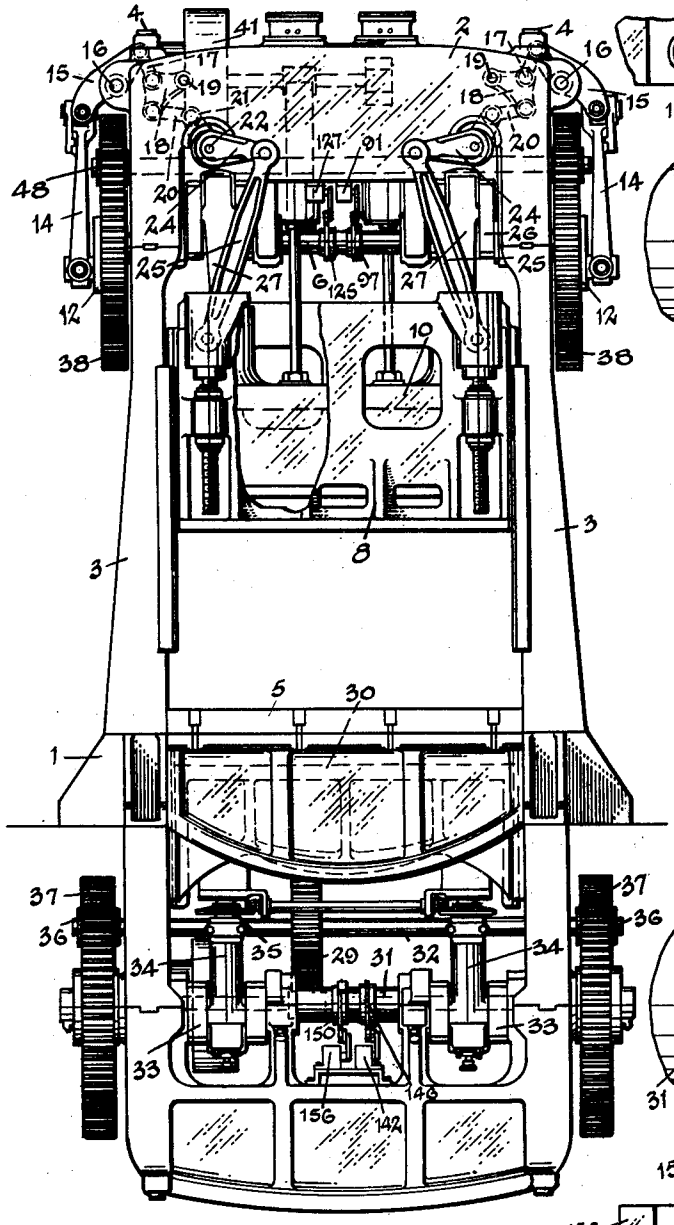


Fig 1

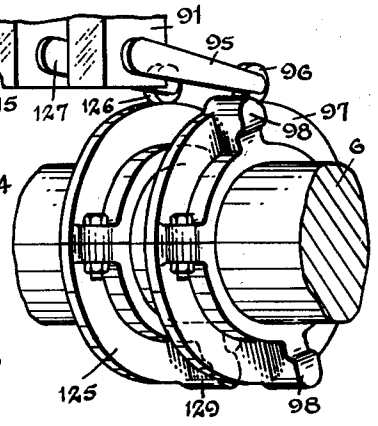


Fig 3

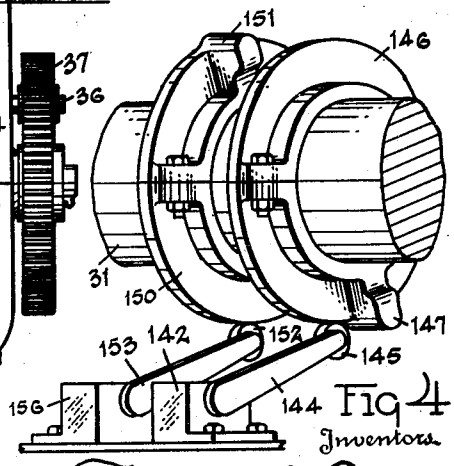


Fig 4

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SHEET METAL PRESS

Filed Dec. 14, 1934 2 Sheets-Sheet 2

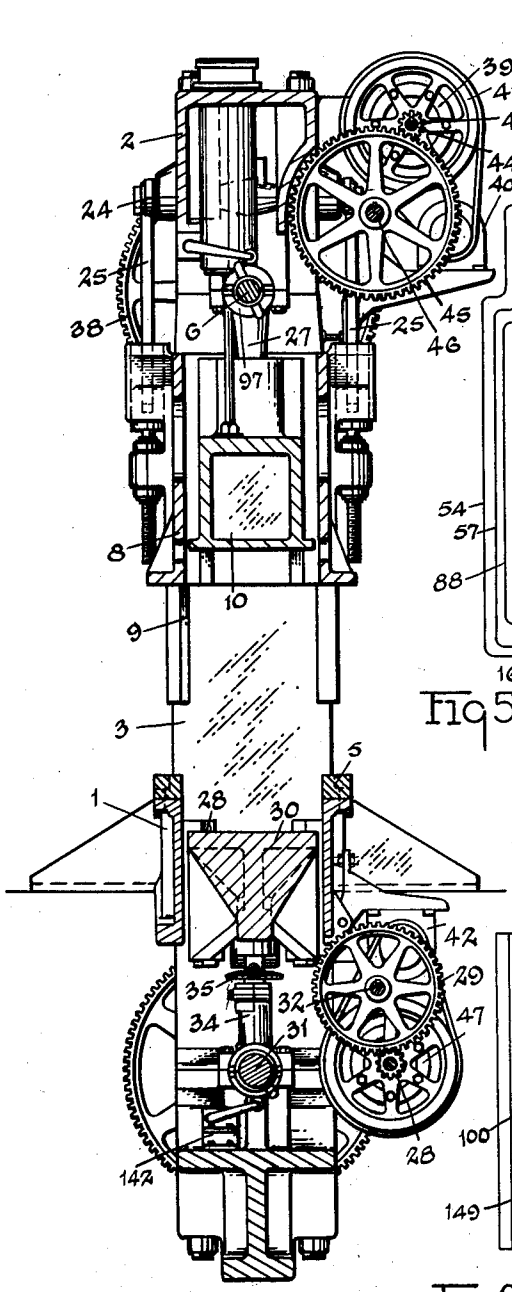


Fig 2

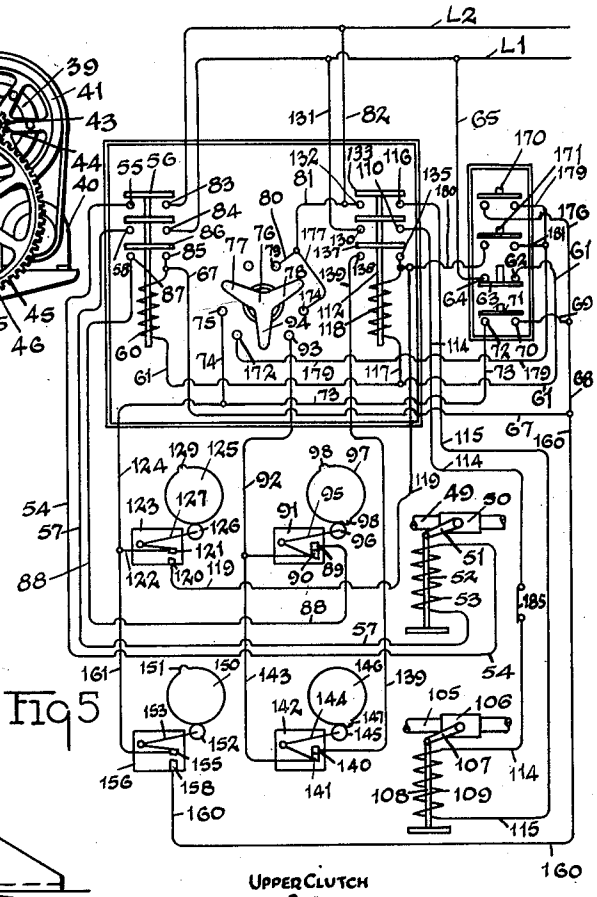


Fig 5

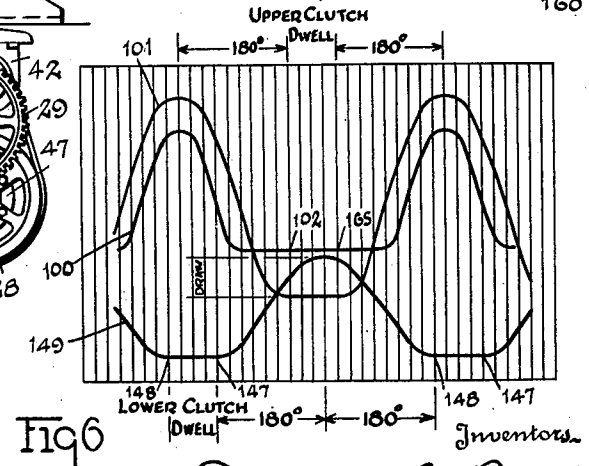


Fig 6

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UNITED STATES PATENT OFFICE

2,018,576

SHEET METAL PRESS

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Application December 14, 1934, Serial No. 757,418

9 Claims. (Cl. 113—38)

Our invention relates to a sheet metal press having a plurality of reciprocable plungers slidably disposed in a frame and adapted to engage and shape sheet metal in accordance with dies carried by the plungers. The invention particularly relates to a sheet metal press having reciprocable plungers some of which move in opposed directions to others to engage sheet metal, those of the plungers movable in one direction to operate on the sheet metal being driven by a machine drive shaft, and those plungers movable in the opposite direction being driven by a second and independent machine drive shaft, each machine drive shaft being operatively connected to an independent source of power.

The invention has for an object to provide a means for controlling the operation of each machine drive shaft whereby a desired synchrony of movement of the plungers connected thereto may be obtained, such as related descending and ascending strokes and periodic dwells of plungers in proper and useful sequence. The invention has for a further object to provide a means which may be manually, but which upon setting will function automatically to control the movement of the plungers of the press eliminating much of heretofore necessary supervision and attention of the press operator. This is of importance when the press being operated is of massive weight and the sheet metal being worked on of a material dimension.

The invention provides a triple action press which may be quickly and easily modified to perform a double action function in a common direction with reference to the work without the heretofore necessary unlinkage of various parts. In a press capable of performing tonnage work, the linkage is of a considerable bulkiness and weight, and interchanging from triple action to double action often involves much expense. In the press of our invention, the change-over may be effected instantly by the operator.

The invention further provides a means whereby sheet metal presses of the "double action" type having a pair of nested plungers, one usually performing a blank holding duty, the other a sheet forming duty, may be modified by the addition of a third plunger acting in opposed direction to the blank holder to embody the features and advantages of a triple action sheet metal press with but little additional outlay and expense. The control means of our invention effects an interrelation and dependency as between the movements of the blank holder and associated plunger and the third plunger without intervention of other means.

The invention has for a particular object to provide in a sheet metal press having multiple plungers, each of which are driven by a driving means operably and independently connectible to a source of power, a means operable on the predetermined movement of some of the plungers for connecting or disconnecting the driving means of other of the plungers with its particular source of power. A still further and more particular object is to provide means operable on the movement of the plunger driving means for connecting the other plunger driving means with a source of power and disconnecting the first named plunger driving means from a source of power.

The invention consists in other features and advantages which will appear from the following description and upon examination of the drawings. Structures containing the invention may partake of different forms and still embody the invention. To illustrate a practical application of the invention, we have selected a sheet metal press as an example of the various structures and details thereof that contain the invention and shall describe the selected sheet metal press hereinafter, it being understood that variations may be made without departing from the spirit of the invention. The particular sheet metal press selected is shown in the accompanying drawings and described hereinafter.

Fig. 1 of the accompanying drawings illustrates a front of the sheet metal press selected as illustrative of structures containing the invention. Fig. 2 illustrates a vertical longitudinal section of the press shown in Fig. 1. Fig. 3 illustrates an enlarged perspective view of the actuating mechanism for controlling the operation of the blank holder and upper plunger of the press. Fig. 4 illustrates a view in perspective of the actuating mechanism for controlling the operation of the lower or third plunger of the press. Fig. 5 illustrates diagrammatically an electrical circuit through which the mechanism of Figs. 3 and 4 function. Fig. 6 illustrates diagrammatically one of the composite movements of the blank holder and plungers relative to the degrees of rotation of the several machine drive shafts obtainable by the use of our invention.

The frame of the sheet metal press shown in the drawings for purposes of illustration and application of our invention has a base 1, a crown 2, and uprights 3 located between the base and the crown. The crown 2 and base 1 are suitably

fixed in assembled relation by the usual tie rods 4 which extend through the uprights 3. The base 1 has a bed portion 5 on which suitable shaping dies may be locked and on which the sheet metal to be worked on may be placed. The crown has suitable bearings in which to support a machine drive shaft 6 for driving a blank holding plunger 8 and shaping plunger 10.

The blank holding plunger 8 is slidably supported in ways 9 on the uprights 3 and is connected to the machine drive shaft 6 so that during successive rotation of the shaft the blank holding plunger approaches the bed 5 and then dwells for a prolonged period of time during the continued rotation of the machine drive shaft. As illustrated in the drawings, the machine drive shaft has end cranks 12 to the ends of each of which are pivotally connected a reciprocating pitman 14. Each reciprocating pitman is connected to a rocker lever 15 pivotally mounted, as at 16, on the crown of the press. Each rocker lever 15 is pivotally connected as by a link 17 to a bell-crank 18 pivotally mounted, as at 19, in the crown of the press. Each bell-crank 18 is pivotally connected as by a link 20 to an arm 21 of a rock shaft 22. Each rock shaft 22 is rotatably mounted in spaced parallelism to each other in the crown of the press and has end arms 24. The end arms 24 of each rock shaft 22 are pivotally connected by links 25 to two corner portions of the blank holder. Each arm 24 and associated link 25 forms in their relation to each other toggle links for moving the blank holder and causing it to perform a prolonged dwell during normally continued rotation of the shaft 6 through certain degrees.

The machine drive shaft 6 may have eccentric or crank connections for connecting the shaping plunger 10 therewith. In the construction shown in the drawings, the machine drive shaft 6 has a pair of cranks 26 to each of which are connected pitmen 27. The end of each pitman 27 is connected to the shaping plunger 10 so that upon continued rotation of the machine drive shaft the plunger 10 will describe a continued reciprocation relative to the bed 5 of the press. The cranks 26 are so angularly disposed on the shaft 6 relative to the cranks 12 that the blank holding plunger 8 approaches the bed 5 of the press in advance of the approach of the shaping plunger 10. Thus it will be seen that sheet metal disposed on the bed will be engaged by the blank-holding plunger 8 and held in position thereby during the dwell period described by the blank holder and during the shaping action of the plunger 10. The plungers 8 and 10 may be provided with suitable adjusting means for adjusting the plungers relative to their actuating elements and to maintain them in desired sheet metal engaging relation. Pneumatic or hydraulic loading means may be provided for taking up play between the points of connections of the plungers with their actuating means in a manner well known in the art.

Slidably disposed in ways 28 below the bed 5 is a third plunger 30 which may, according to the dies carried thereby, constitute a shaping plunger and cooperate in sheet metal shaping function with the plungers 8 and 10. The plunger 30 is reciprocated by means of a machine drive shaft 31. The shaft 31 may be rotatably supported in bearing portions formed in the base 1 of the press. The shaft 31 may be connected to the plunger 30 by suitable eccentric or crank connections. As shown in the drawings, the shaft 31 has a pair of crank arms 33 to each of which is pivotally connected a pitman 34. The end of each pitman is suitably connected to the plunger 30 so that upon continued rotation of the shaft 31, the plunger will be reciprocated relative to the bed 5 and the plungers 8 and 10. The pitmen 34 may have a well-known means 35 for adjusting the effective length of the pitmen and thereby vary the desired extent of the stroke of the plunger 30.

The machine drive shafts 6 and 31 are each driven from an independent source of power through suitable power transmission or coupling means. Thus, the drive shaft 6 is driven by a suitable motor 40 which is belted to a fly wheel 41 of a power transmission means. The power transmission means is preferably of a form and construction described in our application Serial No. 703,192 filed December 20, 1933 wherein a clutch and brake control device is described. The clutch and brake control device 39 has means for operatively connecting the fly wheel 41 with a driven pinion shaft 43 in response to the application of a pneumatic medium to establish clutching and for operatively connecting the pinion shaft 43 to elements resistant to movement upon failure or withdrawal of said pneumatic medium to brake the movement of the shaft. Other brake and clutch combinations may be used with like effect. A pinion 44 may be suitably keyed to the shaft 43 and disposed in meshing relation with a gear wheel 45. The gear wheel 45 is keyed to a countershaft 46 suitably journaled in the crown 2 of the press. At each end of the shaft 46 is keyed a pinion 48 which meshes with the teeth of a bull wheel 38 mounted on each end of the shaft 6 and keyed thereto. Thus, the machine drive shaft 6 may be driven or be held against rotation in direct relation to the application of a pneumatic actuating medium to the clutch and brake control device 39.

A pneumatic actuating medium may be applied to clutch and brake control device 39 from a suitable source through a conduit or pipe, illustrated diagrammatically at 49 in Fig. 5. The pipe 49 has a valve 50, the valve member of which is operated by an arm 51. The arm 51 is operatively connected to the movable core 52 of a solenoid coil 53 which normally holds the arm 51 in a valve closed position. The solenoid 53 may be energized by a current from a suitable source carried by main line conductors L—1 and L—2 and controlled by means disposed in the circuit therewith to open the valve.

The solenoid coil 53 circuit comprises a fixed contact 55 of a suitable relay switch 56, line 54, solenoid coil 53, and line 57 and to a fixed contact 58. The relay switch 56 is magnetically operated by a coil 60, the circuit of which comprises main line L—1, line 65, contact 64 of switch 63 normally held closed, contact 62, line 61, coil 60, line 67, line 68, line 69, contact 70 of the starting switch 71, adapted, on starting, to be closed by depressing, contact 72, line 73, line 74, fixed contact 75 of the rotary selector switch 76, arm 77 and arm 78 of switch 76, fixed contact 79, line 80, line 81, line 82 to main line L—2. Thus, it will be seen that when switch 71 is depressed, the coil 60 will be energized to actuate the relay switch 56 and connect the circuit of the solenoid coil 53 through the switch movable contacts and fixed contacts 83 and 84 of the relay with the main lines L—2 and L—1, respectively. The solenoid coil 53 will thus be energized to magnetically actuate the core 52 to open the valve 50

and thereby apply a pneumatic actuating medium to the clutch and brake control device 39 operatively connecting the shaft 6 with the driving motor 40 and starting the rotation of the shaft with resultant advancement of the plungers 8 and 10.

A holding circuit for the relay 56 is provided so that upon release of the switch 71, the above described circuit relation will be maintained for a predetermined period. The relay holding circuit comprises main line L—1, line 65, contact 64, switch 63, contact 62, line 61, coil 60, fixed contact 85, movable contact 86, fixed contact 87 of relay 56, line 88, fixed contact 89, movable contact 90 of a switch 91, line 92, contact 93, arm 94, of selector 76, arm 78, line 80, line 81, line 82, to main line L—2. The relay holding circuit thus established is controlled by switch 91 normally held closed.

The movable contact 90 is moved in response to a predetermined movement of the plungers 8, 10, and 30 of the press and, as is apparent from the foregoing description, in being moved to break the circuit of the relay 56 results in closing of the valve 50 and the operative disconnection of the shaft 6 with the motor 40. In the form shown in the drawings, the movable contact 90 of the switch 91 is operated by an arm 95 having a roller 96 mounted on the end thereof. The roller 96 is adapted to ride on the face of a cam member 97. The cam member may have peripheral high points 98 at which the roller 96 will be displaced sufficient to cause a break in the circuit controlled by the switch 91. The cam member 97 may be locked on the shaft 6 and rotate therewith, thus causing periodic movement of the arm 95 and its switch 91 with a resulting regulated interruption of the holding circuit of the relay 56 controlling the valve 50 of the clutch and brake control connected to the shaft 6.

By varying the location of the peripheral points 98 and decreasing or increasing the number on the cam 97, variations of sequence of movement of the plungers 8 and 10 may be obtained. In the motion diagram illustrated in Fig. 6 of the drawings, the line 100 represents the movement of the blank holding plunger 8 in relation to the degrees of rotation of the shaft 6 and the line 101 represents the movement of the plunger 10 under like conditions. The high points 98 of the cam 97 are disposed so that disengagement of the shaft 6 from the motor 40 will be automatically effected after the completion of a 180 degree movement of the shaft. On the diagram in Fig. 6, the shaft 6 has ceased to rotate at the point indicated as 102. It will be observed that approximately a half of the normal dwell period of the blank holder 8 has elapsed and that the plunger 10 is substantially at a point in its maximum stroke. At this point in the operation of the press, means is provided for automatically initiating and operatively connecting the machine drive shaft 31 to its source of power to move the plunger 30 toward the bed 5 and the stationary or dwelling plungers 8 and 10.

The drive shaft 31 is driven by a second motor 42 belted to a fly wheel 29 of a second clutch and brake control device 47 similar in form and action to the device 39. The clutch and brake control device 47 drives a pinion 28 which meshes with a gear wheel 29 keyed on a countershaft 32. The shaft 32 is suitably journaled in the base 1 of the press. The shaft 32 has a pinion 36 keyed to each end thereof, said pinion being disposed in meshing relation with a bull wheel 37 keyed to each end of the shaft 31.

The pneumatic actuating medium for the control device 47 may be applied from a suitable source through a conduit or pipe 105, illustrated diagrammatically in Fig. 5. The pipe 105 has a valve 106, the valve member of which is operated by an arm 107. The arm 107 is operatively connected to a movable core 108 of a solenoid coil 109 which normally holds the arm 107 in a valve closed position. The solenoid coil 109 may be energized through circuits established just prior to the above described stopping of the shaft 6 and the plungers 8 and 10 connected thereto.

The circuit of the solenoid coil 109 comprises a fixed contact 110 of a relay switch 112, line 114, coil 109, line 115 and fixed contact 116 of the switch 112. The fixed contacts 110 and 116 of the relay 112 are connectible with the main line source when the relay 112 is moved into circuit closing position.

The relay 112 is moved into circuit closing position by a circuit comprising line L—1, line 65, contacts 64, 63, and 62, line 61, line 117, coil 118 of the relay 112, line 119, fixed contact 120, movable contact 121 of switch 123, line 122, line 124, line 74, fixed contact 75, arms 77 and 78 of selector 76, fixed contact 79, line 80, line 81 and line 82 to line L—2. Thus, the coil 118 will be energized to close the relay 112. It will be observed that the establishment of the foregoing circuit is dependent, while the relay 56 is closed, on the closure of the switch 123 which is normally held open. The closure of the switch 123 is effected just prior to the opening of the switch 91.

In order to effect closure of the switch 123, a second cam member 125 is supported on and rotatable with the shaft 6. A roller 126 is adapted to ride the peripheral surface of the cam 125. The roller 126 is rotatably mounted on an arm 127 of the switch 123. The arm 127 is operatively connected to the movable contact 121. The cam 125 has a peripheral high point 129 which on rotation of the shaft 6 causes periodic displacement of the roller 126 and closure of the switch 123. Upon closure of the relay 112, the contact 110 will be connected by movable contact 130 of the relay 112 to line 131, and main line L—1 and the contact 116 will be connected by movable contact 133 of the relay to a fixed contact 132 and line 82 to main line L—2 to energize the solenoid coil 109 and open the valve 106.

A maintaining circuit for the coil 118 of the relay 112 is provided whereby the relay continues in circuit closed position despite the open position of the switch 123 and subsequent opening of the relay 56. The holding circuit of the coil 118 comprises line L—1, line 65, contacts 64, 63, and 62, line 61, line 117, coil 118, contact 135, contact 137, contact 138, all of the relay 112, line 139, fixed contact 140, movable contact 141 of the switch 142, line 143, line 92, fixed contact 93, arms 94 and 78 of selector 76, fixed contact 79, lines 80, 81, and 82 to main line L—2. The continued maintenance of this circuit after establishment is dependent on the continued closure of the switch 142 which is normally held closed.

The movable contact 141 of the switch 142 is operatively connected to an arm 144 having a roller 145 rotatably mounted at one end thereof. The roller 145 is adapted to ride the face of a peripheral cam 146 mounted on and rotatable with the shaft 31. The cam 146 has a high point 147 which when engaged by the roller 145 causes opening of the switch 142 with a resultant open-

ing of the relay 112 and closure of the valve 106 to disconnect the shaft 31 from its motor. As indicated by the diagram in Fig. 6 of the drawings wherein the line 149 indicates the movement described by plunger 30 relative to the movements of the plungers 8 and 10 and the degrees of rotation of the shaft 31, the switch 123 is operated at the points 147, and the switch 142 is operated at the points 148, the curved portion of the line intermediate the points indicating the approach and recession of the plunger 30 and the straight portion of the line in alternating relation to the curved portion representing the rest or dwell periods of the plunger 30. Variations of performance of the plunger 30 may be obtained by variation of the cams 125 and 146.

In order to retract the plungers 8 and 10 in synchrony with the recession of the lower plunger 30 after completion of the draw and redraw of the sheet metal, means are provided for again closing the relay 56 with a resultant opening of the valve 50, the said means being initiated by the rotation of the shaft 31.

A second cam 150 is mounted on and rotatable with the shaft 31. The cam 150 has a peripheral high point 151 on its peripheral face which is adapted to be ridden by a roller 152. The roller 152 is mounted on an arm 153 which is operatively connected to a movable contact 155 of a switch 156. The contact 155 is normally held in open position relative to a fixed contact 158 and when closed by the combined action of the roller 152 and cam 150 closes a circuit which closes the relay 56. The circuit controlled by the switch 156 comprises main line L—1, line 65, contacts 64, 63, and 62, line 61, coil 60, line 67, line 160, contacts 158 and 155 of switch 156, line 161, line 124, line 74, contact 75, arms 77 and 78, contact 79, lines 80, 81, and 82 to main line L—2. Thus, on closure of the switch 156, the coil 60 is energized to close relay 56 and open valve 50 as heretofore described resulting in the continued rotation of the shaft 6 and recession of the plungers 8 and 10. As indicated in Fig. 6, the switch 156 is operated at the point 165 on the line 100 to again start the shaft 6. It will be observed that the plunger 10 begins to at once recede, while the blank holding plunger 8 completes its natural uncompleted dwell period, whereupon it likewise recedes until the switch 91 is actuated by the cam 97 to open. The plungers 8, 10, and 30 are thus stopped, each at a fully retracted point in their natural stroke. Successive operations may be again effected by depressing the starting button 71. Variations of dwell periods of the plungers 8 and 10 relative to movement of the plunger 30 may be obtained by varying the cam 97.

It will be noted that in all the described control circuits of the circuits actuating either of the valves 50 or 106 include the contacts 62, 63, and 64. Thus, by depressing the movable contact 63, the plungers may all be immediately stopped at any point in their above described cycle of movement.

If desired, the selector 76 may be rotated so as to cut out of circuit the holding circuits for the relays 56 and 112 and cut in to circuit the switches 170 and 171 which may be utilized to cause rotation of the shafts 6 and 31 for only so long as the switches 170 and 171 are maintained closed. The switches 170 and 171 are of great use when it is desired to advance the plungers by steps. The selector 76 may be rotated so that the arm 94 contacts with contact 172 and arm 78 contacts with contact 174. The switch 170 controls a circuit comprising main line L—1, line 65, contacts 64, 63, and 62, line 61, coil 60, lines 67 and 68, line 176, switch 170, line 179, contact 172, arms 94 and 78, contact 174, line 177, lines 81 and 82 to main line L—2. Closure of the switch 170 will cause closure of the relay 56 with a resultant opening of the valve 50 and rotation of the shaft 6. This described circuit will not be sustained upon opening of the switch 170.

The switch 171 controls a circuit comprising main line L—1, line 65, contacts 64, 63, and 62, line 61, line 117, coil 118, line 180, switch 171, line 181, line 179, contact 172, arms 94 and 78, contact 174, lines 177, 81, and 82, to main line L—2. Closure of the switch 171 will cause closure of the relay 112 with a resulting opening of the valve 106 and rotation of the shaft 31.

A hand operated switch 185 may be provided in line 114 which, when open, cuts out the circuit of the coil 109 notwithstanding closure of the relay 112. Thus, the valve 106 will not be operated, and the plunger 30 will be maintained stationary to convert the triple action press into a double action type.

We claim:

1. A sheet metal press having a pair of rotatable machine drive shafts, a pair of movable plungers, each plunger operably connected to a machine drive shaft, a source of power, a controllably operable mechanism for connecting each machine drive shaft to the source of power, actuating means for each of said mechanisms operatively connecting each machine drive shaft and the respective mechanism of the other shaft for actuating the same upon a predetermined rotation of the former shaft.

2. A sheet metal press having a crown and a base, a pair of machine drive shafts, one of said machine drive shafts rotatably supported in the crown and the other of the machine drive shafts rotatably supported in the base, a pair of plungers, one of the said plungers connected to and operated by the drive shaft in the crown and the other of the plungers connected to and operated by the drive shaft in the base, a driving member associated with each drive shaft, a clutch mechanism for connecting each drive shaft with its associated driving member, a clutch operating means connected to each drive shaft for connecting the other drive shaft with its associated driving member and disconnecting the driving member from its associated drive shaft to which the said means is connected.

3. A sheet metal press having a crown and a base, a pair of machine drive shafts, one of said machine drive shafts rotatably supported in the crown and the other of the machine drive shafts rotatably supported in the base, a pair of plungers, one of the said plungers connected to and operated by the drive shaft in the crown and the other of the plungers connected to and operated by the drive shaft in the base, a driving member associated with each drive shaft, a clutch mechanism for connecting each drive shaft with its associated driving member, a clutch operating means adjustably connected to each drive shaft for connecting the other drive shaft with its associated driving member, and a second clutch operating means adjustably connected to each drive shaft for disconnecting the driving member associated with the drive shaft to which the said

second clutch operating means is connected for producing dwells in the movement of its plunger and the same time periods of complete rotation of each drive shaft.

4. A sheet metal press having a crown and a base, a pair of machine drive shafts, one of said machine drive shafts rotatably supported in the crown and the other of the machine drive shafts rotatably supported in the base, a pair of plungers, one of the said plungers connected to and operated by one of the drive shafts and the other of the plungers connected to the other of the drive shafts, a clutch mechanism for operatively connecting each drive shaft with its associated driving member, a clutch operating means operatively connected to each drive shaft for disconnecting the drive shaft from its associated driving member, and a second clutch operating means adjustably connected to each drive shaft for connecting the other drive shaft with its associated driving member subsequent to its disconnection by the first named clutch operating means to produce dwells in each of the plungers during the operation of the other of the plungers.

5. A sheet metal press having a crown and a base, a pair of machine drive shafts, one of the said machine, drive shafts rotatably supported in the crown and the other of the machine drive shafts rotatably supported in the base, a pair of plungers connected to the drive shaft rotatably supported in the crown, one of the plungers connected to the said drive shaft by a plurality of sets of mechanical elements, each set having a plurality of toggles for producing an extended dwell in the movement of the last named plunger, a third plunger connected to and operated by the drive shaft in the base, a driving member associated with each drive shaft, a clutch mechanism for operatively connecting each drive shaft with its associated driving member, a clutch operating means adjustably connected to each drive shaft for connecting the other drive shaft with its associated driving member and disconnecting the driving member associated with the drive shaft to which the said means is connected.

6. A sheet metal press having a crown and a base, a pair of machine drive shafts, one of the said machine drive shafts rotatably supported in the crown and the other of the machine drive shafts rotatably supported in the base, a pair of plungers connected to the drive shaft rotatably supported in the crown, one of the plungers connected to the said drive shaft by a plurality of toggles for producing an extended dwell in the movement of the last named plunger, a third plunger connected to and operated by the drive shaft in the base, a driving member associated with each drive shaft, a clutch mechanism for operatively connecting each drive shaft with its associated driving member, a clutch operating means adjustably connected to each drive shaft for disconnecting the drive shaft from its associated driving member, a second clutch operating means adjustably connected to each drive shaft for connecting the other drive shaft with its associated driving member subsequent to the disconnection produced by the first named clutch operating means to cause cessation of rotation of one drive shaft during the operation of the other drive shaft and to produce a complete rotation of each drive shaft in the same time period.

7. A sheet metal press having a pair of rotatable machine drive shafts, a pair of movable plungers, each plunger operably connected to a machine drive shaft, a source of power, a mechanism associated with each drive shaft for operably connecting the same to the source of power, actuating means operably connected to each shaft for actuating the mechanism associated with the other shaft to connect the same with the source of power, and a second actuating means operably connected to each shaft for actuating the mechanism associated therewith to disconnect the said shaft from the source of power at the end of each complete rotation of the same.

8. A sheet metal press having a pair of rotatable machine drive shafts, a pair of movable plungers, each plunger operably connected to a machine drive shaft, a source of power, a mechanism associated with each drive shaft for operably connecting the same to the source of power, actuating means operably connected to each shaft for actuating the mechanism associated with the other shaft to connect the same with the source of power at a predetermined point in complete rotation of the said one shaft, and a second actuating means operably connected to each shaft for actuating the mechanism associated therewith to disconnect the said shaft from the source of power at the end of each complete rotation of the same.

9. A sheet metal press having a pair of rotatable machine drive shafts, a pair of movable plungers, each plunger operably connected to a machine drive shaft, a source of power, a mechanism for connecting each machine drive shaft to the source of power, actuating means for each of said mechanisms operatively conecting the respective mechanism of each shaft to the other shaft for actuating the said mechanism upon a predetermined rotation of the said other shaft.

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