Nov. 6, 1956 R. E. WISSMAN 2,769,389

CABINET TYPE PRESS LEG

Filed Aug. 18, 1954 4 Sheets-Sheet 1

FIG-2

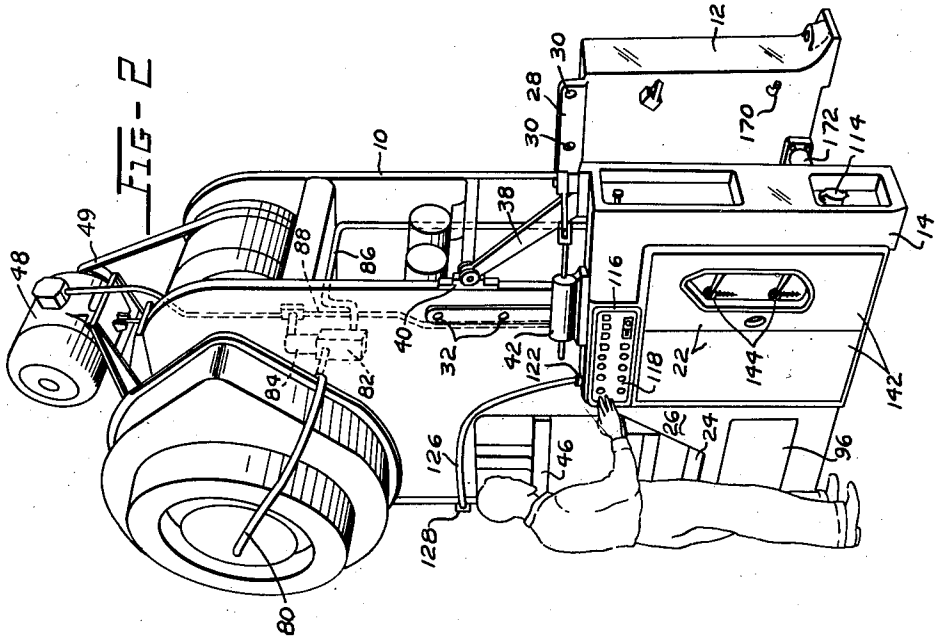
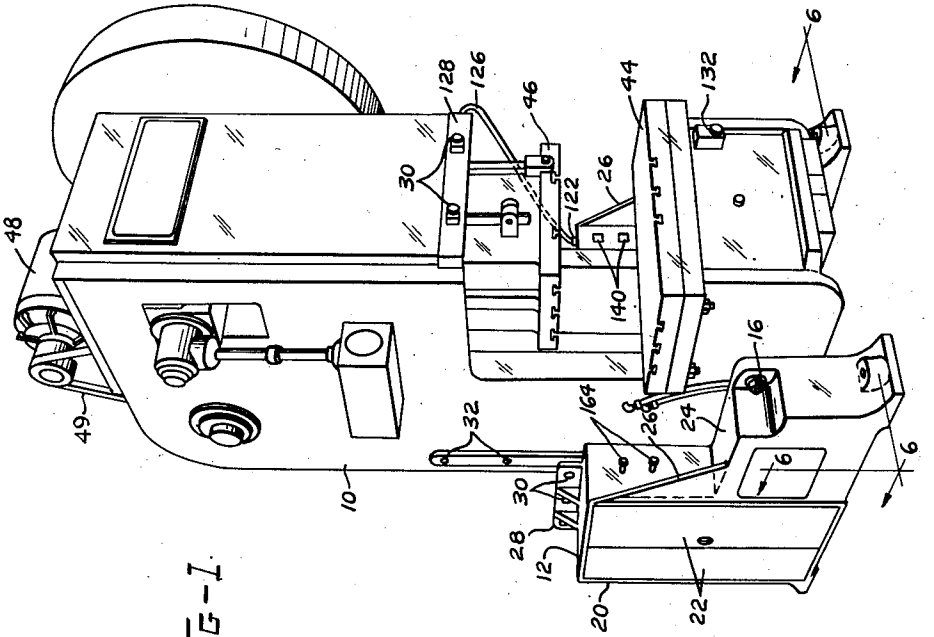


FIG-1



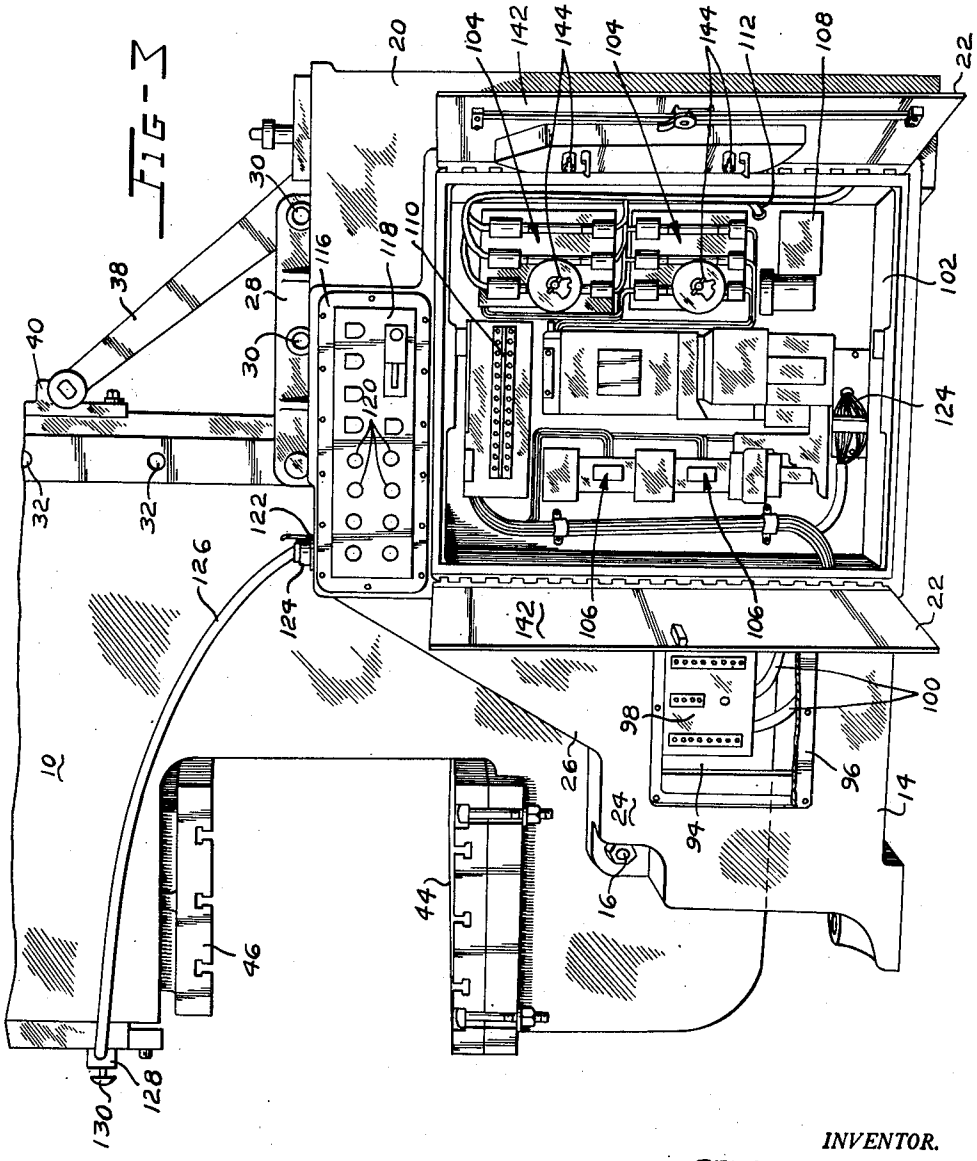
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CABINET TYPE PRESS LEG

Filed Aug. 18, 1954 4 Sheets-Sheet 2

FIG-3



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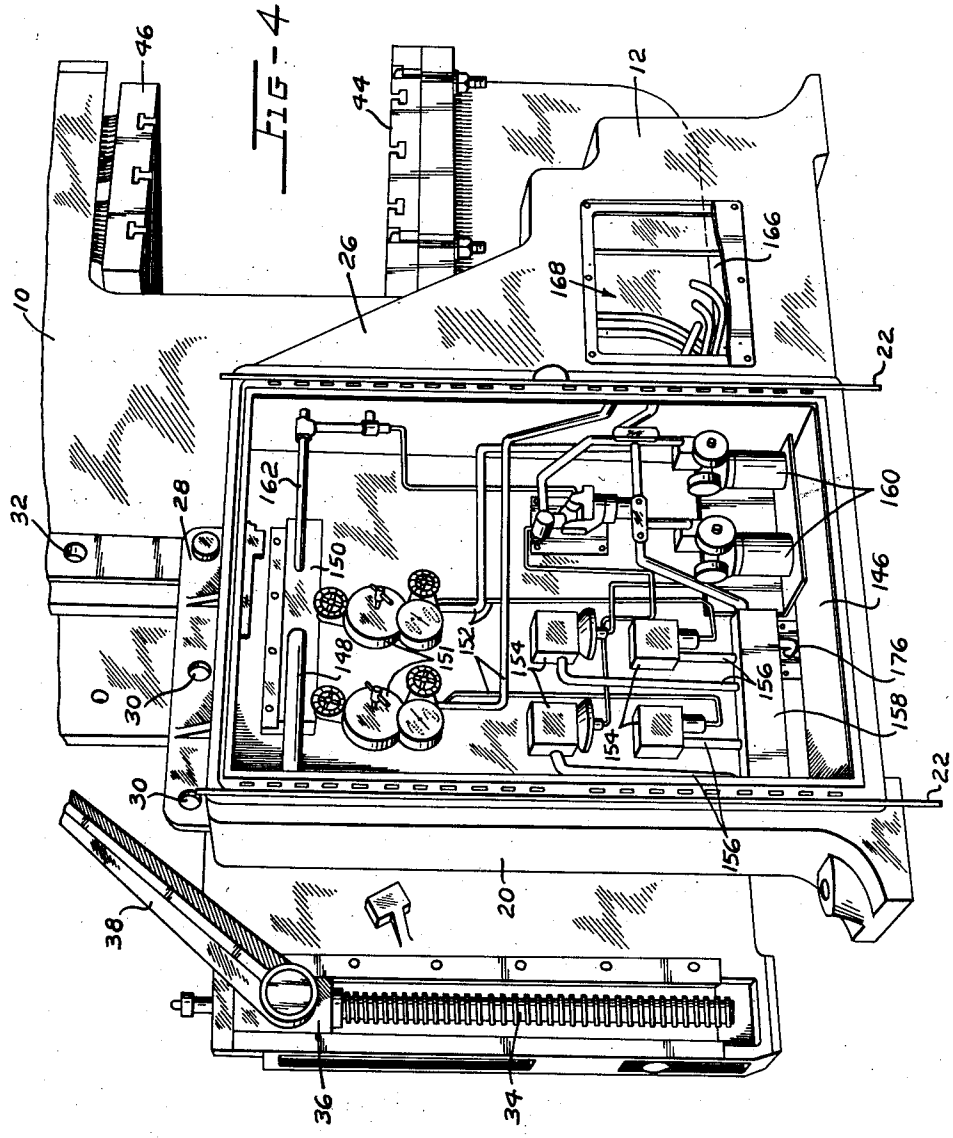
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CABINET TYPE PRESS LEG

Filed Aug. 18, 1954 4 Sheets-Sheet 3

FIG-4



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CABINET TYPE PRESS LEG

Filed Aug. 18, 1954 4 Sheets-Sheet 4

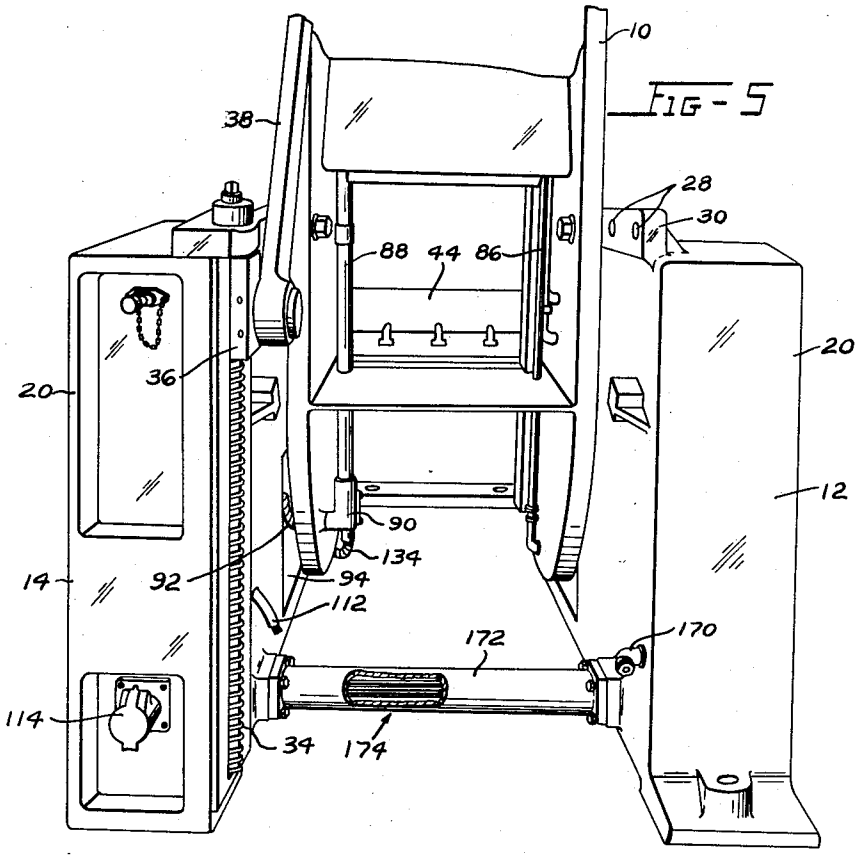


FIG - 5

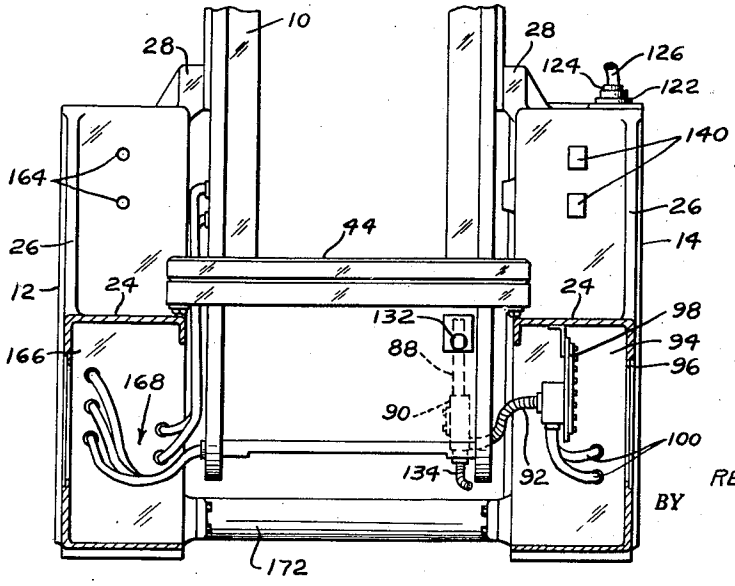


FIG - 6

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United States Patent Office 2,769,389 Patented Nov. 6, 1956

2,769,389

CABINET TYPE PRESS LEG

Reuben E. Wissman, Minster, Ohio, assignor to The Minster Machine Company, Minster, Ohio, a corporation of Ohio

Application August 18, 1954, Serial No. 450,728

9 Claims. (Cl. 100—231)

This invention relates to a press structure and, in particular, relates to a leg construction for a press structure, especially for an inclinable type press.

This application is a continuation-in-part of my U. S. Patent 2,728,288 granted on December 27, 1955, in which is disclosed and claimed an early version of the press leg structure with which this invention is particularly concerned.

Having reference to the co-pending application identified above, there is shown therein an inclinable press structure in which a press frame is pivotally mounted in a supporting leg arrangement which comprises a leg structure at each side of the press, and which leg structures are rigidly interconnected to provide a suitably strong and rigid support for the press frame.

The leg structure identified above is characterized, within the purview of the present invention, by a compartment therein adapted for receiving certain of the press operating auxiliaries, such as relays, pressure switches, valves, and lubricating devices.

The present invention represents a further extension and refinement of this general type of leg structure which, for the purposes of the present invention, is referred to as a "cabinet type" press leg.

The present invention represents still further inventive development of the cabinet type press leg disclosed broadly in the above-referred to co-pending application and the adaptation thereof to various functions in connection with the operation of a press serving to refine and simplify the press operation and to reduce maintenance thereof, and to make it simpler to erect or dismantle the press for shipment or change of location.

Having the foregoing in mind, it is a primary object of the present invention to provide a leg structure for a press of the nature described particularly adapted for receiving and supporting certain of the press auxiliaries.

A further object of the present invention is the provision of a supporting leg structure for an inclinable press particularly adapted for receiving and supporting at least a portion of the auxiliaries of the press in a location where they can be easily serviced.

Another particular object of the present invention is the provision of a leg structure for an inclinable press adapted for receiving at least a portion of the auxiliaries of the press so that they will remain in a fixed position as the press frame tilts on the leg structure, thus remaining in their most efficient operating position.

A still further object of the present invention is the provision of a press leg structure for an inclinable press adapted for receiving and supporting the electrical, pneumatic, and lubricating components of the press structure so that connection thereof to the press frame, which contains the working parts of the press, can readily be made and whereby the said connections can also readily be disconnected in cases where it is desired to dismantle or move the press.

Another particular object of the present invention is

the provision of an arrangement in connection with a press structure that will permit the use of larger and more complete control components than are possible when the said components must be arranged on a press frame itself.

A still further object of the present invention is an arrangement for removing control elements, particularly delicate elements, from the frame of the press to a location elsewhere than on the press frame proper thereby to protect the elements from the shock that is often encountered in the press frame due to the operation thereof.

A still further object of the present invention is the provision of a leg arrangement for a press structure adapted for receiving and supporting the principal auxiliary components of the press in a protected, easily accessible location, and resulting in a press of better appearance.

These and other objects and advantages of the present invention will become more apparent upon reference to the following specification taken in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of a press constructed according to the present invention looking from the front and somewhat to the left of the press;

Figure 2 is a perspective view similar to Figure 1 except looking at the press from the rear and somewhat to the right thereof;

Figure 3 is a side elevational view showing the left hand press leg with the doors to the cabinet compartment open;

Figure 4 is a side elevational view showing the right hand press leg with the doors to the cabinet compartment open;

Figure 5 is a fragmentary rear elevational view showing the legs from the rear of the press and the tie member looking from the legs of the press; and

Figure 6 is a sectional view generally indicated by line **6—6** on Figure 1 and showing chambers that are formed in the press legs and which are availed of for conveying flexible conduits and flexible pipes from the press legs to the press frame.

Referring to the drawings somewhat more in detail, the press shown in Figures 1 and 2 has, as its principal components which are pertinent to the present invention, a press frame **10** which has its lower end disposed between a pair of leg structures, **12** at the left hand side of the press frame and **14** at the right hand side of the press frame.

The frame **10** is supported on the leg structures by the pivot bolt means at **16** so that it can be tilted from the vertical position in which it is shown in Figures 1 and 2 backwardly to a desired angle.

Each of the legs **12** and **14**, according to the present invention, comprise a rear portion generally rectangular in outline and having a recess therein forming a cabinet which is closed by hinged doors. This rear generally rectangular portion is indicated at **20**, and the doors hinged thereto and closing the recess therein are indicated at **22**. The forward portion of each of the leg structures, which is the portion through which the pivot bolts **16** passes, is likewise generally rectangular but extends to considerably less height than the rear portion of the leg structure. This forward leg portion, which is integral with the rear portion, is indicated at **24** in Figures 1 and 2, and may advantageously be provided with a gusset web **26** interconnecting the two rectangular portions of the leg structure and serving, not only as a stiffening means, but also as a means to define a protected recess between the press frame and the outer walls of the leg structures, suitable for locating certain auxiliaries, such as air outlets and electrical outlets.

Upstanding from the top of the rectangular portions **12** on each leg is a longitudinally extending rib member

23 having apertures 30 adapted for registering with the apertures 32 in the press frame so that the press frame may be rigidly bolted to the leg structures in each of several predetermined tilted positions of the press frame.

For the purpose of tilting the press frame on the leg structures it is preferred to employ a screw 34, arranged vertically inside the right hand press leg and which, as will be seen in Figure 4, serves to drive a nut 36 vertically in the slot of the press leg and with a link 38 being pivoted between the nut and a block 40 on the back edge of one side of the press frame. This screw may be rotated manually or an automatic operator, such as at 42, may be provided whereby the screw can be driven for tilting the press frame.

The press frame 10, in a more or less conventional manner, is formed to carry a bolster plate 44 to receive working dies while a press platen 46 is reciprocably guided in the upper portion of frame 10 for carrying cooperating dies or punches for performing work operations.

In the upper end of the press frame is a crankshaft (not shown) connected for driving the platen 46 in its reciprocable movement and a drive is provided for driving the crankshaft, including an electric motor 48, which may be supported on top of the press frame and which is connected by belting 49 and gearing (not shown) with the crankshaft and the drive train including clutch-brake means (not shown), with the brake portion normally being engaged by spring means to hold the crankshaft stationary, and with the clutch portion being responsive to fluid pressure conducted thereto through a conduit 80 for making the brake portion ineffective while completing the drive train and thus causing the crankshaft to rotate to drive the platen.

A valve 82 having a solenoid operator 84 is mounted inside the press frame and is connected on one side to conduit 80 and on its other side to a conduit 86 leading down inside the press frame toward the leg structure.

Electrical energy for the solenoid operator 84 of valve 82 is conducted thereto by wires leading through a conduit 88 also running down inside the press frame toward the leg structure. Conduit 88 may also extend upwardly to motor 48 for conducting electrical energy thereto.

As will be seen in Figures 5 and 6, the electric conduit 88 extends downwardly to adjacent the bottom of the press frame 10 on the right hand side thereof, and at its lower end is connected by a fitting 90 with a flexible cable 92 leading into a chamber 94 in the right hand leg that is formed in the forward portion 24 thereof. This chamber, as will be seen in Figures 3, 5 and 6, is open on the inside of the press leg and is adapted for being closed by a cover plate 96 on the outside of the press leg. The chamber 94 forms a convenient location for mounting a terminal panel 98, to which flexible conduit 92 leads and from which there also leads the cables 100 that pass through the rear wall of chamber 94 and open into the compartment that is formed in the rear portion 20 of the right hand leg.

In Figure 3 it will be noted that the cabinet compartment 102 of the right hand leg of the press, and into which the electric cables 100 previously referred to lead, is arranged for receiving a plurality of electrical components such as the fused switches indicated generally at 104, the relays generally indicated at 106, and other auxiliaries such as transformer 108 and terminal panel 110.

Any other of the electrical components of the operating circuit of the press which it might be convenient to locate within the cabinet compartment 102, up to the extent of the space therein, could be located within the compartment with the resulting advantage that the components are positioned in a protected location where they are protected from possible damage, and also indicated from shocks that are imposed on the press frame during operation of the press.

Suitably large components can be employed since space within the cabinet compartment is not at a premium, and an arrangement of the components can be made so that servicing and replacement thereof is greatly simplified, with the result that the press is cheaper and easier to maintain in operation.

The electric supply to the press, as will best be seen in Figures 3 and 5, is by way of a supply cable 112 leading into compartment 102 through the back wall thereof adjacent the rear of the leg structure.

A convenience outlet may be located as at 114 in a recess in the back of the press leg for connection of tools, such as grinders and the like, that are to be used on the press, or for temporary connection of electrical energy to the press control circuit. This outlet, as opposed to those on the front of the leg, is connected to the power line supplying the press and is thus at 220 or 440 volts.

The right hand leg, according to the present invention, may also comprise a portion at 116 which is a recess closed by a panel 118 with a plurality of control switches 120 mounted therein. This arrangement provides for simple connecting of the switches into the control system of the press and positions the switches where they are convenient to use for such purposes as turning the power on and off, for inching the press, for energizing the press inclining mechanism, and for similar operations.

At the front of portion 116 of the right hand leg there is a receptacle 122 adapted for receiving the plug 124 of a cable 126 that leads to the front of the press where it is connected into a control box 128 having therein press operating switches 130. The receptacle 122 has electrical connections with the electric control circuit of the press, and the combination of the receptacle with the flexible cable 126 and the control box 128, which is detachably or movably mounted on the press frame, affords convenience in operating the press in all positions thereof, and likewise forms a ready means of disconnecting the control buttons from the leg structure should this be necessary.

In Figure 1 it will be noted that there is an emergency stop button 132 located on the lower portion of the press frame, and leading from stop button 132 is a flexible cable 134 which, as will be seen in Figure 5, connects into fitting 90 at the lower end of conduit 88.

The foregoing description of the arrangement of the electrical conduits and cables, control switches, relays, and other components of the electrical system of the press will serve to reveal that the electric wiring leading from the leg structure to the press frame can readily be disconnected at any time whereby the press can be dismantled as to the electric circuits thereof very readily for shipment of the press or for movement thereof from one location to another.

It will also be evident that substantially all of the electrical components of the press structure can be preassembled in the factory, thus requiring a minimum amount of labor and a minimum amount of skill, with a minimum amount of time being required for setting the press up when it reaches its point of use. There is also a minimum chance that a difficulty will be encountered in effecting the proper connections when the press is set up.

As a further convenience that evolves from a press leg arrangement according to the present invention, the front wall of the right hand press leg may advantageously include the convenience electric outlets 140 which may, for example, be 110 volt outlets into which small tools, such as drills, grinders, and the like, can readily be plugged for working on dies and other work members associated with the press.

A further feature in connection with the right hand leg structure, according to this invention, is the arrangement of the doors 142 of the compartment thereof which is so arranged that the right hand door is pro-

vided with levers **144** which operate to open and close switches **104**, and which must be adjusted to open the switches before the doors to the compartment can be opened by virtue of the interengageable elements **146** of a locking mechanism, which will only permit opening of the doors when the said switches are open.

The left hand press leg, as will be seen in Figures 1 and 4, likewise comprises a compartment in the rear portion thereof as at **146**, and within which is mounted the pneumatic, hydraulic, and lubricating components of the press other than the control valve **82** previously referred to. The components may also include pressure switches interlocked with the electric control circuit of the press so as to prevent operation thereof when predetermined conditions of air pressure and lubricant pressure do not exist.

The pneumatic supply to compartment **146** is by way of the conduit **148** leading to a manifold **150**, to which is connected a pair of pressure reducing valves **151** which supply air pressure at a predetermined pressure to a plurality of conduits **152**. Certain of these conduits lead to pressure switch means **154** which are connected into the electric control circuit of the press by electric wires leading through conduits **156** extending into a box **158**.

Pressure operated lubricating devices **160** are provided which receive pressure from certain ones of the conduits **152**, and with which lubricating devices certain ones of the pressure switches **154** are connected.

Manifold **150** also has a conduit **162** connected therewith leading to a pair of convenience air outlet fittings **164** on the front wall of the rear portion of the left hand press leg. These fittings permit the connection of air-operated drills, grinders, and like tools, for working on tools or work members associated with the press.

The pressure supply lines leading to the conduit **86** and to the die cushion (not shown) that may be associated with the press, and to the counterbalancing cylinders (not shown) mounted on the press head and which serve to counterbalance the weight of the platen, and the conduits which conduct lubricant through the lubricating devices **160** to those portions of the press structure that are to be automatically lubricated, such as the drive train (not shown) and the guides (not shown) for the press platen, are carried out through the front wall of compartment **146** into chamber **166** formed on the front portion of the press leg structure and corresponding to chamber **94** previously referred to in connection with the right hand leg structure.

As will be seen in Figure 6, the several pneumatic and lubricant cable means generally indicated at **168** are attached to the press frame at suitable locations thereon and from which points of connection either rigid or flexible conduits can be provided for connecting the flexible conduits **168** with the proper parts of the press to be serviced thereby.

As will be seen in Figure 5, air pressure is supplied to compartment **146** of the left hand leg by a fitting **170** and extending through the inside wall of the compartment toward the rear of the leg which positions the fitting in a convenient location for connecting an air supply line thereto.

It has been mentioned that the compartment **146** in the left hand press leg includes pressure switches connected into the electric control circuit of the press, and the connections that lead from the pressure switches **154** extend through a hollow brace member **172** running transversely between the leg structures and fixedly bolted thereto. The electric connections are generally indicated at **174** in Figure 5, and these connections will be seen in Figure 3 where they enter compartment **102** of the right hand press leg, and contained within an elbow-like fitting **176** which will be seen in Figure 4 as being connected to the bottom of the box **158**.

The hollow member **172** serves as a brace between the two leg structures, thus providing an integrated leg arrangement, and likewise provides a closed protected passage leading between the compartments in the two leg structures through which electric connections can be conveyed, as shown, and through which pneumatic, hydraulic, and lubricating conduits can be led as may be desired for convenience.

From the foregoing it will be appreciated that this invention provides, in connection with a press, particularly an inclinable press, closed and substantially dust and oil-tight compartments in the leg structure of the press for receiving all, or substantially all, of the control devices for the press, such as relays, transformers, circuit breakers, motor starters, fuses, pressure reducing valves, pressure switches, lubricating devices, and other electrical, pneumatic, and lubricating auxiliaries for the press. The controls are protected from accidental damage, are shielded from dust, particularly metal dust, oil and moisture, and are likewise well isolated from the shocks that are encountered in the press frame.

All of the components referred to above remain in a single fixed position even when the press is tilted, and thus remains in the very best operating position. The connection of the control circuits to the power lines, and the connection of the control components with the various motors and other operating elements in the press frame, can readily be made by even relatively unskilled labor from fairly simple instructions, and the servicing of the control systems is likewise greatly simplified.

It is to be noted that the leg structure of the present invention cooperates with the open side press frame in that, in all inclined positions of the press frame, there is ample space above the forward portion of the leg structure to permit lateral feeding of stock.

For lateral feeding operations, the side facing panel **118** is of importance in that it provides an operating position that is conveniently located from which all press operations can be controlled, including inclining movements of the press frame.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions and, accordingly, it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claims.

I claim:

1. A base arrangement for an inclinable press having a press frame and operating systems with components thereof on said press frame and comprising spaced leg members having means pivotally supporting the press frame therebetween, each leg member being formed to define a compartment of substantial size opening outwardly thereof to house control units of said systems mounted therein, door means hinged to said leg members for closing said compartments, flexible connecting means between said compartments, control units and components on said press frame, a tubular brace member extending transversely between said leg members and rigidly connected therewith, and the inner walls of said compartments being provided with apertures registering with the ends of said tubular brace member with said flexible connections passing therethrough and housed in said tubular brace.

2. A base for an inclinable press having a press frame and electrical and pneumatic operating systems with component parts thereof being on the press frame and comprising spaced leg members, means on said leg members pivotally supporting the frame of the press therebetween for tilting movement, each leg structure being formed to define a compartment of substantial size opening outwardly thereof for enclosing and supporting control units for said systems, door means hinged to the leg members for closing said compartments, a hollow brace member extending transversely between said leg members and rigidly interconnected therewith, the inner walls of said compartments being provided with apertures registering with the ends of said brace member to provide

communication between said compartments, each leg member also being formed to define a chamber therein forwardly of the compartment in the leg opening inwardly toward the press frame, and flexible means connecting means extending from the press frame through said chambers and into said compartments for connecting the control in the compartments with the components of the electrical and pneumatic systems.

3. In an inclinable press having a press frame and operating systems with the operating elements thereof on said press frame and comprising a pair of upright spaced leg members, means pivotally supporting the press frame between said leg members for tilting movement of said frame, at least one of said leg members being formed with outwardly opening compartments accessible from the outer sides of said leg members, said compartments enclosing and supporting control components of said operating systems whereby said control components remain in fixed position during tilting movements of the press frame and are protected from damage from forces external of said press.

4. In an inclinable press having a press frame and operating systems with the operating elements thereof being on the press frame and comprising a pair of stationary, spaced, hollow, completely enclosed box-like supporting members, means on said supporting members pivotally mounting the frame of the press therebetween for inclinable movement, control components for the operating systems of said press enclosed, supported and mounted in the same stationary position in said hollow box-like supporting members, and flexible means for connecting the control components with said operating elements for continual press operation irrespective of the degree of inclination of the press frame while said box-like supporting members and the control components remain stationary.

5. A base arrangement for an inclinable press having a press frame and an electrical operating system having at least one operating element thereof on said press frame and comprising a pair of upright spaced leg members having means pivotally supporting said press frame therebetween for tilting movements, one of said leg members being formed with an outwardly opening compartment therein for enclosing and supporting control components for said electrical operating system whereby said control components remain in fixed position during tilting movements of the press frame and are likewise isolated from shocks developed in the press frame during operation of the press, flexible means connecting a source of electric power with the control components in said compartment, and flexible means between said one leg member and said press frame to connect said control components with the electrical operating element on said press frame.

6. A base arrangement for an inclinable press including a press frame and having electrical and pneumatic operating systems with operating elements thereof being on the press frame and comprising a pair of upright leg members having means pivotally supporting said press frame therebetween for tilting movements of the press frame on the base, said leg members being formed with outwardly opening compartments therein of substantial size for enclosing and supporting control components for said electrical and pneumatic operating systems, means conducting service lines into said compartments for connection with said electrical and pneumatic control components, and flexible means extending from said press frame into said compartments connecting the said control components with said operating elements on said press frame.

7. In an inclinable press having a press frame and operating systems with the operating elements thereof on said press frame and comprising a pair of upright spaced leg members, each of said leg members comprising a larger rectangular portion toward the rear thereof and a smaller rectangular portion toward the front, rigidly connected therewith to form a unitary structure, means in the smaller rectangular portions of said leg members for pivotally supporting said press frame for tilting movements between said leg members, said larger rectangular portion being formed to define a recess opening toward the outside of said leg member, said recesses enclosing and supporting control components for the operating systems on said press frame whereby said control components remain in fixed position during tilting movements of the press frame and are protected from damage by forces external of said press.

8. In an inclinable press having a press frame and operating systems with the operating elements thereof on said press frame and comprising a pair of upright spaced leg members, means on said leg members pivotally supporting the press frame between said leg members for tilting movements of said press frame therebetween, each leg member being formed to define a compartment of substantial size opening outwardly thereof for enclosing and supporting control components of said operating systems whereby said control components remain in a fixed position during tilting movement of the press frame and are protected from damage by forces external of the press, and each leg member also being formed to define a chamber therein forwardly of said compartment in the leg opening inwardly toward the press frame for receiving connections to said control components.

9. In an inclinable press having electrical, hydraulic and pneumatic operating systems, an inclinable press frame with the operating elements of said operating systems mounted thereon, a pair of spaced upright hollow legs formed to define outwardly opening enclosures, means pivotally supporting said press frame between said spaced legs, means in said legs to retain the press frame in any desired angle of inclination between said legs, and control components for said press mounted and enclosed in the enclosures in said hollow legs and connected to the press frame to control the operating elements whereby the control components are mounted in a fixed stationary position required for protection and efficient operation while the press frame can be inclined to the angular position of maximum efficiency of operation without affecting the efficiency of the control components.

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