F. J. PERKINS.

PRESS.

APPLICATION FILED SEPT. 30, 1909.

981,468. Patented Jan. 10, 1911.

6 SHEETS—SHEET 1.

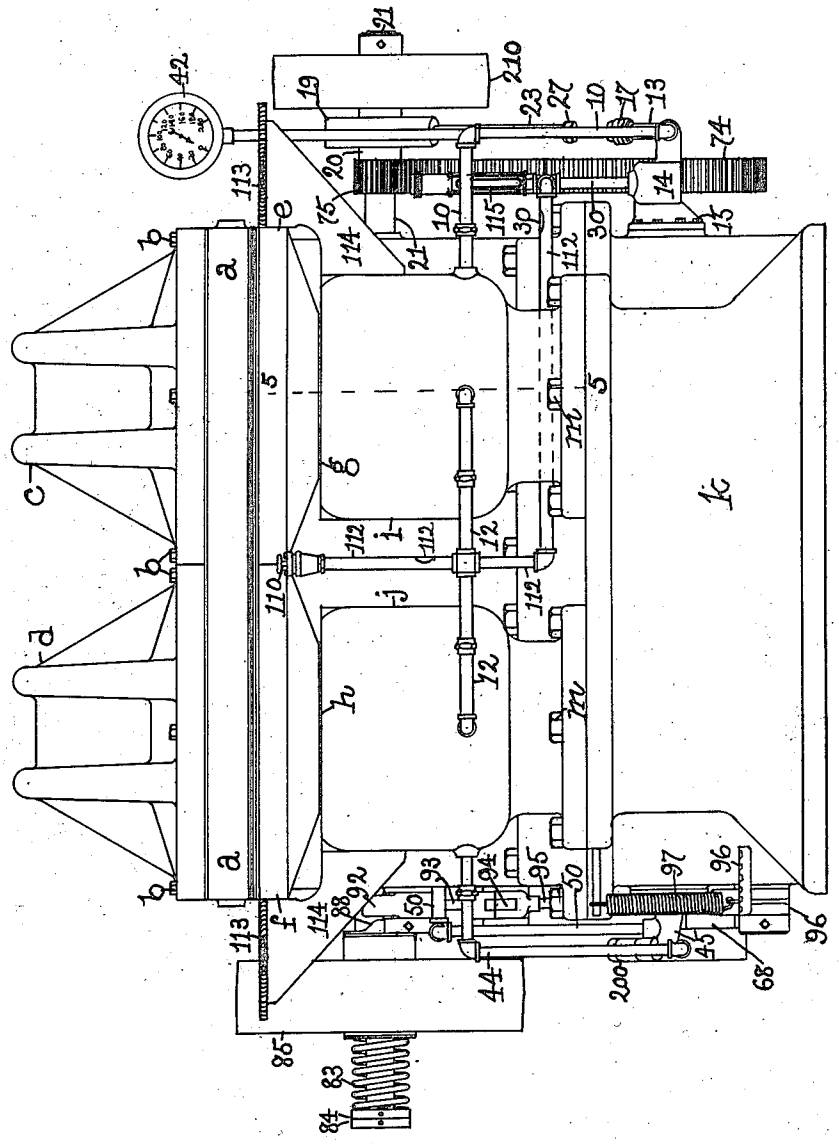

Fig. 1.

WITNESSES:

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J. Murphy

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PRESS.

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6 SHEETS—SHEET 2.

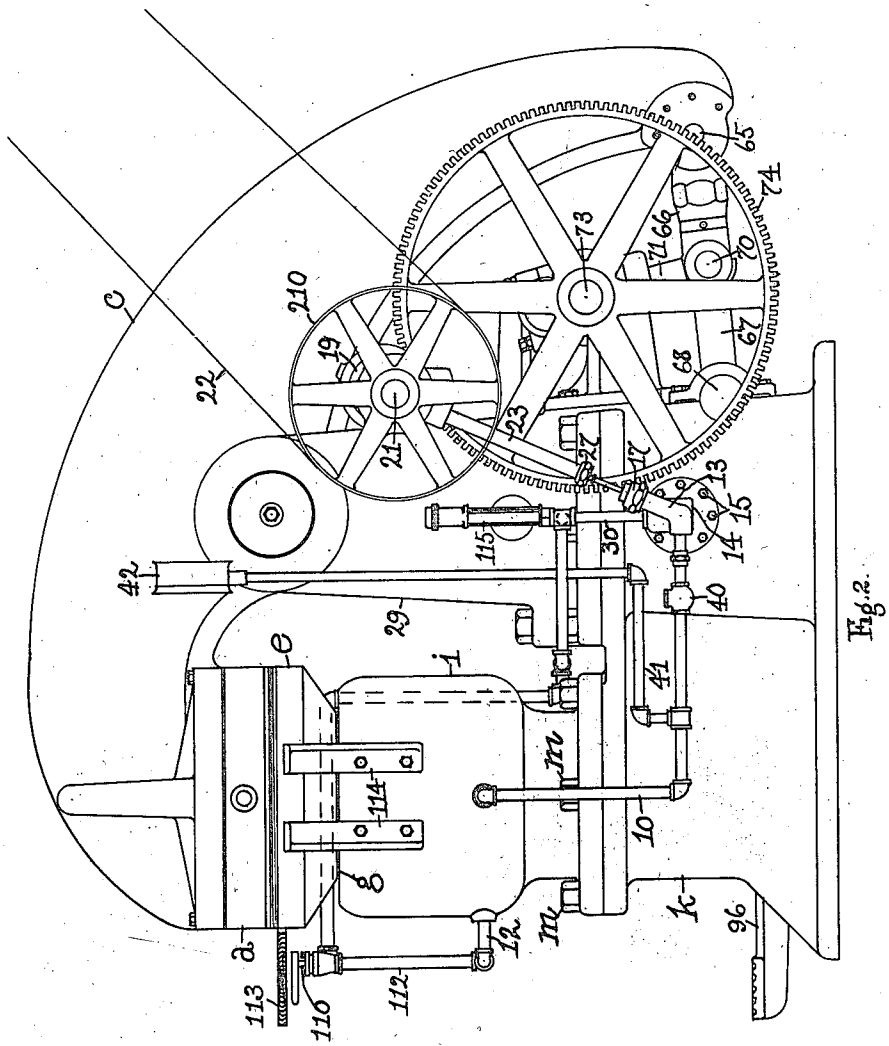

Fig. 2.

WITNESSES:

C. N. Garnett

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6 SHEETS—SHEET 3.

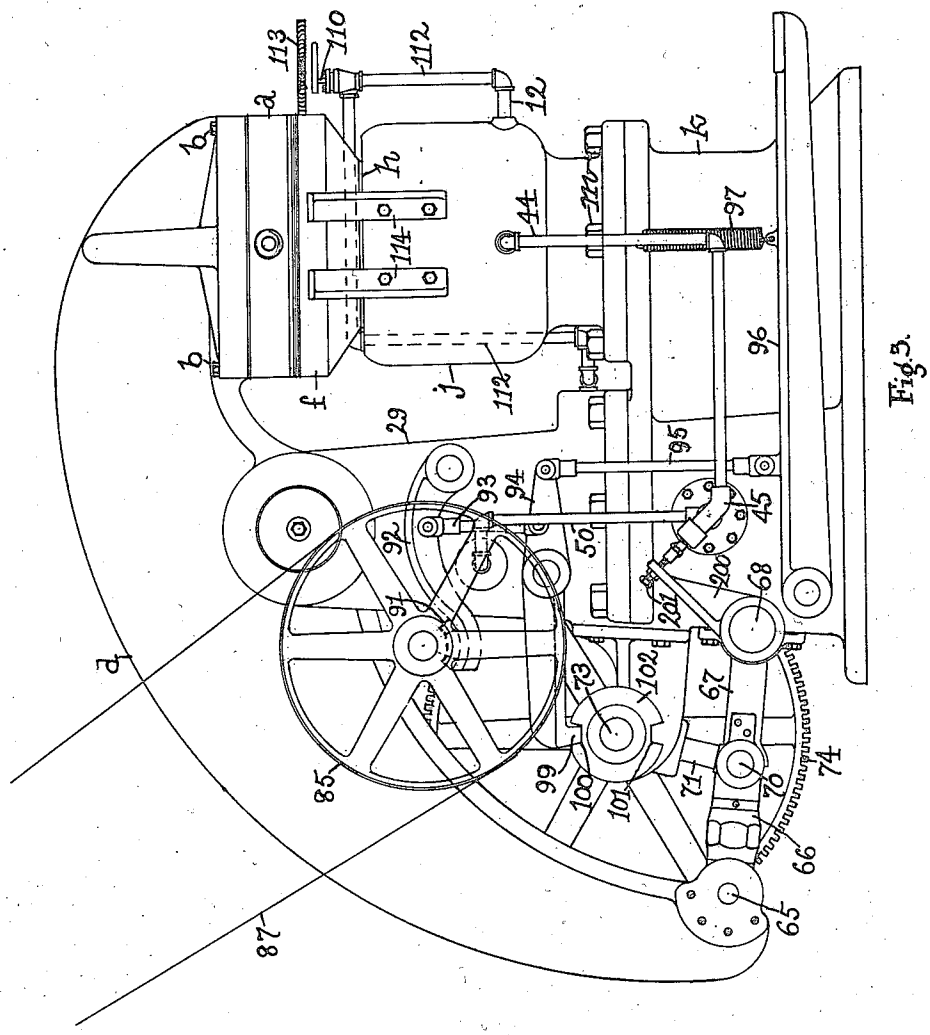

Fig 3.

WITNESSES:

C. H. Garnett

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APPLICATION FILED SEPT. 30, 1909.

981,468. Patented Jan. 10, 1911.

6 SHEETS—SHEET 4.

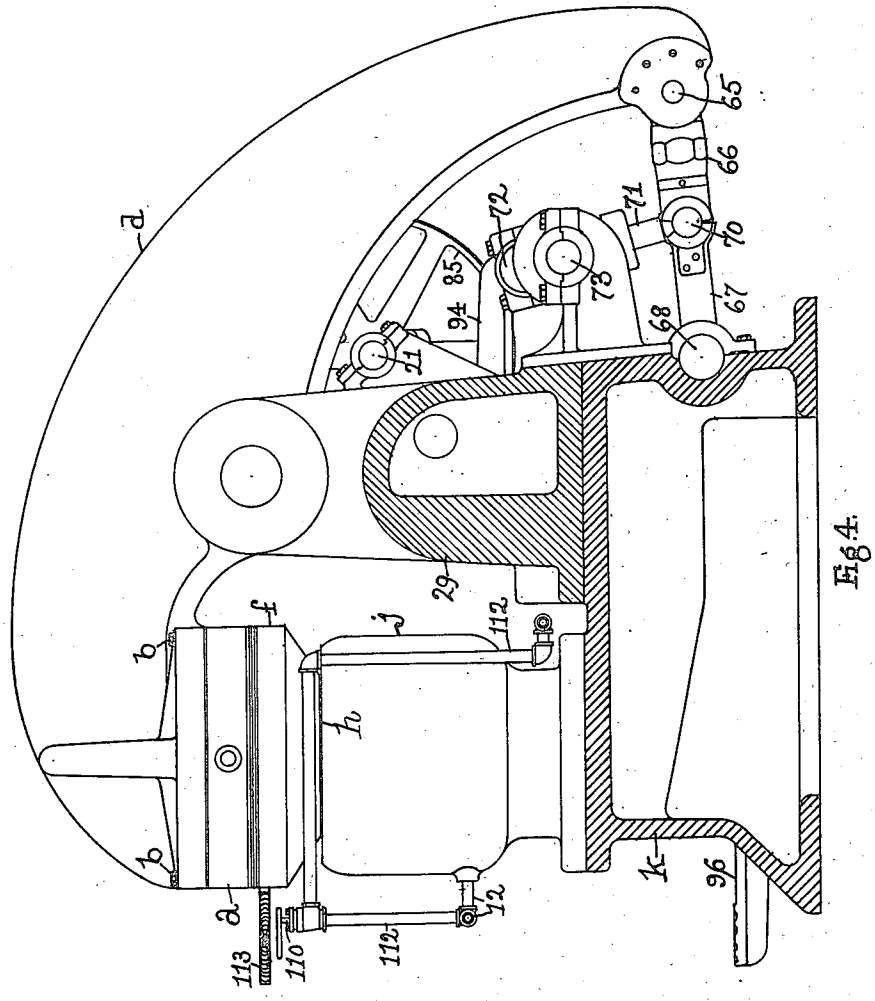

Fig. 4.

WITNESSES:

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APPLICATION FILED SEPT. 30, 1909.

981,468. Patented Jan. 10, 1911.

6 SHEETS—SHEET 5.

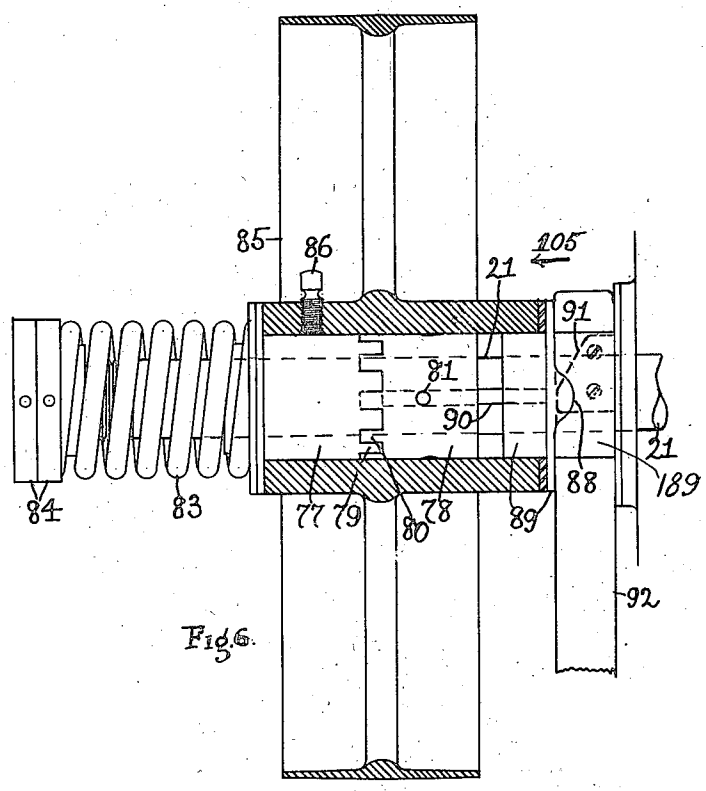

Fig. 6.

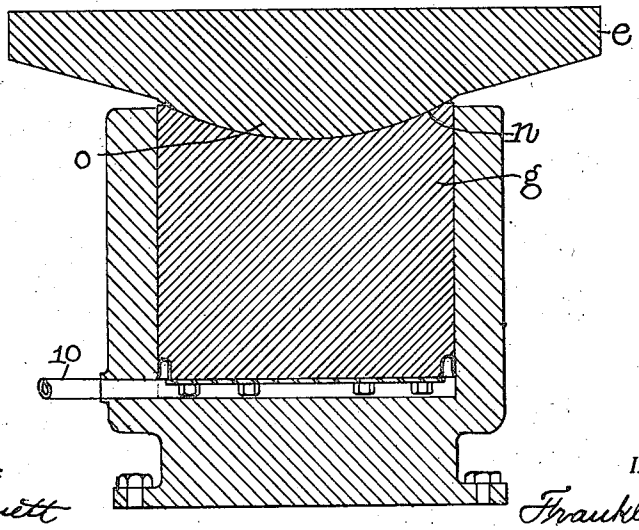

Fig. 5.

WITNESSES:

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J. Murphy

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APPLICATION FILED SEPT. 30, 1909.

981,468. Patented Jan. 10, 1911.

6 SHEETS—SHEET 6.

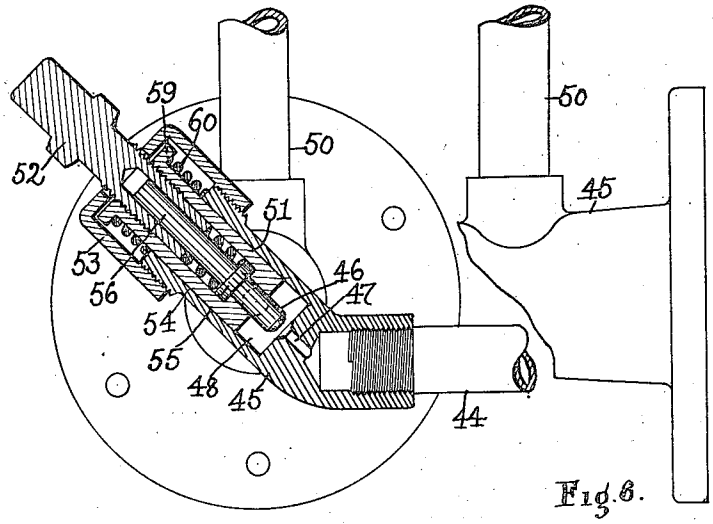

Fig. 6.

Fig 7

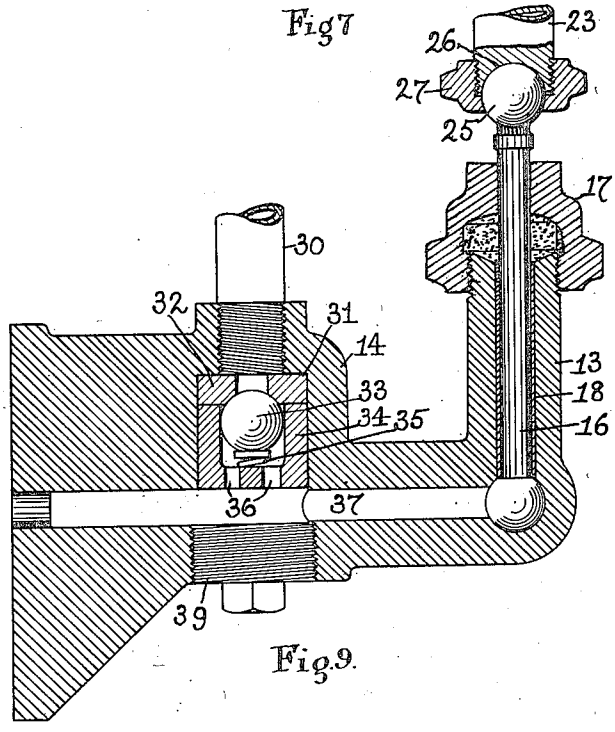

Fig. 9.

WITNESSES:

E. G. Barnett

J. Murphy

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UNITED STATES PATENT OFFICE.

RANKLIN J. PERKINS, OF WOBURN, MASSACHUSETTS, ASSIGNOR TO HOLDER-PERKINS COMPANY, OF WOBURN, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

PRESS.

981,468. Specification of Letters Patent. Patented Jan. 10, 1911.

Application filed September 30, 1909. Serial No. 520,257.

To all whom it may concern:

Be it known that I, FRANKLIN J. PERKINS, a citizen of the United States, residing in Woburn, county of Middlesex, and State of Massachusetts, have invented an Improvement in Presses, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to a power-operated press and is herein shown as embodied in a press of this character, which is especially designed and adapted among other uses to be employed for pressing leather.

The present invention has for its object to provide a power-operated press with which the leather or other stock may be subjected to the same pressure irrespective of the thickness of the same, whereby all the stock may be treated alike and have imparted to it the same surface finish. Provision is also made for avoiding breaking or straining the parts of the press. Provision is also made for manually controlling the pressure for a purpose as will be described. These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a front elevation of one form of press embodying this invention. Figs. 2 and 3, opposite side elevations of the machine shown in Fig. 1. Fig. 4, a partial section and elevation of the machine shown in Fig. 1. Fig. 5, a section on the line 5—5, Fig. 1. Fig. 6, a detail in section and elevation to be referred to. Figs. 7, 8, and 9, details to be referred to.

In the present instance, the invention is shown as embodied in a twin press in which an upper platen *a* is secured as by bolts *b* to two levers *c*, *d*, and coöperates with two lower platens *e*, *f*, which are fluid-operated as will be described. The platens *e*, *f*, rest upon pistons or rams *g*, *h* (see Figs. 1 and 5) movable in cylinders *i*, *j*, open at their upper ends and secured to a supporting base *k*, as by bolts *m* or otherwise. Each platen *e f*, has a ball and socket engagement with its ram or piston *g*, *h*, after the manner represented in Fig. 5, wherein the ram *g* is shown as provided with a concavity *n* in its upper surface, into which extends a convexed projection *o* on the under surface of the platen *e*, whereby the latter can rock or turn on its ram to automatically adjust itself to variations in the thickness of the work. The upper platen *a* may and preferably will be made hollow and is designed to receive steam or other medium for heating the same.

The pistons *g*, *h*, are operated by fluid-pressure, preferably water, which is supplied to the cylinder *i* by a pipe 10 connected with the same near its bottom, and to the cylinder *j* by a pipe 12, which connects the two cylinders, so that the fluid is practically supplied to both cylinders simultaneously. The fluid-pressure may be supplied by a pump, which may be separate from the press or which may be attached thereto as herein shown. In the present instance, the fluid pump consists of a cylinder 13 (see Figs. 2 and 9) secured to or forming part of a hollow casting 14, which is secured as by bolts 15 to one side of the base *k*.

The pump cylinder 13 contains a piston 16, which extends out through a stuffing box 17 attached to the upper end of the cylinder 13. The piston 16 makes a tight fit with a brass or other lining sleeve 18. The piston 16 is driven by an eccentric 19 on a sleeve 20, loose on the main shaft 21 of the press and provided with the pulley 210, which is driven by the belt 22 in a manner well understood. The piston 16 is connected with the rod 23 of the eccentric 19 by a ball and socket joint, which comprises, as shown in Fig. 9, a ball 25 on the piston and a socket 26 in the end of the eccentric rod 23 and the nut 27, which embraces the ball 25 and engages the rod 23. The pump cylinder 13 communicates with the fluid supply, which in the present instance is a hollow standard or upright 29 erected upon the base *k*, said upright being connected by the pipe 30 (see Fig. 2) with a chamber 31 in the hollow casting 14 (see Fig. 9), which chamber contains a valve seat 32, a ball valve 33 coöperating therewith, a cage 34 for the ball and a spring 35 to normally seat the said ball valve and cut off the flow of liquid to the pump cylinder 13. The cage 34 is provided with openings 36 in its bottom for the passage of fluid into a passage 37 in open communication with the pump cylinder 13.

The ball valve 33 and the other parts in the chamber 31 are accessible through an opening which is closed by the screw plug 39.

On one stroke of the pump piston 16, which may be termed its out stroke, the valve 33 is opened and water or other fluid flows or is drawn from the hollow standard 29 into the passage 37 and into the pump cylinder 13. On the in-stroke of the piston, this fluid is forced back, automatically closing the valve 33 and passes to the cylinder *i* through the pipe 10 connected with the hollow casting 14 and provided with a check valve 40 of any suitable construction, which closes to prevent the fluid from flowing back from the cylinder *i* to the pump. The pipe 10 may be considered as the outlet pipe for the pump and the inlet pipe for the cylinder *i*, and is provided as shown with a branch 41 leading to a pressure gage 42, by means of which the pressure of the fluid in the cylinder *i* may be made known to the operator.

The fluid admitted into the cylinder *i* flows by the pipe 12 into the cylinder *j* and passes from the latter out through the pipe 44, which is connected with a valve casing 45 (see Figs. 3 and 7) containing an automatically operated valve, which may be made as herein shown and consists of a rod 46, which coöperates with a port 47 connecting the outlet pipe 44 with a chamber 48 within the valve casing, and which is connected by the pipe 50 with the hollow standard or supply chamber 29. The valve 46 is guided in its movements by the head of a cylinder or sleeve 51 located within the valve chamber 48 and in threaded engagement at its outer, open end with a plug 52, which is extended through a cap 53 in threaded engagement with the valve casing 45. The valve 46 is seated so as to close the port 47 by a spring 54 located in the sleeve 51 and having one end bearing against a collar or flange 55 on the rod 56 of the valve 46 and its other end against the plug 52, which latter is capable of being turned into or out of the sleeve 51, so as to regulate the strength of the spring 54 according to the pressure at which it is desired to have the valve open.

The sleeve 51 is provided at its outer end with a flange 59, between which and the end of the valve casing 45 is interposed a spring 60, which acts to move the sleeve 51 outward so as to normally open the valve 46 and thereby permit the pump to be run continuously, that is, the pump can be driven when the press is idle and the water merely circulated without moving the lower platen. The sleeve 51 is moved in the opposite direction as will be described, so as to close the valve 46, and thereby render the fluid effective for moving the lower platen. It will thus be seen, that the valve 46 can be set to remain closed until the fluid pressure in the outlet pipe 44, which is the same as that in the cylinders *i*, *j*, reaches a predetermined point, say, for example, seventy tons, and when the pressure in the said cylinders reaches this amount, the valve 46 is automatically opened by the fluid pressure compressing the spring 54, and the fluid is permitted to flow through the pipe 50 back into the supply chamber or hollow standard 29, with the result that the pressure of the fluid is prevented from exceeding the amount to which it is desired the leather or other work should be subjected, and insures all of the stock irrespective of its thickness, being treated alike and given the same surface finish. The operation of the automatic valve also reduces to a minimum the liability of straining or breaking the parts of the machine.

The fluid-operated lower platens *g*, *h*, coöperate with an upper platen, which is shown in the form of the steam chest *a*, and which is mechanically operated to obtain a quick acting press. As above stated, the upper platen *a* is attached to two levers *c*, *d*, which in accordance with this invention are power-operated from the main shaft 21, and inasmuch as the mechanism for operating both levers is the same, a detailed description of that for operating one lever as *d* will suffice.

Referring to Figs. 3 and 4, the lever *d* has pivotally connected with its lower end at 65, one member 66 of a toggle, the other member 67 of which is pivoted at 68 to the frame of the press. The central pivot 70 joining said members is joined by a connecting rod 71 to a crank 72 on a crank shaft 73 having bearings in the framework of the press and provided at one end with a gear 74, which is driven by a pinion 75 on the main shaft 21. The rotation of the main shaft 21 is governed by a clutch, which may be of any suitable construction and which is herein shown (see Fig. 6) as comprising two members 77, 78, having engaging projections or teeth 79, 80. The member 78 is normally fast on the shaft 21 as by the pin 81, and the member 77 is normally loose on said shaft and is adapted to be rendered fast thereon by engagement of its teeth 79 with the teeth 80 of the fixed member 78 by a spring 83, which encircles the shaft between adjusting nuts or collars 84 and the hub of a pulley 85, which is fastened to the clutch member 77 by the screw 86 or otherwise. The pulley 85 is designed to be driven continuously by a belt 87 and is moved longitudinally on the shaft against the action of the spring 83 so as to disengage the clutch member 77 from the clutch member 78, by substantially diametrically opposite projections 88 on a disk 89 fast on the main shaft to revolve therewith as by a key 90, said projections coöperating

with an inclined projection or cam 91 on a lever 92 connected by a link 93 (see Fig. 3) to a lever 94, which is joined by a link 95 to a foot treadle 96 normally held elevated by a spring 97.

The shaft 21 is supported by the framework of the machine, and as represented in Fig. 6, has mounted upon it between the disk 89 and the said framework, a collar 189, which is of a length substantially equal to the width of the lever 92, and forms an annular space between the collar and lever, into which the cam 91 on lever 92 is extended in position to be engaged by the lugs 88, the path of said lugs being around the periphery of said collar.

The lever 92 may be designated the cam lever and the lever 94 the stop lever, the latter being provided with a finger or projection 99, which is adapted to enter one of two diametrically opposite notches 100, 101, in a disk 102 fast on the crank shaft 73. In the elevated position of the foot treadle 96, the cam lever 92 is elevated and its cam 91 is projected up into position to engage the lug 88 on the disk 89, with the result that the said lug in the revolution of the shaft 21 rides up the inclined face of the cam and is forced away from the cam or in the direction indicated by the arrow 105 in Fig. 6, thereby moving the pulley 85 longitudinally on the shaft 21 until the clutch member 77 is disengaged from the clutch member 78, at or about which time the finger 99 on the stop lever 94 enters one of the notches 100, 101, in the disk 102 and stops rotation of the crank and main shafts. The notches 100, 101, will be made of sufficient length to enable the shafts 73, 21, to rotate a sufficient distance to bring one of the projections 88 into engagement with the cam 91 to throw out the clutch. The gear 74 and pinion 75 are made of such size with relation to each other, say 8 to 1, that the shaft 21 will make a half revolution while the shaft 73 is being moved but a slight distance and therefore the notches 100, 101, need be but very little wider than the finger 99 as represented in Fig. 3. At each half revolution of the crank shaft, the toggle levers are operated, and on one half revolution they are moved from their broken or open position into their straightened position, shown in Figs. 1, 2 and 3, and as the toggle is straightened the lever *d* is turned on its pivot so as to move the upper platen *a* down into its operative position, and when the toggle is broken the lever is turned in the opposite direction and the upper platen is moved upward into its open or inoperative position. It will thus be seen that the upper platen is moved by mechanical power-operated means, which enables the upper platen to be quickly actuated, thereby increasing the speed of the press.

The pivot 68 for the toggle member 67 is provided, as shown, with a crank or arm 200 carrying an adjustable screw 201 (see Fig. 3) which coöperates with the plug 52 of the automatic valve, so that when the toggle members have been moved into their straightened position shown in Fig. 3, the crank or arm 200 is moved so as to cause its screw 201 to act on the plug 52 and compress the spring 60, thereby closing the valve 46, whereupon the circulation of the fluid is interrupted and the pressure accumulating in the cylinders *i*, *j*, acts to move the lower platens *g*, *h*, toward the upper platen *a* to compress the leather or other material. It will be understood that the main and crank shafts are put in motion only when the operator depresses the foot treadle 96, and that as soon as the shafts 21, 73 are set in rotation, the operator can remove his foot from the treadle, as the cam on the lever 92 is held out of the path of the lug 88 by the disk 102, on whose circumference the finger 99 on the stop lever at such time rests. When the stop disk 102 has made a half revolution, the finger 99 drops into one of the notches 100, 101 and elevates the cam 91 into the path of the lug 88 on the disk 89. In some instances, it may be desired to subject the leather or other stock to a less pressure than that to which the automatic valve is set, or it may be desired not to subject the stock to pressure after the machine has been started, and for this purpose, provision is made for preventing the pressure from actuating the lower platen, which is accomplished as herein shown, by means of a valve 110 under the control of the operator and located in a pipe 112, which connects the cylinders *i*, *j*, with the supply chamber in the hollow standard 29.

In the present instance, the pipe 112 is shown as tapped off from the pipe 12 connecting the cylinders, and the valve 110 is located near the upper end of the vertical leg of said pipe where it is accessible to the operator running the press. The press may be provided at its opposite sides with tables 113, which are supported by brackets 114 attached to the cylinders. The fluid outlet pipe 30 for the supply chamber 29 may have connected with it a glass or gage 115 of usual construction.

It will be observed that the upper platen is moved in the arc of a circle when opened or raised, while the lower platen moves in a substantially straight path, and as a result, the opening between the platens at the front of the same is materially wider than at the back of the platens, which is advantageous, as it affords a better view of the stock and gives easy access to the stock for the purpose of smoothing the same out after it has been inserted between the platens. It will also be observed that the opening between

the platens is not obstructed in any way, which avoids the necessity of rolling the stock to insert it between the platens, enables a single operator to run the press and manipulate the stock, and makes it possible to press endless belts. Furthermore, liability of accidents to the operator is reduced to a minimum.

The automatic valve enables the same pressure of the fluid-operated platen to be applied to all the stock irrespective of its thickness, whereby the same finish is imparted to the surface of all the stock, and the pump automatically compensates for the displacement of the material caused by the compression of the same, and the material irrespective of its thickness is subjected to the same maximum pressure, which is determined by the automatic valve.

In operation, the upper platen is designed to be brought into or substantially into its operative position before pressure is exerted by the lower platen, so that, the upper platen practically becomes a fixed or stationary platen in the operation of the press and the pressure is applied by the fluid operated platen, which pressure may be so gradually applied as to prevent crushing or straining of the fiber of the leather or other stock.

In the present instance, I have shown the invention as embodied in a press having two fluid operated platens and the upper platen as carried by two levers, but I do not desire to limit the invention in this respect, as it is evident a single fluid-operated and a single lever-operated platen may be used, when the character of the work would not require so large a press as that herein shown.

I have herein shown the lower platen as movable on its ram or piston, but it is not desired to limit the invention in this respect, as it is evident that good results would be obtained with a press in which the lower platen was firmly attached to its piston or formed part thereof.

Claims.

1. In a machine of the class described, in combination, an upper platen, a lever carrying said platen, a toggle mechanism connected with said lever, a crank shaft, means for connecting said toggle mechanism with said crank shaft, a driving shaft, gearing connecting said driving shaft with said crank shaft, a clutch controlling the rotation of said driving shaft, a cam controlling said clutch, a stop mechanism for said crank shaft operatively connected with said cam, a treadle connected with said stop mechanism, a lower platen movable toward and from said upper platen, a piston or ram carrying said lower platen, a cylinder in which said piston moves, a fluid supply, a pump connected with said fluid supply and with said cylinder to force fluid pressure therein to move said piston, an outlet pipe for said cylinder, a valve in said outlet pipe controlling the passage of fluid from the said cylinder and automatically operated when the pressure in said cylinder reaches a predetermined point to prevent the piston being operated by a pressure in excess of a predetermined amount, substantially as described.

2. In a machine of the class described, in combination, an upper platen, a lever carrying said platen, a toggle mechanism connected with said lever, a crank shaft, means for connecting said toggle mechanism with said crank shaft, a driving shaft, gearing connecting said driving shaft with said crank shaft, a clutch controlling the rotation of said driving shaft, a cam controlling said clutch, a stop mechanism for said crank shaft operatively connected with said cam, a treadle connected with said stop mechanism, a lower platen movable toward and from said upper platen, a piston or ram carrying said lower platen, a cylinder in which said piston moves, a fluid supply, a pump connected with said fluid supply and with said cylinder to force fluid pressure therein to move said piston, an outlet pipe for said cylinder, a valve in said outlet pipe controlling the passage of fluid from the said cylinder and automatically operated when the pressure in said cylinder reaches a predetermined point to prevent the piston being operated by a pressure in excess of a predetermined amount, a second fluid outlet for said cylinder, and a valve for controlling the passage of fluid from the said cylinder independently of the automatic valve, substantially as described.

3. In a machine of the class described, in combination, a cylinder, a piston therein, a platen carried by said piston, means for supplying fluid pressure to said cylinder, a valve for automatically controlling the pressure of the fluid in said cylinder, a second platen coöperating with the first-mentioned platen, a lever carrying said second platen, and means to mechanically operate said lever, substantially as described.

4. In a machine of the class described, in combination, a cylinder, a piston therein, a platen carried by said piston, means for supplying fluid pressure to said cylinder, a valve controlling the pressure of the fluid in said cylinder, mechanical means for closing said valve and holding it closed until the pressure in the cylinder reaches a predetermined point, other means for permitting said valve to be automatically opened when the pressure reaches a predetermined point and while the said mechanical means is in its active position with relation to said valve, and a second platen coöperating with the first-mentioned platen, substantially as described.

5. In a machine of the class described, in combination, a cylinder, a piston therein, a platen supported by said piston to move therewith and to rock thereon, means for supplying fluid pressure to said cylinder, a valve controlling the pressure of the fluid in said cylinder, mechanical means for closing said valve and holding it closed until the pressure in the cylinder reaches a predetermined point, other means for permitting said valve to be automatically opened when the pressure reaches a predetermined point and while the said mechanical means is in its active position with relation to said valve, and a second platen coöperating with the first mentioned platen, substantially as described.

6. In a machine of the class described, in combination, a fluid-operated platen, a mechanically operated platen coöperating therewith and toward and from which said fluid-operated platen is moved to press the work, a valve controlling the pressure of the fluid upon the fluid-operated platen, means for closing said valve when the mechanically operated platen is operated, and other means for automatically opening said valve and thereby limiting the movement of the fluid-operated platen toward the mechanically operated platen when the fluid pressure reaches a predetermined point and while said valve-closing means is in its operative position, substantially as described.

7. In a machine of the class described, in combination, a fluid-operated platen, a mechanically-operated platen, a valve for automatically controlling the pressure of the fluid-operated platen normally inactive, and means for rendering the said valve active when the mechanically-operated platen is in its operative position.

8. In a machine of the class described, in combination, a fluid-operated platen, a movable platen coöperating therewith, a valve for automatically controlling the pressure of the fluid-operated platen, said valve being normally inactive, and means movable with the coöperating platen for rendering said valve active.

9. In a machine of the class described, in combination, a fluid-operated platen, a mechanically-operated platen coöperating therewith, a pump for circulating fluid which actuates the said fluid-operated platen, a valve for controlling said circulation, means for normally holding said valve open, and means operated in conjunction with the mechanically-operated platen to act on said holding means and close said valve, substantially as described.

10. In a machine of the class described, in combination, a fluid-operated platen, a cylinder therefor, a fluid supply and a continuously driven pump connected in a normally open circuit, a valve in said circuit normally open, means for positively closing said valve to interrupt the circulation of fluid and create a fluid pressure in said cylinder, and means for permitting said valve to automatically open when the pressure in said cylinder reaches a predetermined point.

11. In a machine of the class described, in combination, an upper platen movable into and out of its operative position in the arc of a circle, a lower platen coöperating with said upper platen and movable in a substantially straight path, and means to move said platens.

12. In a machine of the class described, in combination, a cylinder, a piston therein, a platen movable with said piston, a fluid-circulating system including said cylinder, a valve in said system normally open, a second platen coöperating with said fluid-operated platen, a lever carrying said second platen, a toggle mechanism for operating said lever, and means operated by said toggle and cooperating with said valve to effect the closing of the valve with the toggle in its straightened position, substantially as described.

13. In a machine of the class described, in combination, a platen, a lever carrying said platen, a crank shaft operatively connected with said lever, a main shaft, gearing connecting said crank shaft with said main shaft, a clutch controlling the rotation of said crank shaft, a cam lever controlling said clutch, a stop lever coöperating with said crank shaft to arrest the platen in its operative position, and a fluid-operated platen coöperating with and movable toward said lever-operated platen, substantially as described.

14. In a machine of the class described, in combination, a platen, a movable support for said platen, a rotatable shaft, mechanism connecting said support with said shaft, means for automatically effecting intermittent rotation of said shaft, and a fluid-operated platen coöperating with the first mentioned platen, substantially as described.

15. In a machine of the class described, in combination, a platen, a movable support for said platen, a rotatable shaft, mechanism connecting said support with said shaft, means for controlling rotation of said shaft, a fluid-operated platen coöperating with the first-mentioned platen, means for effecting a circulation of fluid through the cylinder of said fluid-operated platen when the platen is not in use, a valve to interrupt said circulation while the pressure in said cylinder is below a predetermined point, means for permitting said valve to be opened again when the pressure reaches a predetermined point.

16. In a machine of the class described, in

combination, a platen, a movable support for said platen, an intermittently rotatable shaft, mechanism connecting said support with said shaft, means for controlling rotation of said shaft, and a fluid-operated platen coöperating with the first-mentioned platen, substantially as described.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

FRANKLIN J. PERKINS.

Witnesses:

JAS. H. CHURCHILL,

J. MURPHY.