June 21, 1927. 1,633,260

J. C. LEDBETTER

PRESS

Filed March 29, 1924 2 Sheets-Sheet 1

Fig. 1.

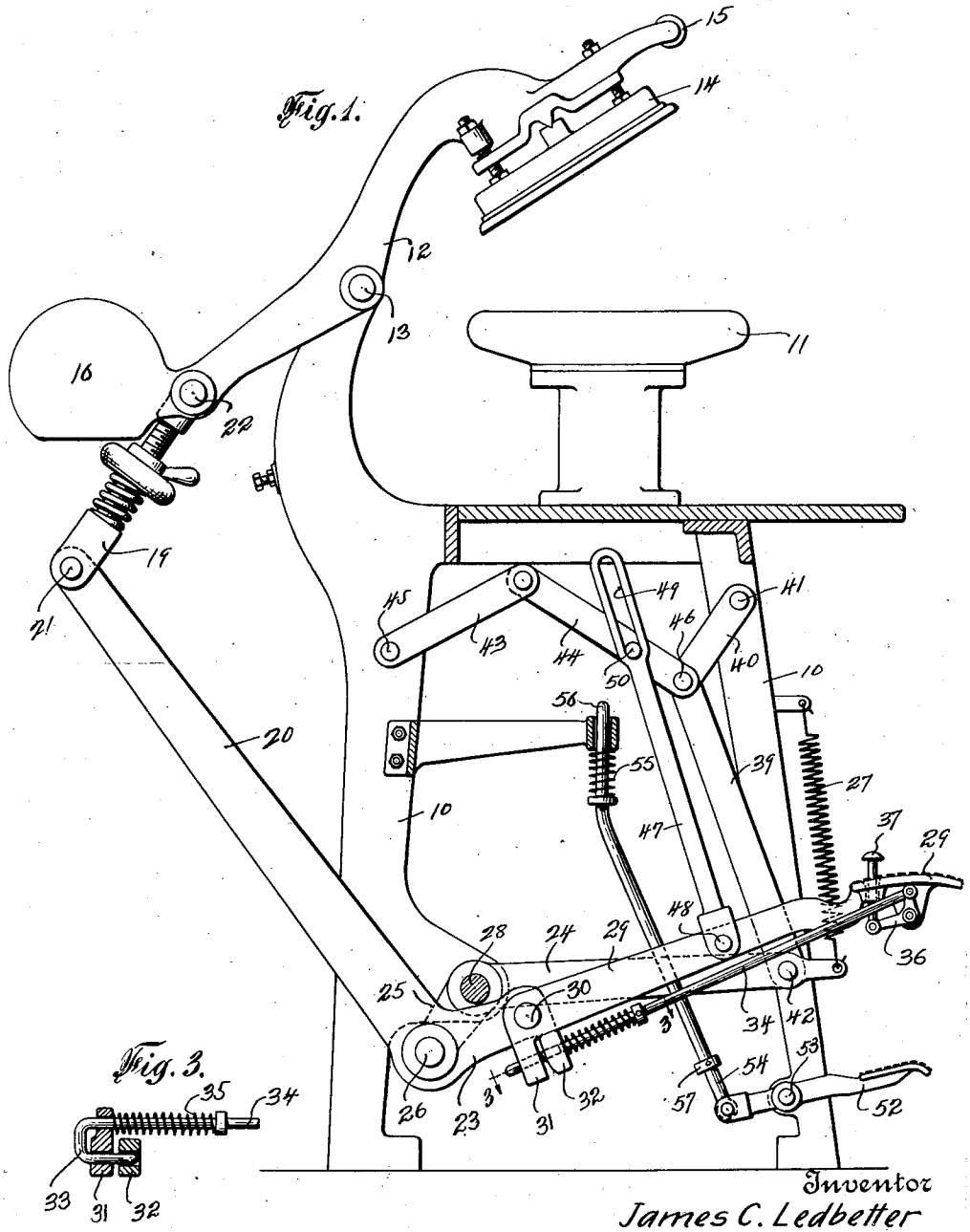


Fig. 3.

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Fig. 2.

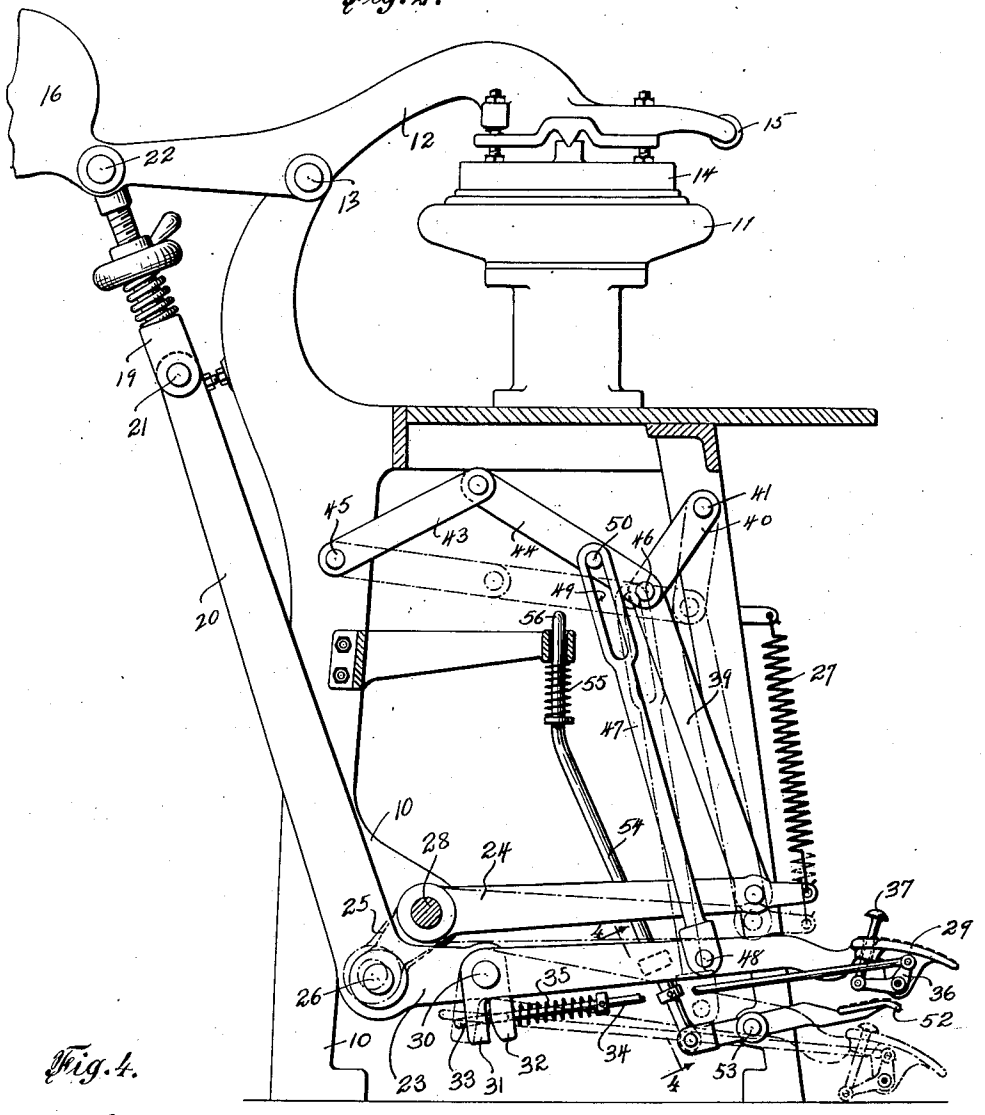
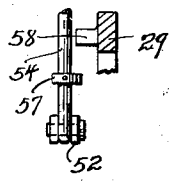


Fig. 4.



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Patented June 21, 1927. 1,633,260

UNITED STATES PATENT OFFICE.

JAMES C. LEDBETTER, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE PROSPERITY COMPANY, INC., OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

PRESS.

Application filed March 29, 1924. Serial No. 702,742.

This invention relates to presses and particularly to improvements in manually operated pressing machines of the power type capable of producing great pressure.

An object of the invention is to produce a power press operated manually more particularly by foot power thereby avoiding the necessity of employing an electric motor, fluid pressure devices or other motive power means for producing high compression between the working jaws or pressing members. Likewise it is an object to produce such a manually operated high power press as will operate easily without any considerable effort on the part of the operator.

A still further object is to produce a press having wide opening pressing members whereby the press head lifts high above the buck to permit the operator to smooth the work out thereupon together with a treadle mechanism which has a predetermined movement of substantially limited degree so arranged and constructed that the pedal does not move very high above the floor thereby rendering it unnecessary for the operator to lift his foot high to reach the pedal.

To accomplish the above ends, I provide a substantially low standing pedal having two stages of movement whereby the first portion of the pedal travel is directed to closing the head and the second part of the pedal stroke is directed to imposing high pressure between the pressing members. This two-stage operating pedal is preferably so arranged that a very short portion of its initial movement is directed to closing the head, and this is found in practice to be a distinct advantage because the head of the press is balanced to close easily and does not offer closing resistances. Inasmuch as the resistance in press operation comes only after the members have reached contacting relation, it follows that it is most desirable to employ a greater portion of the pedal travel to the imposition of high pressure on the work, and thus I have so constructed my improved pressing machine as to accomplish these purposes.

A feature of my invention also resides in certain improved manual control means whereby the operator breaks the closing pedal loose from the closing mechanism after the pressing members have reached contact, and thereafter permits the remaining stroke of the pedal to be directed entirely to the production of high compression between the pressing jaws. A further object and feature of the invention resides in an improved two-stage kick-off pedal whereby the pressing members are first relieved of high compression and thereafter are relieved of their contacting relation and immediately followed by the opening of the press.

The accompanying drawings illustrate an embodiment of the invention serving to illustrate the construction and mode of operation inherent in the machine; and certain changes in operation and structure may be made without departing from the principle of the invention.

Figure 1 shows the machine in side elevation in open position.

Figure 2 shows a side view of the machine in closed position under light pressure, and the dotted line position is that of high compression.

Figure 3 shows a section developed on the line 3—3; and Figure 4 shows a view developed on the line 4—4.

Referring now more particularly to the drawings for a detailed description of the invention there is shown a pressing machine frame 10 carrying a press buck 11 usually mounted in fixed relation thereon but which may be arranged to move up and down if necessary. A press lever 12 is pivoted at 13 on the frame and at the forward end thereof carries a pressing head 14 with a handle 15 by which the operator may, if he chooses, assist in closing the machine by grasping the handle to aid in initiating the closing movement. The rear end of the press lever is balanced by a counterweight 16.

A press closing toggle 19—20 is pivoted together at 21 and suspended at 22 on the rear end of the press lever. The toggle link 20 carries a short stub lever end 23 on the lower end thereof upon which a pedal is at will either pivotally or rigidly mounted as will be explained. A power or booster lever 24 is provided with a short arm 25 which pivotally supports the lower end of the closing toggle 19—20 as designated by the numeral 26. In other words, the pivot point 26 supports the closing toggle, not upon the frame 10 of the pressing machine,

but upon the rear end of the booster lever 24; and the front end of the booster lever is provided with a tension spring 27 which urges it upwardly in a normal inactive position.

A treadle 29 is pivoted at 30 on the short arm 23 of the closing toggle. This pedal has a downturned lug 31 which is disposed parallel with a similar downturned lug 32 made on the short lever arm 23. The two lugs 31 and 32 are fitted with an operator operated locking and unlocking means for the purpose of, at one stage of pedal operation, locking the pedal 29 rigidly to the link 20, and for, at the next stage of operation, unlocking the said pedal 29 from said rigid position to permit it to perform functions incident to operating the power lever 24. This locking means may take the form of a locking pin 33 carried on a rod 34 and normally urged by a spring 35 into constant engagement and locked position with the two lugs. Figure 3 shows the lock pin 33 sprung into position holding the lug 32 and pedal 29 rigidly with the lug 31 and link 20. The rod 34 extends forwardly to the outer end of the treadle 29 where it is connected with a bell crank 36. The bell crank 36 is actuated by a toe plunger 37 carried in the pedal foot piece 29 and convenient to the toe of the operator. The operator, by depressing the toe plunger 37, disengages the lock pin 33 from the lug 32 thus releasing the pedal 29 from the closing toggle 19—20. This arrangement permits the pedal 29 to stand rigid with the link 20 during the downward stroke to bring the head 14 down into contact with the buck 11 thereby permitting the operator to apply light pressure to the work if the same is desirable. The pressing machine is quite effective for light pressing work by using the upper first travel stage of the pedal without resorting to the use of the toe plunger. This constitutes a marked advantage for the press user may, with one and the same machine, secure either light or heavy pressure. My invention constitutes this advance in the art in that its head is lowered through a long travel by a short stroke pedal motion and this utilizes a long stroke pedal motion to move the head an extremely short distance, all of which contributes toward efficiency in operation to gain maximum power for minimum effort.

The outer end of the booster lever 24 is fitted with a toggle 39—40, the upper link 40 of which is pivoted at 41 on the frame 10, while the lower link 39 thereof is pivoted at 42 on the power lever 24. Thus by straightening the toggle 39—40 forwardly, the short arm 25 of the power lever 24 thrusts upwardly a short distance with great force thus inducing a thrust through the closing toggle 19—20 to impose high pressure between the head and buck. The toggle 39—40 is connected with a third toggle comprising links 43 and 44 one of which is pivoted at 45 on the frame while the other end of this toggle is pivoted at 46 to the second named toggle 39—40. Thus by straightening the toggle 43—44 the second toggle 39—40 is straightened. A draw link 47 is connected at 48 to the pedal 29 and has a lost motion slot 49 in the upper end thereof fitting over a pin 50 which pin is anchored to the toggle link 44. The slot 49 is of sufficient length to permit the pedal 29 to move downwardly a portion of its stroke far enough to close the head 14 onto the buck without effecting the movement of the toggle link 44 which means that the slot 49 travels along the pin 50 without coming into engagement therewith for the first stage of the pedal travel. The first and third toggle 39—40 and 43—44, respectively, constitute high pressure forcing means for subjecting the power lever 24 to a short stroke of great force.

A kick-off pedal 52 is pivoted at 53 on the frame and the rear end thereof pivotally connects with a push rod 54 which extends upwardly through a guide and is fitted with a spring 55 to urge the kick-off pedal 52 upwardly. The upper end 56 of the push rod normally comes to rest closely to one of the high pressure linkages as observed in dotted lines in Figure 2. By depressing the outer end of the kick-off pedal 52, the upper end 56 of the push rod breaks the toggle 43—44 to push the toggle 34—40 rearwardly, which causes the spring to lift the power lever up, which drops the pivot point 26 downwardly a short distance to remove the high pressure from the pressing members. The kick-off pedal 52 is equipped with suitable means for thrusting upwardly on the pedal 29 after the high pressure toggle linkage 43—44 has been broken, and this means may comprise a shoulder 57 which impinges upwardly against a lug 58 integral with the pedal 29 to throw the said pedal upwardly. It is to be noted, therefore, that the push rod end 56 first punches upwardly on the high pressure forcing toggle system to remove the high compression between the pressing jaws, and the operator continues downward movement on the pedal 52 to bring the kick-off means 57 up against the pedal to throw the toggle 19—20 rearwardly past center line position to permit the weight 16 to overbalance and lift the head.

From the foregoing it will be understood in a general way how the pressing machine functions, but it is repeated here that the operator first spreads the work upon the buck 11 and places his foot on the pedal 29 without depressing the toe plunger 37 thus pressing the garment lightly; and simul-

taneously with closing the head 14, the slot 49 has reached engagement with the pin 50. Further depression of the pedal 29 is carried out without affecting the straight line position of the closing toggle 19—20, but said further pedal motion does affect the high pressure toggles to such an extent that they are straightened to force down on the power lever 24 to impose high compression on the work.

This pressing machine possesses advantages in that the greater portion of the pedal stroke is utilized in producing high compression and only a portion of the pedal stroke is used up in closing the head.

What I claim is:

1. A pressing machine comprising in combination, cooperating pressing members, means embodying a toggle which when straightened sets up an initial press closing motion to bring the members into contact, a treadle lever, means actuated by said treadle lever during the initial depression thereof for straightening the toggle, means comprising a horizonal lever disposed parallel to the treadle lever for exerting an endwise thrust upon the toggle during further depression of the treadle lever, and means actuated by the treadle lever to operate the horizontal lever.

2. A pressing machine comprising in combination, cooperating relatively movable pressing members, a toggle connected to the pressing members for normally bringing said members into closed position, a second toggle actuated by said treadle to exert additional force through the first named toggle to impose high compression between the closed members, a lever having one end connected to the first named toggle and the other end connected to the second named toggle, a pedal including means for actuating both toggles, an operator controlled means for releasing the pedal from one toggle to permit the pedal to operate the other toggle, and a kick-off pedal having means for breaking first one toggle and then the other to open the press.

3. A press comprising cooperating relatively movable pressing members, a treadle lever, means operative upon a partial depression of said lever to bring said pressing members into closed contacting relation, means acting upon a further depression of said lever to set up a relatively heavy pressure between the pressing members, a toe plunger mounted upon the treadle lever, means controlled by the toe plunger to render the treadle lever independently operable in respect to the aforesaid means, and a kick-off pedal having means to first relieve the heavy pressure and subsequently to relieve the contacting relation causing the press to open.

4. A press comprising cooperating pressing members, means embodying a toggle which when straightened sets up an initial contacting light pressure between the pressing members, a treadle lever pivotally supported on one end of the toggle including means to lock the treadle lever and toggle together, means actuating through the toggle when thus straightened to exert an endwise thrust upon the toggle upon a further depression of the treadle lever, and a two stage release kick-off pedal having means which when first depressed releases the high pressure and when further depressed releases the contacting pressure.

5. A press comprising cooperating relatively movable pressing members, a press lever attached to one pressing member, a toggle mechanism connected to the press lever, a pedal pivoted on one end of the toggle mechanism including means to lock the pedal and toggle mechanism together, said toggle mechanism upon the first downward motion of the pedal serving to close the press, and a second toggle being connected with the pedal through a lost motion connection and serving as the pedal moves through its last portion of travel to exert a thrust through the first named toggle mechanism and apply pressure between the pressing members.

6. A press comprising cooperating pressing members, a treadle to close the press, a toggle mechanism connected to the treadle and connected with the pressing members for initially closing the press, a pivot connection and locking means between said toggle mechanism and treadle to permit the treadle to move further after the pressing members are closed, means under the control of the operator serving to break said pivot connection and locking means when the treadle lever has been moved downwardly to such an extent that the press is closed, and means operated by the treadle after the pivot connection and locking means are broken to produce final pressure between the pressing members.

7. A press comprising cooperating relatively movable pressing members, a press lever by which one of the said members is carried, a toggle connected to the press lever to rock the lever and close the press, a second toggle connected to the first toggle to produce a thrust through the first toggle, a third toggle to straighten the second toggle, a pedal connected to two of the toggles, means rendering said pedal effective during part of its travel upon one toggle and effective during another portion of its travel upon the other toggle, and said means being operator operable.

8. A press comprising cooperating relatively movable pressing members, a press lever by which one of said members is carried, a lever having a long and short arm, a

closing toggle interposed between the short arm of said lever and one end of the first mentioned press lever, a second toggle connected to the long arm of the lever and serving when straightened to produce a thrust through the closing toggle, a treadle lever carried rigid with one link of the closing toggle, and means actuated by the treadle lever to operate the second toggle.

9. A press comprising cooperating relatively movable pressing members, a press lever by which one of said members is carried, a lever having a long and short arm, a closing toggle interposed between the short arm of said lever and one end of the first mentioned press lever, a second toggle connected to the long arm of the lever and serving when straightened to produce a thrust through the closing toggle, a treadle lever carried rigid with one link of the closing toggle, control means by which the treadle is broken from the link of the closing toggle, and means actuated by the treadle to operate the second toggle.

10. A pressing machine comprising in combination, a frame, cooperating pressing members carried thereby, a press lever pivoted in the frame, a booster lever pivoted in the frame, a linkage connected with the press lever and connected with the booster lever, a pedal pivoted in the frame and locked to the linkage, high pressure forcing means connected with the booster lever and connected with the pedal, means for unlocking the pedal from the linkage and to permit it to move freely thereof, means for rendering effective the connection between the high pressure forcing means and pedal, and operator operated means for unlocking the pedal from the linkage.

11. A pressing machine comprising in combination, a frame, cooperating pressing members carried thereby, a press lever pivoted in the frame, a booster lever pivoted in the frame, a linkage connected with the press lever and connected with the booster lever, a pedal pivoted in the frame and locked to the linkage, high pressure forcing means connected with the booster lever and connected with the pedal, means for unlocking the pedal from the linkage and to permit it to move freely thereof, means for rendering effective the connection between the high pressure forcing means and pedal, operator operated means for unlocking the pedal from the linkage, and a kick-off pedal having means to first move the pedal up to release the high pressure forcing means and thereafter to break the linkage to open the press.

12. In a press of the character described the combination of cooperating relatively movable pressing members, a treadle lever, means operative upon a partial depression of said lever treadle to bring said pressing members into contacting relation, means acting upon a further depression of said treadle lever to set up a relatively heavy pressure between the pressing members, a kick-off pedal having means to first relieve the heavy pressure and subsequently to relieve the contacting relation causing the press to open, and foot controlled means carried upon the treadle lever for causing said treadle lever to release one means.

13. A high power press comprising in combination, cooperating pressing jaws, a toggle for opening and closing the jaws, a power lever supporting the toggle and adapted to exert a thrust therethrough, a toggle adapted to swing the power lever to compress the jaws, a pedal rigidly attached to the first named toggle and adapted during a part of the pedal travel to straighten the first named toggle to close the press, and means for disengaging the rigid connection and in the further travel thereof operate the second named toggle.

14. A high power press comprising in combination, cooperating pressing jaws, a toggle for opening and closing the jaws, a power lever supporting the toggle and adapted to exert a thrust therethrough, a toggle adapted to swing the power lever to compress the jaws, a pedal rigidly attached to the first named toggle and adapted during a part of the pedal travel to straighten the first named toggle to close the press, means for disengaging the rigid connection and in the further travel thereof operate the second named toggle, pedal trip means for performing the disengaging action, and a kick-off pedal including means to open the press.

15. A pressing machine comprising in combination, a pivoted booster lever, a pedal pivotally carried with the booster lever and capable of relative motion thereto, pressing jaws operated by the pedal and closed thereby to contacting relation, and high pressure means operator operated to swing the booster lever and produce high compression between the contacting jaws.

16. A pressing machine comprising in combination, a pivoted booster lever, a pedal pivotally carried with the booster lever and capable of relative motion thereto, pressing jaws operated by the pedal and closed thereby to contacting relation, high pressure means operator operated to swing the booster lever and produce high compression between the contacting jaws, and a device cooperating with the pedal and the high pressure means by which said pedal is rendered effective to actuate the high pressure means.

17. A pressing machine comprising in combination, a pivoted booster lever, a pedal pivoted on the booster lever and capable of relative motion thereto, pressing jaws oper-

ated by the pedal and closed thereby to contacting relation, high pressure means operator operated to swing the booster lever and produce high compression between the contacting jaws, a device cooperating with the pedal and pressure means by which said pedal is rendered effective to actuate the high pressure means, and a two-stage kick-off pedal having means which operates first to release high pressure and operates further to release the contacting jaws causing the press to open.

18. A press comprising in combination, a frame, a power lever pivoted in the frame, a pedal pivotally carried with the power lever and adapted to move relatively therewith, pressing members pivoted in the frame, a connection established between the pedal and a pressing member adapting the members to be brought into contact by partial movement of the pedal, said connection being also established with the power lever, and a linkage cooperating with the pedal and power lever by which the pedal moves further to operate the power lever to produce compression between the contacting members.

19. A press comprising in combination, a frame, a power lever pivoted in the frame, a pedal pivoted on the power lever and adapted to move relatively thereto, pressing members pivoted in the frame, a connection established between the pedal and a pressing member adapting the members to be brought into contact by partial movement of the pedal, a linkage cooperating with the pedal and power lever by which the pedal moves further to operate the power lever to produce compression between the contacting members, and foot control means which in one position permits the pedal to actuate the connection and close the press and which in another position causes the pedal to actuate the linkage to produce compression.

In testimony whereof I affix my signature.

JAMES C. LEDBETTER.