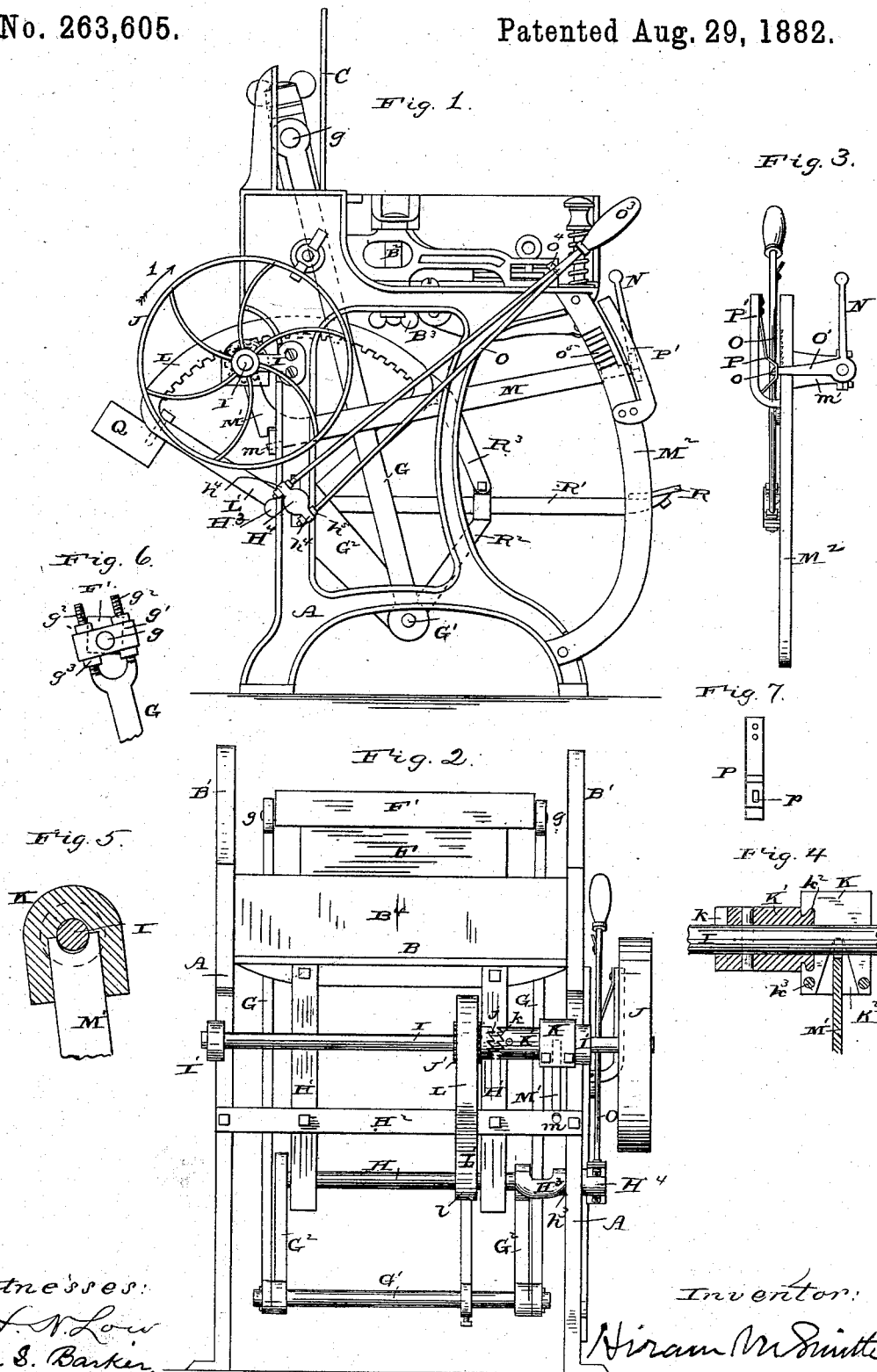


(No Model.)

H. M. SMITH.
PRESS.

No. 263,605.

Patented Aug. 29, 1882.



Witnesses:

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UNITED STATES PATENT OFFICE.

HIRAM M. SMITH, OF RICHMOND, VIRGINIA.

PRESS.

SPECIFICATION forming part of Letters Patent No. 263,605, dated August 29, 1882.

Application filed August 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, HIRAM M. SMITH, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Presses, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a side elevation of a press embodying my improvements. Fig. 2 is a rear view of the same. Fig. 3 is a front view of the devices for automatically throwing the power mechanism out of engagement with the press. Fig. 4 is a view of a portion of the power-shaft, showing also the clutch thereon. Fig. 5 is a cross-section of the clutch. Fig. 6 shows a modified form of the devices for connecting the pitmen with the plunger. Fig. 7 is a face view of the spring shown in Fig. 3.

My improvements relate more especially to the devices by which power is imparted to the plunger, said improvements being applicable to presses not only of the form shown, but also to those having compressing parts more or less modified. I have shown one form of said compressing parts for the purpose of illustrating the method of applying thereto my operating mechanism.

I am aware that the plunger and table shown have been heretofore used, and I make no claim to that part of the machine shown. Therefore there need be no description in detail given of said parts, it being sufficient to say that A A in the drawings represent the two side pieces of the frame, connected together in any suitable manner. B' B' are the sides projecting upwardly from the table B, upon which they are supported adjustably by means of one or more threaded bolts, B². C is a swinging plate hinged to the table, it being arranged to swing down into an inclined position when the material is being introduced, and up into a vertical position, so as to form the front side of the press-box. The ends of the press-box are preferably movable in the way now common, so as to act conjointly with the plunger F for imparting the desired shape to the lumps of material to be pressed. The plunger is carried by a cross-bar, F', which latter is pivoted to two pitmen, G G. Said pitmen are caused to reciprocate up and down, and thus carry the

plunger. The pitmen G G are straight strong bars pivoted at their lower ends to a cross bar or rod, G'. This cross-bar G' is supported in two arms, G² G², which are carried by a shaft, H. This shaft H is mounted in two downwardly-extending hangers, H' H', fastened at their upper ends to the table at points between the sides A A. To provide a strong bracing they are fastened at or near their lower ends to a cross-beam, H². The hangers H' and the shaft H are so arranged that the pitmen G G can swing down to or a little beyond the vertical line without their being interfered with by any of the supporting parts.

By supporting and arranging the parts in the manner which I have described I provide a much stronger mechanism than any that have been heretofore used to my knowledge.

Heretofore use has been made of bent or curved links or pitmen instead of the straight ones G G, they having been bent or curved to allow the lower ends to swing down to or beyond the vertical line of the upper pivots, g; but machines thus constructed have been practically inoperative, from the fact that the most important part of the strain is experienced by these pitmen, and when thus curved it is practically impossible to make them sufficiently strong to resist said strain, and as a result they easily break and twist, throwing the machine out of order. On the other hand, with machines as heretofore constructed, it has been impossible, without bending the said pitmen, to bring them down to or beyond the vertical line of the pivots g on account of the lower supporting-shaft, which has commonly been extended out laterally to a point beyond the plane of said pitmen. By my improved arrangement and method of supporting the parts no such interference is experienced, and I can employ perfectly-straight pitmen, which nevertheless can move outwardly sufficiently far, they being arranged to swing outside of the ends of the lower supporting-shaft, H.

Another great trouble experienced with the machines heretofore in use has been the fact that it was impossible to apply power thereto from an engine or other similar motor, inasmuch as the parts were so constructed and related that it was impossible to operate them except by treadle. I have so constructed and

arranged the parts that as great a power as may be necessary can be applied from an engine.

I represents a shaft mounted across the machine under the rear end, and supported in brackets I' I' or in any other suitable manner. It is provided with a band-wheel or power-wheel, J, a pinion, J', and a sliding clutch, K K'. By means of the band-wheel J power may be imparted continuously in one direction from any motor. The pinion J' engages with a cogged segment or quadrant, L, of any suitable length, and having radial arms L', the hub of which is keyed to the shaft H. When the power-wheel and the segment or quadrant are moving in the direction of the arrow 1 the pitmen G G will be swung downward and the compressing action will be effected. The pinion J' is loose upon the shaft I, but can be engaged therewith at will by means of the clutch K K', the latter having teeth k, adapted to engage with the teeth j in the ordinary manner. The clutch is pinned to or feathered upon the shaft I, and is provided with a shifting-lever, M M', the part M of which is arranged to rock in bearings at m m'. To provide the front bearing, m, I attach an additional leg, M², to the front side of the machine, it being supported at the top and bottom by any suitable brackets or part of the frame. The part M' of the shifting-lever engages by means of a fork or otherwise in the recess K² of the clutch.

N is a handle secured to the outer end of the part M of the shifting-lever, and by this handle it will be seen that the clutch can be thrown into operation.

In order to automatically disengage the clutch from the pinion, I combine with the parts above described the following devices:

O is the tripping arm or handle, secured by means of an arm, H³ H⁴, to the shaft H, and long enough to extend to a short distance outside of the machine. O' is an arm projecting laterally from the rocking part M of the shifting-lever, the end o of said arm lying across the path of the arm or handle O. Said arm or handle O moves downward when the machine is in operation—that is, when the segment or quadrant is moving in the direction of the arrow, and when the arm or handle O reaches the end o of the arm O', it will press the latter downward, and thus rock the lever M M' and draw the clutch out of engagement with the pinion.

In order to hold the clutch in engagement with the pinion as long as desired, I combine with the arm O' a spring, P, which is held by a tongue, P', fastened to the side of the leg M². This spring has a slot or aperture, p, adapted to receive the end o of arm O'. When said end of the arm is in said slot or aperture the clutch will be locked in position in engagement with the pinion. When the arm or handle O is descending it first comes in contact with the spring P and pushes it laterally out of engagement with the arm O'. If, after the arm O has thus

disengaged the spring from the arm O', said arm O' does not drop and disengage the clutch, the consequent continuing rotation of the pinion and the quadrant will carry the arm O down far enough to have it positively depress the arm O', rock the lever M M', and disengage the clutch, as above described. After this disengagement of the clutch the compressing mechanism will be at rest until the handle N is again thrown up into its vertical position by the operator. Before throwing it up into said vertical position the segment or quadrant L should be returned to its outermost position. This return may be caused either by the operator by means of the handle or arm O, or it may be caused automatically by means of a weight, as at Q, or by a spring or any other equivalent returning mechanism.

o⁴ is a spring-dog on the side of the handle O, adapted to engage with ratchet-teeth a⁵ on the leg M² to hold the handle O down until it is intentionally disengaged.

The curved arm H² has a bearing at h³ in the side frame, and has a projecting part, H⁴, to receive the handle O. Its curved part should be so situated in relation to the pitman and the shaft that when the pitman is in a vertical position it shall be immediately behind the pitman. Preferably it is cast in one piece with one of the swinging arms G², though I do not wish to be limited to this way of making it, as they may be made separately and secured to the shaft in any suitable way.

I have shown that method of securing the arm or handle O to the part H⁴ which I prefer to use—that is to say, I cast two ears, h⁴ h⁴, on the outer end of the arm H², and form the arm or handle O with two legs, the rear or lower ends of which can pass through the ears and be clamped thereon by means of nuts h⁵. The arm or handle O is preferably made of two bars or rods welded together at their outer ends in such manner as to receive a wooden handle, a³, the inner ends of the rods being screw-threaded to engage with the nuts h⁵ in the manner just described. When the handle or arm is secured in this way I can easily adjust it accurately, so as to disengage the arm O' from the spring P at the proper instant.

The clutch K K' may be feathered upon the shaft I and be arranged to move longitudinally thereon; but I prefer for some reasons to have the shaft slide longitudinally to a limited extent, and therefore I key or pin one part of the clutch to the shaft. The part K' of the clutch has at the outer end a head, k², which is seated within a recess formed in the part K. This part K is made in two pieces, which fit around the shaft I and are bolted together at k³.

The upper end of the part M' of the shifting-lever is recessed, so as to partially surround the shaft I, and is seated in a chamber or recess, K², in the part K of the clutch. Any of the well-known forms of clutch, however, may be used in place of that I have shown and specifically described. The rocking shifting-lever

may be supported upon the top of the cross-piece H^2 , if desired, by means of a recessed pillow-block or other support thereon.

In order to provide for an adjustment of the throw of the plunger, it can be joined to the pitmen G G by means of the devices shown in Fig. 6. In this case the stud g passes through a movable box, g' , which is attached to the pitman G by means of two arms, g^2 , which are screw-threaded, and thereby adapted to engage with nuts g^3 . When a large lump is to be compressed the nuts g^3 are loosened and the box g' is moved up a distance corresponding to the size of the lumps, and the set-screws g^3 are then fastened, so as to clamp the box in its new position. If a smaller lump is to be compressed, the parts are adjusted in a reverse manner.

With the mechanism above described may be combined also a set of devices for permitting the press to be operated by the foot of the attendant.

R represents a foot-treadle carried by a lever, R' , which at the inner end is secured to the shaft H .

R^2 is a brace connecting the lever R' with the cross-bar G' , and by these devices a downward swinging movement can be imparted to the pitman G from the treadle R . When the machine is thus operated by the foot of the attendant the handle O , with its spring-dog o^4 and the teeth o^5 , operates in the same manner as when the machine is moved by steam—that is to say, after the foot of the operator has drawn down the plunger and brought the pitmen G G into a vertical position the spring-dog o^4 engages with the teeth o^5 and locks the arm O (and therefore all of the mechanism) in its lowermost position.

R^3 is a link or brace connected at one end to the segment L and at the other to the arm R' or brace R^2 . When steam or other power is being applied through the shaft I this part R^3 operates to transmit the downward pressure to the pitmen G G and obviates the danger of twisting loose the devices which fasten the segment L to the shaft. In both cases—that is to say, whether the machine be operated by the foot of the attendant or by steam—I secure similar advantages. The pitmen G G , being placed outside of the ends of the shaft H , can be made straight, and therefore much stronger than the curved ones heretofore used. The hangers or supports H' H' prevent the bending downward of the table, as they transmit to the under side of the table substantially the same pressure which is being exerted above by the plunger F . This latter result is a matter of great value, and entirely obviates one of the most serious inconveniences that have been experienced heretofore.

It will be seen that after the press has been locked by bringing the pitman into vertical position the care of the operator is no longer wanted until it is necessary to remove the lump and insert a new charge. Hence one operator can attend to three or four presses, each

press acting temporarily as a retainer for its lump while the charges are being inserted and the lumps are forming in the other machines under the care of the operator. By allowing the lump to be retained in the press for a time the expansive reaction of the tobacco is prevented, and the compression of the lump is more effectively produced.

What I claim is—

1. In a pressing-machine of the character described, the combination, with the reciprocating plunger, of the straight pitmen G G , pivoted to the plunger, the arms G' G' , pivoted to the straight pitmen, the shaft H , carrying said arms G' G' , and the supporting-hangers H' H' , inside of the arms G' G' , substantially as set forth, whereby the pitmen can be swung down to or beyond the vertical line of their pivots g without requiring the pitmen to be bent.

2. The combination, with the reciprocating plunger of the press and the mechanism for reciprocating said plunger, of the shaft H , the spur segment or quadrant keyed to said shaft H , the devices for imparting power to said segment, and the devices which automatically disengage from said segment the power mechanism, substantially as set forth.

3. In a press, the combination, with a reciprocating plunger, the shaft H , and the reciprocating devices connecting the plunger with said shaft, of the cogged segment secured to said shaft, the power-shaft I , the power-wheel J , the loose pinion J' , the clutch K K' , the rocking lever M M' , the arm O' , carried by said lever, and the tripping-arm O , carried by the shaft H , and adapted to engage with the arm O' to automatically throw the clutch out of engagement with the plunger, substantially as set forth.

4. The combination, with the reciprocating plunger, of the shaft H , the reciprocating devices which connect the plunger with said shaft, the means for imparting power to said shaft H during the operation of pressing, the shifting-lever for releasing the power devices, the arm O' , carried by said shifting-lever, the slotted spring P , adapted to engage with said arm, and the tripping-arm O , carried by shaft H , and arranged to release the arm O' from said spring P , substantially as set forth.

5. The combination, with the reciprocating plunger, the rocking shaft H , the reciprocating devices which connect said shaft with the plunger, the quadrant, the detachable power devices adapted to be engaged with said quadrant during the operation of pressing, the devices which automatically disengage the power devices from said quadrant, and returning mechanism which carries the quadrant outwardly after its disengagement, substantially as set forth.

6. The combination of the pressing-table, the plunger above the table, the means for moving the plunger down, the shaft H , and the devices which support said shaft from the table.

7. The combination, with the table and the

plunger above the table, of the means for drawing the plunger toward the table, and the devices for thrusting upward against the table in the line of the plunger when it is drawn downward, substantially as set forth.

8. The combination, with the plunger, of the pitman adapted to be brought into vertical position when the plunger is down, the means for bringing down the pitman, the arm O for throwing the pitman-moving devices out of operation, and the crank-arm or curved arm H³, attached to said arm O, and arranged to have its curved part lie immediately below the pitman when it is down, substantially as set forth.

9. The combination, with the plunger, the pitman for drawing the plunger down, and the devices which move the pitman, of the means which positively lock the pitman in its lowermost position, substantially as set forth.

10. The combination, with the plunger, of the pitman, the shaft H, the segment L, the means for rotating the segment, the arms G², and the intermediate devices which connect the seg-

ment with the arms G², substantially as set forth.

11. The combination, with the plunger, of the pitman, the shaft H, the devices which rock the shaft H to swing the pitman down, the means for throwing the power devices out of engagement, the arms O, and the means for adjusting the position of said arm relatively to the shaft H, whereby the time at which the power devices are thrown out can be regulated, substantially as set forth.

12. The combination, with the plunger and the pitman G, provided with two upwardly-projecting threaded arms, g² g², of the box g', arranged to have both ends simultaneously adjusted upon the arms g² g², substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HIRAM M. SMITH.

Witnesses:

HARRY M. SMITH,
J. R. HAW.