



No. 680,164.

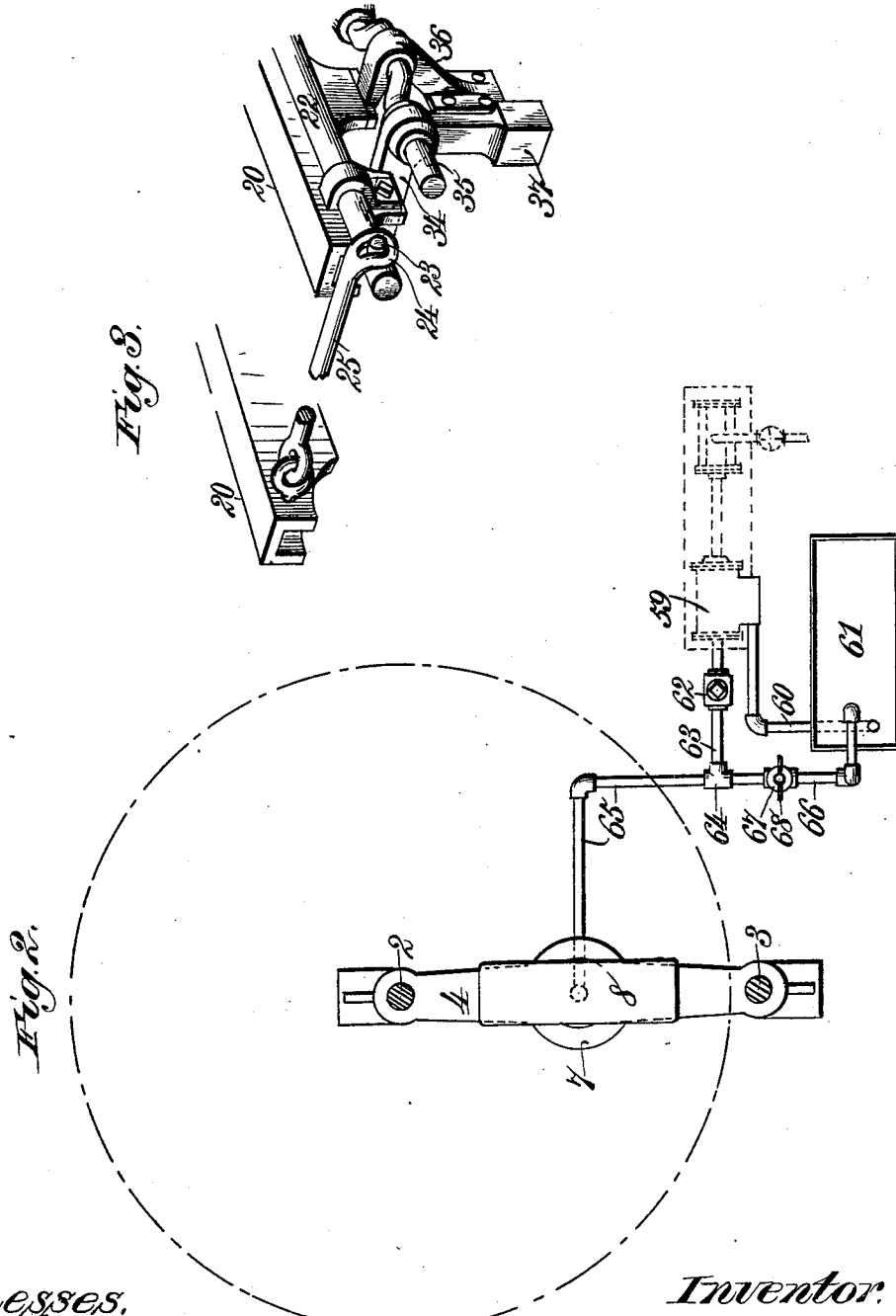
Patented Aug. 6, 1901.

R. S. MUNGER.  
BALING MACHINE.

(Application filed May 19, 1898.)

(No Model.)

3 Sheets--Sheet 2.



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3 Sheets—Sheet 3.

Fig. 4.

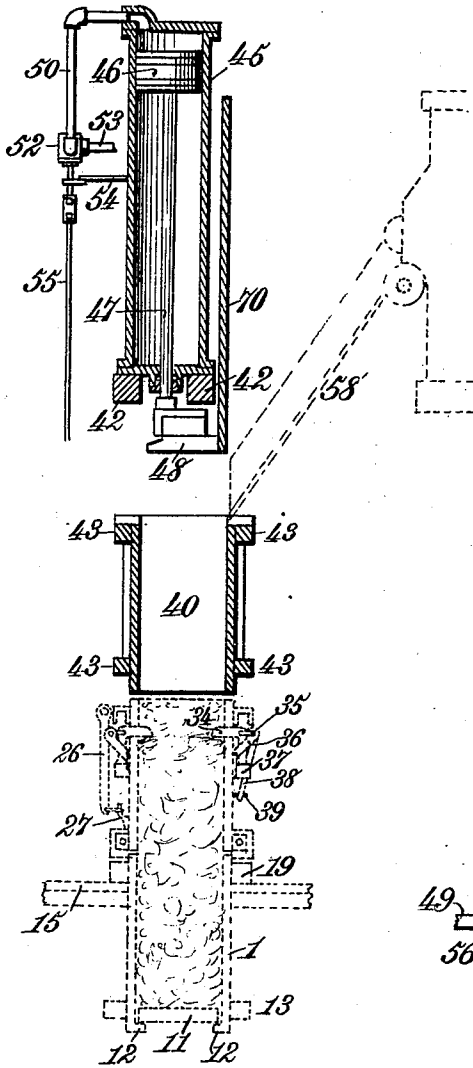


Fig. 5.

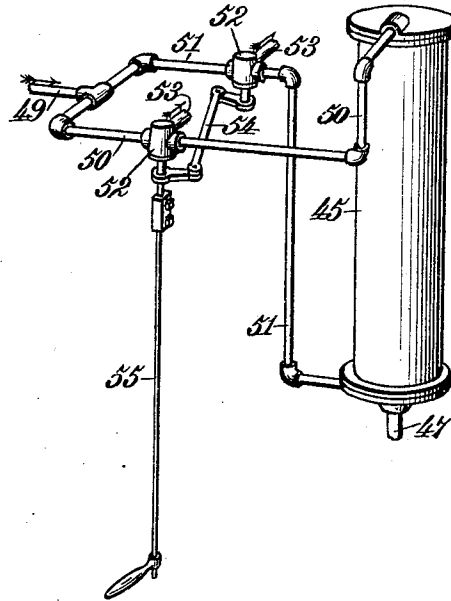


Fig. 6.

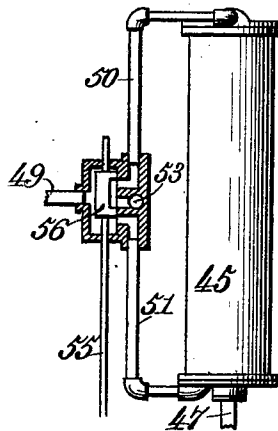
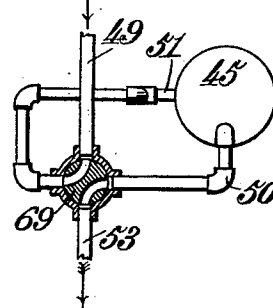


Fig. 7.



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# UNITED STATES PATENT OFFICE.

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## BALING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 680,164, dated August 6, 1901.

Application filed May 19, 1898. Serial No. 681,150. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT S. MUNGER, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented new and useful Improvements in Baling-Machines, of which the following is a specification.

This invention relates more especially to baling-machines that are designed for the handling of lint-cotton preferably supplied direct from a condenser.

It is a principal object of my invention to provide a charging-chamber through which cotton is to be forced by means of a packer or tramper into one baling-compartment of a double box-press, while the cotton previously charged or packed into the other press-box or baling-compartment is being formed into a bale, such charging-chamber being of great advantage in permitting a full stroke of the tramper or packer during the whole of the charging operation, besides avoiding any necessity for frequent up-and-down movement of the tramper, and also facilitating an economy of power and labor in operating the baling apparatus.

Other objects and advantages will appear from the features of construction and novel combinations of parts comprised in the invention, as hereinafter described and claimed.

In the annexed drawings, illustrating the invention, Figure 1 is an elevation of my improved baling machine or apparatus. Fig. 2 is a horizontal section of the same on the line 2 2 of Fig. 1. Fig. 3 is a perspective detail of locking and releasing mechanism for the press-box doors and retainers for holding the cotton down in the box. Fig. 4 is a vertical section of the packer-cylinder and press-charging chamber, showing in dotted lines one of the press-boxes of a duplex baling-machine and a portion of an adjacent gin or condenser. Fig. 5 is a perspective of the packer-cylinder and connections for controlling the supply and exhaust of steam at opposite ends of said cylinder for the operation of a double-acting tramper. Fig. 6 shows in section a modified valve mechanism for the packer-cylinder. Fig. 7 shows in section another modification of valve mechanism for the packer-cylinder.

My improvements in baling apparatus are

illustrated in their application to a double box-press for compressing cotton, preferably direct from the gin or condenser, the press-boxes 1 being mounted to turn or pivot on a vertical standard or column 2, forming part of a stationary framework, Fig. 1, and the apparatus being so arranged that one press-box is in position for charging while the cotton previously packed into the other box is under pressure to form a bale. The stationary framework of the baling apparatus comprises vertical standards or columns 2 and 3, secured to a webbed truss-frame 4, having pedestals 5, for which masonry foundations 6 are provided. This truss-frame 4, Figs. 1 and 2, also supports a vertically-arranged hydraulic cylinder 7, having therein a ram or plunger, to which the movable or lower press-head 8 is attached. The upper or stationary press-head 9 is secured to upper portions of the standards or columns 2 and 3 and has the stationary platen 10 secured to its under side. In each press-box 1 there is a movable or lower platen 11 to be acted on by the movable lower press-head 8, and when in its normal lowermost position this lower press-platen is supported by shoulders or lugs 12 at the open bottom of the press-box.

At their lower ends the two press-boxes 1 are connected by a rectangular frame 13, having a socket 14, by which the boxes are made capable of turning on the standard or column 2 when it is desired to change the position of said boxes for charging one box or baling-chamber while the contents of the other are being pressed into a bale. A circular platform or turn-table 15 is secured to and surrounds the two baling-chambers or press-boxes 1 at a suitable distance above the frame 13 and on a level with the floor 16, in which there is a circular opening that receives said platform or turn-table. The platform or turn-table 15 turns with the press-boxes 1 and is supported by brackets 17 at suitable intervals. In order to facilitate the turning of the press-boxes, a number of antifriction-rollers 18 may be provided at suitable points beneath the platform or turn-table. Immediately above the platform 15 the lower portion of each press-box may be independently braced by a rectangular frame 19, forming part of the box framework.

The upper portion of each press-box is constructed so as to be opened to release the bale. For this purpose the upper section of each press-box comprises hinged side doors 20, that are hung at the bottom in any suitable manner on horizontal shafts or journals 21, so that the said doors can be swung down onto the platform 15 in order to afford access to the interior of the press-box when removing the pressed bale. The side doors 20 are held in a closed or raised position by means of a locking and releasing mechanism, which comprises a horizontal rock-shaft 22, mounted on the outer side of one of the press-box doors near its top, as shown in Figs. 1 and 3. Near its ends the rock-shaft 22 is provided with pins or lugs 23 to engage in eyes 24 on rods 25, that are jointed to a top portion of the opposite press-door near its ends, as best seen in Fig. 3. The rock-shaft 22 is provided with a central depending lever 26, that is adapted to be engaged with a hook or locking projection 27 on the outside of the press-box door. When the doors 20 are closed and the eye-rods 25 are engaged with the pins or lugs 23 of rock-shaft 22, the lever 26 will be swung downward into engagement with its locking projection 27, thus locking both press-box doors firmly; but when the pressed bale is to be removed the lever 26 is released, and thereupon the expansive force of the bale will act on the hinged doors in such manner as to effect a disengagement of the eye-rods and rock-shaft, so that the doors will be free to lower into a horizontal position, turning on their lower hinge-joints.

In order to assist the raising and lowering of the heavy press-doors 20, it is preferable to provide weights 28, running in a guide-frame 29 on the upper press-head 9 and provided with cords or ropes 30, passing over pulleys 31 at suitable points and provided with hooks 32 for engaging any suitable projection on an upper part of the press-door. Aided by these weights the press-doors can move gradually to and from an open or closed position without shock or jar, and obviously when the press-boxes are to be shifted the hooks 32 will be disengaged.

Each press-door 20 is formed with a series of vertical slots 33 for passage of retainers 34, that are provided for the purpose of holding the cotton down in the press-box during the charging or packing operation and while the packed press-box is being swung or shifted over to the bale-pressing mechanism. These retainers 34 are in the form of bell-cranks that are loosely pivoted or mounted on the crank portion of a crank-shaft 35, which is mounted to rock in bearings 36, Figs. 1 and 3, on an outer and upper portion of the press-door. The outer arms of these retainers or bell-cranks are formed at their lower ends as weights 37, by which their inner arms, projecting within the press-box, are held in a normally horizontal position to prevent rebound of the cotton as it is packed or tramped

into the box, but leaving them free to swing downward with the cotton as it is forced in by the packer or tramper. On one end of the crank-shaft 35 there is a depending lever 38, that is adapted to be engaged with a fastening 39 on the press-box door, as shown in Figs. 1 and 4. The crank-shaft bearings 36 are offset from the press-box door a sufficient distance, so that when the lever 38 is released from its fastening 39 and swung outward the crank-shaft 35 will be oscillated in such manner as to withdraw the cotton-retainers 34 from within the press-box and into the slots 33 of the press-box door. In this manner the retainers 34 in the sides of a press-box will be withdrawn after the press-box has been shifted from the charging position to the point where the pressing of the bale is to be accomplished, and when thus withdrawn they cannot in any way obstruct the bale-pressing operation.

Adjoining the stationary framework of the press there is a stationary or non-rotary charging-chamber 40, Figs. 1 and 4, that is preferably suspended from a frame composed of uprights 41 and cross-beams 42, arranged in any convenient manner. This stationary or non-rotary charging-chamber 40 is securely braced by frames 43, with which the tie-rods or suspension devices 44 are connected. On the cross-beams 42 there is supported a vertical steam-cylinder 45, Figs. 1, 4, and 5, having steam-passages in its opposite ends. In this cylinder 45 there is a piston 46, which carries at the lower end of the piston-rod 47 a tramper or packer-head 48 for forcing cotton through the charging-chamber 40 and packing it in the press-box 1 that is for the time in position below the charging devices. The piston 46 is preferably operated by steam in both directions. In Figs. 1, 4, and 5 the main steam-supply pipe 49 is shown as having a branch pipe 50, connecting with the upper end of the cylinder 45, and a branch pipe 51, connecting with the lower end of said cylinder. Each of these branch pipes 50 and 51 may have therein a three-way valve 52, with which an exhaust-pipe 53 is connected. These three-way valves 52 are connected by lever mechanism 54 in such manner that when by means of an operating-rod 55 one valve is turned in position to admit steam to one end of the cylinder the other valve will be simultaneously turned in the proper direction to permit the escape of exhaust-steam from the other end of the cylinder. Instead of providing three-way valves 52 and valve-operating mechanism, such as above described, the communication between the pipes 49, 50, and 51 and exhaust 53 may be preferably controlled by means of a slide-valve 56, as shown in Fig. 6, or any other suitable valve mechanism may be provided. As shown in Fig. 1, the steam-cylinder 45 may be braced by any suitable framing 57, erected on the cross-beams 42 of the packer-frame.

The cotton to be baled may be taken con-

tinuously from a gin or condenser and is fed over a chute 58, Figs. 1 and 4, into the charging-chamber 40, through which it is gradually forced by the steam-operated tramper or packer 48 into the press-box beneath the charging-chamber. The provision of this charging-chamber 40 intermediate the press-box and the tramper or packer enables the tramper-head 48 to be operated at its full stroke while the cotton is being packed into the press-box and permits such an accumulation of cotton under pressure in the charging-chamber that the tramper does not have to be run up and down so often. Although this necessitates an increased vertical lengthening of the charging or packing mechanism, it obviously facilitates a compact tramping of the cotton into the press-box, and thereby conduces to an economy of power, time, and cost in the operation of the hydraulic ram for pressing the cotton from below and this, too, without diminishing the density of the bale, but rather adding thereto. The charging-chamber 40 is open at its upper and lower ends, and the cylinder 45 is placed at such elevation that the tramper-head 48 can move clear through the charging-chamber and out of the upper open end thereof. This enables me to use the chute, as at 58, to feed the cotton direct from the condenser into the upper open end of the charging-chamber when the tramper-head is raised out of the same, as will be understood by reference to Fig. 4. While the cotton is being packed into a press-box, the crank-shafts 35 are locked by engagement of their levers 38 with the fastenings 39, thereby holding the retainers 34 within the press-box. Under pressure of the entering cotton the retainers 34 are free to oscillate on the crank-shaft in a downward direction within the box; but by the influence of their weighted outer ends 37 and any elastic return pressure of the cotton these retainers will immediately resume their normal horizontal position, and thus hold the cotton down while the press-box is being packed and until it is ready for the action of the baling-press. After one of the press-boxes is charged the two connected boxes are swung around so as to bring the other box beneath the charging-chamber 40, while the charged press-box takes its place between the lower head 8 and upper head 9 of the baling-press. When the press-box is brought into this position, the crank-shafts 35 will be released and oscillated into position to withdraw the retainers 34, so that they may not obstruct the compressing of the bale. It is preferable to operate the movable lower press-head 8 by means of hydraulic power that may be applied through a steam-actuated duplex hydraulic pump 59 of any suitable construction or pattern. This pump 59 takes water or other liquid through a pipe 60 from an elevated tank 61, Figs. 1 and 2, and forces it past a check-valve 62 and through pipe 63, T-coupling 64, and pipe 65 into the lower part of the

hydraulic cylinder 7 below the ram to which the lower press-head 8 is attached. The press-head 8 and lower platen 11 are thus forced upward in the press-box, and the bale is compressed between the upper and lower press-plates 10 11 and is thereby shaped or formed in the upper section the press-box. Steam should now be shut off from the hydraulic pump. As shown in Fig. 2, the T-coupling 64 connects with the upper part of the tank 61 through a pipe 66, Figs. 1 and 2, in which a globe-valve 67 is located. A rod or lever 68 is provided for operating this globe-valve. When the pump 59 is in operation for forcing liquid into the hydraulic cylinder 7, this valve 67 is closed. When the bale is fully compressed, the hooks 32 of the door-weight mechanism, Fig. 1, are connected with the press-box doors 20, and the rock-shaft lever 26 is disengaged from its locking device 27, so that by expansive force of the bale and oscillation of the rock-shaft 22 the shaft lugs or pins 23 will disengage from the eyes 24 of the jointed rods 25, Fig. 3, and permit the doors 20 to gradually open in an outward and downward direction under the restraining action of the weights 28 and without shock or jar. The bale-bands are now secured, the globe-valve 67 is opened to release the pressure of liquid in the hydraulic cylinder 7, and the bale is removed from the press-box. Under the weight of the released lower press-head and ram the liquid in the hydraulic cylinder 7 will be forced out through the pipe 65, T-coupling 64, pipe 66, and open valve 67 and is thus returned to the tank 61, from which the hydraulic pump 59 is supplied. The valve 67 may then be closed. The press-doors 20 are easily lifted to a closed position, assisted by the weights 28. The doors will be locked by means of the eye-rods 25, rock-shaft 22, and its lever-locking devices 26 27, and the hooks 32 will then be disengaged from the doors. In the meantime the other press-box is being charged, and when all is ready the position of the two press-boxes will be reversed, and the several operations already described will be repeated first in one press-box and then in the other.

While it is preferable to operate the tramper or packer 48 both upward and downward by steam-power, it will be obvious that it may be actuated by steam in a downward direction only, and any suitable arrangement of weights, cords, and pulleys may be provided for lifting the packer when steam is exhausted from the upper end of the cylinder. In Fig. 7 I have shown an arrangement of single rotary valve 69 for controlling the steam supply and exhaust at both ends of the cylinder 45 when steam-power is to be employed for actuating the tramper or packer in both directions of its movement.

The provision of a charging-chamber 40 intermediate the tramper-operating mechanism and press-box with simple means for controlling the operation of the tramper, as de-

scribed, results in a large saving of press-power and in the time required to operate the press or to make and take out a bale, because by this construction a larger and longer tramper can be used, thereby enabling more cotton to be pressed in a given time and with a given power. Furthermore, by making the charging-chamber 40 closed on all sides and with its upper and lower ends open and by providing for the rise of the tramper-head therein out of the upper end of said chamber to a position above said chamber the danger of causing the cotton to be caught between the tramper-head and the inner walls of said chamber upon the upstroke of the tramper-head and the rolling of the cotton into wads is effectually prevented. This is an important feature of the invention.

It will usually be preferable to provide the tramper or packer 48 with a shield 70, that is arranged on the side next to the condenser, so as to hold back the lint and prevent it from falling onto the packer when the latter is below the chute.

The door-lift weights 28, that balance the swinging press-doors, could be arranged to drop below the press-floor, if desired, by simply extending the cords and pulley-supports beyond the sides of the press-frame.

The working of this baling apparatus is rapid, economical, and thoroughly effective and requires very little labor and attendance.

What I claim as my invention is—

1. The combination with a movable box-press, of a stationary charging-chamber above said press, closed on all its sides, but open at its upper and lower ends, a tramper-head movable in said charging-chamber and out of the upper open end thereof to a position above said chamber to permit the feeding of the material into the open end of the latter, and means for reciprocating said tramper-head, substantially as described.

2. The combination with a rotatable double box-press, of a stationary charging-chamber above said press having its sides closed and its upper and lower ends open, a feed-chute arranged to deliver the material into the upper open end of the charging-chamber, a reciprocating tramper-head movable in said charging-chamber and out of the upper open end thereof to a position above said chamber, a piston connected with the tramper-head, a cylinder containing the piston, and means for supplying a working fluid to the cylinder to operate the piston and tramper-head, substantially as described.

3. The combination with a rotatable double box-press, of a stationary charging-chamber above said press having its sides closed and its upper and lower ends open, means for feeding material into the upper open end of the chamber, a reciprocating tramper-head movable in said charging-chamber and out of the upper open end thereof to a position above said chamber, a cylinder arranged above and in alinement with said charging-chamber, a

piston in said cylinder connected with said tramper-head, and means for supplying a working fluid to either end of the cylinder for reciprocating said piston and tramper-head, substantially as described.

4. The combination with a movable box-press, of a stationary charging-chamber above said press open at its upper and lower ends and having its sides closed, a reciprocating tramper-head movable in said chamber and out of the upper open end thereof to a position above said chamber, means for delivering material into the upper open end of said chamber, and means for preventing the material from entering said chamber above said tramper-head, substantially as described.

5. The combination with a movable box-press, of a stationary charging-chamber above said press open at its upper and lower ends and having its sides closed, a reciprocating tramper-head movable in said chamber and out of the upper open end thereof to a position above said chamber, means for delivering material into the upper open end of said chamber, and means actuated by said tramper-head for cutting off the supply of material to said chamber when said tramper-head enters the upper end thereof, substantially as described.

6. The combination with a movable box-press, of a stationary charging-chamber above said press open at its upper and lower ends and having its sides closed, a reciprocating tramper-head movable in said chamber and out of the upper open end thereof to a position above said chamber, means for delivering material into the upper open end of said chamber, and a movable shield or guard for cutting off the supply of material to said charging-chamber when said tramper-head enters the upper end thereof, substantially as described.

7. The combination with a movable box-press, of a stationary charging-chamber above said press open at its upper and lower ends and having its sides closed, a reciprocating tramper-head movable in said chamber and out of the upper open end thereof to a position above said chamber, means for delivering material into the upper open end of said chamber, and a shield or guard carried by said tramper-head for cutting off the supply of material to said charging-chamber when said tramper-head enters the upper end thereof, substantially as described.

8. The combination with a press-box having vertical slots in its sides, of crank-shafts journaled outside the press-box, retainers loosely mounted on the crank portions of said shafts, projecting through the vertical slots of the press-box and capable of rocking on the crank-shafts while they are stationary, and devices for turning the crank-shafts to bodily swing the retainers inward and outward, substantially as described.

9. The combination with a press-box having vertical slots in its sides, of crank-shafts

5 journaled outside the press-box, retainers  
loosely mounted between their ends on the  
crank portions of the said shafts to rock there-  
upon while the shafts are stationary, each  
retainer extending at one end through a slot  
10 into the press-box and weighted at the other  
end, a lever connected with each crank-shaft  
to rock the same and bodily swing the retain-  
ers inward and outward, and means for lock-  
ing the levers to hold the shafts stationary,  
15 substantially as described.

10 10. The combination with a press-box hav-  
ing vertical slots in its sides, of crank-shafts  
journaled on the press-box, bell-crank retain-

ers loosely mounted at their angles on the 15  
crank portions of the shafts to rock inde-  
pendent thereof, and each having one arm  
extending through a slot in the press-box and  
the other arm weighted, and devices for rock-  
ing and locking the crank-shafts, substan- 20  
tially as described.

In testimony whereof I have hereunto set  
my hand in presence of two subscribing wit-  
nesses.

ROBERT S. MUNGER.

Witnesses:

GEO. M. FLETCHER,  
GEO. T. HILL.