L. L. JONES.

BALING PRESS.

APPLICATION FILED JAN. 20, 1920.

1,408,599.

Patented Mar. 7, 1922.

4 SHEETS—SHEET 1.

Fig. 6.

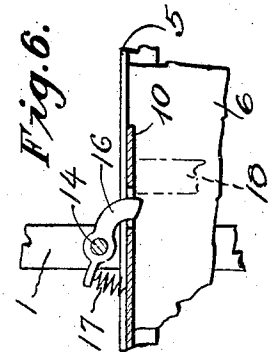


Fig. 1.

Witnesses

W. C. Fielding.

V. B. Hillyard.

Inventor

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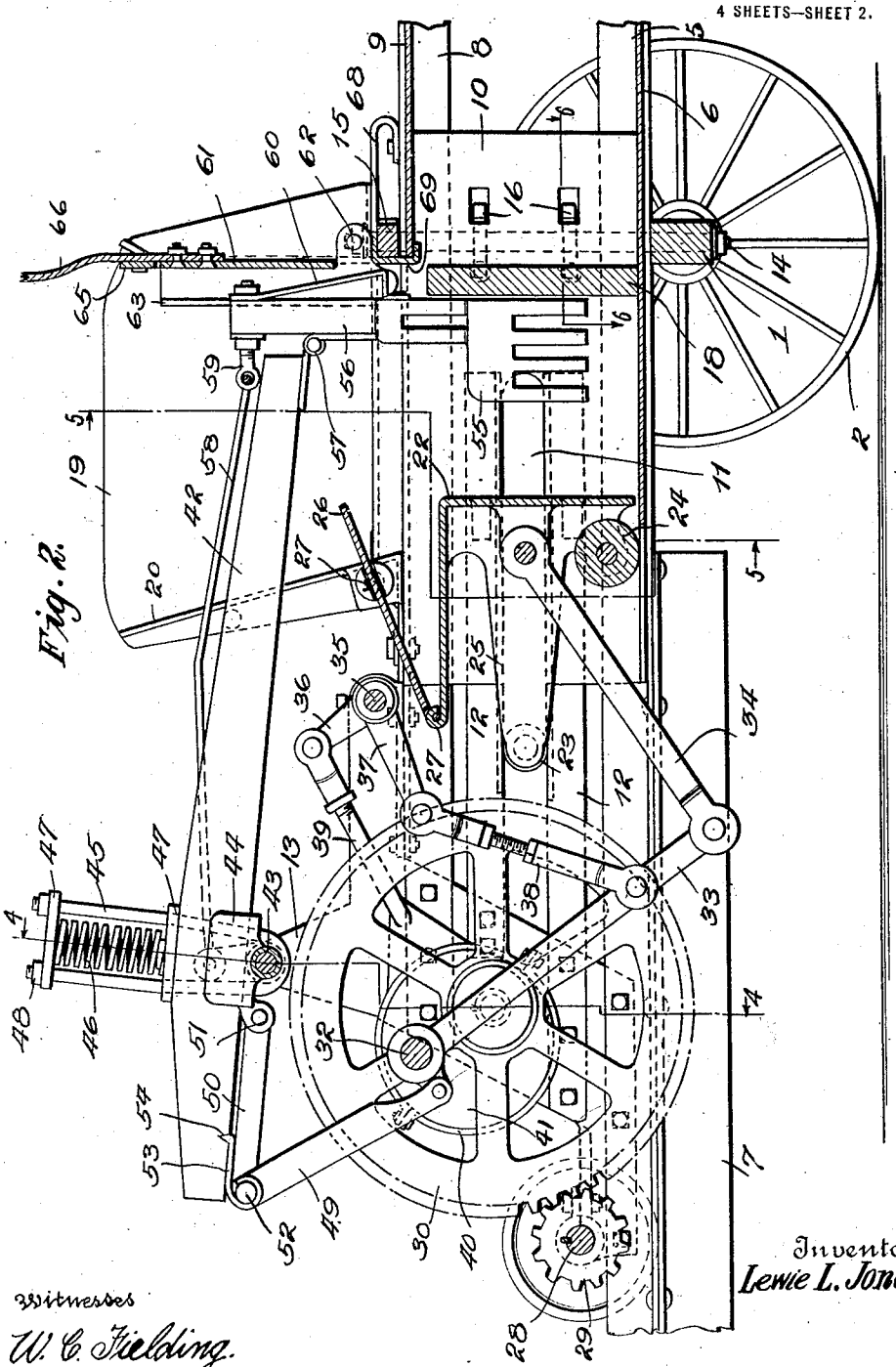


Fig. 2.

Witnesses

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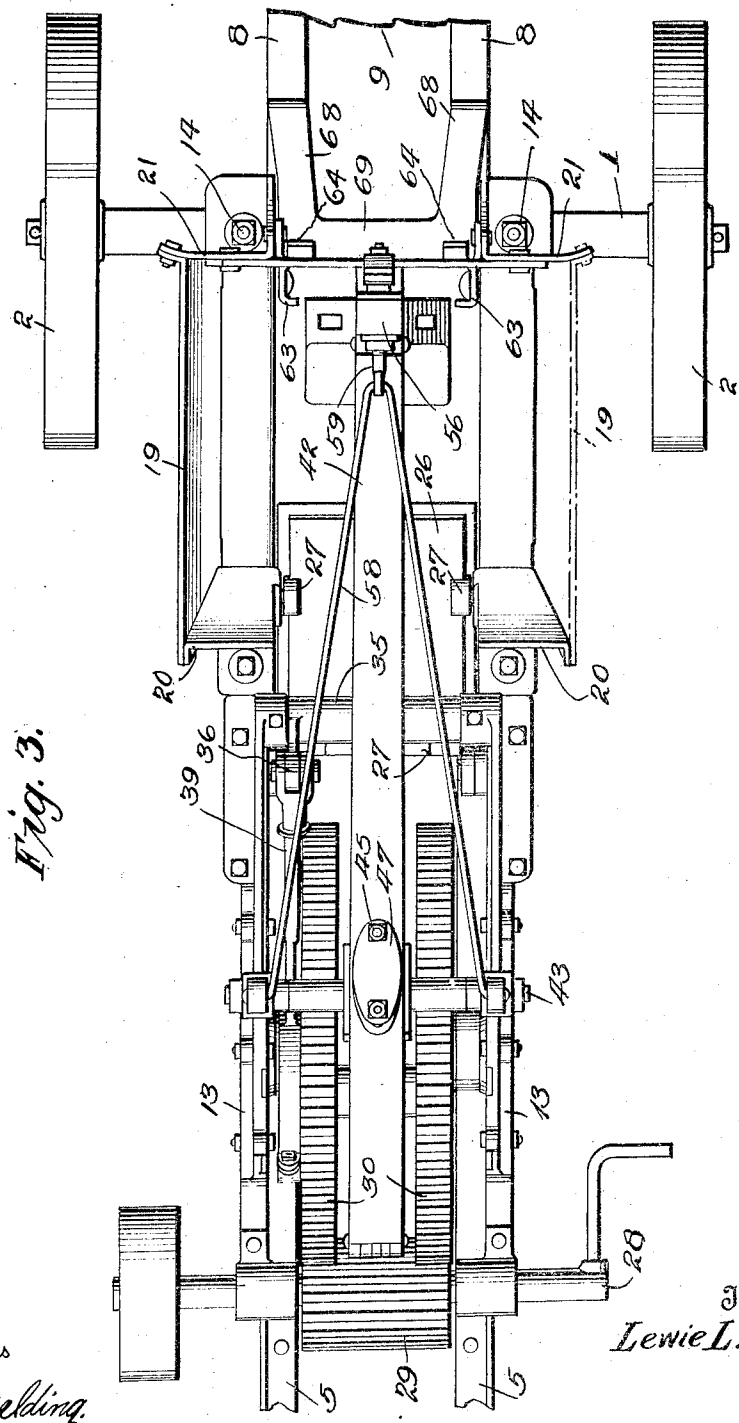


Fig. 3.

Witnesses

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4 SHEETS—SHEET 4.

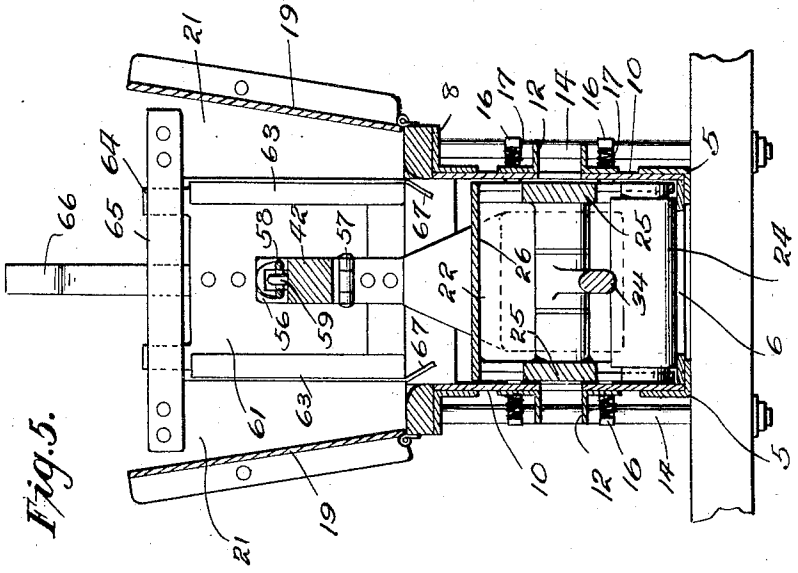


Fig. 5.

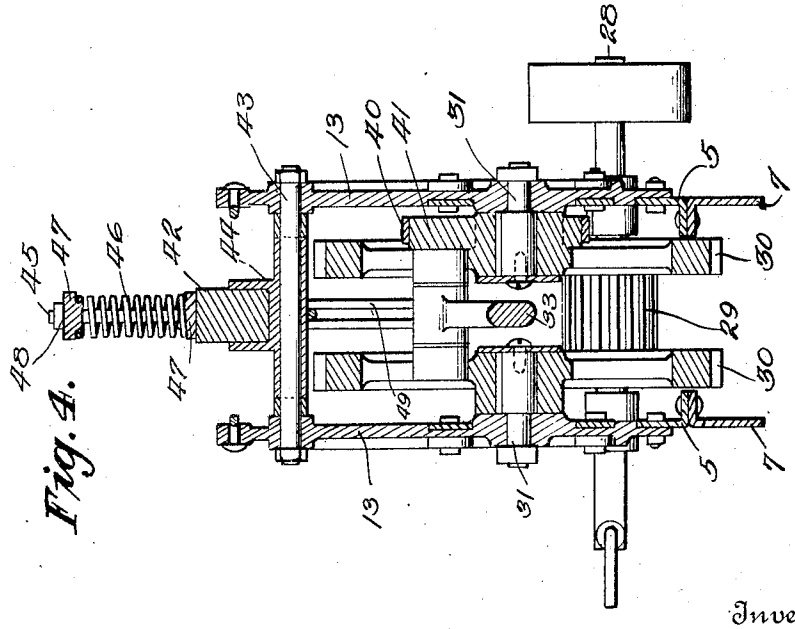


Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

LEWIE L. JONES, OF GREAT BEND, KANSAS.

BALING PRESS.

1,408,599. Specification of Letters Patent. Patented Mar. 7, 1922.

Application filed January 20, 1920. Serial No. 352,882.

To all whom it may concern:

Be it known that I, LEWIE L. JONES, a citizen of the United States, residing at Great Bend, in the county of Barton and State of Kansas, have invented certain new and useful Improvements in Baling Presses, of which the following is a specification.

The invention relates to mechanism for compressing material in the formation of bales, being designed chiefly for baling excelsior and like fibrous material.

The invention provides a yieldable mounting for the walking beam of the packer to prevent injury to the parts under abnormal stress; also a separable connection between the walking beam and the actuating mechanism therefor for a like purpose.

The invention also provides peculiar operating means for the compressing plunger including toggle links, means for alining the toggle members and breaking the joint thereof, and means for moving the toggle links when alined.

The drawings illustrate a preferred embodiment of the invention. However, it is to be understood that in adapting the same to meet different conditions, various changes in the form, proportion and minor details of construction may be resorted to without departing from the nature of the invention as claimed hereinafter.

Referring to the drawings hereto attached:—

Figure 1 is a vertical central longitudinal section of a baling press embodying the invention,

Figure 2 is a longitudinal section of that portion of the press containing the operating mechanism showing the parts on a larger scale,

Figure 3 is a top plan view of the parts illustrated in Fig. 2,

Figures 4 and 5 are transverse sections on the respective lines 4—4 and 5—5 of Fig. 2 looking in the direction indicated by the arrows.

Figure 6 is a detail view of a portion of the baling chamber showing one of the dogs for preventing rebound of the follower in co-operative relation.

Corresponding and like parts are referred to in the following description and indicated in the several views of the drawings, by like reference characters.

The press is shown mounted upon wheels to admit of its ready transportation from one place to another. The rear axle 1 is relatively thick, and the rear wheels 2 are mounted on the arms thereof in any preferred way. The front axle 3 is mounted to turn about a vertical axis for convenience of steering and the front wheels 4 are mounted upon the arms of said axle in any desired manner. The frame work embodies longitudinal beams 5 which extend the entire length of the press and for some considerable distance in the rear of the axle 1. The beams 5 are preferably of L-form in cross section and are disposed with their horizontal flanges extending inwardly so as to be out of the way and utilized as supporting means for cross pieces and the floor 6 of the baling chamber. The longitudinal beams 5 are reinforced near their forward ends by other beams 7 which are secured to the inner horizontal flanges of the beams 5 as shown most clearly in Figs. 2 and 4. Upper longitudinal beams 8 extend approximately parallel with the lower longitudinal beams 5 and terminate at their forward ends at a point about midway between the front and rear axles. A plate 9 secured to the inner horizontal flanges of the beams 8 constitutes the top of the baling chamber. Side plates 10 are secured to the vertical flanges of the longitudinal beams 5 and 8 and constitute the side walls of the chamber which receives the material to be compressed. Longitudinal slots 11 are formed in the side plates 10 and parallel bars 12 are disposed in line with the upper and lower edges of the slots 11 and project beyond the front edges of plates 10. Standards 13 are secured to the longitudinal beams 5 and 8 and the forward ends of the bars 12 are likewise attached thereto. Rods 14 are disposed near the rear edges of the side plates 10 and have their lower ends stepped in the rear axle 1, and their upper ends passing through a cross piece 15. Dogs 16 are pivotally mounted upon the rods 14 and operate through openings formed in the side plates 10. Springs 17 co-operate with the dogs 16 to normally hold their active ends projected through the openings in the side plate 10 so as to engage a follower 18 and prevent any rebound thereof. As indicated most clearly in Figs. 2 and 5 there are two sets

of dogs 16 which are disposed to engage the follower near the top and the bottom thereof to hold the same in upright position.

A hopper is located above the compressing chamber and comprises side walls 19, a front wall 20 and a rear wall 21. The front and rear walls are of sectional formation, the intermediate portion of each being omitted as indicated most clearly in Fig. 3. The compressing chamber is located directly beneath the hopper and in communication therewith and is formed by the side plates 10 and an extension of the bottom 6 of the baling chamber. The compressing plunger operates in the compressing chamber and is adapted to have a reciprocating movement imparted thereto. The plunger is indicated at 22 and is of hollow formation, and is mounted upon rollers 23 and 24. The roller 24 is located just in the rear of the face of the plunger and extends approximately the entire width of the compressing chamber and travels upon the forward end portion of the bottom plate 6. The rollers 23 are disposed at the outer ends of arms 25 which project horizontally from the face of the plunger. The rollers 23 operate in the slots 11. As indicated most clearly in Fig. 2 the rollers 23 and 24 are disposed in different vertical planes, hence direct the plunger in its reciprocating movements and maintain it in a given position. A plate 26 is hingedly connected to the upper rear portion of the compressing plunger as indicated at 27^a, and is adapted to extend across the bottom of the hopper as shown in Fig. 1 to support the material when the compressing plunger is at its forward stroke. The plate 26 is inclined to the horizontal when the plunger is at its forward stroke. Guide elements 27 co-operate with the plate 26 to support and give direction thereto in its movements. The guide elements 27 are located upon opposite sides of the cut away portion of the front wall 20 and are rotatably mounted and have their inner ends slotted to receive the longitudinal edge portion of the plate 26. As the plunger 22 reciprocates, the plate 26 receives a combined oscillatory and sliding movement. This is due to its hinge connection 27^a with the plunger 22 and its sliding connection with the guide elements 27 which as stated are rotatably mounted. As the plunger 22 reciprocates the hinge joint 27^a moves in a straight line and this causes the plate 26 to slide in the slots of the guide elements 27 and said guide elements simultaneously have a rotary movement imparted thereto. When the plunger 22 is at the limit of its forward or compressing stroke the plate 26 occupies the position indicated in Fig. 1 thereby acting jointly with the plunger to close the bottom of the hopper and support the material placed in position for the next charge. When the plunger 22 is at the limit of its return stroke, the plate 26 occupies the position indicated in Fig. 2, so as to be out of the way of the packer and not interfere with free operation thereof.

The operating mechanism is a drive shaft 28 which is adapted to receive power from any suitable source or to be operated by hand. A long pinion 29 is secured to the drive shaft 28 so as to rotate therewith. The drive shaft 28 is mounted in the standard 13. Gear wheels 30 are in mesh with the pinion 29 and are driven thereby. The gear wheels 30 are independently mounted on stub shafts 31 secured to and supported by the standards 13. A wrist pin 32 connects the gear wheels 30 and is disposed a predetermined distance from the axis of said gear wheels. Toggle levers 33 and 34 connect the wrist pin 32 with the compressing plunger 22. The toggle links 33 and 34 are caused to aline and the joint therebetween is broken by means of a special mechanism. This mechanism includes a rock shaft 35, and arms 36 and 37 projecting from the rock shaft. An adjustable link 38 connects the arm 37 with the toggle member 33 near the joint formed between the toggle links. A rod 39 connects the arm 36 with a strap or band 40 mounted upon an eccentric 41 which constitutes a part of one of the gear wheels 30 so as to rotate therewith. When the plunger 22 is at the limit of its return stroke, the parts assume the position substantially as indicated in Fig. 2. When the plunger is nearly at the limit of its forward or compressing stroke, the parts assume the position substantially as indicated in Fig. 1. It will be observed that the toggle links 33 and 34 are alined and are maintained in such position during the final movement of the plunger so as to insure the application of the maximum amount of compressive stroke.

The packing mechanism comprises a walking beam 42 which is mounted upon a transverse shaft 43 supported in the upper ends of the standards 13. The walking beam is yieldably mounted so as to give under abnormal stress and prevent injury or overstraining of the working parts. A saddle 44 is mounted upon the shaft 43 and receives the walking beam 42. A shackle 45 has its members passing through the saddle 44 and walking beam 42 and its lower closed end embracing the shaft 43. An expansible helical spring 46 is confined between glands 47 which are mounted upon the members of the shackle 45, said spring normally exerting a downward pressure upon the walking beam 42 and adapted to have its effective tension regulated by set nuts 48 threaded upon the ends of the members comprising the shackle 45. It will thus be understood that provision is had for a yielding of the

walking beam in the event of the packer meeting with an unyielding object or being subjected to abnormal stress.

A pitman 49 forms connecting means between the short arm of the walking beam 42 and the wrist pin 32. The pitman 49 is pivotally connected at one end to an extension of the toggle member 33 and its opposite end is pivotally connected to an arm 50 which is pivoted at 51 to the saddle 44. The pin 52 pivotally connecting the pitman 49 with the arm 50 is mounted in a bracket 53 which is adapted to detachably engage the walking beam. One end of the bracket 53 is offset as indicated at 54 and enters a cut formed in the walking beam for its reception. Under normal conditions the bracket remains in engagement with the walking beam but under abnormal conditions as when the walking beam yields under excessive stress, the bracket 53 will become disconnected from the walking beam thereby preventing injury to the mechanism.

The packer is carried by the long arm of the walking beam and is adapted to operate through the hopper and compressing chamber so as to force the material from the hopper into the compressing chamber and initially compress the same. The packer comprises a head 55 and a stem 56. The head 55 is slotted to provide a plurality of spaced elements which are adapted to penetrate the material and initially compress the same. The packer is hingedly connected to the walking beam by means of the stem 56, the hinge connection being indicated at 57. The stem 56 projects above the joint of the hinge and its upper end is connected by rods 58 with the upper ends of the standards 13. An eye bolt 59 adjustably connects the upper end of the stem 56 with the rods 58 whereby provision is had for properly adjusting the parts to insure their correct working. The rods 58 or analogous connecting means serve to hold the packer in proper position when entering and leaving the hopper.

The follower 18 after being placed in position is caused to enter the compressing chamber by means of a tappet 60 which is carried by the packer being preferably attached to the stem 56 thereof. A holder receives the follower 18 and is pivotally mounted and arranged to fill the opening formed by the separated parts comprising the rear wall 21 of the hopper. This holder comprises a plate 61 which is pivoted at 62. Guides 63 at the vertical edges of the plate 61 are adapted to receive the follower 18 and retain it in position. Vertical extensions 64 at the upper edge of the plate 61 are adapted to engage a cross piece 65 and retain the holder in vertical position. The cross piece 65 connects the upper ends of the separated parts comprising the rear wall 21. A strap 66 projects from the holder and constitutes a handle by means of which the same is adapted to be manipulated. Spring detents 67 depend from the lower ends of the guides 63 and are adapted to engage the follower 18 and retain it in position until forcibly removed from the holder by the tappet 60. Spring arms 68 are disposed in the rear of the hopper and at each side of the opening in the rear wall 21 thereof. A cross piece 69 connects the forward ends of the arms 68 and extends in front of the cross piece 15 and the front end of the top plate 9. The lower edge of the cross piece 69 is bent rearwardly so as to underlap the forward end of the top plate 9. The cross piece 69 has a limited vertical movement and is normally held in given position by the spring arms 68.

The top of the baling chamber inclines slightly to the horizontal towards its rear end with the result that the space formed between the top plate 9 and the bottom plate 6 converges rearwardly. As a result, the bales are slightly compressed in their travel through the baling chamber. A yoke 70 connects the rear ends of the top and bottom of the bailing chamber. A gland 71 connects the upper ends of the side members of the yoke 70, and is pressed downwardly by means of expansible helical springs 72 adjustably confined on the upper ends of the side members comprising the yoke 70.

When the press is in operation the drive shaft 28 is continuously rotated either by hand or from any suitable source of motive power. As the drive shaft 28 is rotated it imparts a simultaneous rotary movement to the gear wheels 30 or like rotary members. Rotation of the members 30 causes the plunger 22 to reciprocate and the walking beam 42 to oscillate whereby the packer is moved up and down. When the parts are in the position shown substantially in Fig. 1 the material to be compressed is placed in the hopper. It is to be understood that the rear wall of the hopper is closed by means of the plate 61 of the follower holder. While the wrist pin 32 is traveling from the position shown in Fig. 1 to a corresponding position above a plane passing horizontally through the axis of the rotary members 20, the shaft 35 is turned so as to break the joint between the toggle links whereby the plunger is retracted and the plate 26 moved so as to occupy a substantially upright position. A continued movement of the rotary members 30 carries the wrist pin 32 rearwardly whereby the packer is actuated and when the wrist pin 32 assumes the position shown in Fig. 2 the packer is at the limit of its lowest stroke and the plunger 22 at the limit of its return stroke or rearward movement. During a continued rotation of the members 30 to carry the wrist pin 32 from the position shown in Fig. 2 to a corre-

sponding position below a plane passing horizontally through the axes of the rotary members 30, the packer is elevated and the toggle links caused to aline and as the wrist pin passes to the position indicated in Fig. 1 the plunger 33 is moved forward and compresses the charge. It should be stated that during the travel of the wrist pin 32 from the position indicated in Fig. 1 to a plane passing horizontally through the axes of the rotary members 30, the plunger 22 is slightly advanced. When it is required to separate the bales the holder is turned into the position indicated in Fig. 1 and a follower 18 is placed in position, after which the holder carrying the follower is returned to normal position. At the next operation of the walking beam the tappet 60 of the packer will engage the upper edge of the follower 18 and forcibly eject the same from the holder and cause it to assume the position indicated in Fig. 2. At the next advance of the compressing plunger 22 the follower 18 will be advanced and after clearing the dogs 16 the latter will engage the follower and prevent any rebound thereof. Any material caught between the upper end of the follower 18 and the forward edge of the top 9 will be prevented from wedging by the yielding action of the cross piece 69. Should the packer be arrested in its downward movement before reaching the limit of its throw, the walking beam 42 will yield vertically to prevent injury or overstraining of the parts, in the manner herein indicated.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. In a press, a reciprocating plunger, toggle links in cooperative relation with the plunger, a rock shaft, an arm projecting from the rock shaft and a connection between said arm and toggle links, the parts being so disposed as to cause an alining of the toggle members and a breaking of the joint therebetween.

2. In a press, a reciprocating plunger, toggle links in co-operative relation therewith, a pivotally mounted arm and an adjustable connection between said arm and toggle members to effect an alining thereof and a breaking of the joint therebetween.

3. In a press, a reciprocating plunger, a rotary drive member, toggle links connecting the plunger with the drive member, a rock shaft, arms projecting from the rock shaft, a connection between one of said arms and the toggle links, and another connection between the other arm and the rotary drive member,

4. In a press, a reciprocating plunger, spaced rotary drive members, a wrist pin connecting the drive members, toggle links connecting the wrist pin with the plunger, and means for alining the toggle links and breaking the joint therebetween.

5. In a press, a reciprocating plunger, a rotary drive member, toggle links connecting the drive member with the plunger, an eccentric rotatable with the drive member and connecting means between said eccentric and toggle links to effect an alining and breaking of the joint between the said toggle links.

6. In a press, a reciprocating plunger, spaced rotary members, a wrist pin forming connecting means between the rotary members, toggle links connecting the wrist pin with the plunger, an eccentric rotatable with one of the rotary members, a pivoted arm, connecting means between the pivoted arm, the eccentric and toggle links and means for imparting simultaneous movement to the rotary members.

7. In a press, a reciprocating plunger, a plate hingedly connected with the plunger and a guide element rotatably mounted and having said plate slidably connected therewith.

8. In a press embodying a compressing chamber and a hopper, the latter having an intermediate portion of its front wall cut away, a plunger adapted to reciprocate in the compressing chamber, a plate hingedly connected to the plunger and operable across the hopper and through the cut away portion of the front wall thereof, and a rotatably mounted guide element having said plate slidably connected therewith.

9. In a press comprising a compressing chamber and hopper, the latter having an intermediate portion of its front wall cut away, a plunger mounted to reciprocate in the compressing chamber, a plate hingedly connected with the plunger and operable across the hopper and through the cut away portion in the front wall thereof and guide elements at opposite sides of the cut away portion in the front wall of the hopper and having said plate slidably connected therewith.

10. In a press, a walking beam yieldably mounted, an arm pivoted to the walking beam, a pitman connecting the arm with actuating means, and a connection detachably connected with the walking beam and having the arm and pitman connected thereto.

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

LEWIE L. JONES.

Witnesses:
H. C. Cook,
Frank E. Wells.