L. L. LYONS.

PLUNGER OPERATING ATTACHMENT FOR HAY BALERS.

APPLICATION FILED AUG. 18, 1917.

1,291,961.

Patented Jan. 21, 1919.

3 SHEETS—SHEET 1.

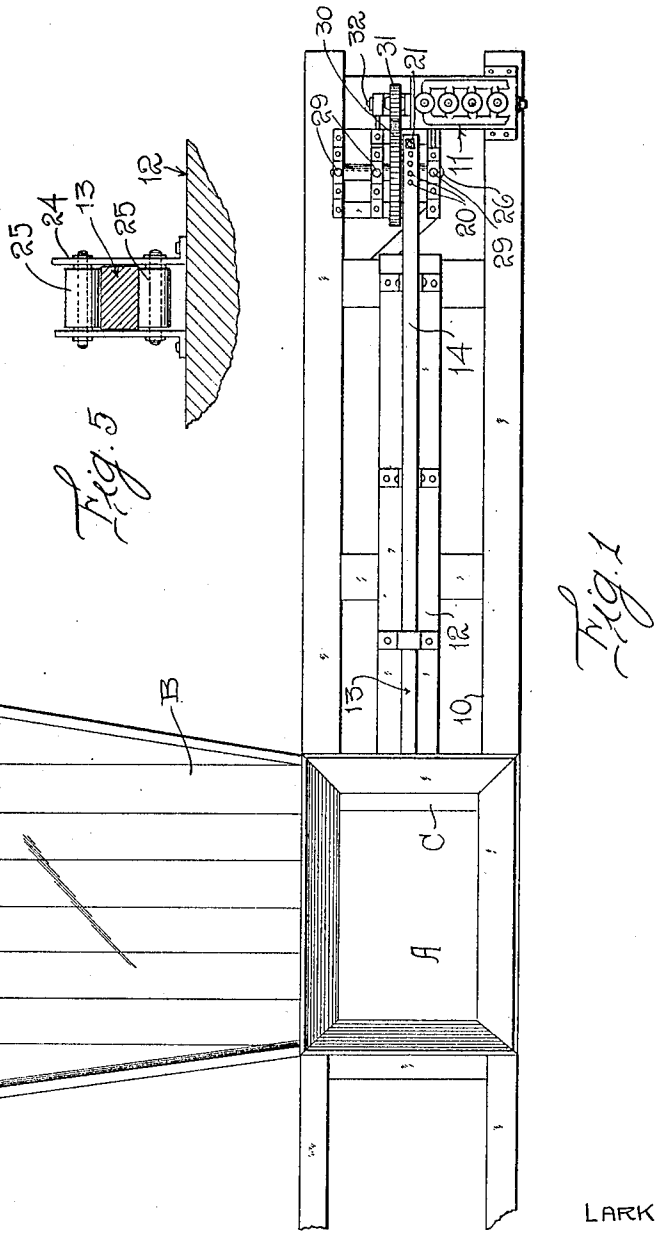


Fig. 5

Fig. 1

Inventor

LARK L. LYONS

By Watson E. Coleman

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

L. L. LYONS.

PLUNGER OPERATING ATTACHMENT FOR HAY BALERS.

APPLICATION FILED AUG. 18, 1917.

1,291,961.

Patented Jan. 21, 1919.

3 SHEETS—SHEET 2.

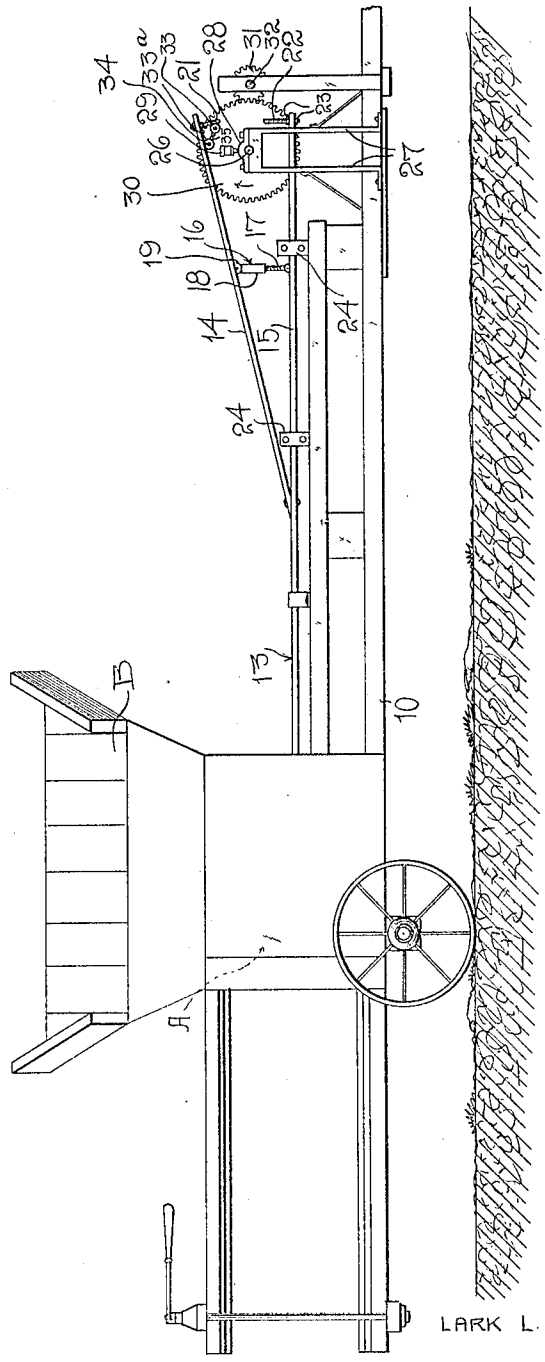


Fig. 2

Inventor

LARK L. LYONS

By Watson E. Coleman

Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

L. L. LYONS.

PLUNGER OPERATING ATTACHMENT FOR HAY BALERS.

APPLICATION FILED AUG. 18, 1917.

1,291,961.

Patented Jan. 21, 1919.

3 SHEETS—SHEET 3.

Fig. 3

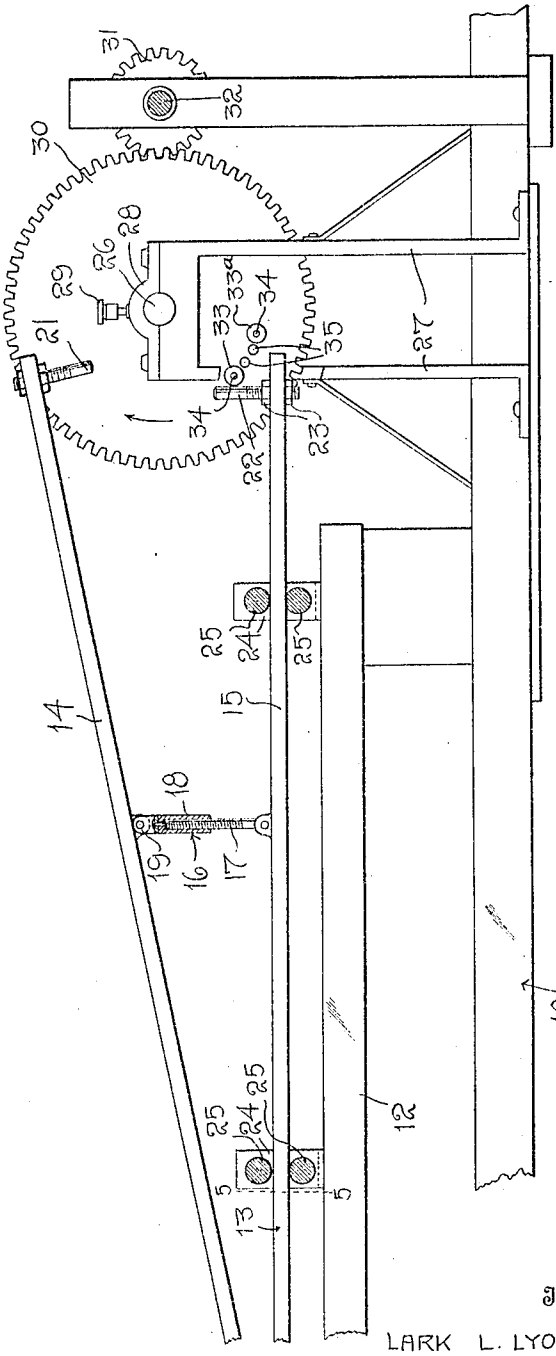
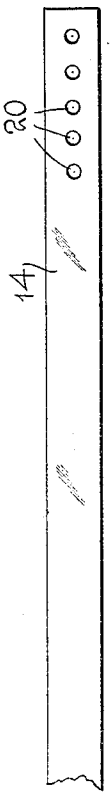


Fig. 4



Inventor

LARK L. LYONS

By Watson E. Coleman

Attorney

UNITED STATES PATENT OFFICE.

LARK L. LYONS, OF HOLDENVILLE, OKLAHOMA, ASSIGNOR OF ONE-HALF TO JOHN M. JACKSON, OF HOLDENVILLE, OKLAHOMA.

PLUNGER-OPERATING ATTACHMENT FOR HAY-BALERS.

1,291,961. Specification of Letters Patent. Patented Jan. 21, 1919.

Application filed August 18, 1917. Serial No. 186,893.

To all whom it may concern:

Be it known that I, LARK L. LYONS, a citizen of the United States, residing at Holdenville, in the county of Hughes and State of Oklahoma, have invented certain new and useful Improvements in Plunger-Operating Attachments for Hay-Balers, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to means for operating the plungers of hay balers, and particularly to means for translating a rotary movement into a reciprocating movement.

The general object of the invention is to provide a very simple mechanism, whereby the power of an engine may be transmitted to the plunger of a hay baler.

And a further object is to provide a construction of this character in which the amount of reciprocation of the plunger may be readily adjusted and controlled.

A further object is to provide a very simple mechanism to this end, which may be readily adjusted and regulated, which is positive in its operation and may be readily applied to all forms of hay baling mechanism.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a top plan view of a hay baler with my driving mechanism applied thereto;

Fig. 2 is a side elevation of the construction shown in Fig. 1;

Fig. 3 is an enlarged side elevation, partly in section, of the means for causing the reciprocation of the plunger;

Fig. 4 is a top plan view of the upper plunger element;

Fig. 5 is a section on the line 5—5 of Fig. 3.

Referring to these drawings, A designates a baling chamber of any suitable form and B the chute discharging thereinto. The hay baling chamber has within it a plunger head C operated by means of a plunger 13. The baling chamber and allied parts are all mounted upon a suitable base frame designated 10 of any desired or suitable construction and also mounted upon this base is an engine 11, which is illustrated as an internal combustion engine.

Connected to the plunger head and operating over a supporting beam 12 is the plunger rod 13, which toward its rear end is forked that is, the plunger rod is provided with an upward and rearward extension 14, this extension 14 extending backward and terminating at a point directly above the termination of the extension 15ª of the main portion of the plunger rod 15. The members 14 and 15 are held in proper spaced relation to each other by means of a longitudinally adjustable strut, designated generally 16, which is in the form of a jack screw, the strut being composed of two members, the member 17 being screw-threaded and having screw-threaded engagement with the member 18, which in turn is swiveled to a bracket 19, whereby it is pivotally attached to the member 14. The branch 14 of the plunger rod is provided with a plurality of screw-threaded openings 20, in any one of which may be disposed a downwardly extending pin 21. The branch 15 of the plunger rod is formed with only one opening, and disposed in this opening is a screw-threaded pin 22, which extends upward and which may be adjusted through the opening to any desired extent and which is held in its adjusted position by means of the set nuts 23. The branch 15 of the plunger rod is supported in roller bearings 24 mounted upon the beam 12, these roller bearings providing for supporting the plunger rod, as illustrated in Fig. 5. All of these roller bearings have upper and lower rollers 25, between which the branch 15 passes.

Extending transversely to the path of movement of the plunger is a shaft 26 mounted in suitable bearings carried by the standards 27. The shaft is held in place upon the bearings by means of the cap plates 28, each of which is provided with an oil cup 29. Mounted upon the shaft 26 is a gear wheel 30, which is engaged by a gear wheel 31, mounted upon the shaft 32, which is preferably an extension of the crank shaft of the engine 11. I do not wish to be limited to this, however, as the shaft 32 might be driven from the engine and not by part of the crank shaft. The wheel 30 carries upon it a plurality of rollers 33 and 33ª mounted on pins 34, projecting out from the face of the wheel 30. I have illustrated two of these rollers 33 and 33ª and disposed between them are two pins 35, which do not carry

rollers. These rollers 33 and 33ª and the pins 35 are arranged in an arc concentric to the axis of rotation of the wheel 30.

In the practical operation of this invention, the gear wheel 30 is rotated in the direction of the arrows Fig. 3. When the foremost roller 33 strikes the pin 22, it shifts the plunger forward in the manner illustrated in Fig. 3 and this forward movement of the plunger continues until the roller 33 escapes the pin 22. As soon as the roller 33 escapes the pin 22, the plunger remains stationary until the roller 33 engages the pin 21. As soon as this occurs, the plunger is drawn rearward until the roller 33ª comes into such a position as to strike the under face of the branch 14 of the plunger, as illustrated in Fig. 2. The roller 33 now rolls down the pin 21 and as the second roller 33ª moves against the pin 21, a slight rearward movement is given to the plunger and then the roller 33ª escapes the pin and there is another "dwell" until the roller 33 again strikes the pin 22. It will thus be seen that a constant rotation of the wheel 30 gives intermittent reciprocating movement to the plunger. It will also be seen that the length of the stroke of the plunger can be controlled by adjusting the pin 21 in any one of the holes 20 or to a slight degree by adjusting the distance of the branch 14 from the branch 15, by means of the adjusting jack 16 or by adjusting the degree of projection of the pin 22. This driving attachment may be made so that it can be adjusted to either side of the engine. This attachment may exert its compressing power either from a forward movement of the plunger or a rearward movement thereof. It will be seen that this construction will be thoroughly effective for the purpose intended, that it provides for any desired stroke of the plunger and for any desired period of dwell at either end of the stroke, and that it may be applied to practically all hay balers and may also be applied to other mechanisms in which it is desired to transmit an intermittent reciprocatory movement to an element. It is also to be noted that while the initial inward movement of the plunger is relatively rapid, that the final inward movement of the plunger is generally slow and powerful, due to the wedging action of the roller 33 against the plunger as it moves upward upon the pin 22. Thus the final compressive movement of the plunger is very powerful, while the movement of the plunger inward is relatively rapid at first.

Preferably, and as illustrated in the drawings, the pin 21 is also made adjustable through the member 14 in the same manner that the pin 22 is made adjustable through the member 15. The reason for providing the gear wheel 30 with a plurality of rollers 33 and 33ª and with the intermediate rollers 35 is as follows: If only one roller, for instance the roller 33 be used, then when the roller 33 struck the pin 21, this pin would catch and be bent. By using the roller 33ª in conjunction with the roller 33, the arm 14 is raised by the roller 33ª, as before described, and the roller 33 escapes the pin 31, without bending this pin. If the gear wheel 30 is rotated in a counter-clockwise direction, that is reverse to the roller in Fig. 3, substantially the same action takes place with relation to the arm 15. The rollers 35 are used to prevent the pin 21 from dropping down between the rollers 33 and 33ª.

The pin 21, as before stated, is adjustable along the arm 14 in any one of the openings 20, and the pin 22 is adjustable through the arm 15. This adjustment of the pins through the arms 14 and 15 is to provide for a proper engagement of the pins by the rollers 33 and 33ª and, furthermore, to provide for the power stroke of the plunger being secured upon a retractive movement of the plunger, as distinguished from a forward movement thereof. In some classes of balers, the hay or other material being baled is compressed in the press by a pulling stroke, while in other makes, the machine is shoved or pushed out and by adjusting the pin 21 in the openings 20, the gear wheel 30 may be reversed so that the power stroke may be reversed and accomplish the reciprocation of the plunger. Thus if the attachment be adjusted so as to shove the baled hay out of the baling press, then by shifting the pin 21 along the arm 14, and drawing backward on the arm 15, that is, drawing backward on the plunger, so that the rollers 33 and 33ª will strike the pin 22 on the opposite side from that illustrated in Fig. 3, then upon a counter-clockwise rotation of the wheel 30 the plunger will be pulled in order to compress the bale and will be shoved forward in order to receive a fresh charge of hay. The pins 21 and 22 are adjustable through the arms 14 and 15 so that proper engagement may be made by the rollers 33 and 33ª. In order to secure a proper action of the rollers 33 and 33ª upon the pins 21 and 22, it often becomes necessary to relatively adjust the arms 14 and 15 and this is secured by adjusting the screw 16. This adjustment may be also secured by adjusting the pins 21 and 22 or by a combination of both methods.

To recapitulate: A plurality of pins 35 and 33ª are used to raise the member 14 to permit the rollers to pass the pin 21 and, of course, to reciprocate the conjoined arms 14 and 15 with the rotation of the wheel 30. The pin 21 is made adjustable into any one of a plurality of perforations 20 in order to make the attachment either pull or push to fit any kind of hay baler. The pin 22 is

adjustable through the arm 15 to cause the attachment to run either fast or slow, and a screw 16 is used to relatively separate or contract the members 14 and 15 when either or both pins 21 or 22 are changed.

Having described my invention, what I claim is:—

1. A mechanism of the character described including a plunger having spaced extensions and having inwardly directed pins carried by said spaced extensions, a wheel rotating in one direction and having an outwardly projecting pin, and a roller mounted thereon, said pin and roller being disposed to engage alternately with the pins on said spaced extensions to alternately project and retract the plunger, and means for adjusting the pins to control the length of the stroke of the plunger.

2. A mechanism of the character described including a plunger having spaced extensions and having inwardly directed pins carried by said spaced extensions, a wheel rotating in one direction and having an outwardly projecting pin, a roller mounted thereon, said pin and roller being disposed to engage alternately with the pins on said spaced extensions to alternately project and retract the plunger, and means whereby the pins may be adjusted toward or from each other.

3. A mechanism of the character described including a plunger having spaced extensions and having inwardly directed pins carried by said spaced extensions, a wheel rotating in one direction and having an outwardly projecting pin, a roller mounted thereon, said pin and roller being disposed to engage alternately with the pins on said spaced extensions to alternately project and retract the plunger, and means whereby one of said pins may be adjusted toward or from the other pin and whereby the second named pin may be adjusted toward or from the adjacent end of the extension of the plunger upon which it is mounted.

4. A mechanism of the character described comprising a plunger having two divergent spaced extensions, means whereby the spaced extensions may be adjusted toward or from each other, pins carried upon the extremities of the spaced extensions and extending toward each other, a wheel rotating in one direction, and a pin mounted upon said wheel and adapted to alternately engage with one or the other of said pins, as the wheel is rotated to thereby project or retract the plunger.

5. A mechanism of the character described including a plunger mounted for reciprocation, said plunger having two spaced extensions at its rear end, one of said spaced extensions extending horizontally and the other extension extending upward and rearward in divergent relation to the first named extension, roller bearings in which the first named branch is supported for reciprocation, means for adjusting the angular relation of the two spaced extensions with relation to each other, pins projecting inward from the extremities of the two spaced extensions, one of said pins being adjustable toward or from the other pin and the other pin being adjustable longitudinally upon its corresponding branch of the plunger, a gear wheel operatively connected to a source of power, and a plurality of pins mounted upon the face of the gear wheel, extending out therefrom and disposed concentrically to the axis of rotation of the gear wheel, and rollers mounted upon the pins, the rollers being adapted to alternately engage with the pins on the extremities of the plunger spaced extensions to thereby cause a reciprocation of the plunger as the gear wheel is rotated in one direction.

6. A mechanism of the character described comprising a plunger having two divergent extensions, pins carried upon the extremities of the extensions and extending toward each other, one of said pins being adjustable longitudinally along the corresponding extension, the other pin being adjustable through said extension, and a roller mounted upon said wheel and adapted to alternately engage with one or the other of said pins as the wheel is rotated to thereby project or retract the plunger.

7. A mechanism of the character described comprising a plunger having two divergent extensions, pins carried upon the extremities of the extensions and extending toward each other, one of said pins being adjustable longitudinally along the corresponding extension, the other pin being adjustable through said extension, a roller mounted upon said wheel and adapted to alternately engage with one or the other of said pins as the wheel is rotated to thereby project or retract the plunger, and a pair of rollers mounted upon the wheel, said pins projecting into the path of movement of the rollers, one of said rollers acting to engage the corresponding extension after the other roller has engaged the pin thereon to thus cause the pin to lift off of the roller.

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

LARK L. LYONS.

Witnesses:
J. L. Bruce,
M. Fortson.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."