

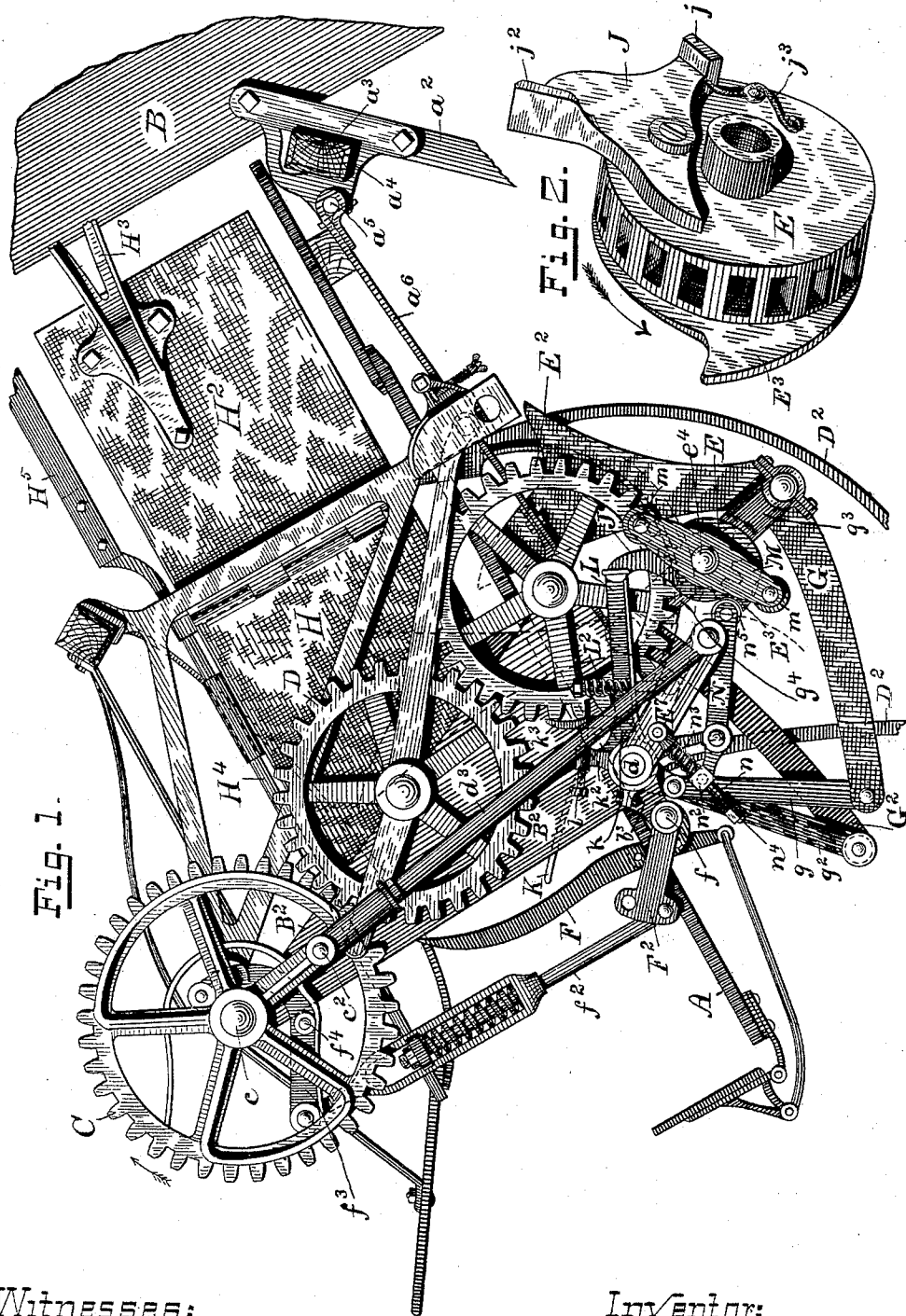
(No Model.)

3 Sheets—Sheet 1.

W. BAYLEY.
GRAIN BINDING MACHINE.

No. 497,111.

Patented May 9, 1893.



Witnesses:
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A. S. Perrigo,

Inventor:
William Bayley

(No Model.)

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Fig. 3.

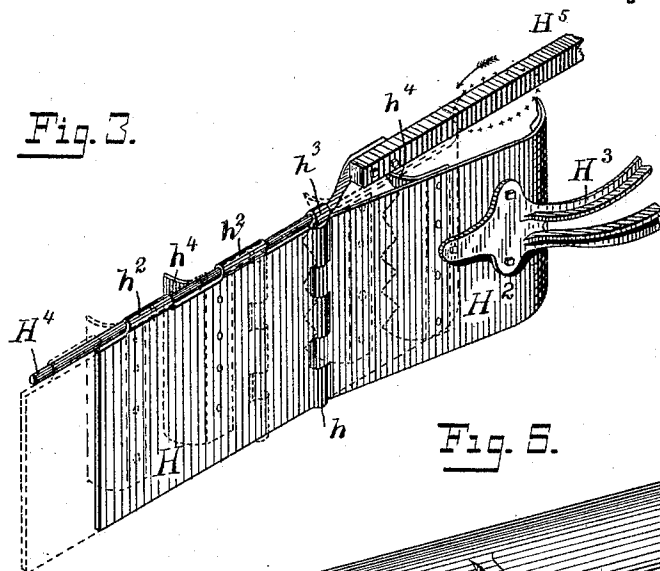


Fig. 5.

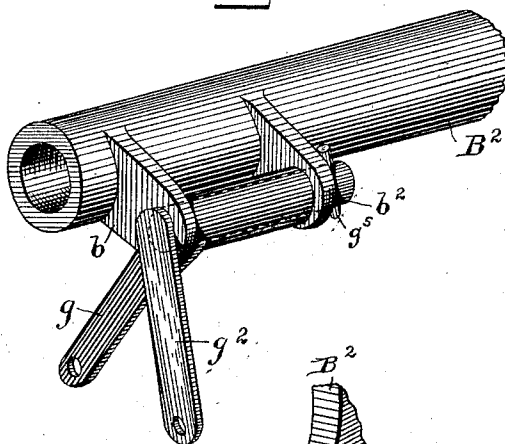
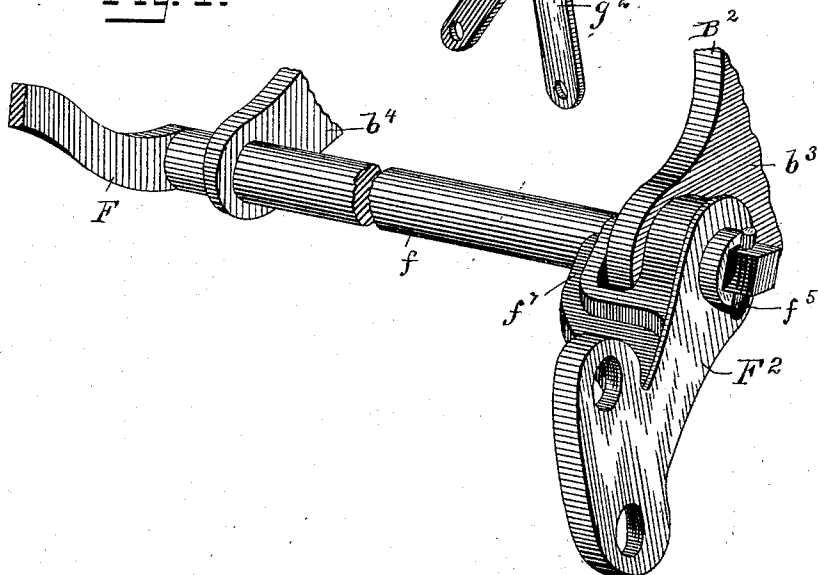


Fig. 4.



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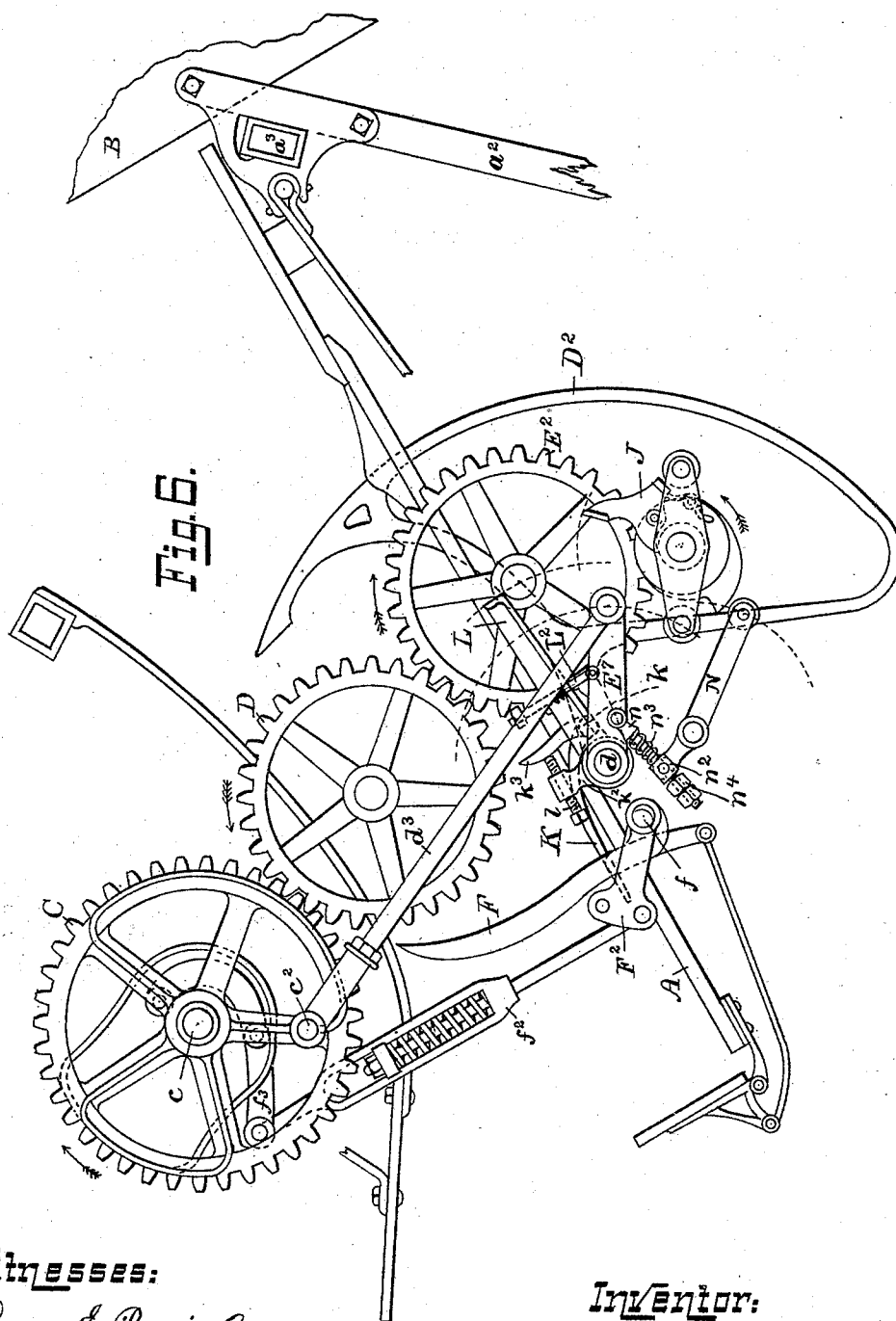
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UNITED STATES PATENT OFFICE.

WILLIAM BAYLEY, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE TORONTO REAPER AND MOWER COMPANY, OF SAME PLACE.

GRAIN-BINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 497,111, dated May 9, 1893.

Application filed June 24, 1887. Serial No. 242,370. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BAYLEY, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Grain-Binding Machines, of which the following is such a full, clear, and exact description thereof as will enable any person skilled in the art to construct and use the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to binders for grain harvesters in general, and particularly to that class known as "Appleby binders," *i. e.* the general form shown and described in Letters Patent No. 212,420, granted February 18, 1879, to J. F. Appleby, and is in the nature of improvements upon the usual form thereof.

My invention consists, first, in providing an automatic stop which prevents the binding mechanism from backward motion during the interval of rest, while the bundle is being formed ready for binding; second, in certain parts and combinations thereof hereinafter more particularly set forth. These features are fully illustrated in the drawings, in which

Figure 1. is a front end elevation of my binding machine. Fig. 2. is a perspective view of the driving pinion. Fig. 3. is a perspective view of the butt-board. Fig. 4. is a perspective view showing the compressor shaft device. Fig. 5. is a perspective view showing the packer links and the method of pivoting them. Fig. 6. is a front end elevation of the binder, in the form of a diagram, only the important, operative parts and their connections being shown, so as to avoid complication.

Similar letters refer to like parts in the several views.

Referring to Fig. 1. A, is the binder deck; B, a portion of the elevator side.

a^2 , is the front standard supporting the same, and the cross girt a^3 .

Fixed to the standard a^2 , is the bracket a^4 , which supports the rod a^5 , upon which in turn the front end of the binder is supported by the bar a^6 , in the usual manner, the rear end being similarly supported. The packer-shaft e^4 , and binder shaft c , are located and sup-

ported as usual and power transmitted from the pinion E, on the packer-shaft by means of the intermediate gears, D, E^2 , to the binder gear C, in the usual manner. The needle-arm D^2 , is fixed to the needle-arm shaft d , which has fixed at its front end, or formed thereon the crank E^7 , connected by the pitman d^3 , to the wrist-pin c^2 , fixed in the binder gear C, and is operated thereby as usual. The compressor F, is fixed to the compressor shaft f , which has fixed at the front end the crank F^2 , connected by the usual spring connecting-rod f^2 , with the lever f^3 , pivoted to the binder-frame B^2 , and having pivoted to it the friction roller f^4 which is engaged by the usual cam track on the binder-wheel C, and operated thereby. The packers G, and G^2 , are pivoted upon the packer cranks g^3 , and g^4 , formed on or fixed to the packer-shaft e^4 , as usual, the rear ends of the packers being connected to the binder-frame by the links g and g^2 as shown in Fig. 5, *i. e.* the link g , is formed upon a sleeve fitting between the two perforated lugs b , and b^2 , formed on the binder frame B^2 , while the link g^2 , is formed on a rod at right angles thereto which passes through the lugs b , and b^2 , and the sleeve of the link g , and is confined in its place by the pin g^5 , both links being thereby pivoted by a simple and efficient device. The compressor crank F^2 , is fixed to the compressor shaft f , by fitting upon a square portion thereof and being confined by a pin f^5 , this end of the shaft passing through a perforated lug b^3 , formed upon the binder-frame B^2 , at the front end thereof. The compressor-crank F^2 , is situated outside of the lug b^3 , of the binder frame while formed upon it is a projecting lip f^7 on the inside of the lug b^3 , the shaft being by this means prevented from sliding endwise through the lugs b^3 , and b^4 .

The butt-board consists essentially of two parts, H, and H^2 , of sheet metal, hinged to each other at h , as shown in Fig. 3. Fixed to the part H^2 , is the bracket H^3 , which is pivoted to a crank (not shown) and operated in the usual manner. The part H, has formed upon its upper edge the eyes h^2 , h^2 , and the hinge-pin or rod h^3 has also formed in its top end an eye, which slides upon the guide rod H^4 , fixed to the wooden supporting bar H^5 ,

fixed to the harvesting machine as usual. The upper end of the part H^2 , is curved inward in order to so shape it as to properly grasp the butts of the grain, while at intervals there are also fixed to the parts H , and H^2 , the strips h^4 , h^4 , toothed or plain as may be desired, for the same purpose. The movement of the part H , sliding on the guide-rod H^4 , is therefore in a straight line while that of the part H^2 , is a straight line at its lower end where it is hinged to the part H , and an ellipse at its upper end as shown by dotted lines, the movement being in direction of the arrow in Fig. 3. By this arrangement the grain is effectually grasped by the curved end of the part H^2 , and forced down the binder deck, its course being continued by the strips h^4 , on the part H .

The gearing for driving the binding mechanism; for starting and stopping the same, and the automatic stop for preventing it from turning backward, are as follows, viz., (see Figs. 1, and 2:) The trip-lever or arm K , is fixed to the usual trip-shaft k , upon which is the lever k^3 . Pivoted upon the needle-arm shaft d , is the starting or trip lever L , which is provided with a right-angled projection k^2 , in which is fitted the set-screw l , which rests against the lever k^3 . The end of the trip lever L , rests against the upwardly projecting end of the starter-pawl J , pivoted upon the driving pinion E , turning loosely upon the packer-shaft e^4 . Fixed to the packer-shaft e^4 , is the carrier or driver M , having pivoted at each end the rollers m , m , which engage the lug j , on the starter-pawl J , whenever the latter is thrown forward by the spring j^3 . The extended end of the trip-lever L , rests against the upper end j^2 , of the starter-pawl J , and holds it in the position shown whenever the binding mechanism is at rest. The trip-lever L , is held in contact with the starter-pawl J , by the rod L^2 , pivoted to the needle-arm crank E^7 , and passing up through a hole in the trip-lever L , above which it is provided with a spiral spring and adjusting nut. Thus far, the parts are constructed and operate in the usual manner.

Pivoted to a downwardly projecting ear on the binder frame B^2 , is the stop-lever N , one end of which is connected to the needle-arm crank E^7 , by the rod n , pivoted thereto and passing through a block n^2 , pivoted to the stop-lever N . The rod n , is provided with a spiral spring n^3 , pressing against the pivoted block n^2 , below which it is threaded and provided with the adjusting nuts n^4 . The opposite end of the stop-lever N , is provided with the friction roller n^5 , pivoted thereto, which rests against the stop-cam E^3 , formed upon the driving pinion E . The parts being in the positions shown in Fig. 1, and the packer shaft and packers in motion, the latter form the gavel, the weight of which presses down the trip-arm K . The lever k^3 , pressing against the set-screw l , throws up the extended end of the trip-lever L , out of contact with the lug j^2 , on

the starter-pawl J , as shown in Fig. 2, allowing the spring j^3 , to throw it forward sufficiently that one of the rollers m , on the driver M , will engage it and rotate the pinion E , in direction of the arrow. This puts in motion the train of gears composed of the pinion E , and wheels E^2 , D , and C , the latter drawing up the pitman d^3 , and needle-arm crank E^7 , which in turn, acting through the rod n throws down the longer end of the stop-lever N , and removes the roller n^5 , from contact with the stop-cam E^3 , as shown in Fig. 2. However, this act was not absolutely necessary, as the form of the stop-cam E^3 would have forced the roller n^5 out of its way, but, to avoid contact between the two at subsequent revolutions, up to the time the bundle is bound and discharged, it is in practice deemed preferable. The binding mechanism continuing its movements the bundle is bound and the needle-arm retreats below the deck, the trip-lever L , being lowered with it, as usual, and engaging the starter-pawl as at first, throwing it back to the position shown and relieving the lug j , from contact with the friction rollers m , of the driver M . At the same time the needle-arm crank E^7 has forced down the rod n , and thrown up the end carrying the roller n^5 , into contact with the stop cam E^3 , as it comes around and thus preventing it from turning backward by the shaking or jarring of the machine.

The reason for providing a stop device for preventing the binding mechanism from moving backward during the interval when it ought to stand at rest is that it would displace various operative parts so that they would be out of their proper working positions when the proper time arrived for them to act, and by removing the pressure of the trip-lever L , against the starter-pawl J , allow the spring j^3 , to throw the latter far enough forward to cause the rollers m , to strike the lug j , twice at every revolution of the packer-shaft, producing a disagreeable pounding and rendering the parts liable to be broken.

The usual method of locking the binding mechanism to prevent it from moving backward during the interval of rest, *i. e.* while a gavel is being formed, is by some device applied to the binder-wheel C , or some connected part of its shaft, as for instance a lever provided with a roller resting upon a cam-track so formed on said wheel as to be held in place thereby during the proper interval. But it is found in practice that this is not the proper point to place the stop device, as the "lost motion" of the train of gears C , D , E^2 , and E , owing to the looseness of the fitting of their teeth, allows the pinion E , to turn backward far enough to allow the friction rollers m , m , of the carrier M , to strike against the lug j , of the starter pawl J , as before described. By locating the stop at the packer-shaft, the source of power, this defect is entirely remedied.

Having now described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. In an automatic grain binder a pivoted lever having one arm connected with the needle arm crank, in combination with the binder driving pinion having a stop adapted to engage by its rear face the other arm of said lever to prevent backward rotation of the pinion.
2. In an automatic grain binder, the binder frame having perforated lugs, in combination

with the packer links, one of said links having a sleeve at right angles thereto and situated between said lugs, and the other packer link having a round rod at right angles thereto passing through said lugs and sleeve, and secured therein.

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Witnesses:

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