E. DEDERICK.

Grain-Binder.

No. 196,640. Patented Oct. 30, 1877.

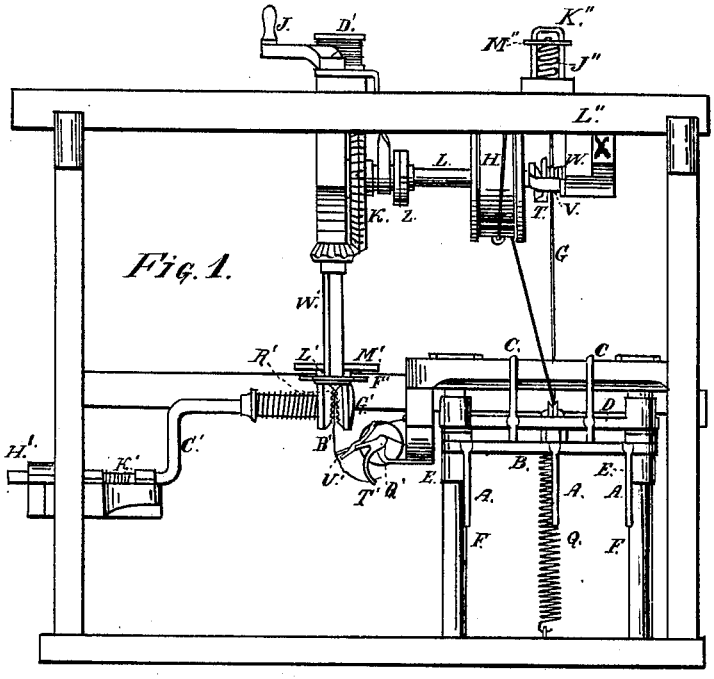

Fig. 1.

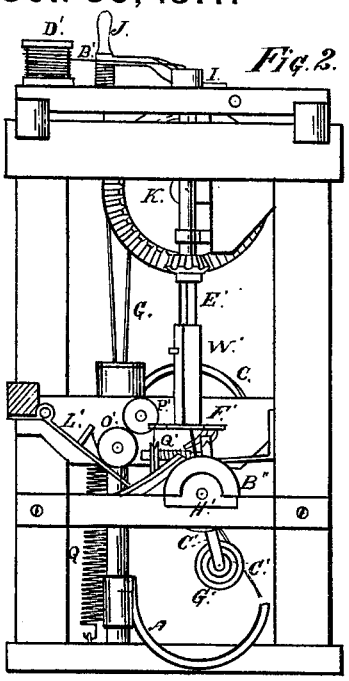

Fig. 2.

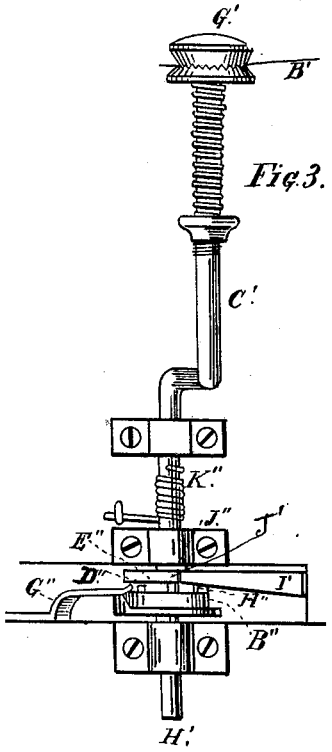

Fig. 3.

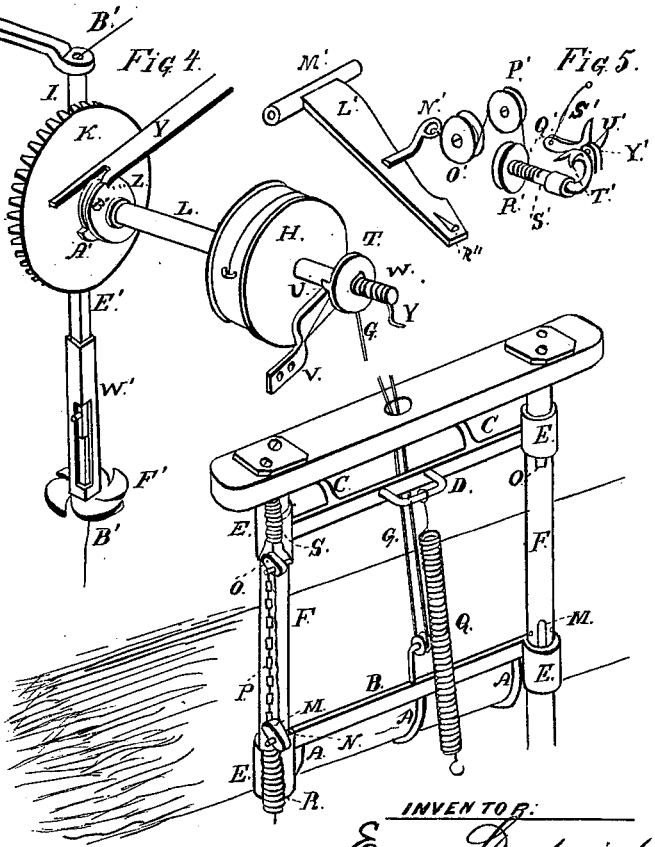

Fig. 4.

Fig. 5.

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IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. **196,640**, dated October 30, 1877; application filed May 21, 1877.

To all whom it may concern:

Be it known that I, EZRA DEDERICK, of the city of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Grain-Binders; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 of the accompanying drawings represents a side view of my invention. Fig. 2 represents an end view. Fig. 3 represents the binding-crank and its attachments. Fig. 4 represents a perspective view of the device for pressing the bundle together and tying the cord around it. Fig. 5 represents the device for tucking under the band and cutting the cord.

The object of my invention is to furnish a device for binding grain with a cord automatically, to be used in connection with any ordinary reaper, and is so arranged that as the grain is raked from the platform of the reaper it is deposited into the arms A, while the upper side of the gavel is compressed and held in its place with the arms C. The arms A and C are attached to the bars B and D, which are provided with thimbles E at each of their ends which surround the standards F, and slide easily upward and downward upon them. When the gavel is thrown into the arms A they are drawn upward by the cord G, which is wound upon the pulley H. Motion is communicated from the reaper to the shaft L with gearing where the crank J is now attached, and from thence, by means of the gear-wheel K, to the shaft L, upon which the pulley H is secured. As the arms are being thus raised the thimbles E press against the levers M, which are attached with pins N within the standards. One end of the levers projecting slightly through the standard is pressed upward with the sliding thimble E. There are similar levers O above, secured within the standards F in the same manner, which also project through to the outside, their office being to support the bar D and prevent it from dropping. The levers M and O are connected with a chain, P, within the standard, in such a manner that when the thimbles E are slid against the levers M their inner ends are inclined downward, which motion is communicated to the levers O through the connecting-chains P, thus drawing in their projecting ends and releasing the upper sliding thimbles E, when the bar D is drawn down by the spiral spring Q upon the bar B, while at the same time the bar B is being drawn upward by the cord G, thus carrying back with it the bar D above the levers O, which retain it in that position. The levers M and O are held at right angles to the standards by spiral springs R and S, so that their short arm projects through the standard and supports the sliding thimbles. When both bars B and D are drawn up, as described, the shaft L is released from its couplings with the wheel K by an automatic device, and allowed to turn backward with the pulley H, thus unwinding the cord G, when the bar B drops of its own gravity to its former position, and is ready for the deposit of another gavel. The shaft L is released from its couplings with the wheel K as follows:

There is a disk, T, attached to the shaft L, having an inclined plane, U, upon its side, which is brought in contact with the arm V at each revolution of the shaft, and by means of which the shaft is crowded toward the right and away from the wheel K, and is thus uncoupled, and is thrown back, as described, by the spiral spring W, which is attached to the frame X, and the cam-wheel T. The spiral spring W also operates laterally upon the shaft, and crowds it back again to its former position as soon as it is released from the arm V. When the cord is wound upon the pulley H, the bundle being drawn up, and the arms A and C being compressed around it, they become stationary, and are thus held by the spring-pawl Y, which drops into the ratchet Z, while the wheel K performs one revolution, when the spring-pawl Y is thrown out of the ratchet by an eccentric, A′, which moves with the wheel K, and the shaft L, being thus released, turns back, as previously described. The shaft L is coupled with the wheel K by a projecting pin upon the side of the disk B′, which is thrown into a hole upon the side of the eccentric-disk A′ by the lateral pressure of the spring W. When the bundle is thus drawn up and held at rest by the means described, the binding-

cord B′ is carried around it by the crank C′. The binding-cord B′ is supplied from the spool D′, and is carried downward through the shaft E′ to the twisting-claws F′. The end of the binding-cord, being thus suspended, is caught between the serrated faces of the knob and disk G′, where it is thus held until it is carried around the gavel, by the motion of the crank C′, immediately between the twisting-claws F′, by which it is caught and twisted until the shaft H′ performs one revolution, when the spring-pawl I′ is released from the ratchet J′, by a projecting pin, H″, from the side of the disk B″, which is attached to the shaft H′, from which it receives its motion, and the crank C′ is thrown back around the bundle by the spiral spring K″ against the lever L′.

The lever L′ is attached at one end to the frame with a hinge, M′; the other end is supported by a spring. (Not shown in drawing.) It is also attached to cord or chain N′, which cord or chain is carried under pulley O′, over pulley P′, and partially around pulley Q′, and to which it is attached at its periphery. There is a wedge-shaped projection, R″, upon the lever L′, the office of which is hereinafter explained. The pulley Q′ is attached to the shaft S′, upon the end of which is a V-shaped hook, T′, and a pair of shears, U′. As the crank C′ is being thrown back around the bundle it strikes against the under side of the lever L′, and raises it up against the twisting-claws F′. The claws F′ are attached to the hollow shaft W′, which slides over the shaft E′, and as the lever L′ presses against the claws they are raised upward, so that the crank C′ passes beneath them. As the lever L′ is being raised it draws upon the cord N′, which, operating around the pulleys O′, P′, and Q′, causes the shaft S′ to incline forward, thus bringing the V-shaped binding-hook against the binding-cord which is being twisted, and turns the united ends of the cord over and beneath the band, and as the lever L′ rises still higher the shears U′, which follow closely behind the binding-hooks, close upon the binding-cord and cut it in two, and the operation of binding is completed. The shears are kept open with spring Y′, which is attached to one of the handles.

There is a cord, S′, attached to the longest handle of the shears A″, and secured at the other end to the stationary frame, and as the shears incline forward the handle, being thus held, causes the shears to close upon the cord, as described. As the crank C′ is passing beneath the lever L′, as described, the wedge-shaped projection R″ enters between the knob and disk G′, and separates them, thus releasing the end of the band, and at the same time allowing the end of the cord B′ to re-enter between them, preparatory to binding the succeeding bundle. The office of the spiral spring R′ is to throw back the binding-hook, thus releasing the lever Y′, which drops of its own gravity to its former position.

The shaft H′ and crank C′ are coupled together by means of a projecting pin, D″, upon the side of the disk B″, which is thrown by the lateral movement of the shaft H′ into a hole in the side of the disk E″. When thus coupled together the shaft H′ carries the crank C′ forward around the bundle with the cord, as described, until the knob G′ strikes upon the front side of the shaft W′, above the twisting-claws, when the spring-pawl I′ drops in the ratchet J″, and retains it in that position while the band is being united and twisted by the twisting-claws. At the same instant the shaft H′ is uncoupled from the crank C′, and continues to revolve independently of it.

The shaft H′ is uncoupled in the following manner: Upon the side of the disk B″ is an inclined plane, which comes in contact with the stationary arm G″, and crowds the disk and shaft laterally until the pin D″ is disengaged. When the shaft H′ completes its revolution the projection H″ throws up the spring-pawl J′, and the crank C′ is released, and is thrown back by the spiral spring beneath the twisting-claws F′, when the shaft H′ and crank C′ are again coupled together.

To accommodate the arms A and C to different-sized gavels, one end of the cord G is attached to a tension-spring J″, which is made in a spiral shape, and is provided with a plate, M″, across its upper end, to which the cord G is attached. The spiral spring is held in an upright position by a staple, K″, which passes through each end of the plate, and is secured in the frame L″, the plate being allowed to play loosely upward and downward upon the staple. When the bundle is larger than usual, the spring J″ is compressed by the cord G; when the bundle is smaller, the spring recoils, and thus the cord G is accommodated to gavels of various sizes without danger of breaking the cord.

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

1. The combination of arms A and C with bars B and D, sliding thimbles E, standards F, levers M and O, chains P, and springs R and S, constructed, arranged, and operating substantially as set forth.

2. The combination of shaft L with pinion K, a coupling and uncoupling device, a retracting-spring, cord G, pulley H, and compressing-arms, substantially as set forth.

3. The combination of crank C′, having a knob and disk G′, with binding-cord, coupling device, shaft H, and retracting-spring K′, substantially as set forth.

4. The combination of shaft S, V-shaped binding-hook J′, shears N′, helical spring R′, cord N′, and pulleys O′, P′, and Q′, substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

E. DEDERICK.

Witnesses:
J. B. ERWIN,
K. SHAWVAN.