J. E. BUXTON.

GRAIN-BINDER.

No. 191,929. Patented June 12, 1877.

Fig. 1.

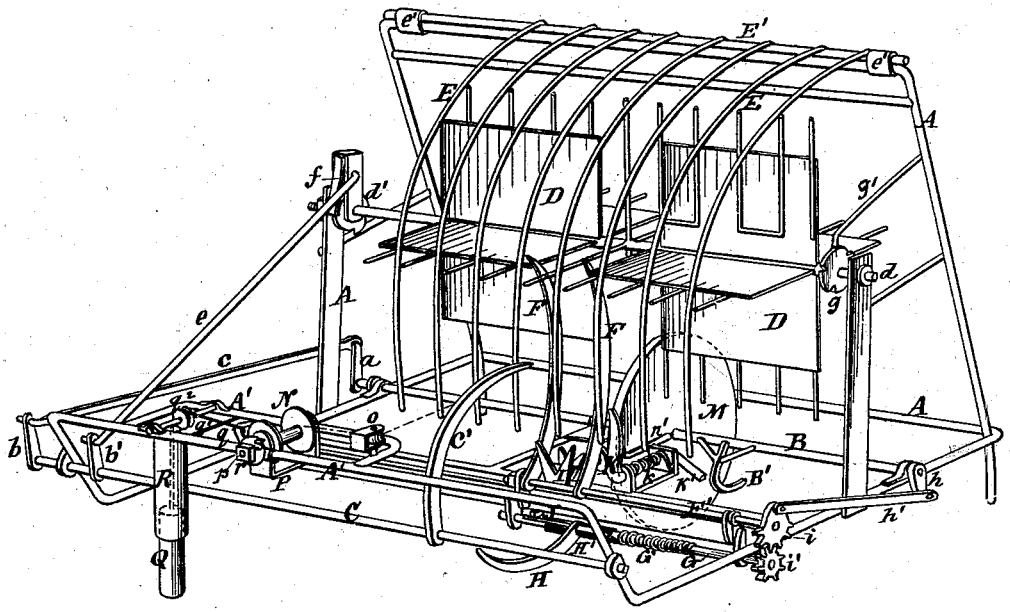


Fig. 2

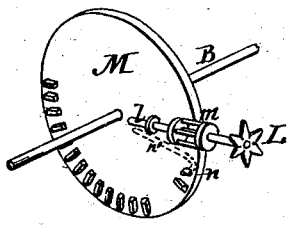


Fig. 3.

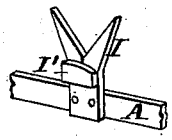
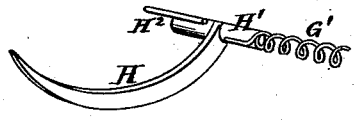


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN E. BUXTON, OF OWATONNA, MINNESOTA.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. **191,929**, dated June 12, 1877; application filed October 9, 1876.

To all whom it may concern:

Be it known that I, JOHN E. BUXTON, of Owatonna, in the county of Steel and State of Minnesota, have invented certain new and useful Improvements in Grain-Binders, of which the following is a specification:

Figure 1 represents, in perspective, my grain-binding machine. Fig. 2 represents, in perspective, the gearings that operate the wire-twisting wheel. Fig. 3 represents the forked receiver and block, upon which the binding-wire is clamped. Fig. 4 represents the gavel-compressor.

My invention relates to that class of grain-binding machines, in which wire is used to bind the grain, and is to be employed in connection with harvesters, in which the cut grain is received on an endless apron, and elevated by means of canvas or belts, or any suitable device, above the driving-wheel of the harvester, and comes down on the opposite side in a continuous stream, and being an improvement upon the Letters Patent granted to me June 20, 1876. Some of the parts fully described in that patent, being used in this machine, need not be described in detail.

My invention consists in providing a harvester-binder with a revolving receptacle, operated intermittently to receive the cut grain and deliver it in gavels to the binding mechanism; a shield hinged to the frame, to direct the gavel from the receiver to the binding mechanism; a compressor operated by intermittent gearing and a spring; a stationary forked arm or receiver and block, in connection with a clamping-arm, to receive and retain the binding-wire; a wire-twisting mechanism operated by a segment-gear; and a tension and take-up arrangement for the binding-wire, all as will now be more fully described.

In the drawing, A represents the frame of the machine, and B the main driving-shaft. C is a rock-shaft, receiving its motion from the shaft B through the medium of the cranks *a* and *b* and connecting-rod *c*. D represents a grain-receiver, having four wings to receive the continuous falling grain and divide it into bundles. This receiver is attached to a shaft, *d*, that is automatically revolved one-quarter of a revolution at a time, and receives its motion from the rock-shaft C through the medium of the crank *b'* and rod *e*, operating a pawl, *f*, that engages with a ratchet-wheel, *d'*, mounted upon one end of the shaft *d*, while at the other end there is a small wheel, *g*, having four notches upon its circumference, in which the spring-hook *g'* engages, to retain the receiver D in position while the grain is falling into it. E represents a shield, formed of a series of bent wires attached to a rod, E', hinged at *e'* to the frame A above the receiver, to retain the grain while the receiver is turned, and direct it to the compressing and binding mechanism.

The compressing mechanism is formed of two bent arms, F F, mounted upon a shaft, F', connected to the frame by suitable bearings. Upon one extremity of the shaft F' there is a segment gear-wheel *i*, operated by the main shaft B through the crank *h* and connecting-rod *h'*. The segment-wheel *i* gears with a pinion, *i'*, mounted upon one end of the shaft G, that carries the spring compressing-arm H. This arm is mounted upon a sleeve, H^1, which is fitted loosely upon the shaft G, and is connected with said shaft at one end by the coiled spring G', and at the other by a prolongation, H^2, resting at certain times against a button, J, projecting from the shaft G, the arms F, F, and H forming a clasping and compressing device for the bundle of grain. A slotted platform can be used, as in my former patented machine, to support the grain in a horizontal position on each side of the arm H, and wire-cutting nippers are also used; but the griping device to hold the wire next to the bundle while the ends are twisted together is different, and is as follows:

To the frame is attached, in front of the twisting-wheel, a forked wire-receiver, I, and a block, I', upon which the binding-wire is clamped at the right time by the clamping-arm K, pivoted in bearings of the frame A. This arm is retained in a vertical position by the coiled spring *k*, wound around the central portion of its stem, and the rear end is bent at K', so as to be in the path of a bent arm, B', revolving with the shaft B, that brings, for a short interval of time, the arm K in close contact with block I', and effectually clamps the wire, while the ends are united by

the twisting-wheel L. This wheel L is mounted upon a shaft, *l*, rotating in suitable bearings attached to the frame A. This shaft carries a pinion, *m*, that meshes with a crown-wheel, M, having teeth only upon a portion of its circumference, and arranged so that a couple of teeth (more or less) will give the pinion and twisting-wheel one-half of a revolution, after having first received the former end of the wire, before receiving the opposite end. There is then a vacancy between the teeth, to give time to the clamping-arm K to seize both ends of the wire before the twisting-wheel is revolved by the remaining teeth upon the crown-wheel M. The first cog *n* is placed upon the end of the spring *n'* attached to the crown-wheel, so that there will be no danger of breakage or strain upon the gears if the cogs upon the crown-wheel and pinion should not come together in position to mesh.

The binding-wire is brought from the spool N around the pulley *o* to a crescent wire-carrier, C', the upper extremity of which should be constructed similarly to the one shown in my former patent. This carrier is connected to the rock-shaft C, and is operated once for each revolution of the main shaft B.

The spool N is placed upon a shaft, *p*, mounted upon a sliding carriage, P, that can move back and forth upon horizontal rods A'. The carriage P is connected by means of a yoke, *q*, and cord q^1 passing over a pulley, q^2, with a weight, Q, free to run up and down within a tube, R, said weight acting to take up any slack wire during the operation of binding. Upon the shaft *p*, between one of its bearings and the nut *r*, there is a rubber spring, *s*, to regulate the tension upon the wire of the spool, and upon the band passing around the bundle.

To bind grain with this machine, motion is transmitted from the harvester to the main driving-shaft B, the binding-wire having been passed from the spool N over the guide-pulleys, and the extremity of the arm *c'* through one of the indentations of the twisting-wheel to the pinchers, as shown in my machine previously patented. The receiver D is placed in position to receive the falling grain, with the end of the spring-hook *g'* within one of the notches of the wheel *g*. The machine is started, and the grain, guided by the shield E, falls upon the binding-wire, and is retained by the compressor H and slotted platform, if one is used. The shaft B, continuing to rotate, brings the compressor F down upon the bundle by revolving the segment-wheel *i* partly round, the latter turning the pinion *i'*, and its shaft G allows the compressor H to rise, and its sleeve extension H^2 being released from the button J upon the shaft, the spring G continues to press the arm H against the bundle of grain. The wire-carrier C' is then brought down, and continues the operation of encircling the bundle of grain with the wire, its upper end overlapping the pinchers. The wire is then caught by them and then cut ready to be twisted, both ends of the wire having previously been retained together next to the bundle, between the vibrating arm K and block I'. After the ends of the wire have been twisted together the arm H is turned down and the sheaf dropped upon the ground, the machine bringing a new bundle every quarter of a revolution of the main shaft. The above-described operations are repeated for every sheaf.

Having thus fully described my invention, what I claim is—

1. In combination with a grain-receiver, D, revolved periodically, and a shield hinged above it to guide the falling grain from the first receiver, D, to a second receiver, the compressor H and its sleeve H^1, mounted loosely upon a shaft, G, to which it is connected by a spring, G', substantially as and for the purposes described.

2. In combination with a grain-receiver, D, shield E, compressor H, and wire-twisting wheel L, a forked wire-receiver, I, holding block I' connected rigidly to the frame and clamping-arm, substantially as described.

3. In combination with the twisting-wheel L and pinion *m*, the segment crown-wheel M and spring-cog *n*, substantially as and for the purposes described.

4. In a grain-binder, substantially as set forth, and combined therewith, the take-up weight Q and carriage P for the binding wire spool, and the tension-spring *s*, all substantially as and for the purposes set forth.

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

JOHN E. BUXTON.

Witnesses:
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A. J. LEACH.