

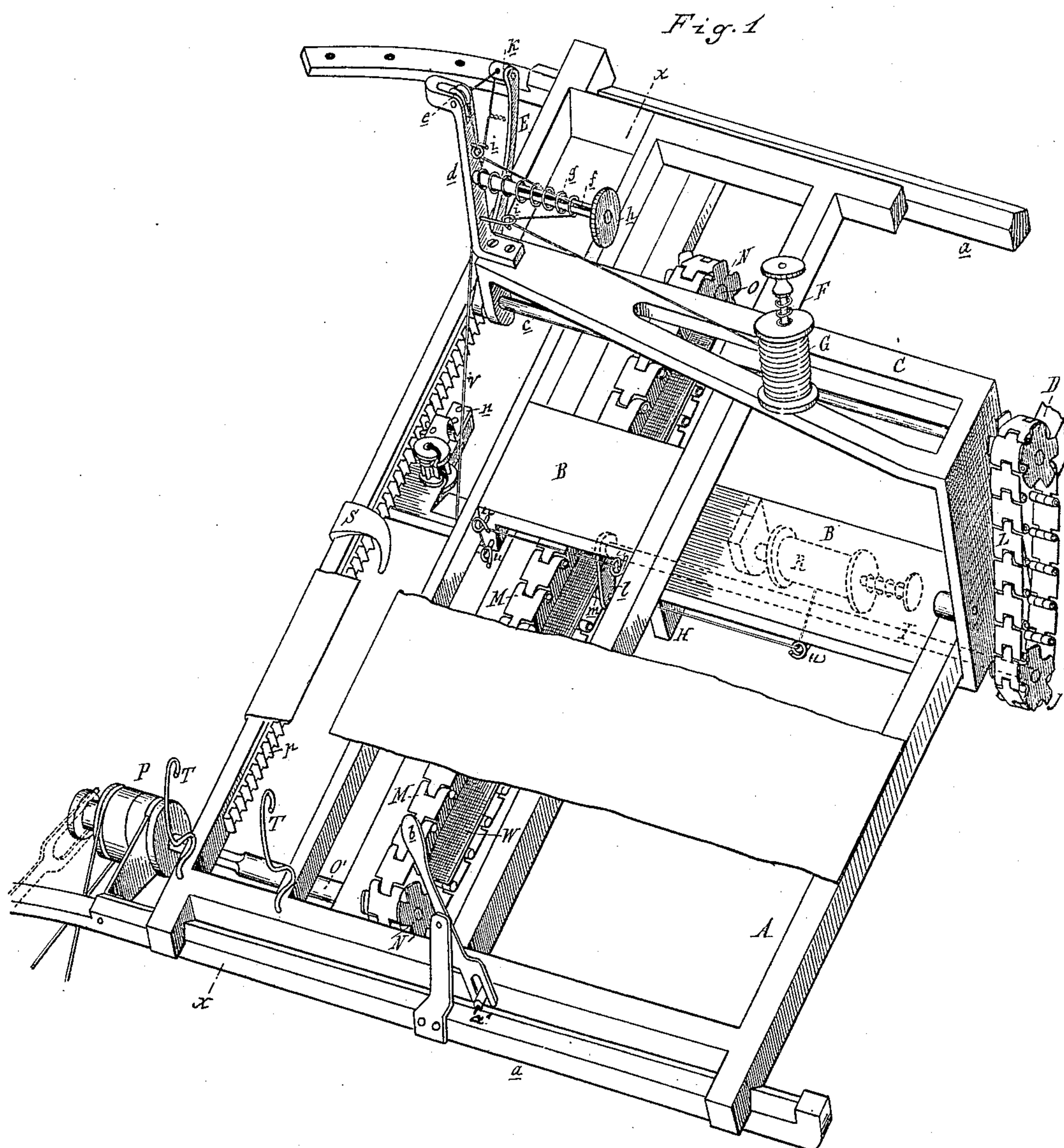
(Model.)

2 Sheets—Sheet 1.

J. D. REED.
Grain Binder.

No. 238,436.

Patented March 1, 1881.



Attest:
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Inventor:
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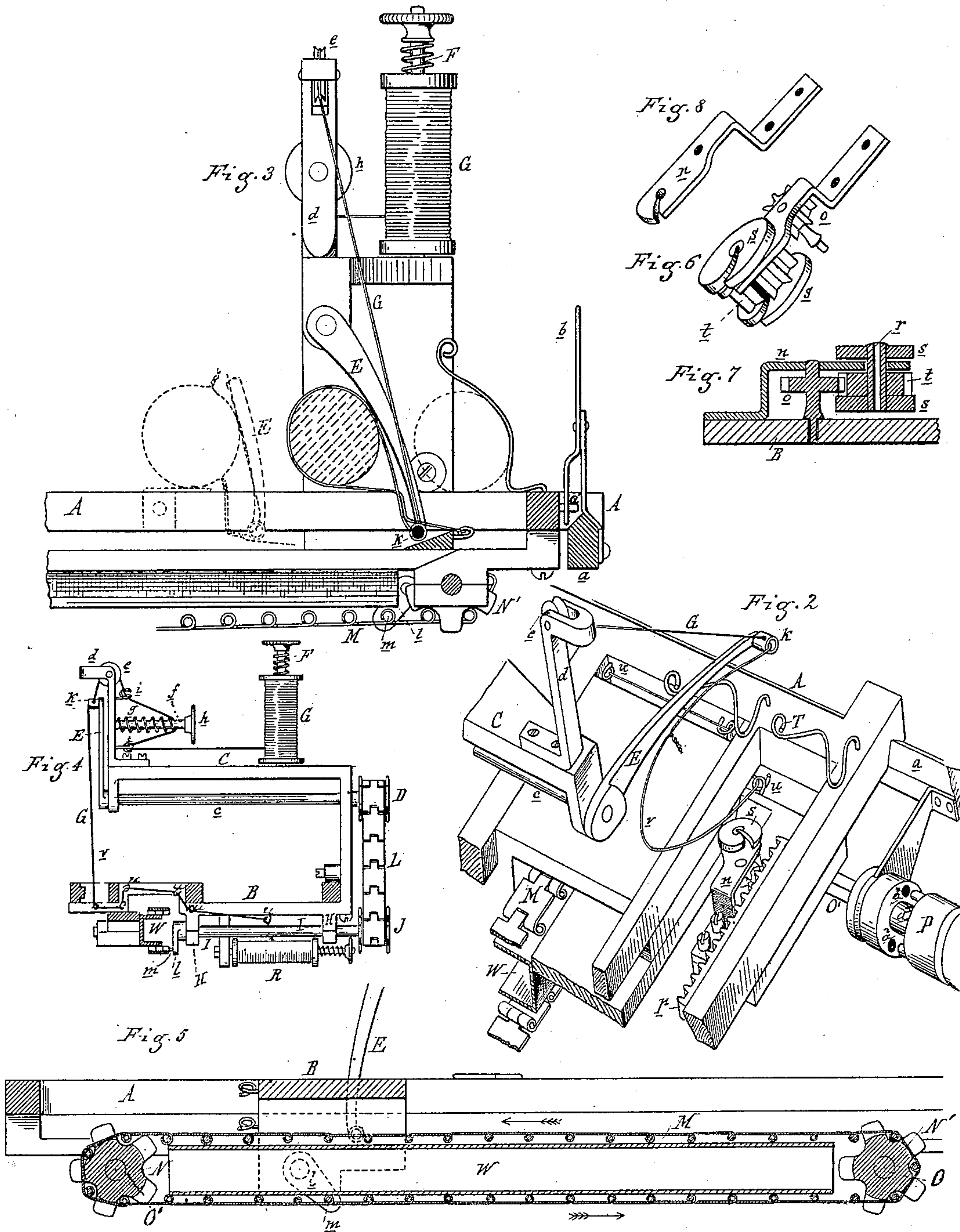
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Attest:
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UNITED STATES PATENT OFFICE.

JAMES D. REED, OF RILEY, MICHIGAN.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 238,436, dated March 1, 1881.

Application filed April 15, 1880. (Model.)

To all whom it may concern:

Be it known that I, JAMES D. REED, of Riley, Clinton county, Michigan, have invented a new and useful Improvement in Grain-Binders, of which the following is a specification.

My invention relates to grain-binders; and it consists in certain improvements therein, as hereinafter more fully set forth, and pointed out in the claims.

In the drawings, Figure 1 is an isometrical perspective view. Fig. 2 is a detached sectional perspective, showing the parts as in the first step of the binding. Fig. 3 is a sectional elevation of the same at an advanced stage of the binding. Fig. 4 is a vertical cross-section. Fig. 5 is a vertical longitudinal section on line *xx*, Fig. 1. Figs. 6, 7, and 8 are details of construction.

In the accompanying drawings, which form a part of this specification, A represents the binding-frame, provided with a pin, *a'*, at one end, and V-shaped recesses at both ends, which fit over V-shaped ways *a*, which are secured to the harvester, the frame being laterally adjustable upon the ways by means of the lever *b*, having a recess in its lower end, which engages with the pin *a'*.

B represents the binding-carriage, properly supported upon and within the frame A, as shown. This binding-carriage is provided with an overhanging arm, C, in which is properly journaled a shaft, *c*, carrying upon one end a sprocket-wheel, D, while to its opposite end is rigidly secured the binding-arm E.

Rising from the front end of the overhanging-arm C is a standard, *d*, having journaled in its upper end a small grooved pulley, *e*. Projecting laterally from the rear side of this standard is a slotted arm, *f*, around which is placed a coil-spring, *g*, the free end of the arm being threaded to receive a thumb-nut, *h*. To the rear face of the standard are also secured guide-loops *i*. From near the rear end of the arm C rises a spool-carrier, F, which receives a spool of wire, G, the wire passing from said spool through the guide-loops and slotted arm on the standard *d*, and over the grooved pulley thereon, and being threaded through the side of a cup, *k*, pivotally secured to the free end of the binding-arm E, said wire passing out

at the open end of the said cup, as is clearly shown in the drawings.

In hangers H, pendent from the under side of the binding-carriage, is properly journaled a shaft, I, carrying upon its outer end a sprocket-wheel, J, from which motion is communicated to the sprocket-wheel D by means of an endless chain, L. The inner end of this shaft I has rigidly secured to it a crank, *l*, the wrist-pin *m* of which engages with the endless chain M. This chain is operated by means of sprocket-wheels N N', which are secured to shafts O O', journaled near each end of the frame A, the shaft O' being squared at its outer end and carrying suitable clutch-pulley P, which is driven from any convenient point on the harvester, so as to turn the shaft, and to slide thereon in the different adjustments of the binding-table.

The clutch-pulley P is formed in two parts, one of which has a square hole through it to fit the square end of shaft O', and has a round sleeve, *a*³, (see Fig. 2,) on which slides the other part of the clutch, which revolves freely thereon, until the pins on one part enter the holes in the opposite part, when both revolve together and drive the shaft O'.

Upon the front end of the binding-carriage and between the two outward longitudinal bars of the binding-frame is secured the arm *n*, between which and the bed of the binding-carriage is properly journaled a small pinion, *o*, Fig. 6, which engages with a rack, *p*, secured to the inner face of the longitudinal bar of the binding-frame.

In the free end of the arm *n* is properly journaled a hollow-shaft, *r*, the side of said shaft being slotted its entire length. Upon each end of this shaft is rigidly secured a small disk, *s*, and between these two disks, and upon the same shaft, is secured a pinion, *t*, which engages with the small pinion *o*, heretofore described. The end of this arm *n* is slotted, as shown, and the disks *s* and pinion *t* are also slotted, said slots being in the same vertical plane or registering with each other and leading into the slot in the hollow-shaft *r*. Guide-loops *u* are secured to one edge of the binding-carriage, through which the wire *v* from the spool R below the carriage is passed, the

end being twisted to the end of the upper wire from the spool G, as is clearly shown in Figs. 2, 3, and 4.

A knife, S, is secured to the front longitudinal bar of the frame, projecting inwardly over the rack-bar *p*, and sufficiently elevated so that the twisting device above described will pass beneath such knife in its reciprocating movements. T T are arms or fenders, against which the sheaf lies preparatory to binding. A guide, W, is secured to one of the bars of the frame upon which the chain M travels.

In operation, the parts being constructed and arranged substantially as herein described, the sheaf of grain to be bound is delivered upon the binding-table, (which latter should be covered excepting over the two bars, so as to leave a free space for the travel and operation of the twisting device,) resting against the arms T. A rotary motion is then given to the shaft O', which, through the connections described, carries the binding-carriage toward the binding end of the table. As the endless chain M continues to travel around its sprocket-wheels the crank-arm is compelled to make a semi-rotation, which compels a like movement of the shaft I, and through its connections the binding-arm E is likewise semi-rotated, carrying with it the binding-wire around the sheaf, as shown in Fig. 3. In the further travel of the chain M a retrograde movement is given to the carriage, and a rotating motion is imparted to the twisting mechanism described, the wires which encircle the sheaf entering the slots in the disk *s* and pinion *t*, which firmly twist the wires together, and as the twisting device passes under the knife the wire is cut off by such knife above the twister, which leaves the sheaf thoroughly bound with wire, and with the two ends of the main wires twisted together. When the carriage reaches the rear or opposite end of the frame, as the chain continues to travel the binding-arm is, by the connections hereinbefore described, compelled to assume its original position, as seen in Figs. 1 and 4, and ready to repeat the operation of binding as often as may be desired. As the binding-carriage travels toward the binding end of the frame a retrograde movement is given to the twisting device, so as to prevent its catching the binding-wire, excepting on the return motion of the carriage and after the sheaf has been gathered.

The various tension devices shown and de-

scribed are for the purpose of preventing a too rapid delivery of the wire, and to take up the slack of the same during the various motions of the binding-arm.

By means of the lever *b* the binding-table can readily be adjusted to or from the harvester-table, to which it may be attached, in order to have the sheaf bound at or about its center.

What I claim as my invention is—

1. The combination of the binding-frame A, provided with a pin, *a'*, and V-shaped recesses near its ends, with the shaft O', squared at its outer end, clutch-pulley P, formed in two parts, one of which is provided with a square central orifice for the shaft, holes *a*², and a sleeve, *a*³, on which the other part of the clutch, provided with pins, is adapted to slide, V-shaped ways *a*, and pivoted lever *b*, substantially as described, and for the purpose set forth.

2. The combination of the frame A, sprocket-wheels N N', and chain M with the intermittingly-rotating shaft I, journaled horizontally in the binder-frame, and crank *l*, the wrist-pin of the latter being rigidly connected with the chain and crank-arm, substantially as described, and for the purpose set forth.

3. The combination, with the frame A, sprocket-wheels N N', and chain M, of the intermittingly-rotating crank *l*, the wrist-pin of the latter being rigidly connected with the chain and crank-arm, intermittingly-rotating shaft I, and the intermittingly-rotating shaft *c*, carrying the binding-arm E, and connected with the shaft I by suitable mechanism, substantially as described, and for the purpose set forth.

4. The combination, with the frame A, shafts O O', sprocket-wheels N N', and chain M, of the intermittingly-rotating crank *l*, shaft I, sprocket-wheels D J, chain L, and shaft *c*, carrying the binding-arm E, substantially as described, and for the purpose set forth.

5. The combination of the frame A, having the rack *p*, shafts O O', sprocket-wheels N N' D J, chains M L, intermittingly-rotating crank *l*, shafts I *c*, and binding-arm E, with the slotted hollow shaft *r*, slotted disks *s*, pinions *o* *t*, and knife S, substantially as described, and for the purpose set forth.

JAMES D. REED.

Witnesses:

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