E. W. JENKINS.

Grain Binder.

No. 233,098. Patented Oct. 12, 1880.

Fig. 1

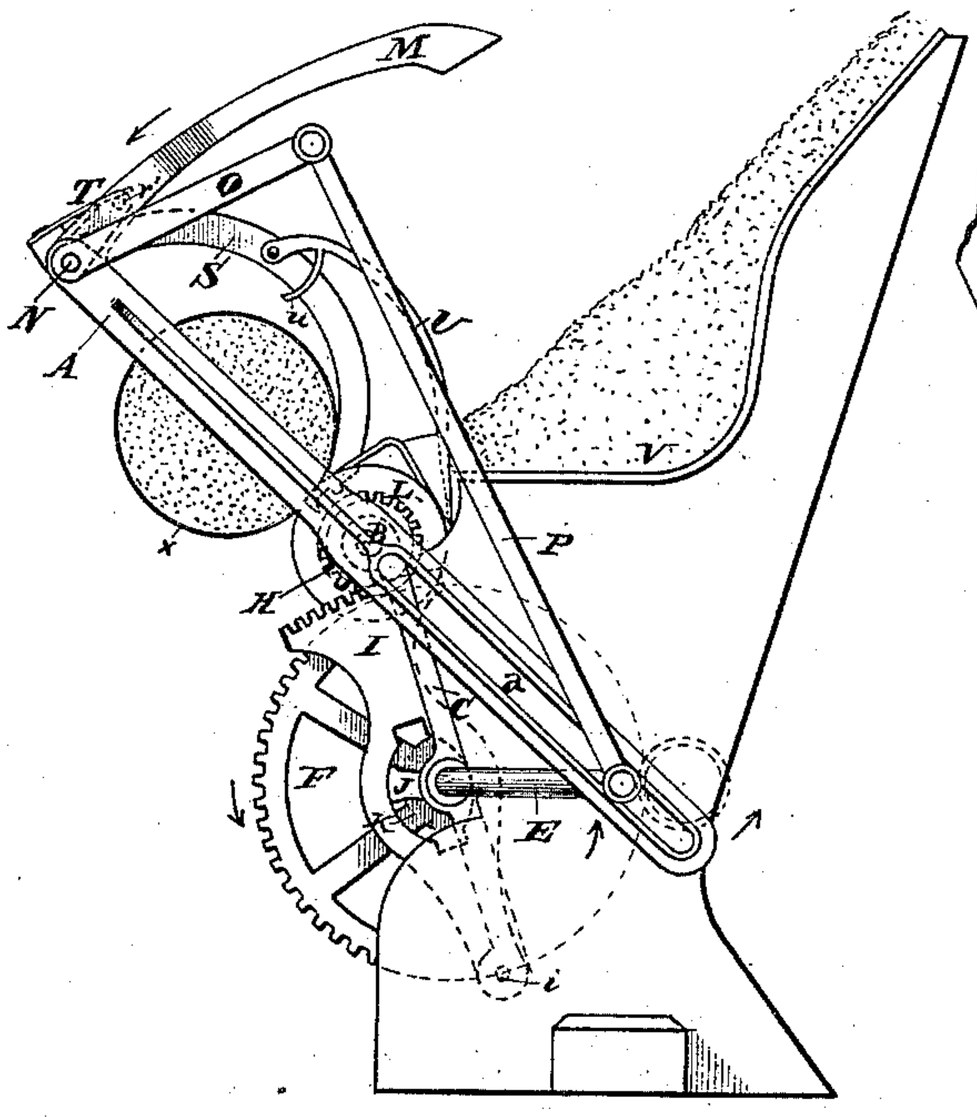
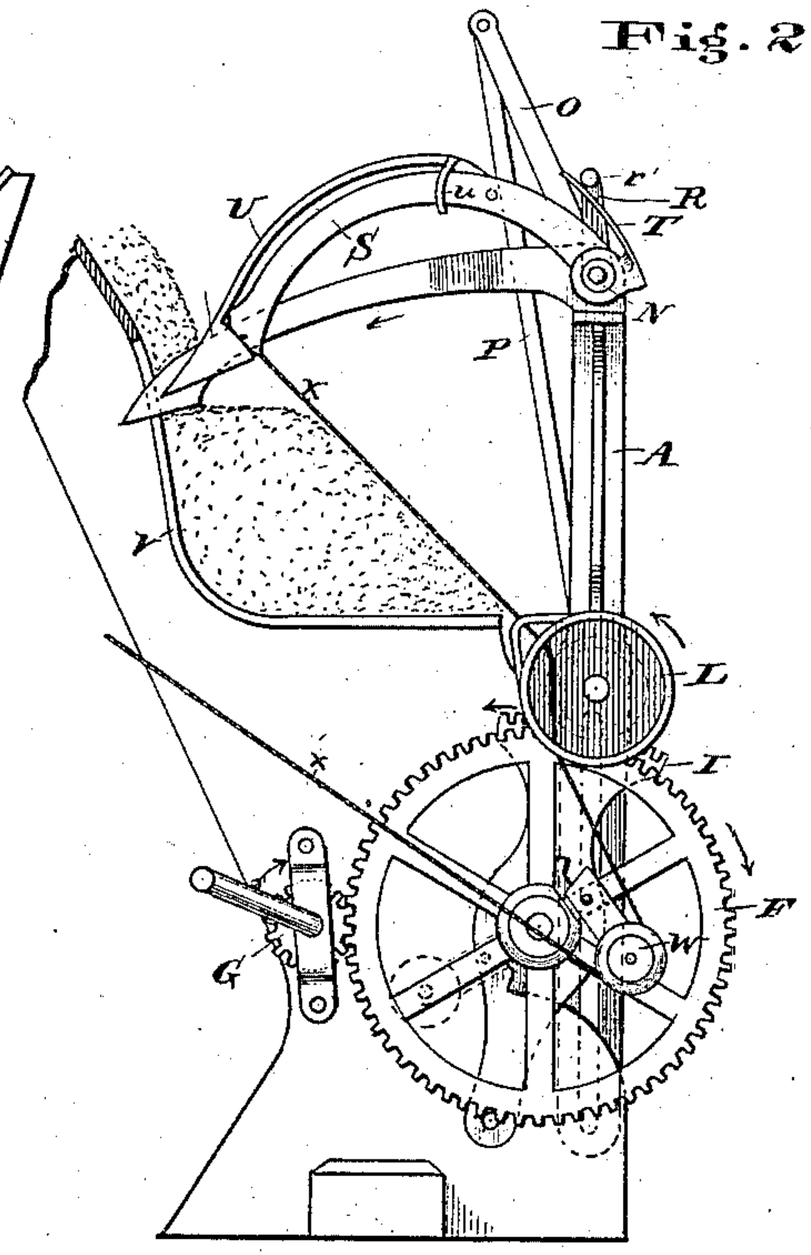



Fig. 2



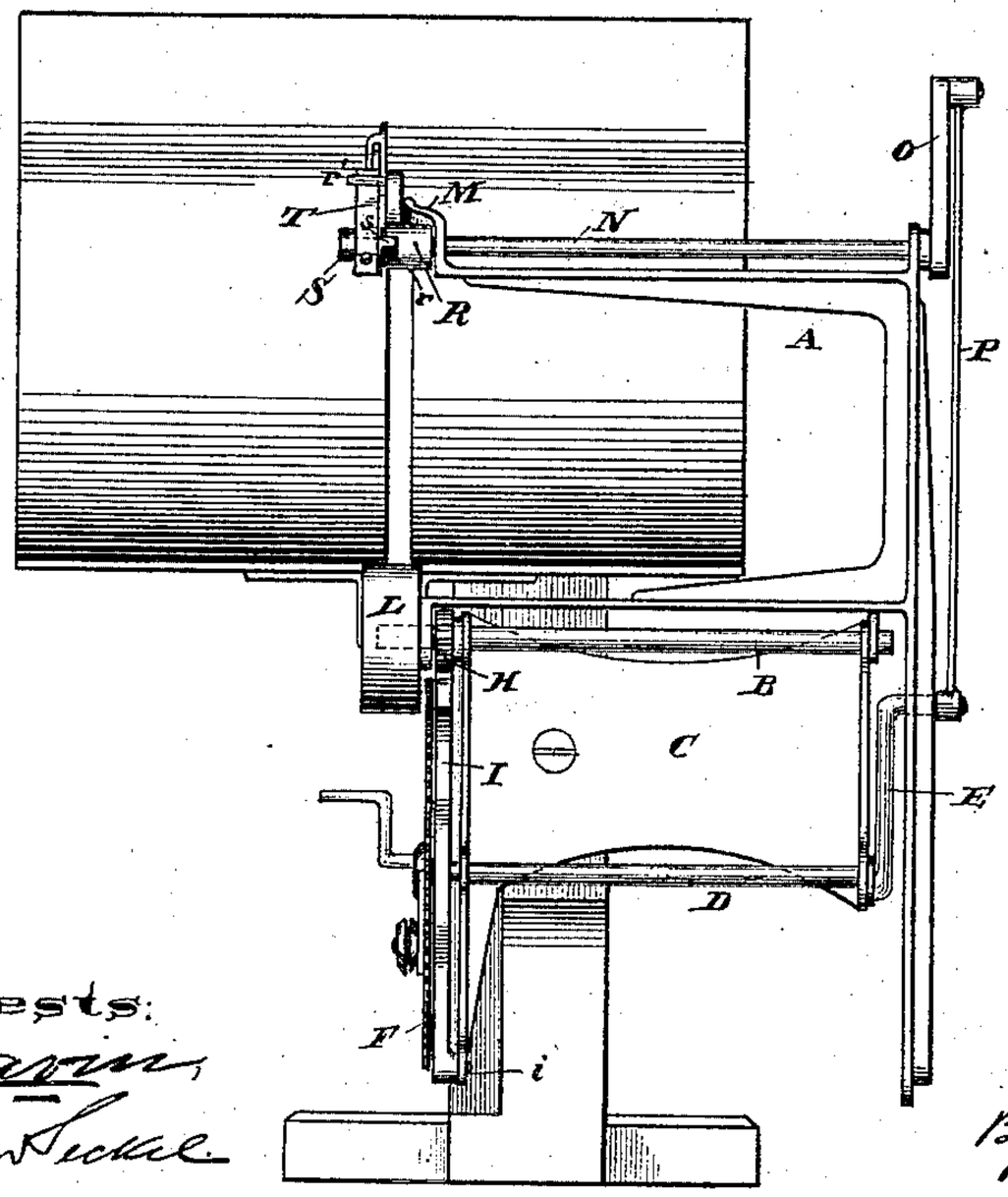
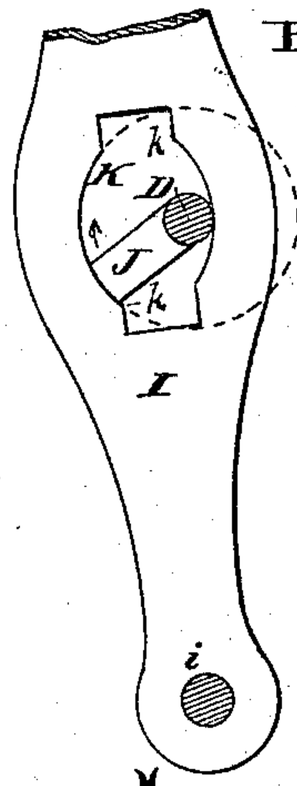




Fig. 3

Fig. 4

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# UNITED STATES PATENT OFFICE.

EDWARD W. JENKINS, OF NORRISTOWN, PENNSYLVANIA.

## GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 233,098, dated October 12, 1880.

Application filed December 23, 1879.

*To all whom it may concern:*

Be it known that I, EDWARD W. JENKINS, of Norristown, in the county of Montgomery and State of Pennsylvania, have invented an Improvement in Grain-Binders, of which the following is a specification.

My invention relates to grain-binding, harvesting, or gleaning machines; and it consists in certain improvements on the same, which improvements are hereinafter fully described, and clearly set forth in the appended claims.

The invention herein described is an improvement upon the invention set forth in a patent to me dated November 4, 1879, and numbered 221,235.

In the drawings are shown four views, of which Figure 1 is a side elevation of my improved binding mechanism. Fig. 2 is also a side elevation only from the opposite side of the machine. Fig. 3 is a front elevation of the same. Fig. 4 is an enlarged view of mechanism for oscillating the segmental gear which operates the knot-tyer.

A is a frame of F-shape construction, the lower leg of which is provided with a slot, *a*. This frame is oscillated to and from the grain-table V upon a pivot-shaft, B, as its fulcrum, which shaft is supported and rotates in bearings on crab C.

D is a crank-shaft, which rotates in bearings on the lower part of the crab C. Upon one end of shaft D is a crank, E, and upon the other a tooth or cog, J, and a gear-wheel, F. The crank-pin of crank E works in slot *a* of frame A. A small pinion, G, meshes with the wheel F. The wheel F and pinion G can be placed on the side next to the slot *a*, if desired, and a crank-pin in said wheel F may work in the slot.

Secured to the pivot-shaft B is a pinion, H, which meshes with a segmental gear, I, which oscillates upon a pin, *i*, as a fulcrum. The segmental gear I has an oval perforation, K, with notches at top and bottom. The shaft D passes through this perforation K and rotates the cog J within the same, thereby imparting an oscillating motion to the segmental gear I by the cog J striking the edges *k* of the notches, as shown in Fig. 4.

L is the tyer-box, which is secured fast to the frame A, and contains the knot-tyer mechanism, which is operated by the pivot-shaft B. The upper arm of the frame A has the dividing-arm M secured to it, and carries a rock-shaft, N, upon one end of which is secured a crank, O, and upon the other a small crank, R, provided with a crank-pin, *r'*, and a clutch-recess, *r*. Upon the end of shaft N, outside the crank R, is a loose sleeve, to which are secured the binding-arm S and relief-spring T, which presses against crank-pin *r'*, as shown in Figs. 2 and 3. The sleeve is also provided with a projection, *s*, which plays in clutch-recess *r*, the relief-spring T always keeping it against the forward end of the same.

U is a pointed safety-cap, which is pivoted to the binder-arm S and guided by pieces *u*. When this cap U is over the binder-head, as shown in Fig. 2, it acts as a dividing-arm, and also prevents any straw or grain from getting into the nippers on the end of binder-arm, which are not shown. These nippers are to be operated to cut and hold the cord by the crank-pin *r'*.

When using a pointed safety-cap, as shown, the dividing-arm M may be dispensed with, if so desired, and the cap, moved by the binder-arm, will perform the function of the dividing-arm. The crank-pins of cranks O and E are connected together by a connecting-bar, P. Attached to the wheel F is a pivoted slack-up and take-up, W, the object of which is to give sufficient cord to the tyer to make the knot without taking any from the bundle, and when the knot is tied to take up all the surplus cord and give the desired tension. This take-up and slack-up may be secured rigidly to the wheel, if so desired.

The operation is as follows: The pinion G being rotated, as indicated by the arrows, Fig. 2, the wheel F rotates in an opposite direction, carrying with it the cog J and crank E. As the crank-pin moves in slot *a*, when in position shown in Fig. 1, the top of frame A is thrown back until the crank makes an angle of about forty-five degrees with the horizontal, and as it continues to rotate the pin moves up the slot *a* until it is near the fulcrum of the frame A, thereby causing it to be oscillated forward with a quick motion, causing the dividing-arm M, binder-arm S, and cap U to pass quickly through the grain and

slot in table V, Fig. 2, separate the gavel and recede until the binder-head is butted firmly against the abutment in tyer-box L, as shown in Fig. 1, when the motion becomes slower, allowing more time in which to tie the knot. The motion of the frame A becomes slower as the crank-pin moves to the bottom of the slot *a*. As the binder-head is butted against the abutment the safety-cap U is held back by the box L, thereby preventing the grain from crowding the said binder-arm during the tying of the knot. This is shown in Fig. 1. During every complete oscillation of the frame A the segmental gear I is thrown forward and backward by the cog J, as before explained, thereby rotating the pivot-shaft B and its pinion H first in one direction and then in the other, which movement, through the agency of the knot-tyer, ties the knot. As the crank E rotates an oscillating motion is imparted to crank O through the connecting-bar P, giving a rocking motion to the shaft N and crank R, and as the pin *r'* presses on the relief-spring T an oscillating motion is also given to the binder-arm S. The binder-head butts against the abutment before the crank E has reached the bottom of its orbit, and as said crank descends the crank R and its pin also descend, pressing on the relief-spring T, and as the crank E passes the dead-center and ascends the crank R does the same, and the pressure on the spring T is relieved, and the binder-arm begins to ascend as soon as the projection *s* strikes the forward end of the clutch-recess *r'*. During all the time the relief-spring T is under pressure the binder-head is butted against the abutment, thereby giving a contact with the tyer during some length of time in which to tie the knot. This contact always takes place when the frame A is oscillating slowest. As the knot is being made the slack-up W is ascending, thereby giving plenty of cord X wherewith to make the knot, and after the knot is made the cord X is given tension as the take-up W descends.

Pivoted to the wheel F, or its equivalent, is a take-up and slack-up, W, which, during its rotating movement, becomes placed in such a position with reference to the tyer that it trips and takes up the surplus cord drawn out by the binder-arm, and on its upward motion or movement it is as though rigidly attached to said wheel F so far as the downward tripping movement is concerned, and gives cord to the knot-tyer. The take-up and slack-up advances to and recedes from the tyer-box.

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

1. In a grain-binder, a rotary take-up and slack-up pivoted to a wheel or its equivalent in such a manner that as it moves around it becomes placed in such a position with relation to the tyer that it trips and takes up the surplus cord drawn out by the binder-arm until the knot is being tied, when it again gives up the surplus cord, substantially as and for the purpose specified.

2. In a grain-binder, a binder-arm, in combination with a pivoted rotating take-up and slack-up, which, during its rotation about a fixed axis, recedes from and advances toward the tyer-box and takes up the surplus cord the said arm may draw out and slackens the cord while the knot is being tied, substantially as and for the purpose specified.

3. In a grain-binder, an oscillating frame, A, provided with a slot, *a*, in combination with a binder-arm, S, crank E, and a tyer-box, L, located on the axis of the oscillating frame A, said frame oscillating upon the pivot-shaft which actuates the tying mechanism, carrying the binder-arm upon a rock-shaft at the top, whereby said arm, when brought firmly against the abutment in the tyer-box, may be oscillated with the frame without changing its position with relation to the tyer-box, the binder-arm being operated by the same crank which vibrates or oscillates the frame, substantially as and for the purpose specified.

4. The combination of a binding-arm, S, cap U, pivoted to the same, rock-shaft N, spring T, crank R, crank O, and bar P, or their equivalents, frame A, provided with slot *a*, crank E, and grain-table V, substantially as and for the purpose specified.

5. A binder-arm hinged to and operated by an oscillating frame provided with a slot in which a crank works, in combination with a divider-arm, the whole arranged and operated so that the binder-arm and divider-arm enter the grain together, then the head of the binder-arm is projected forward and down at the same time, and finally reaches the abutment in the tyer-box on the axis of the oscillating frame, which continues its movement without displacement of the binder-head, but withdraws the divider-arm from the grain, allowing the same to descend to form a fresh bundle, substantially as and for the purpose specified.

6. The combination of the shaft N, carrying rigidly attached to it a crank, R, carrying a pin, *r'*, binder-arm S, carrying rigidly secured to it a metallic relief-spring, T, slot *r*, and projection *s*, substantially as and for the purpose set forth.

7. The combination of a shaft, D, crank E, oscillating frame A, slot *a*, rock-shaft N, cranks O and R, connecting-bar P, relief-spring T, projection *s*, slot *r*, and binder-arm S, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

EDWARD W. JENKINS.

Witnesses:

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R. N. STEWART.