E. WOODBURY.

GRAIN-BINDERS.

No. 194,117. Patented Aug. 14, 1877.

Fig. 1.

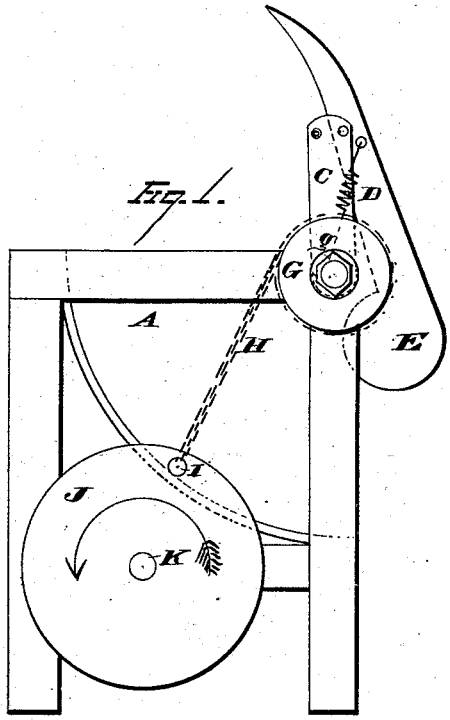


Fig. 2.

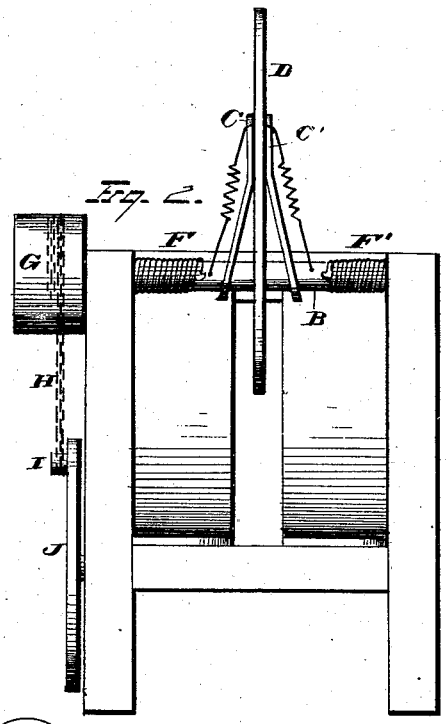
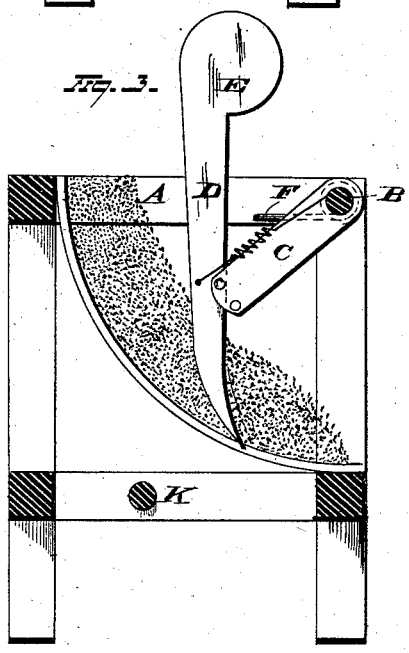


Fig. 3.



WITNESSES

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EDWARD WOODBURY, OF KALAMAZOO, MICHIGAN.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. **194,117**, dated August 14, 1877; application filed June 12, 1877.

To all whom it may concern:

Be it known that I, EDWARD WOODBURY, of Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented certain new and useful Improvements in Attachments for Grain-Binders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improved binding-arm attachment for grain-binders, the object of the same being to provide a binding-arm of such construction that it will operate in a positive manner to compress the flowing grain into bundles of the desired size, and carry the bundle to the desired point for binding, when the binding-arm will be automatically retracted, and in its passage through the flowing grain assume a vertical position, whereby little power is required for carrying it back into position for a succeeding stroke, and, also, it will not disturb or lift the flowing grain through which it rises. After the arm has passed above the flowing grain it automatically assumes its proper position for compressing another bundle of grain.

My invention consists in the combination, with a rock-shaft having the binding-arm secured thereto, of one or more springs, connected with the rock-shaft in such a manner that the binding-arm will be forced upwardly through the flowing grain by the action of said spring or springs.

My invention further consists in the combination, with the rock-shaft having a binding-arm secured thereto, said shaft having one or more springs secured thereto to turn it in one direction, of a pulley or chain-wheel secured to the shaft, a chain wound thereon, and the free end of the chain secured to a revolving disk or wheel attached to a counter-shaft.

In the accompanying drawings, Figure 1 represents a side elevation of my invention; Fig. 2, a rear elevation; and Fig. 3 shows the position of the arm as it is moving upwardly through the grain.

A represents a hollow receptacle or hopper, into which the grain flows. The means employed for directing the flow of the grain and for operating the binding wire or cord are not shown, as it will be understood that my invention is adapted to be applied to many of the grain-binders now in use without materially changing any of the parts of the same.

B is a rock-shaft, the ends of which are journaled in any suitable portion of the frame of a grain-binder. C C′ are arms, the ends of which are rigidly secured to the rock-shaft. Between the outer ends of arms C C′ is pivoted the binding-arm D, the rear end of arm D extending over the rock-shaft and weighted at E. F F′ are spiral springs, having their inner ends attached to the rock-shaft, and their outer ends secured to some stationary portion of the grain-binder frame. The springs serve to rotate the rock-shaft in one direction—that is, to turn the shaft and raise the binding-arm. G is a pulley or chain-wheel, secured to one end of the rock-shaft B by a nut, *g*, said pulley having one end of a chain, H, wound thereon, while the opposite end of the chain is secured to a wrist-pin, I, on the disk or wheel J attached to the counter-shaft K.

The position of the pulley may be readily changed by unscrewing the nut *g* and adjusting the pulley either to alter the position of the binding-arm or tighten the chain. The nut is then turned tightly against the pulley, and serves to hold the same securely against the shaft.

The operation of the device is as follows: The flowing grain enters the hopper or hollow receptacle A, and is therein retained by means of the binding wire or cord, (not shown,) wheel J being actuated in the direction of the arrow by any suitable connection, while the main portion of the binder operates to turn the pulley or chain-wheel G on the rock-shaft by means of the chain H, and revolve the rock-shaft B against the tension of the springs F. As the rock-shaft is turned it carries with it the pivoted binding-arm D, and forces the same against the flowing grain in the hopper. The binding-arm D in its descent operates as a rigid arm, as its rear portion has firm bearing on the rock-shaft, and hence it compresses the grain into a bundle and carries the bundle clear of the lower portion of the hopper, that it may be properly bound. As the wrist-pin I reaches

its dead-center, or extreme limit of movement away from the rock-shaft, the spiral springs F F′ operate to reverse the action of the binder-arm and carry the same backwardly through the grain in an upward direction.

In order to lessen the resistance of the grain to the upward movement of the binding-arm, the latter is jointed, as described; and hence, instead of describing a circle, the same as in its descent, the point of the arm yields to the pressure of the grain, and in its upward passage the arm assumes nearly a vertical position, and thereby moves with little resistance, and also leaves the grain undisturbed in the hopper. When the arm has passed upwardly through the grain the rear and weighted end D falls, and thereby raises the forward portion into its proper position for operating on another portion of the grain in the hopper.

It is evident that many slight changes in the construction and arrangement of parts may be effected without departing from the spirit of my invention—as, for instance, the throw of the binding-arm may be easily regulated by providing the wheel J with a number of holes on a line from the center to the periphery of the wheel, and, by varying the position of the wrist-pin, any desired throw may be imparted to the binding-arm. Again, instead of using a chain to depress the binding-arm, a thin metallic ribbon or strap, or other equivalent flexible connection, might be employed with good effect. Also, the binding-arm may be made to assume a proper position by attaching a spring to the rear end of the same, instead of employing a weight for such purpose. Again, instead of employing spiral springs to raise the binding-arm, a weighted lever may be secured to the rock-shaft, and serve to turn the same and raise the binding-arm.

Hence, I do not limit myself to the particular construction and arrangement of parts shown and described; but

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

The combination, with a rock-shaft, a binding-arm connected therewith, and springs or equivalent means to turn the shaft in one direction, of a chain or other flexible connection, one end of which is secured to a pulley on the rock-shaft, and the other end to a wheel on a counter-shaft, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of June, 1877.

EDWARD WOODBURY.

Witnesses:
JNO. W. TAYLOR,
A. HENRY.