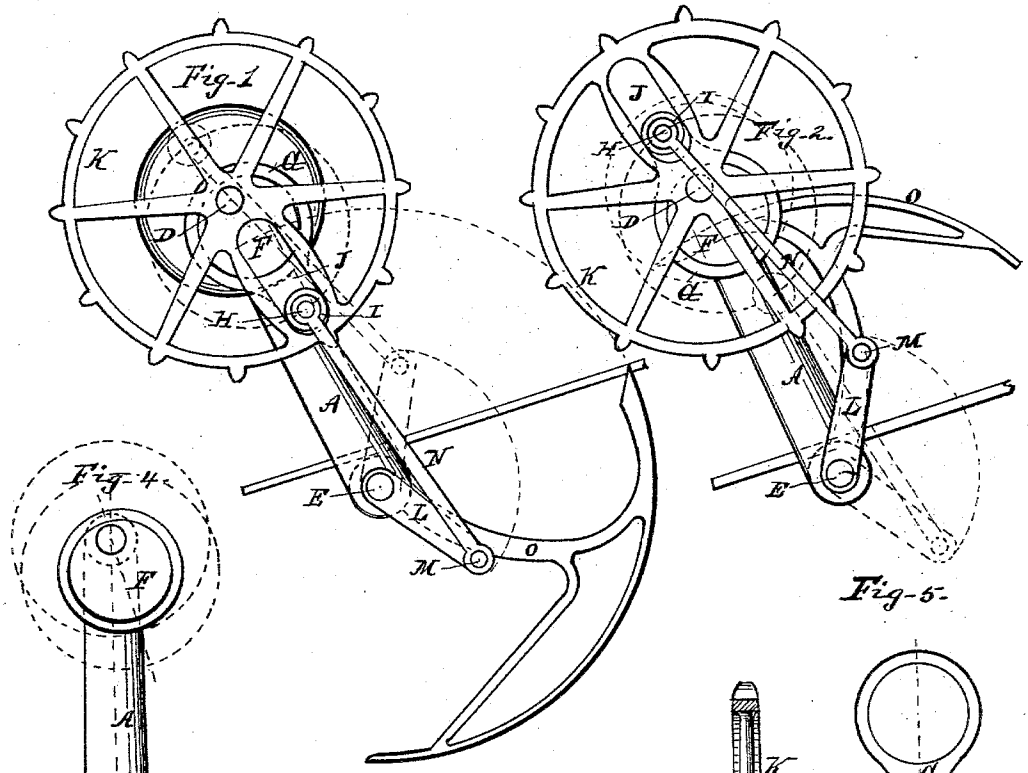
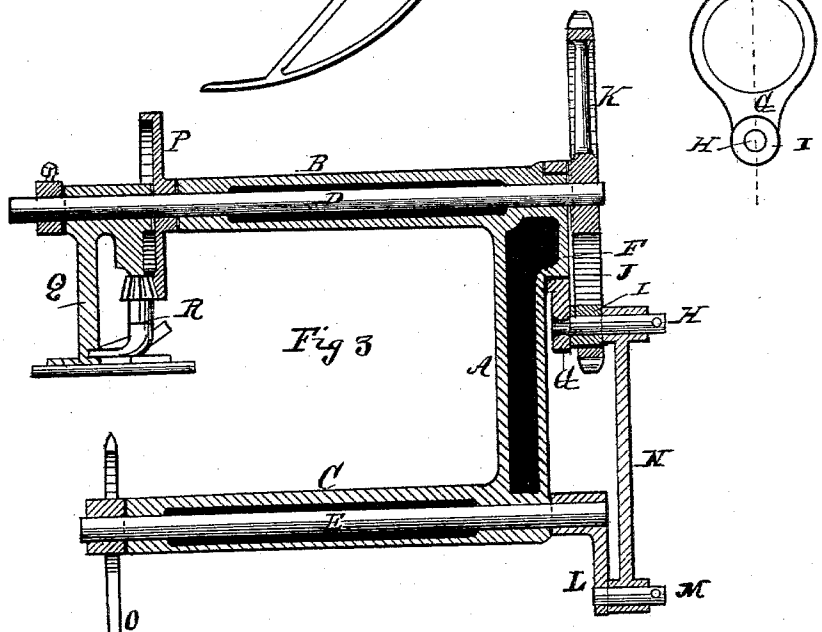
(No Model.)

M. A. KELLER.

BINDING MECHANISM FOR HARVESTERS.

No. 569,580. Patented Oct. 13, 1896.





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BINDING MECHANISM FOR HARVESTERS.

SPECIFICATION forming part of Letters Patent No. 569,580, dated October 13, 1896.

Application filed March 14, 1895. Serial No. 541,690. (No model.)

To all whom it may concern:

Be it known that I, MOSES A. KELLER, a citizen of the United States, residing at Batavia, in the county of Genesee and State of New York, have invented a new and useful Improvement in Binding Mechanism for Harvesters, of which the following is a specification.

My invention relates to improvements in grain-binders of that class in which the needle is operated by a variable movement, whereby a greater power is exerted when the gavel is being compressed and greater speed is developed when the needle is returned after it has compressed the bundle, and is especially designed as an improvement on the construction set forth in my pending application, Serial No. 537,537, filed February 6, 1895.

Like letters refer to the same parts in the several figures in the drawings, in which—

Figure 1 is a right-hand side view with the operating parts in their normal position. Fig. 2 is also a right-hand side view, but showing the position of the operating parts at the stage of one half-revolution of the operating-gears and when the needle is fully compressed home. Fig. 3 is a longitudinal sectional view of the entire mechanism. Figs. 4 and 5 are detail views of the frame and revoluble crank.

A, B, and C form the main frame, to which all the operating parts are connected.

D is the knotter-driving shaft and is journaled in the upper arm B of the frame.

The needle-operating shaft E is journaled in the lower arm C of the frame. At the upper end on the right-hand side of the frame is formed or otherwise secured an eccentric F about the knotter-driving shaft. As shown, on this eccentric is journaled a cranked arm G, and on the crank-pin H is journaled a roller I. This roller engages the slot J of the wheel K. This wheel is fast on the knotter-driving shaft D and is the means for giving power to all of the parts, as will be seen. This wheel usually gets its power through an endless chain or a train of gears from the clutch-shaft in the way common in this style of binding mechanism. It is immaterial whether the power is communicated to the wheel K by a chain or gears. Therefore the wheel K only is shown. This wheel makes one complete revolution, no more, no less, to each tying operation and has a uniform motion throughout its complete revolution.

It will be seen by this construction and arrangement that when the crank G starts from its normal point (shown in Fig. 1) the roller I and the crank-pin H must move gradually in the slot toward the axis of the wheel in the first half-revolution of the wheel K, when they will be in the position shown in Fig. 2 at a half-revolution of the wheel K. By this gradual moving toward the axis of the wheel the motion of the crank-pin H grows slower and the power increases as the leverage or power of the wheel is greater at its axis than at its circumference, and as the crank-pin H approaches and departs from the position shown in Fig. 2 the compressing-arm or needle O shows hardly any movement for one-sixth of a revolution of the wheel K, which is more than is required to tie the knot.

The needle O is fast on the shaft E; also the crank-arm L. A pitman N is journaled on the crank-pins H and M, and thus power is communicated from the variable motion of the crank G to the needle or compressing-arm O, as above described. The knotter-operating wheel P is fast on the shaft D, and the knotter-frame Q is journaled on the shaft in the usual way and secured to the arm B of the main frame. The knotter R is so timed in relation to the position of the slot J of the wheel K that when the needle O has placed the cord on the knotter in the usual way the knotter will complete the tying of the knot in less than one-sixth of a revolution of the shaft D and while the gavel is held fully compressed, and therefore less strain is on the twine in tying the knot than is the case when the knotter-driving shaft has a variable and slower motion at the time the tying of the knot takes place, as the compressing-arm O begins to recede and allows the gavel to expand before the knot is completed. Hence there must be more strain on the twine than when the gavel is held fully compressed while the knot is tied; but as shown in this invention lighter and cheaper twine can be used and with better results than with a variable motion of the knotter-driving shaft. Thus all the desirable points are obtained in my present invention forming the subject-matter of this application, namely, an increasing

compressing power of the binding-needle or compressing-arm to prevent the clogging of the binder in difficult grain or an unusually large bundle and by holding the gavel fully compressed while the knot is being tied.

Having thus fully described the construction and operation of my invention, what I desire to secure by Letters Patent is—

1. The combination with the binder-frame and knotter-driving shaft, of a stationary eccentric formed on or secured to the frame about the said shaft, a crank journaled on the eccentric, and a driving-gear or sprocket-wheel rigidly secured on the knotter-driving shaft and provided with means connecting it with the crank, whereby said crank is caused to have a variable motion through a uniform motion of the knotter-driving shaft, substantially as and for the purpose set forth.

2. The combination with the binder-frame, the knotter-driving shaft and needle-shaft, of a crank eccentrically journaled on the frame about the knotter-driving shaft, a driving gear or wheel fast on the knotter-driving shaft, means for movably connecting it with the crank to give said crank a variable motion by a uniform motion of the wheel, and means connecting the crank with and operating the needle-shaft, substantially as and for the purpose set forth.

3. The combination with the binder-frame, the knotter-driving shaft and the needle-operating shaft, of a crank journaled on the frame eccentrically to the knotter-driving shaft, a driving gear or wheel fast on the knotter-driving shaft and provided with a radial slot, means adapted to move in said slot for connecting the said crank with the said gear or wheel, whereby the crank is caused to have a variable motion through a uniform motion of the driving-gear, and the pitman connecting the said crank with the cranked arm of the needle-shaft whereby the needle or compressing-arm is caused to have a variable motion through a uniform motion of the knotter-driving shaft, substantially as shown and described.

4. The combination with the binder-frame, the knotter and needle operating shafts journaled in the frame, a revoluble crank journaled on the frame eccentric to the knotter-operating shaft, a driving gear or wheel fixed to the said knotter-operating shaft, means connecting the crank with said driving-gear adapted to allow relative radial movement, and means connecting the crank with the needle-shaft, whereby a variable vibrating motion is given to the needle-shaft, and a uniform rotating motion to the knotter-driving shaft by a uniform rotating motion of the driving-gear.

5. The combination with the binder-frame, the knotter and needle operating shafts, of a revoluble crank journaled on said frame, means connecting it with the driving-gears of the knotter-driving shaft and the needle-operating shaft, and adapted to give a variable vibrating motion to the needle-shaft and a uniform rotating motion to the knotter-driving shaft.

6. In a grain-binder, the combination with a needle, and a needle-shaft, of mechanism for driving such shaft, comprising a knotter-driving shaft and a gear mounted concentrically thereon, and a crank mounted upon an axis eccentric to the knotter-driving shaft and having a sliding connection with the gear and devices connecting the crank with the needle-shaft; substantially as and for the purpose set forth.

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