

A. S. HOYT.
Grain-Binders.

No. 141,507.

Patented August 5, 1873.

Fig. 7.

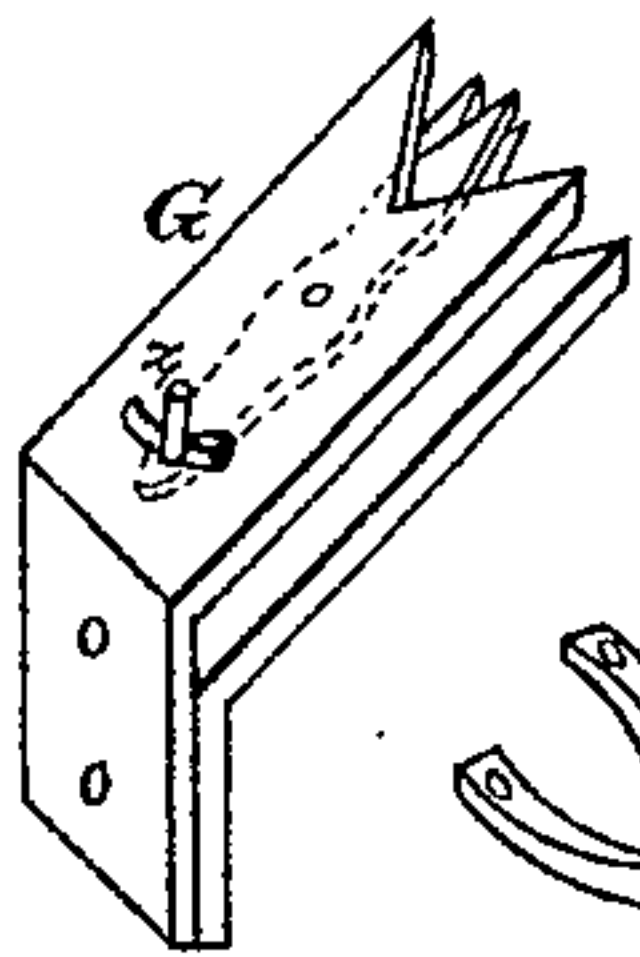


Fig. 5.

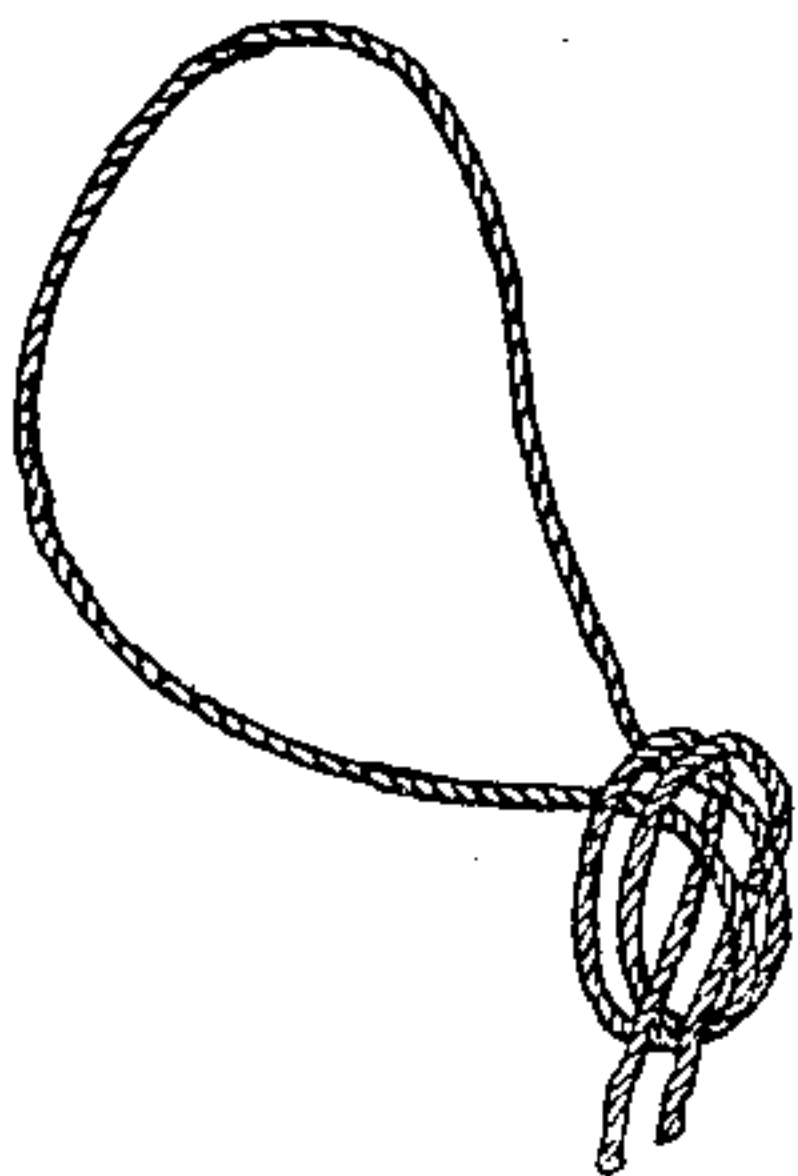


Fig. 4.

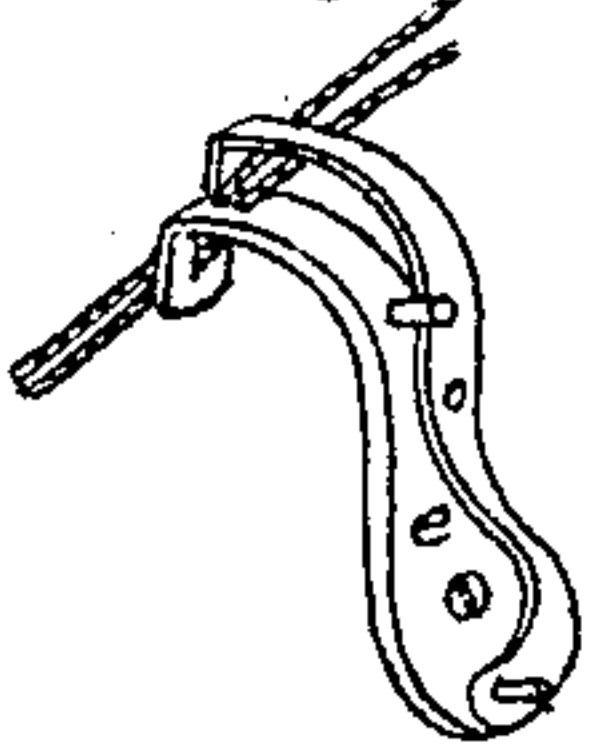


Fig. 6.

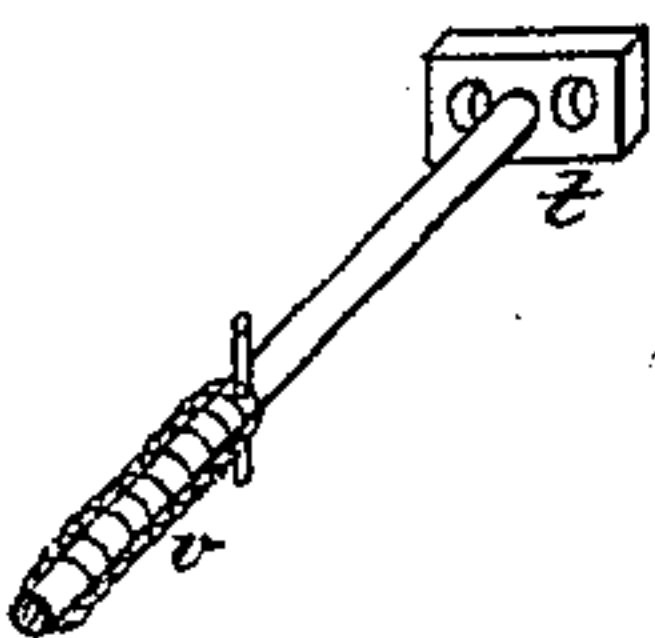


Fig. 2.

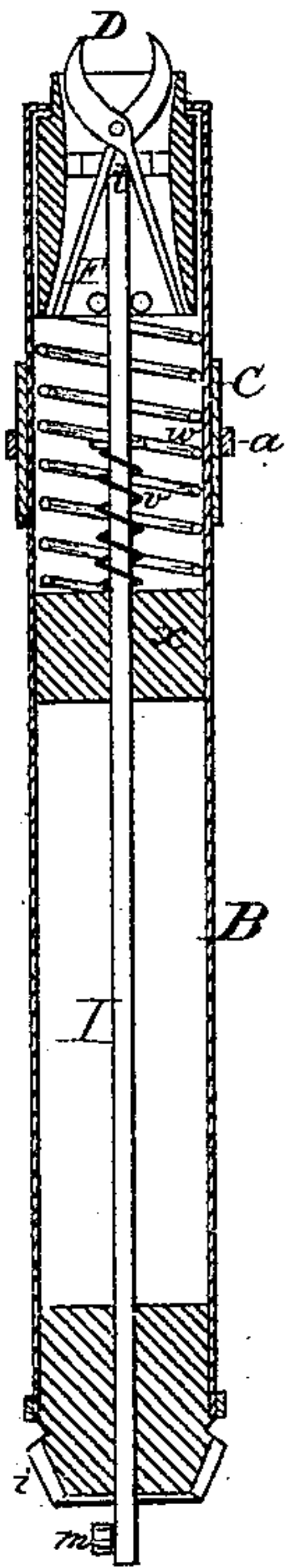


Fig. 3.

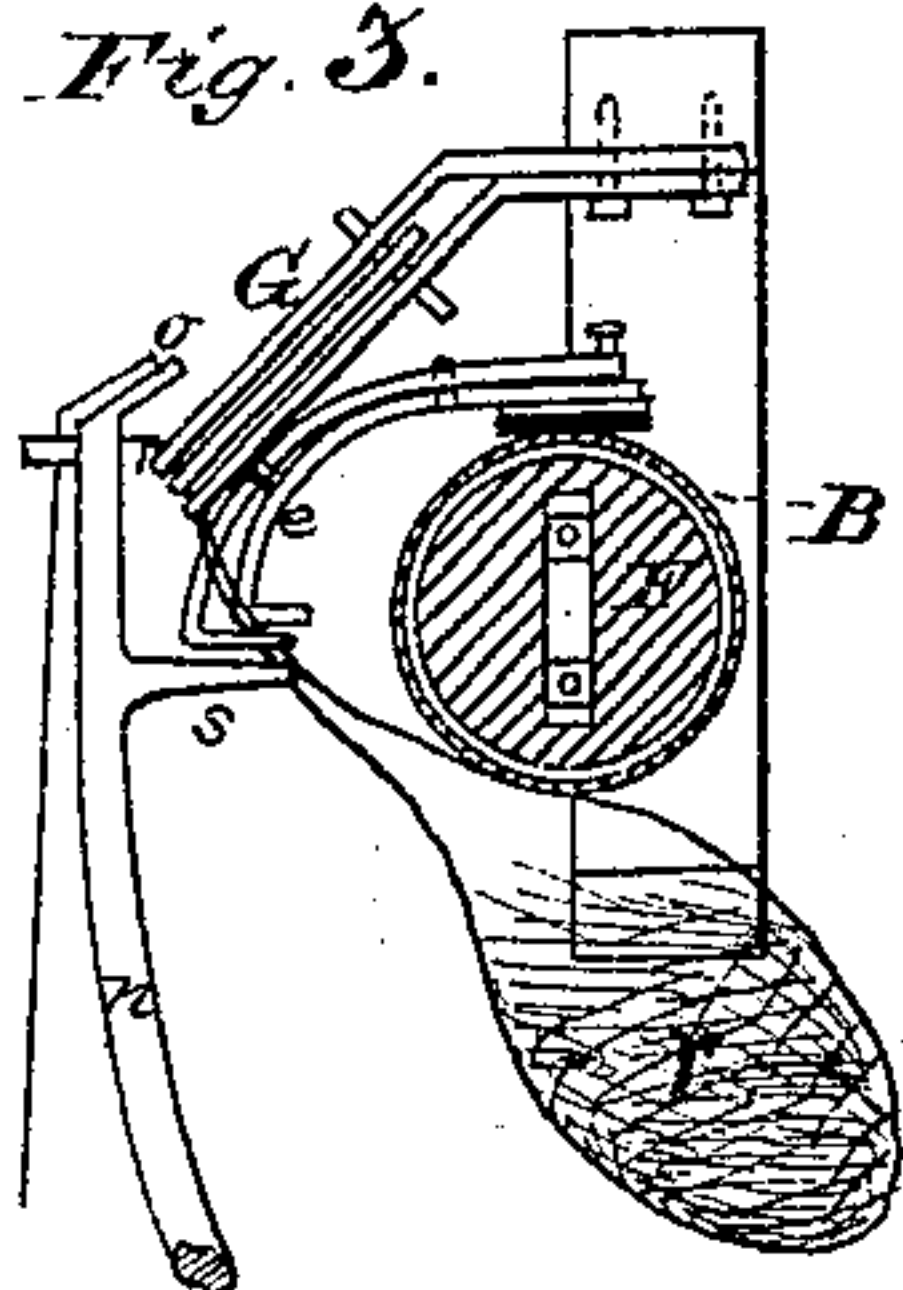


Fig. 1.

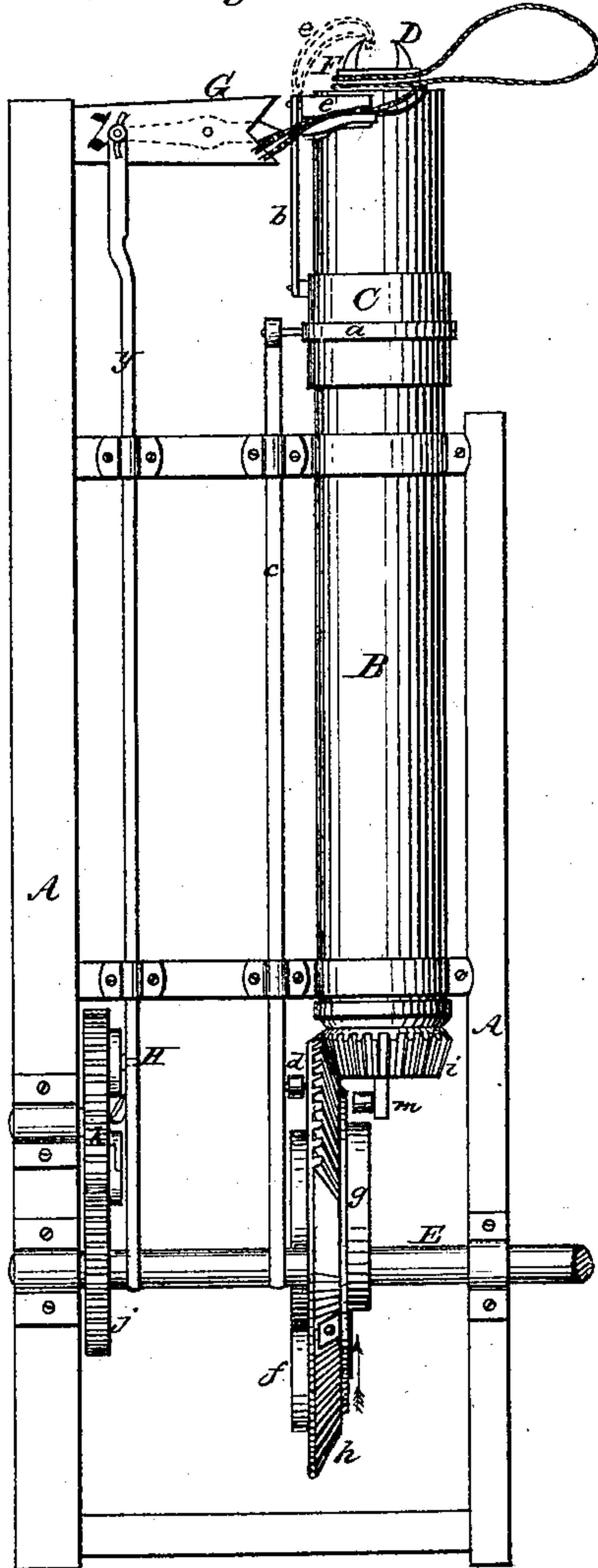
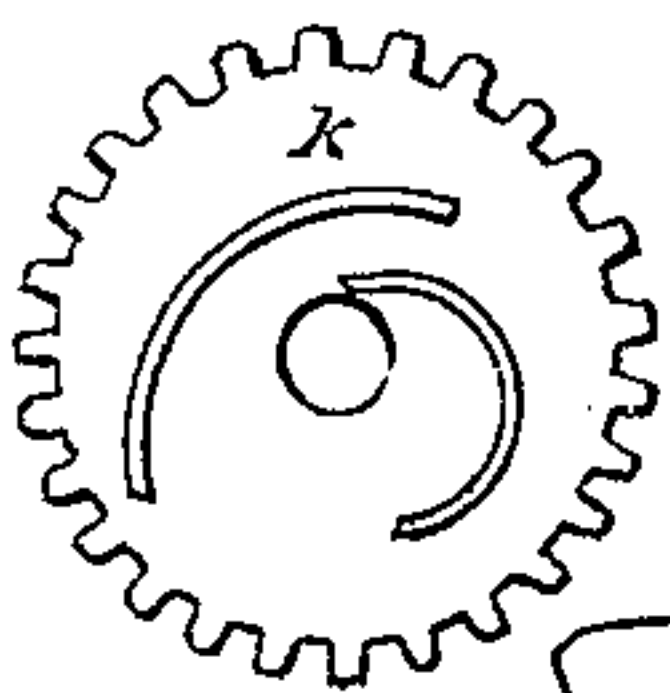


Fig. 8.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALBERT S. HOYT, OF WINONA, MINNESOTA.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. **141,507**, dated August 5, 1873; application filed October 10, 1872.

To all whom it may concern:

Be it known that I, ALBERT S. HOYT, of Winona, in the county of Winona and State of Minnesota, have invented certain new and useful Improvements in Grain-Binders; and I do hereby declare that the following is a full, clear, and exact description thereof, that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that class of grain-binders which are attached to a reaper or harvester, and as the grain is cut, gathered, and delivered to it in proper shape for binding it binds the grain into a bundle automatically, by the use of a cord, tying the same in a substantial manner around the bundle, cuts off the cord, and at the same time retains the end of the cord cut off from the bundle for the next operation. The object of my invention is to furnish a new and novel device which will act automatically, when attached to a reaper or harvester, to bind the grain into bundles in a substantial manner, and at the same time be simple in its parts, and thereby not liable to get out of order.

In the drawing, Figure 1 is a representation of a top view of my invention. Fig. 2 is a sectional view of the hollow spindle, showing the inside working parts. Fig. 3 is an end view of the hollow spindle, showing the position of the cord-carriers and the cord cutting and holding device. Fig. 4 is a perspective view of the cord-carriers. Fig. 5 is a representation of the knot as tied by my tying device. Fig. 6 is a perspective view of the sliding cross-head. Fig. 7 is a perspective view of the cord cutting and holding device with its connection detached. Fig. 8 is a side view of the gear-wheel *k*, showing its cams.

A is the frame of the machine. B is the hollow spindle. C is a sliding sleeve, having on it a loose ring, *a*. D is a pair of nippers, which draws the ends of the cords through the loop when formed. G is the cutting and holding device. F is a movable circular plug, which is situated inside of one end of the hollow spindle B, with its smaller end reaching out of an opening in the end of the spindle and serving

to wind the cords upon to form the loop. E is the driving-shaft, which is to be geared to the harvester. Upon the shaft E are two gear-wheels, *j* and *h*, the latter of which is peculiar in its construction. It has a section or segment of bevel-gear teeth on its outer rim, and on each of its sides is a sectional cam, which serves to operate different parts of the device. The gear-wheel *j* is so arranged that it engages with a second gear-wheel, *k*, which is twice the diameter of, and consequently revolves once to twice of, the wheel *j*. This second wheel *k* has two alternate cams on one of its sides, which operate the holding and cutting device G through its connection *y*. *e* is a pair of nippers, which we will call cord-carriers. These are fast to one side of the spindle B, near its end, and are so hung on a pivot as to swing over and carry and deliver the ends of the cords between the jaws of the nippers D.

The operation is as follows: First, the end of the cord is drawn from a spool (not shown) and strung through a hole in the pin on top of the broken arm *n*, Fig. 3, and then back again through the end of the arm *n*, and made fast to the holding device G. Now, as the arm *n* is hinged at its end, (not shown,) and is raised by the action of the harvester, there will be a portion of cord drawn off the spool. Now, as the harvester delivers the grain onto this cord, which bends down to receive it, then the arm *n* is caused to return to its position shown in Fig. 3, and it will be seen that the cord is thus passed around the bundle *r*, and the stud *s* on the arm *n* has pressed both cords into the notch in the cord-carriers *e*, in the position shown in Fig. 4. Now, motion is given to my tying device through its driving-shaft E, and the cam *f* comes in contact with the pin *d* on the connection *c*. This, by its connection with the sliding sleeve at *a*, will move it a little away from the end of the spindle B. This, in turn, by its connection *b* with one of the jaws of the cord-carriers *e*, closes the jaws of the cord-carrier onto both cords already in them. At the same time one of the cams *l* on the wheel *k* will come in contact with the connection *y*, by its pin *h*, and cause the shear of the cutting device G to cut off both cords between the cord-carriers *e* and the holder of the cutting and holding device G, and at the same time

the cord-holder will press and hold the end cut off (between it and the back of the shear) for the next operation. Then the segment of teeth on the wheel *h* will engage with the pinion *i* on the end of the spindle B. This will cause the spindle B to revolve once around, carrying the cord-carriers around with it, they still holding the ends of the cord. This movement of the spindle B and cord-carriers *e* will wind the cords once around the end of the movable plug F, as seen at Fig. 1. The spindle then stops, as there are no more teeth in the wheel *h*. Then the cam *f* on the wheel *h*, still in contact with the connection *c*, will cause a farther movement of the sliding sleeve C, and still, by its connection *b*, will cause the cord-carriers *e* to turn over to the position shown by dotted lines in Fig. 1, and carry both ends of the cord with them into and between the nippers D. Then the cam *g* on wheel *h* will come in contact with the pin *m* on the connection *i* of the cross-head *t*, better shown in Fig. 2. This causes the pinchers D to close upon the two cords already between them, and, by a continued movement of the cross-head, it will hit against the pins *u* and pull the movable plug F with it back into the spindle B. Thus, it will be seen, the nippers D have drawn both ends of the cord through the loop formed by winding the cords once around the plug F, and by the plug F being drawn into the spindle B the loop is pushed off its end by the end of the spindle, and the heft and expansion of the bundle will draw up the knot at once. At this point the cam *g* on wheel *h* will release the hold on the cross-head

t, and, by the action of the spiral springs *w* and *v*, between the fixed plug *x*, Fig. 2, and the movable plug F and cross-head *t*, the movable plug F and nippers D will be driven back to their position for another operation, and then, by loosing the hold on the cord and freeing the bundle at the same time, the cam *f* on wheel *h* will operate to bring the cord-carriers *e* back to proper position also for another operation.

I claim as my invention—

1. In a grain-binder, the bevel-wheel *h* provided with segmental gear adapted to the pinion *i* to operate the spindle B, in combination with the cam *g*, rod I, nippers D, and the cam *f* and rods *c b* and carriers *e*, all arranged to operate substantially in the manner and for the purpose described.

2. In a grain-binder, the gear-wheel *h* provided with a cam or cams, *l*, in combination with the pin H, rod *y*, and holding and cutting device G, all arranged to operate in the manner herein described.

3. In a grain-binder, the hollow spindle B, its plug F and nippers D, and rod I and its pin *m*, with or without the reacting spring *w*, all constructed, arranged, and operated substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 17th day of September, 1872.

ALBERT S. HOYT.

Witnesses:

JACOB STORY,

JAMES W. DYCKSON.