2 Sheets—Sheet 1.

G. W. HOBBS.

Grain Binder.

No. 196,452. Patented Oct. 23, 1877.

Fig. 1.

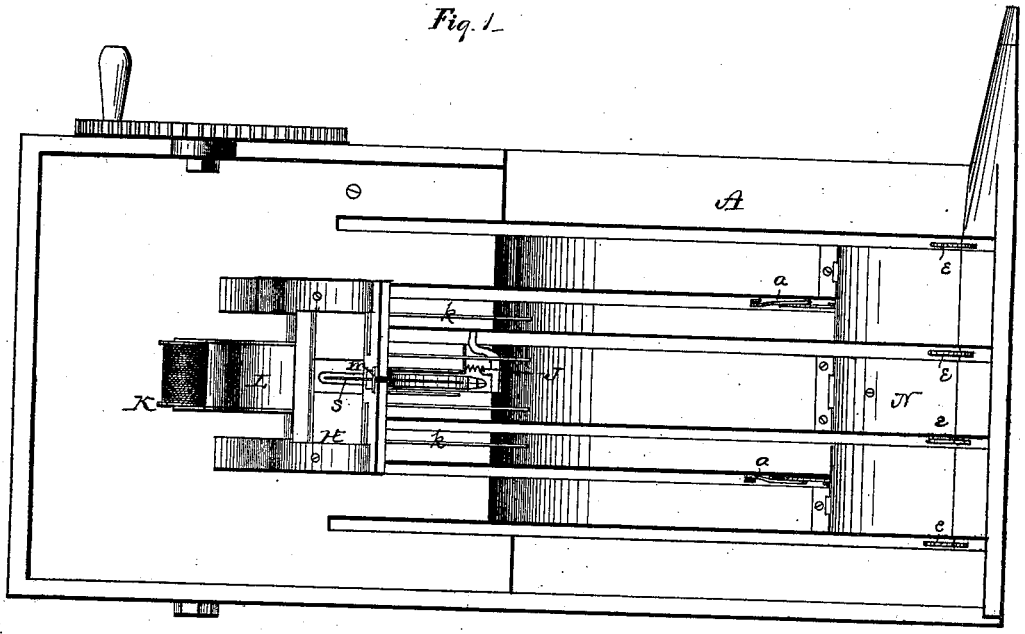


Fig. 2.

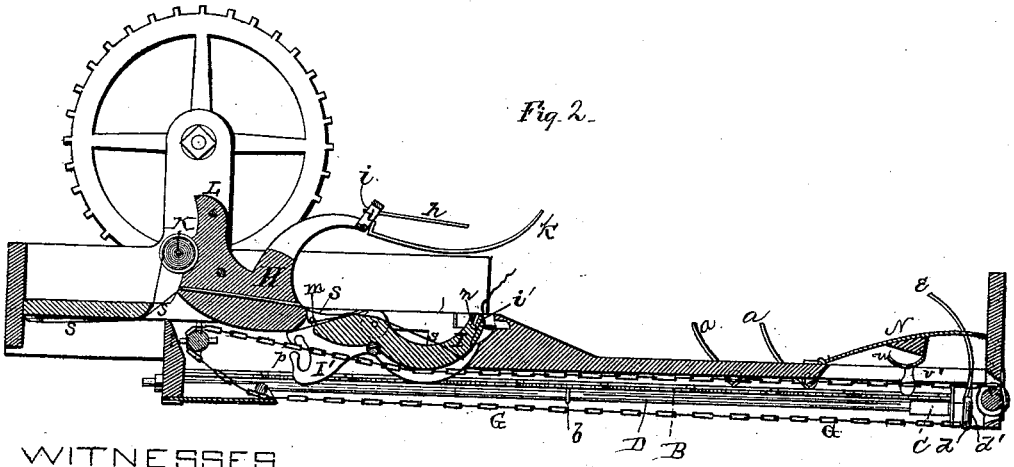
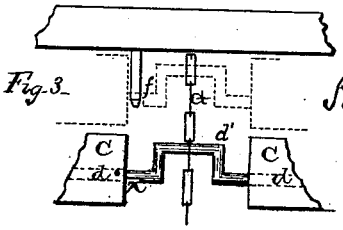


Fig. 3.



WITNESSES.

J. Wm. Garner,

Albert J. de Geyk

INVENTOR

George W. Hobbs.

per F. A. Lehmann, Atty.

2 Sheets—Sheet 2.

G. W. HOBBS.
Grain Binder.

No. 196,452. Patented Oct. 23, 1877.

Fig. 4.

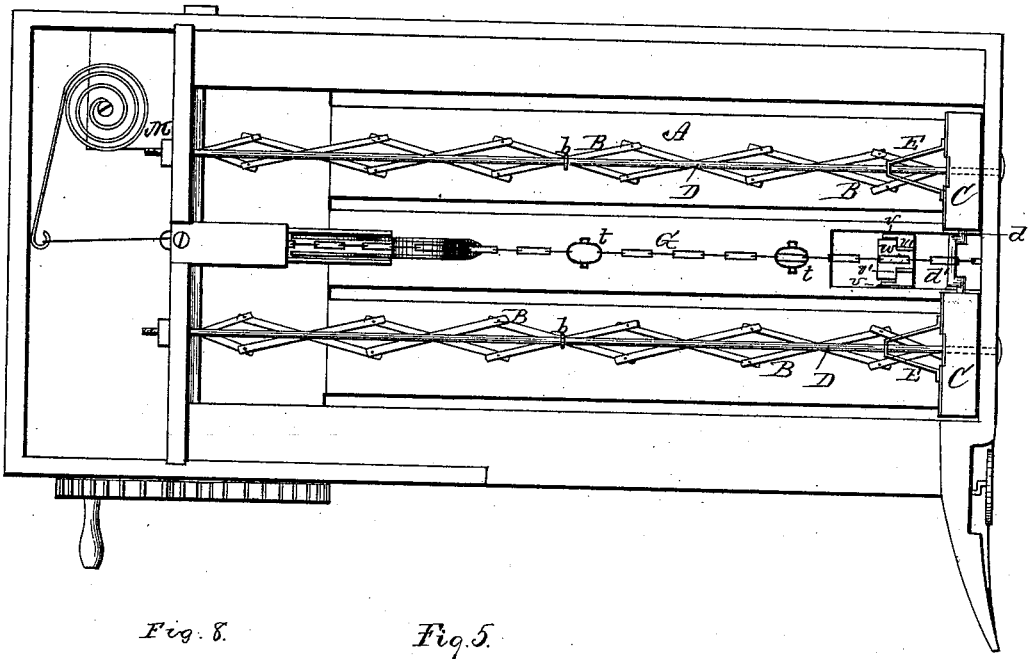


Fig. 8.

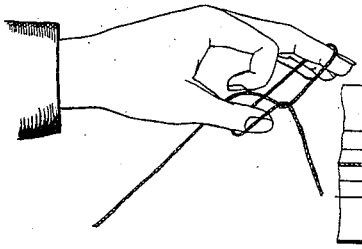


Fig. 5.

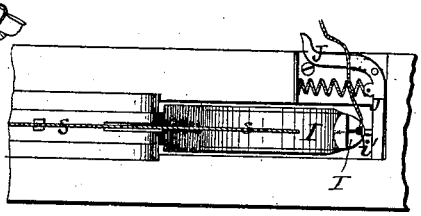


Fig. 6.

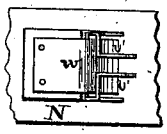


Fig. 10.

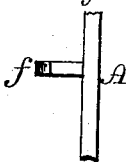


Fig. 7.

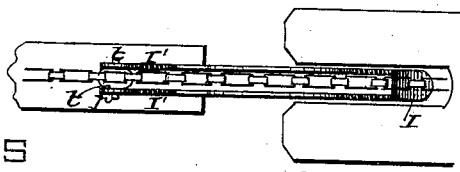
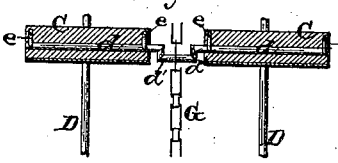


Fig. 9.



WITNESSES

J. Wm. Garner

Albert J. de Goyler

INVENTOR

George W. Hobbs.

per F. A. Lehmann Att'y

UNITED STATES PATENT OFFICE.

GEORGE W. HOBBS, OF APPLE CREEK, OHIO.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. **196,452**, dated October 23, 1877; application filed April 21, 1877.

To all whom it may concern:

Be it known that I, GEORGE W. HOBBS, of Apple Creek, in the county of Wayne and State of Ohio, have invented certain new and useful Improvements in 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.

The nature of my invention consists in the construction and arrangement of a binder attachment for reapers, as will be hereinafter more fully set forth.

The annexed drawings, to which reference is made, fully illustrate my invention.

A represents the platform of the reaper, upon which the grain falls as it is cut by the cutter-bar. Under this platform is arranged the packing mechanism, consisting of two compound levers, B B, arranged on the lazy-tongs principle. One end of each lazy-tongs B is attached to a stationary cross-bar under the platform, and the other end attached to a block, C, said blocks sliding upon stationary rods D D, as shown. In the center of each lazy-tongs B are two spring-teeth, *a a*, which incline forward so that about one-third thereof will project above the platform A. The object of these teeth is to gather and pack the sheaf in sections, and to give motion to the first part of the sheaf, so as to keep it moving in front of the rear part, which will prevent any drifting of straw over the rake-teeth.

Each sliding block C is provided with a guide, E, to hold it straight upon the rod D, and each lazy-tongs B has also a ring, *b*, around said rod, to cause it to work properly. In longitudinal slots in the blocks C is placed the rake-head *d*, which is provided with a crank, *d'*, between said blocks. *e e* are the rake-teeth, in front of which the blocks are cut away, and in rear of them the blocks form rests for the teeth, to prevent backward motion, the teeth being bent at their inner ends, as shown, to correspond with the shape of the blocks. The crank *d'* in the center of the rake-head gives leverage, and is attached to an endless chain, G, by which the rake is moved back and forward, and up and down. This crank also takes the power off the center of the rake-head when the teeth rise.

The rake-teeth *e* stand upright as the rake-head is being drawn toward the binder, and until they have passed the latch J. As the head moves backward, one of these teeth strikes against the back of the latch, and turns the crank-shaft partly around, thereby depressing the teeth below the level of the platform. The pull of the chain G upon the crank *d'* turns the shaft *d* back into position, thereby raising the teeth upward again. The teeth *a* are fastened at the joints of the tongs B, so that as the tongs are extended these teeth are moved farther and farther apart, and as the tongs are contracted they are drawn nearer and nearer together. As these teeth *a* move backward, they sink down between the slats, so as not to interfere with the grain that has fallen upon the platform.

In the rake-head *d*, on one side of the crank *d'*, is a notch, *x*, which, when the rake passes to the extreme outer end of the platform, enters a spring-latch, *f*, to prevent any forward motion of the rake until the teeth rise up, at which time the notch assumes another position by a partial revolution of the head, and causes the spring-latch to release the rake and allow it to pass forward. Thus any forward motion of the rake is prevented while the rake-teeth are down.

On top of the platform A, at the inner end, is secured the binder-head H, and in a slotted projection at the bottom thereof is pivoted the binder-arm I. The binder-head is constructed to form part of a circle in which the grain is forced and bound. In the center of the front cross-tie of the binder-head is made the noose-hole *i*, and above the same, in said cross-tie, is the noose-slide *h*, which is movable out and in. Four wires, *k*, project forward from the head, to keep the straw from the noose-hole *i*, and to keep the grain from rising up when forced on the string, so that the grain will be bounded on the upper side by said wires *k*, on the lower side by the platform, on the rake side by the rake, and on the opposite side by the string, and hence there is no way left for the grain to escape the string.

The string *s* is drawn from the spool K back

of the binder-head, passed through the end of the tension-spring M, forward through the loop *m* on the rear end of the binder-arm I, and then horizontally forward through a hole in the arm, and up vertically through another hole, *i'*, in the extreme end of the arm, as shown. As the chain moves forward, one of the links *t* on the chain catches in the cam *p*, and raises the outer end of the arm I upward until the end passes through the noose-hole *i*, carrying the string with it.

The end of the string is held in the right hand, the noose made over the left hand, as shown in Fig. 8, from six to eight inches from the end in the right hand, and placed on the noose-slide *h*. When the latch J is operated by one of the rake-teeth *e*, the binder-arm I rises, and after it passes through the noose the end of the string is put through the slot *n* in the end of the arm. Then, holding onto the string while the binder-arm is reacted back under the latch J, the noose-slide *h* is pushed in to release the noose, and the end of the string is drawn on, which will draw the noose out and thus form the junction. The noose should not be more than one-half inch in size. Then the string is cut between the sheaf and the latch, and the string then drawn off the spool, as before.

The binder that manipulates the string is seated on the seat L, directly in front of the spool.

The binder-arm I, when in the noose, forms a part of the circle around the bundle while it is being bound, and carries the string into the noose. The pivot of the arm I is on a line of the circle, and the part projecting below the pivot forms the binder-arm lever I'. On this lever is a cam, *p*, which is operated by a cam-link, *t*, on the chain G, to open and close the arm.

The string *s* passes from the spool K to and through an eye in a take-up spring, M, and from thence through the seat and binder-head; then through an eye in the lower end of lever I'; thence through the arm I, near the point, and through the point in a direction toward the spool.

The cam-link *t* of the chain G also operates a straw-guard, N, at the outer end of the platform A. This straw-guard is a little curved, and hinged to the platform. On the under side of this guard is placed a double cam, *v v'*, the upper side, *v*, of said double cam being large enough to let the link *t* pass through. The link then stops its forward motion, and is, by a spring, *w*, forced into the lower cam, *v'*, and this cam being too small to let the link *t* pass back, the link will force it out of its way, at which time the guard N will rise and throw the grain forward. At the same time the chain tumbles the rake behind the grain; then, when the cam-link passes the extreme point of the cam, the guard N will drop and resume its position. By these means the rake obtains its position behind the grain that actually fell behind the rake.

The endless chain G passes over suitable pulleys, one of which is on a shaft operated by suitable gearing, so that the chain will obtain a reciprocating motion.

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

1. The packing mechanism herein described, consisting of the lazy-tongs B and spring-teeth *a*, in connection with the rake *d e*, binder-arm I, and head H, substantially as and for the purposes herein set forth.

2. The combination of the lazy-tongs B, sliding blocks C, with braces E, guide-rods D, teeth *a*, rake *d e*, endless chain G, binder-arm I, and head H, all substantially as shown.

3. The binder-head H, constructed as described, and provided with wires *k*, noose hole and slot *i i'*, and noose-slide *h*, as and for the purposes set forth.

4. The latch J, in combination with the binder-arm I and one of the rake-teeth *e*, substantially as described.

5. The cam *p* on the binder-arm, and lever I', in combination with the cam-link *t* on the chain G, for the purposes specified.

6. The hinged straw-guard N, arranged on the platform A, and operated by means of the double cam *v v'*, spring *w*, and cam-link *t*, substantially as shown.

7. The noose-slide *h*, projecting through the front of the cross-tie of the binder-head, and made movable back and forth, so as to release the noose when the binder-arm has reacted, substantially as shown.

8. The binder-arm I, having a hole in its end, through which the binding-cord *s* passes, and slot *n*, and provided with the lever I' and cam *p*, in combination with the links *t*, whereby the binder-arm is operated, and the string carried through the noose-hole *i*, so that the knot may be tied, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 28th day of March, 1877.

GEORGE W. HOBBS.

Witnesses:

I. M. MERRIMAN,

A. H. JAMESON.