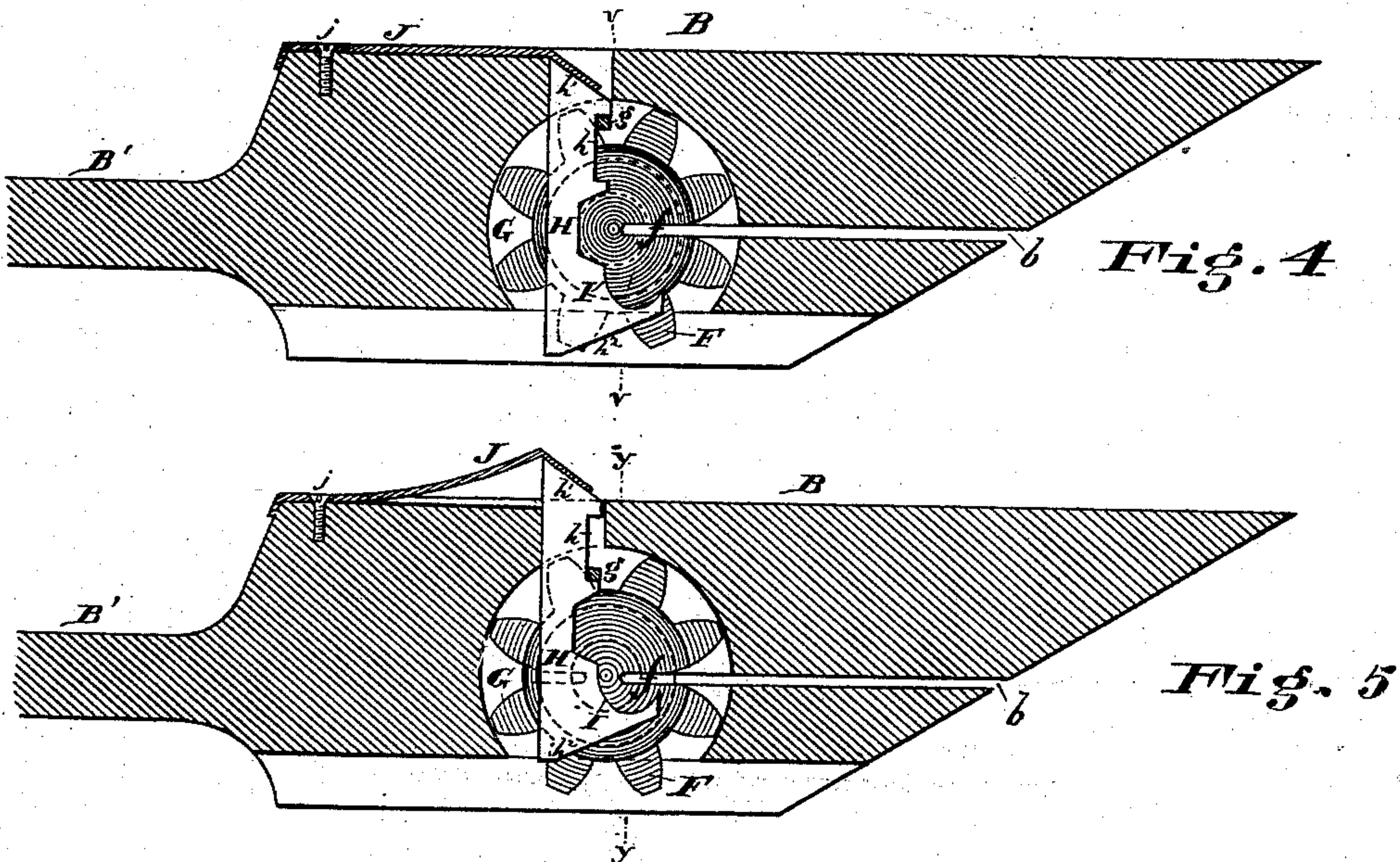
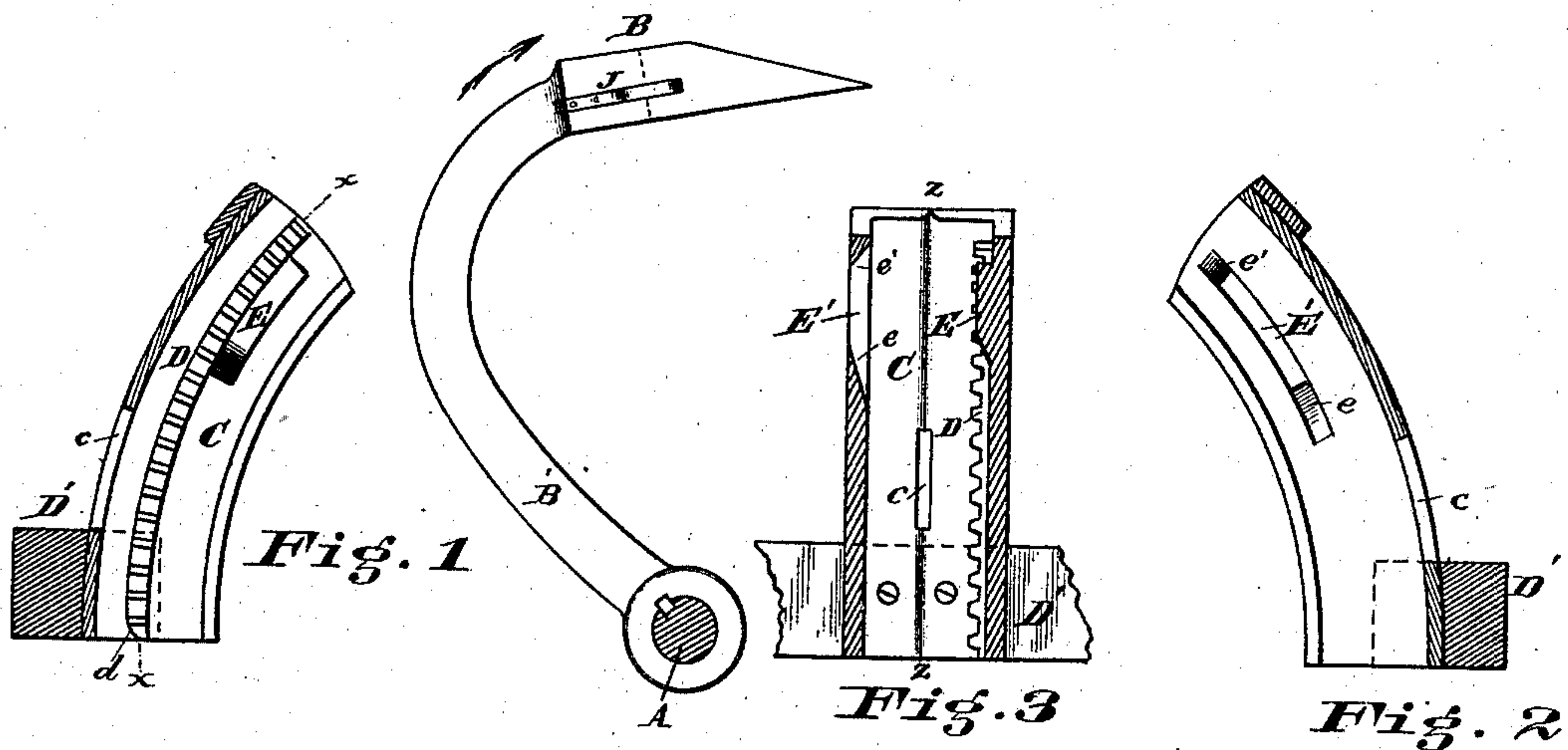


(No Model.)

M. G. HUBBARD, Jr.
Grain Binder.

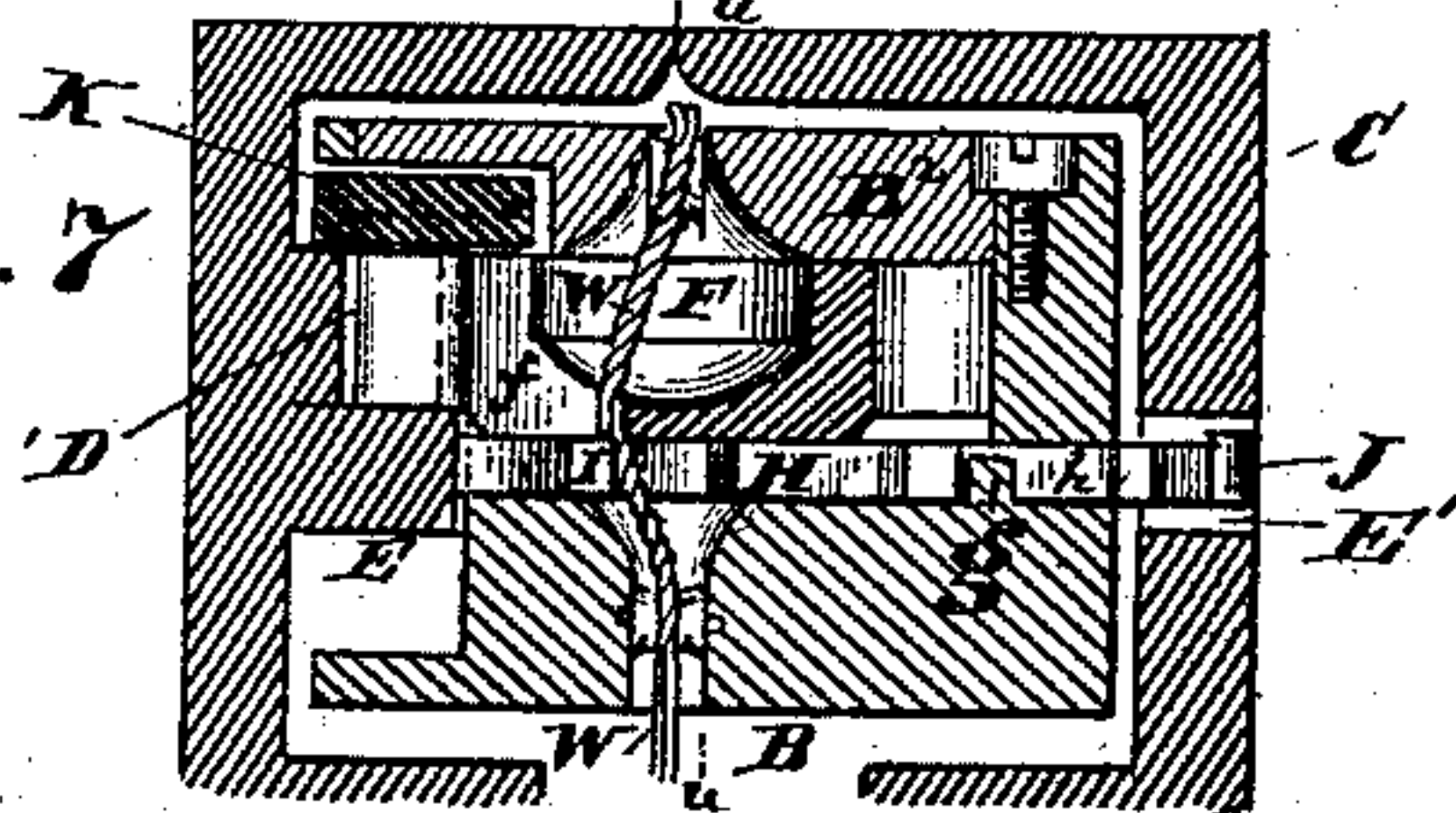
No. 238,904.

Patented March 15, 1881.



Attests
Wm. H. Williams
H. Williams

Fig. 7



Inventor
Moses G. Hubbard Jr.
By his atty.
Thos. A. Smith

UNITED STATES PATENT OFFICE.

MOSES G. HUBBARD, JR., OF NORRISTOWN, PENNSYLVANIA.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 238,904, dated March 15, 1881.

Application filed June 8, 1880. (No model.)

To all whom it may concern:

Be it known that I, MOSES G. HUBBARD, Jr., of the city 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-binders in general, but more particularly to that class of machines known as the "gleaner and binder," as manufactured by the Gleaner and Binders' Association of Norristown, Pennsylvania; and it consists in certain changes in the construction of wire binders heretofore used, so as to operate in a more effective manner, all of which construction and operation is fully set forth in the following specification, shown in the accompanying drawings, and referred to in the appended claims.

In the drawings, Figure 1 is a section of the rack-segment and binder-shaft on the line $z z$, Fig. 3, and shows the binder-head in elevation. Fig. 2 is a section of the rack-segment on line $z z$, Fig. 3, looking at the other side. Fig. 3 is a section of same on line $x x$, Fig. 1. Fig. 4 is a section of the binder-head, showing knife and pinion in position for twisting. Fig. 5 is a similar section to that shown in Fig. 4, only in this case the knife is in a position to sever the wire. Fig. 6 is a cross-section of Fig. 4 on line $v v$. Fig. 7 is a cross-section of Fig. 5 on line $y y$, and also a cross-section of the rack-segment.

A is the binder-head shaft, which is supported in brackets from the main sill or frame D' , and is rotated by any suitable means, passing the head B through the segment C, having a single gear-rack, D, on one side to rotate the slotted twister-pinion F, which at all other times is held in proper position by the spring-pawl K, and is released when said pawl K strikes the curved edge d of the gear-rack D. During the revolution of the binder-head B about its shaft A the slot f in the twister-pinion F is made to face the slot b in the binder-head.

Heretofore the binder-head usually had two slotted twister wheels or pinions, both of which twisted the wire, and one of which, having an extra turn, caused the wire to be severed. When two pinions are used it is necessary to have two spring-pawls and two racks in the segment.

Now, with my improved construction I dispense with one of the slotted twister-pinions, and in lieu thereof I substitute a knife or cutter, H, provided with a cutting-edge, I, and inclined or oblique edges $h' h^2$, which, by means of the spring J, is held stationary at some distance from the wire while it is being twisted, and then slightly moved and held in position by the cam-projection E on the side of the segment C, the opposite end and spring J passing through slot E' on the other side of the segment until the twister wheel or pinion F, in rotating, brings the wire around against the knife-edge I of the cutter H, by which, without any movement of the knife, the wire is gradually and easily cut or severed. This is effected by the slot f in the twister-pinion F being made a little less than the semi-diameter of the pinion, and the end of the cutting-edge I of the knife H being brought over, or nearly over, the center of the pinion, as shown in Fig. 5 of the drawings. After the end of the knife or cutter passes the cam E the spring J will cause the knife or cutter H to move back into its original position; but for greater certainty I locate the slot E' on the side of the segment C, and while it allows lateral movement due to spring J, its beveled edge or cam e' will force the knife or cutter back into position should it be obstructed by any foreign matter like gum or dirt or a pin from the end of the severed wire, or in any case where the spring J is inefficient. The cam-slot E' is furnished with beveled edges or cams e and e' . By this arrangement of a single gear-rack, D, a single slotted twister-pinion, F, a stationary knife or cutter, H, the cam E, and spring J, I am enabled to dispense with an entire gear-rack, one twister-pinion, and its spring-pawl, and at the same time attain a much more simple and effective device for twisting and cutting the wire, which makes a longer and stronger twist in the same space and cuts the wire more gradually and easily.

To obtain the most perfect shearing cut the knife or cutter should be shaped as shown in Figs. 4 and 5, in which the curve forming the cutting-edge I gradually approaches the center of the twister-pinion, and the cam E should be so located to slide the knife or cutter H into position that the wire will be cut on the second quarter of the last revolution of the twist-

er-pinion. The wire is brought in contact with the curved cutting-edge I of the knife, and by the resistance of the gear-rack the greatest possible perfection of cut is made.

- 5 The movement of the knife or cutter may be restricted by the projection or pin *g* and slot *h* in the knife.

The wire to bind the gavel or bundle passes from the rear spool through the slot *c* in the
10 segment C to the front spool in the ordinary way.

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

- 15 1. In a wire-twister for a grain-binder, the combination of the single slotted twister-pin-ion with its movable knife or cutter, having rectilinear reciprocation, and held stationary while cutting the wire, substantially as and
20 for the purpose specified.

2. In a binder for grain, the combination of the segment C, provided with a single rack,

D, and cam E, head B, carrying the slotted pinion F, cutter H, having rectilinear reciprocating motion, and spring J, substantially as 25 and for the purpose described.

3. In a binder for grain, the slotted twister-pin-ion F, in combination with the cutter H, having rectilinear reciprocating motion, and spring J, substantially as and for the purpose 30 specified.

4. In a binder for grain, the combination of cutter H, having cutting-edge I and beveled edges *h'* *h*², with segment C, provided on one side with the cam-projection E and on the op- 35 posite side the slot E', having beveled edge *e'*, substantially as described.

In testimony of which invention I hereunto set my hand.

M. G. HUBBARD, JR.

Witnesses:

HENRY R. BROWN,
WALTER S. JENNINGS.