

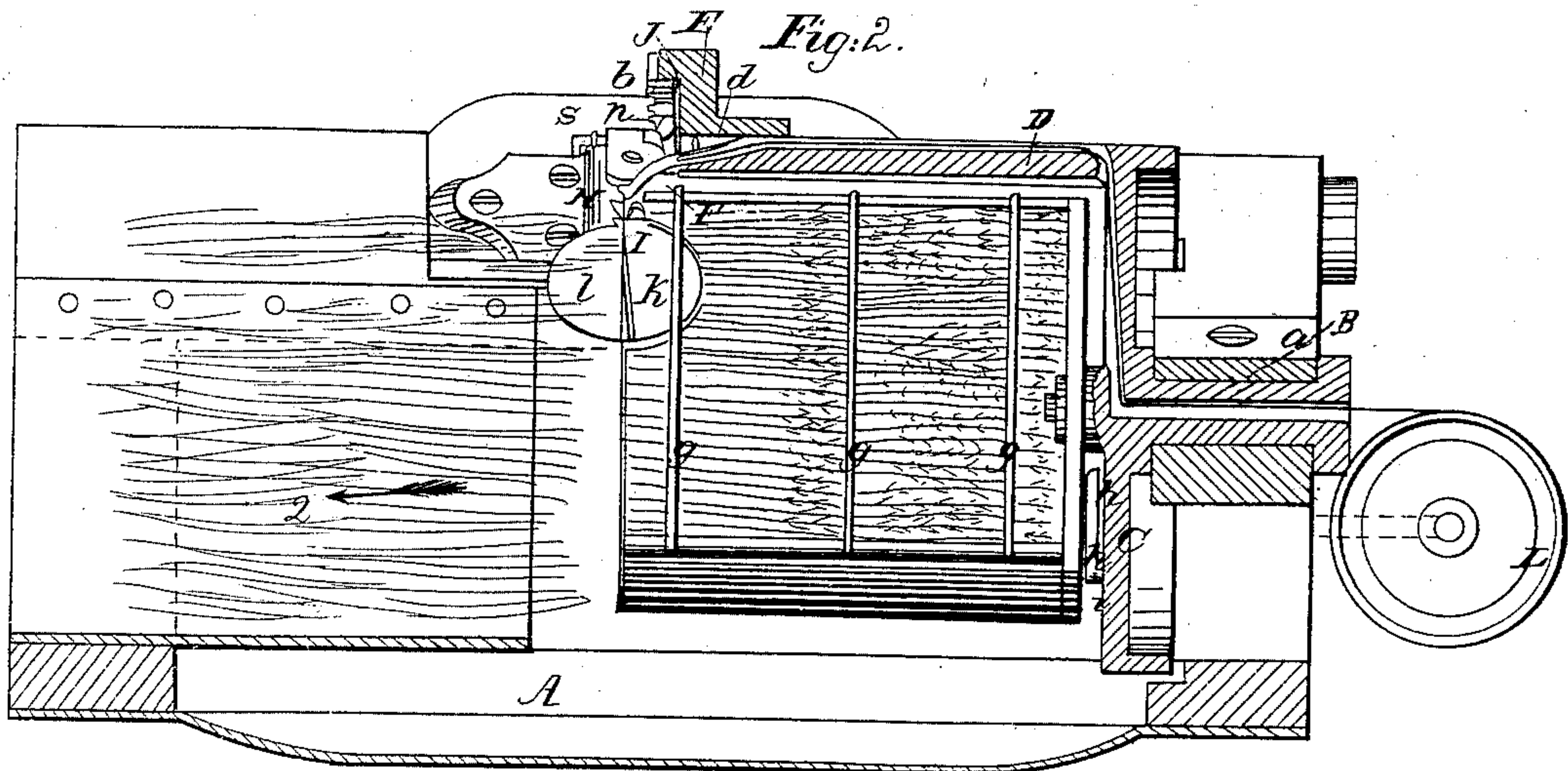
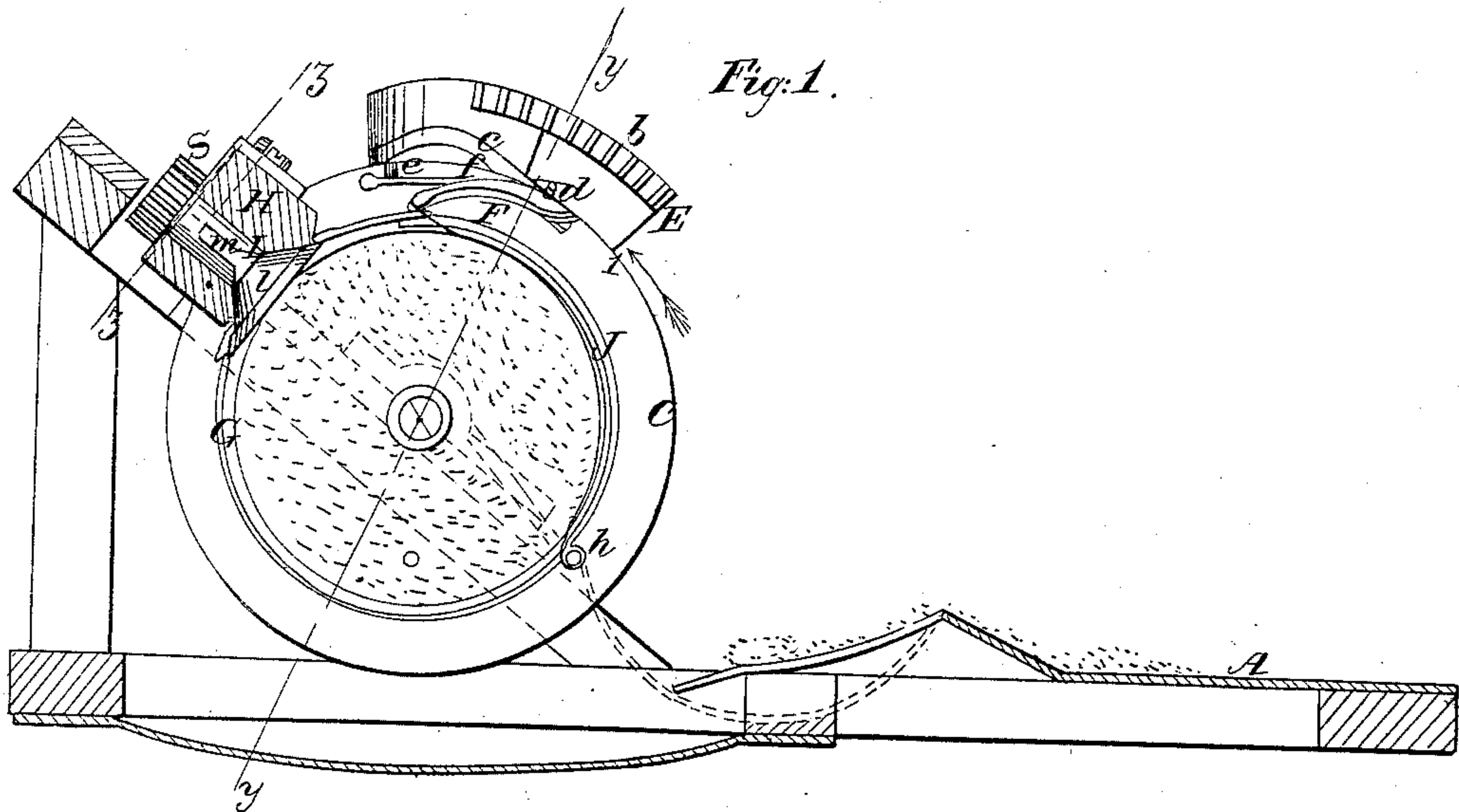
D. W. AYRES.

2 Sheets—Sheet 1.

Grain-Binder.

No. 28,338.

Patented May 22, 1860.



Witnesses

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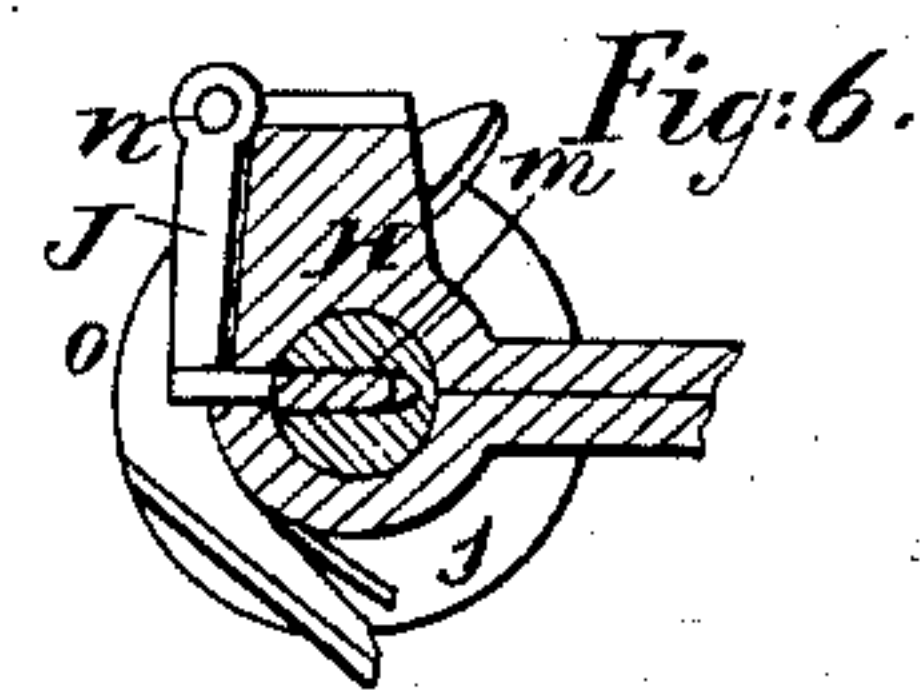
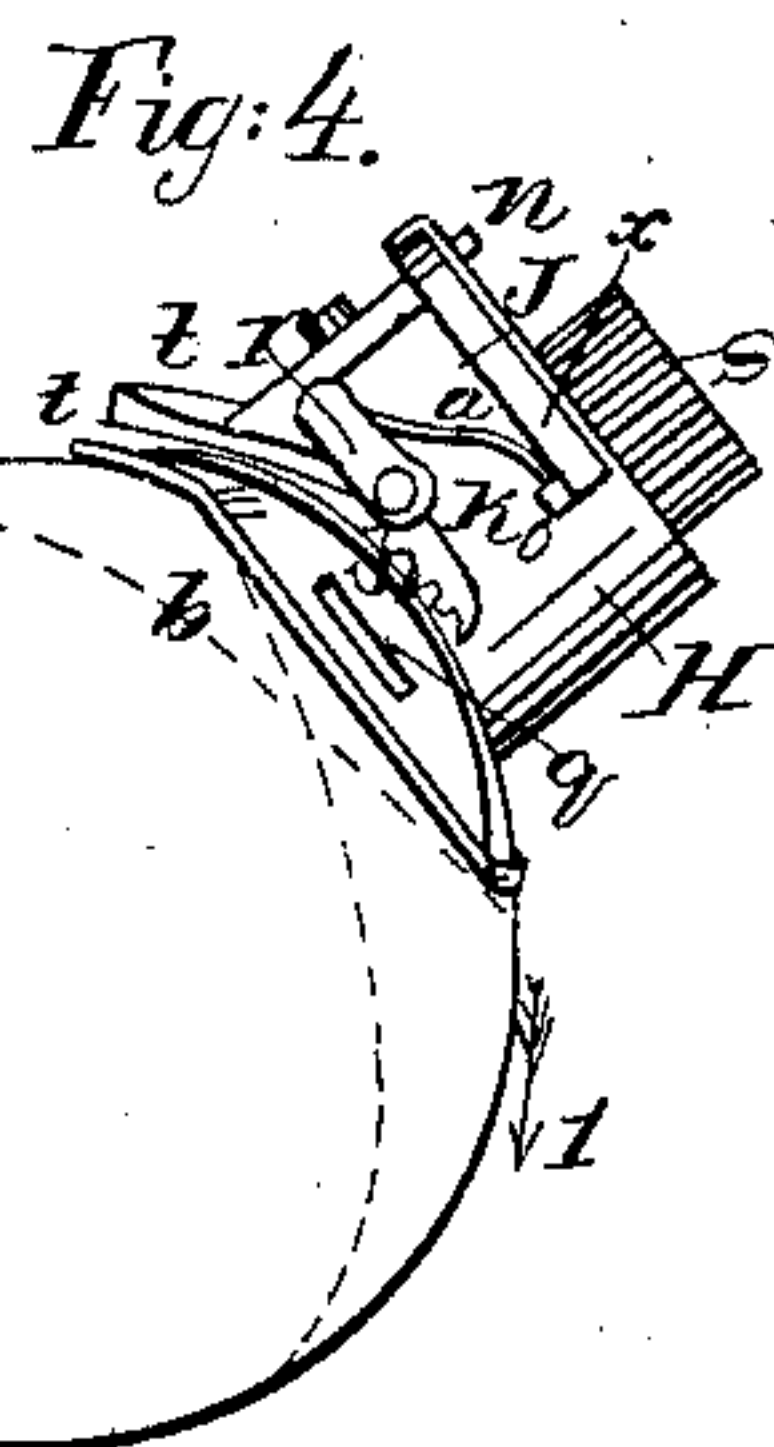
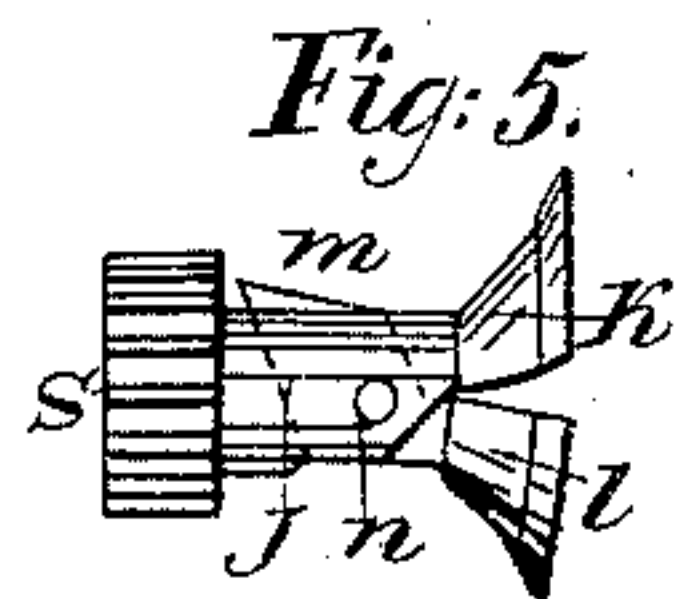
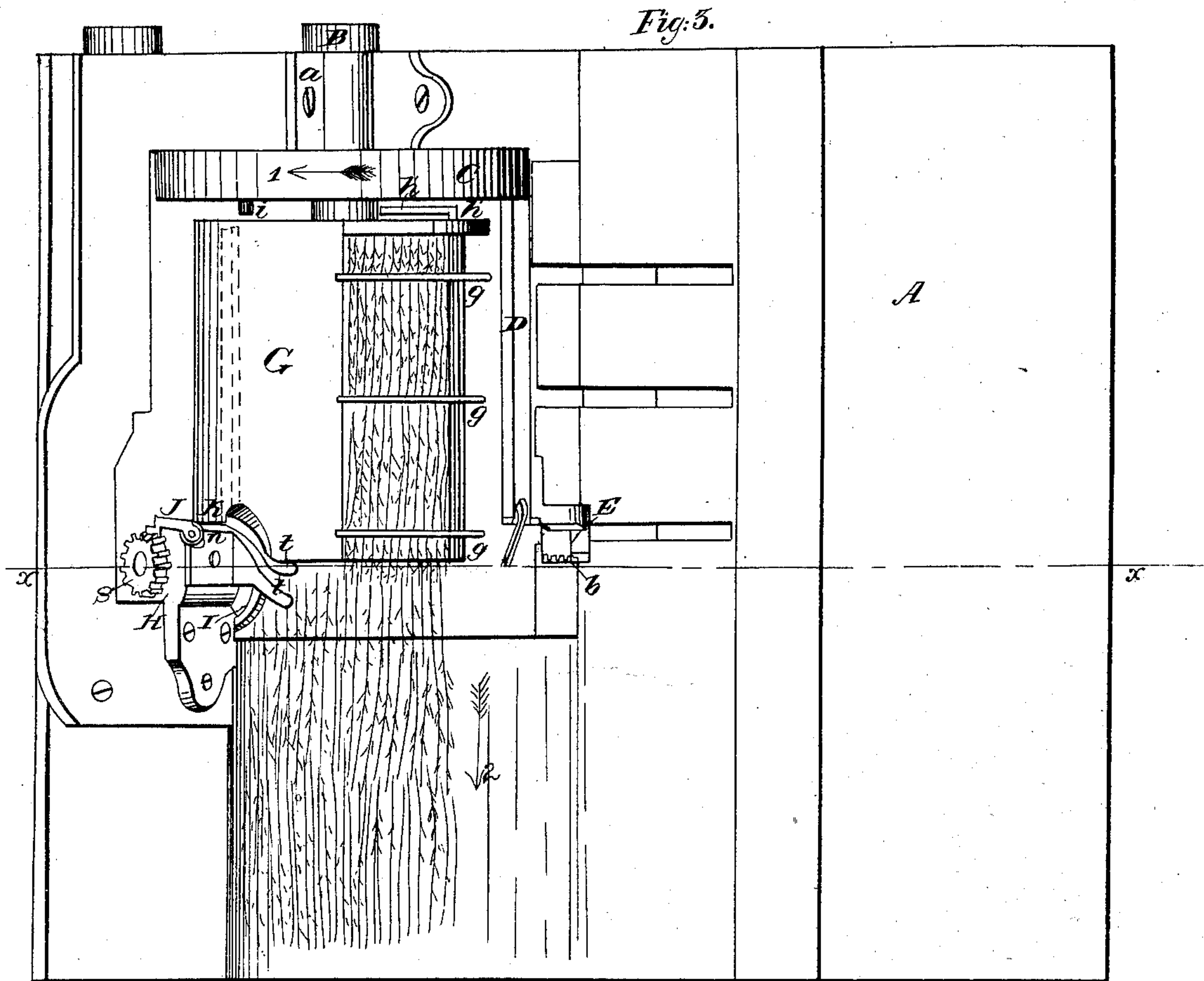
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# UNITED STATES PATENT OFFICE.

DANIEL W. AYRES, OF MIDDLEPORT, ILLINOIS.

## IMPROVEMENT IN GRAIN-BINDING MACHINES.

*Specification forming part of Letters Patent No. 28,338, dated May 22, 1860.*

*To all whom it may concern:*

Be it known that I, D. W. AYRES, of Middleport, in the county of Iroquois and State of Illinois, have invented a new and Improved Grain-Binding Attachment for Reapers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a transverse vertical section of my invention, taken in the line  $x x$ , Fig. 3; Fig. 2, a section of my invention, taken in the line  $y y$ , Fig. 1; Fig. 3, a plan or top view of my invention; Figs. 4 and 5, detached views of portions of my invention; Fig. 6, a section of a portion of my invention, taken in the line  $z z$ , Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in the employment or use of a rotating arm, stationary gavel-receiving box, twisting device cutter, and holder, and fingers or teeth, all arranged substantially as hereinafter fully shown and described, whereby the gavels may be bound, and the binding-wire twisted and cut and secured in proper position for a succeeding operation, all the parts working automatically by the turning of a single shaft, and a gavel bound at each revolution of said shaft.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents the platform of an ordinary reaper, and B is a hollow shaft, which is fitted in a proper bearing,  $a$ , on the framing of the platform. To the inner end of the shaft B a circular disk, C, is attached, said disk having an arm, D, projecting horizontally from it at its periphery, as shown clearly in Figs. 2 and 3. To the end of the arm D a geared segment, E, is attached, the face side of which, below its teeth,  $b$ , has a curved slot,  $c$ , made in it, as shown clearly in Fig. 1, the teeth  $b$  projecting beyond the face of the segment, as shown clearly in Fig. 2. To the end of the arm D a curved rod or bar, F, is attached by a pivot,  $d$ , said rod or bar being pivoted in a recess,  $e$ , into which at certain times it is forced against a spring,  $f$ , which has a tendency to keep the

rod or bar thrust out from the arm D. (See more particularly Fig. 1.)

G is a semi-cylindrical box, which is secured in a permanent position concentrically with the disk C, and has three curved teeth or fingers,  $g$ , at its front end, said teeth or fingers being secured to a rod,  $h$ , which is allowed to turn in a bearing on the box G. One end of the rod  $h$  is bent at right angles to the other part, as shown at  $h'$ , and said bent part extends within the space between the disk C and the end of box G, and within the path of rotation of a pin,  $i$ , attached to disk C.

To the framing of the platform A, and at a point opposite the upper end of the box G, there is secured a bearing, H, in which a twister, I, is secured. This twister is formed of two parts, one part being comprised of a cylinder or arbor, J, with a semicircular head,  $k$ , and the other part being comprised of a similar semicircular head,  $l$ , attached to a shank,  $m$ , which is pivoted in the arbor  $j$ , as shown at  $n$ , Fig. 5. The straight edges of heads  $k$  and  $l$  are opposite or face each other, and by moving shank  $m$  the straight edges of the heads may be entirely closed. This moving of shank  $m$  is performed in a way hereinafter shown.

To one side of the bearing H a hooked or bent bar, J, is attached by a pivot,  $n$ , the outer end of said bar passing into an opening,  $o$ , in the bearing H, opposite the upper end of the shank  $m$  of the twister I. To the same side of the bearing H there is attached a lever, K, which forms a cutter and holder for the wire, said lever performing the function of a cutter in consequence of a cutting projection,  $p$ , at its under side, and the function of a holder in consequence of tooth-like projections,  $q$ , adjoining the cutter. (See Fig. 4.) The lever K has a pin,  $r$ , projecting horizontally from it, the object of which will be presently shown.

The upper end of the arbor  $j$  of the twister has a pinion,  $s$ , on it, said pinion being within the path of rotation of the segment E, and the lower part of the bearing H has two projecting ends,  $t t$ , which are nearly in line with the bar or rod. To the framing of the platform A, and directly opposite the outer end of the hollow shaft B, there is placed a wheel, L, on



which the wire M is wound that is used for binding the gavels.

The operation is as follows: The wire M is passed through the hollow shaft B, through the disk C in a straight or radial direction, and through the arm D, and then through an eye in the outer end of the rod or bar F. At the commencement of the operation the attendant places the end of the wire under the holding-teeth *g* of the lever K, the spring *a*<sup>x</sup> of said lever causing the wire to be firmly held. The fingers *g* are turned outward and fit in recesses in the platform, and the gavel to be bound is raked on them toward the box G. The disk C is then turned in the direction indicated by arrow 1, and the arm D will rise and close the fingers *g* which confine the gavel in the box G, and the wire M, the end of which is held by the teeth of the lever K, is carried around the gavel by the rotation of the arm D. The rod or bar F conducts the wire between the projecting ends *t t* of bearing H, and causes the same to pass down between the heads *k l*. It will be understood that the wire now encompasses the gavel, and that both ends of the wire are between the heads *k l*, as the end first secured by the lever K passed between the heads as the arm D first rotated. The face of the segment E now strikes the bent bar J, and causes the latter to bear against the shank *m* of the head *l*, closing the same and causing the ends of the wire to be firmly grasped. The rod or bar F then carries the

wire under the lever K, and the pin *r*, as the segment and arm D move, passes into the groove *c*, which actuates lever K, and causes the wire to be cut; the teeth *q* retain the end, however, for a succeeding revolution of the arm D. At this instant the teeth *b* of the segment E engage with the pinion *s*, and the heads *k l* are rotated, making one revolution, and thereby securing the wire around the gavel. The gavel or sheaf is then removed from box G endwise, as indicated by arrow 2, and the succeeding operation follows.

The shaft B and arm D may be rotated manually, the wire being drawn from the wheel L by the rotation of the arm D, or they may be operated from the driving-wheel or other working parts of the machine.

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

The employment or use of the rotating arm D with the toothed segment E and rod or bar F attached, in connection with the stationary box G, the twister formed of the stationary and movable heads *k l*, and the holder and cutter formed of the lever K, provided with cutting and holding teeth *p* and *q*, all being arranged for joint operation, substantially as and for the purpose set forth.

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