

(No Model.)

2 Sheets—Sheet 1.

J. F. HATFIELD.

GRAIN SEPARATOR.

No. 373,737.

Patented Nov. 22, 1887.

Fig. 1.

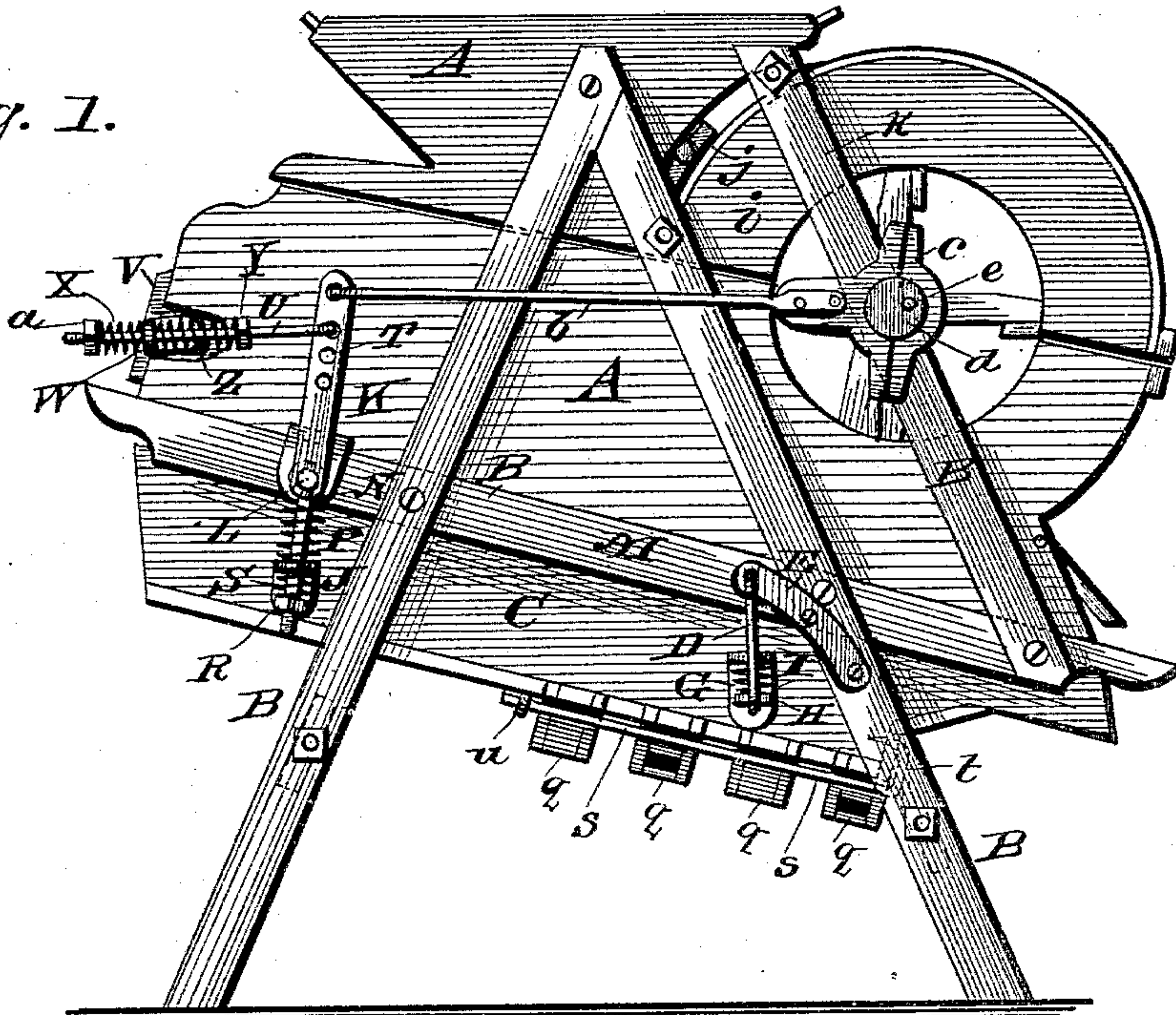
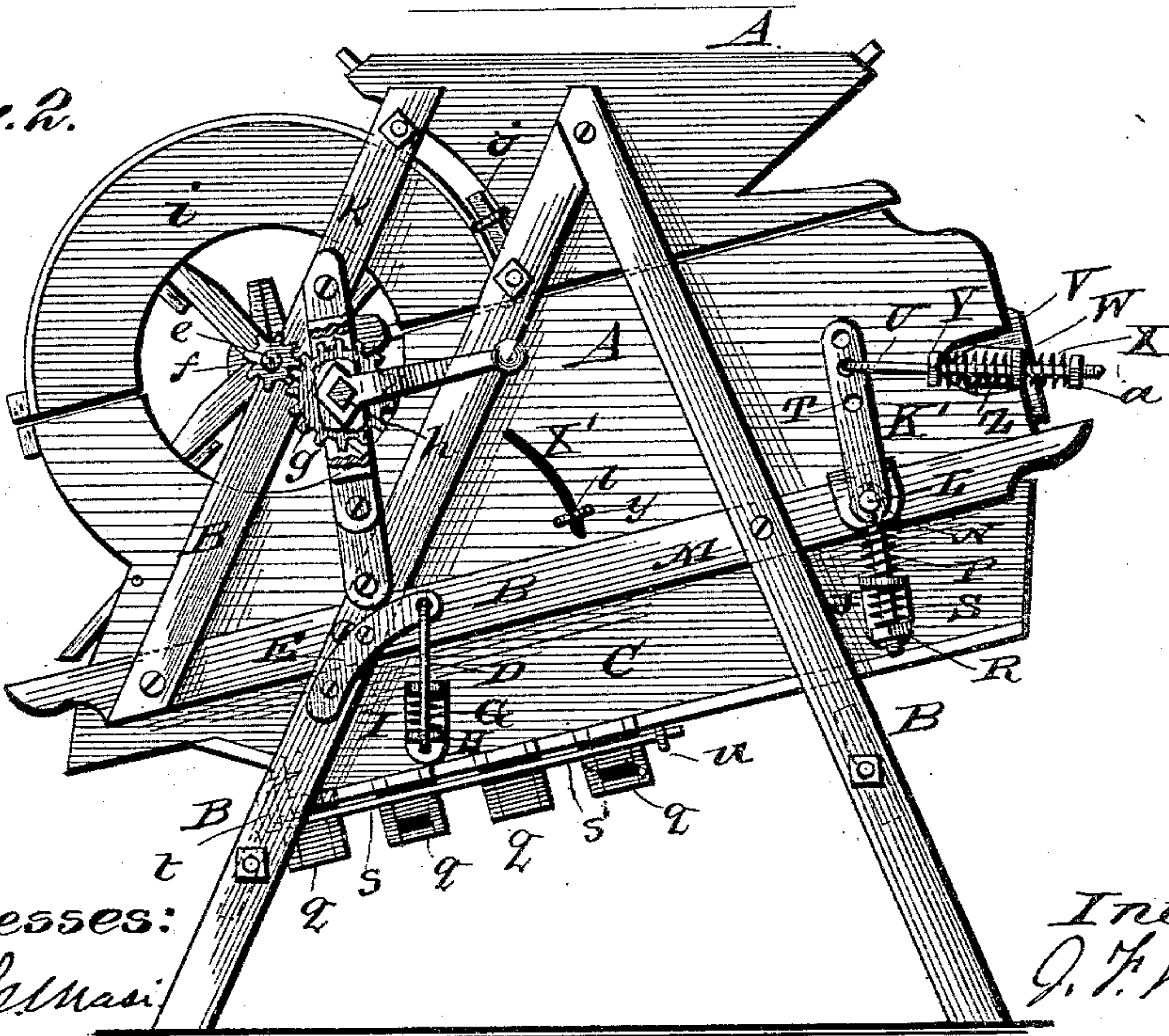


Fig. 2.



Witnesses:

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Inventor:

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2 Sheets—Sheet 2.

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Fig. 3.

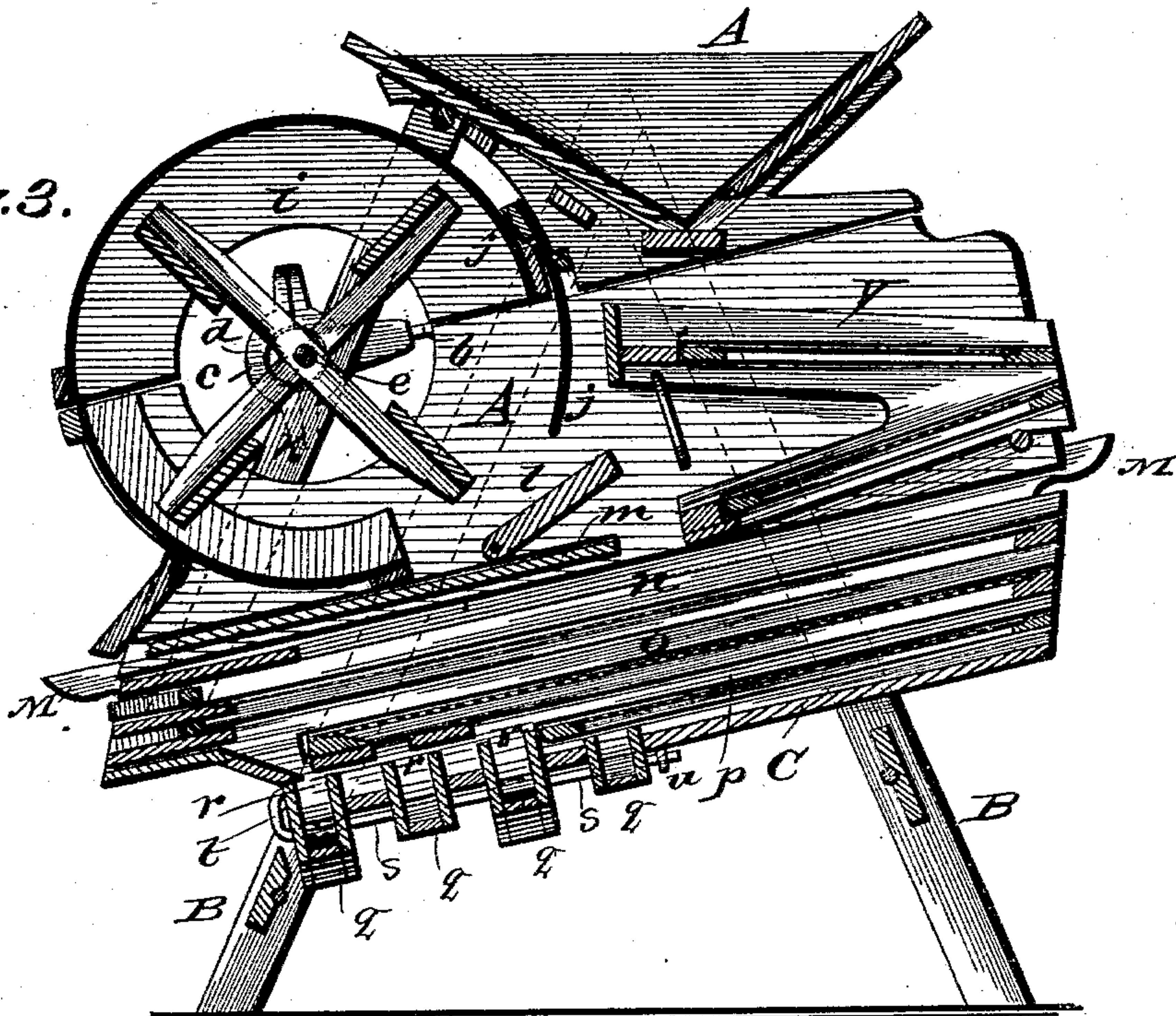


Fig. 4.

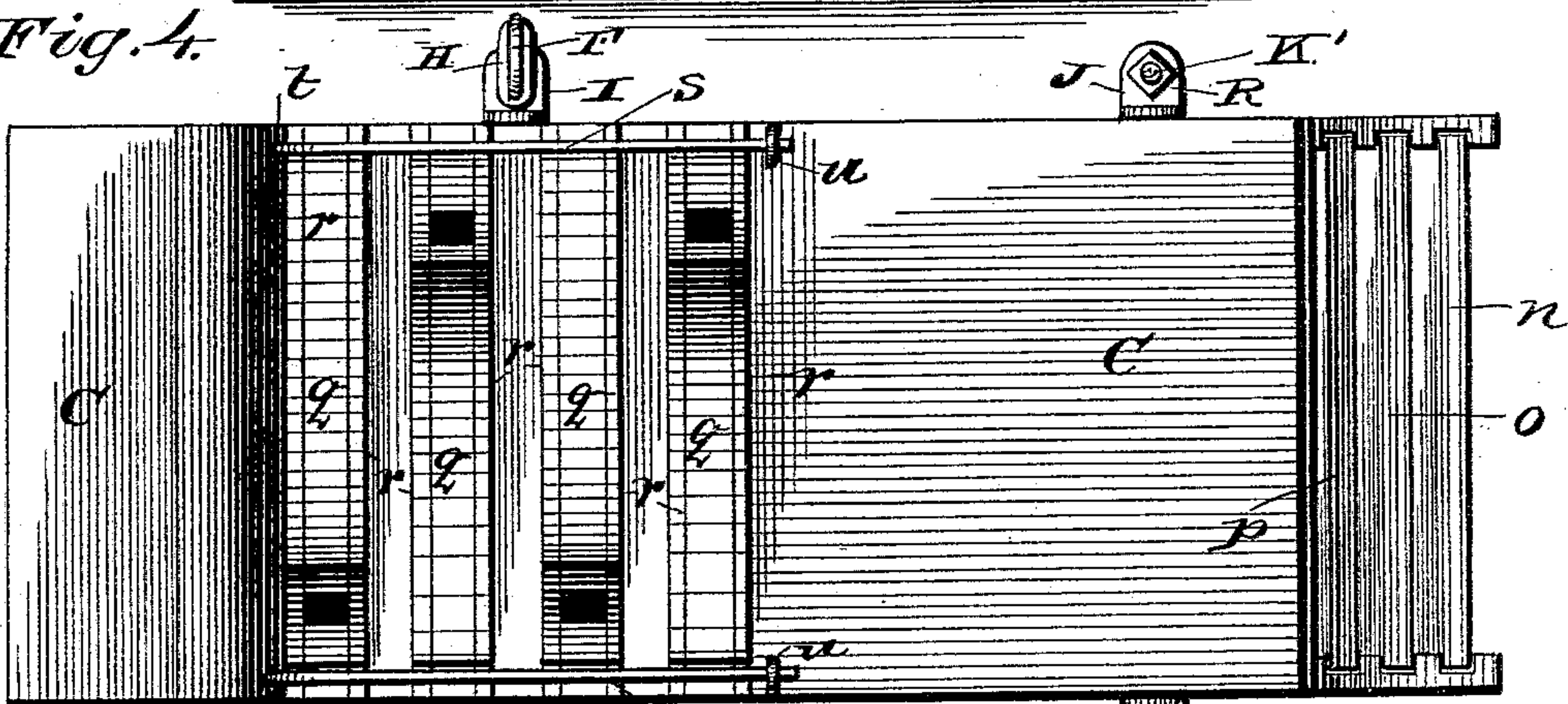


Fig. 5.

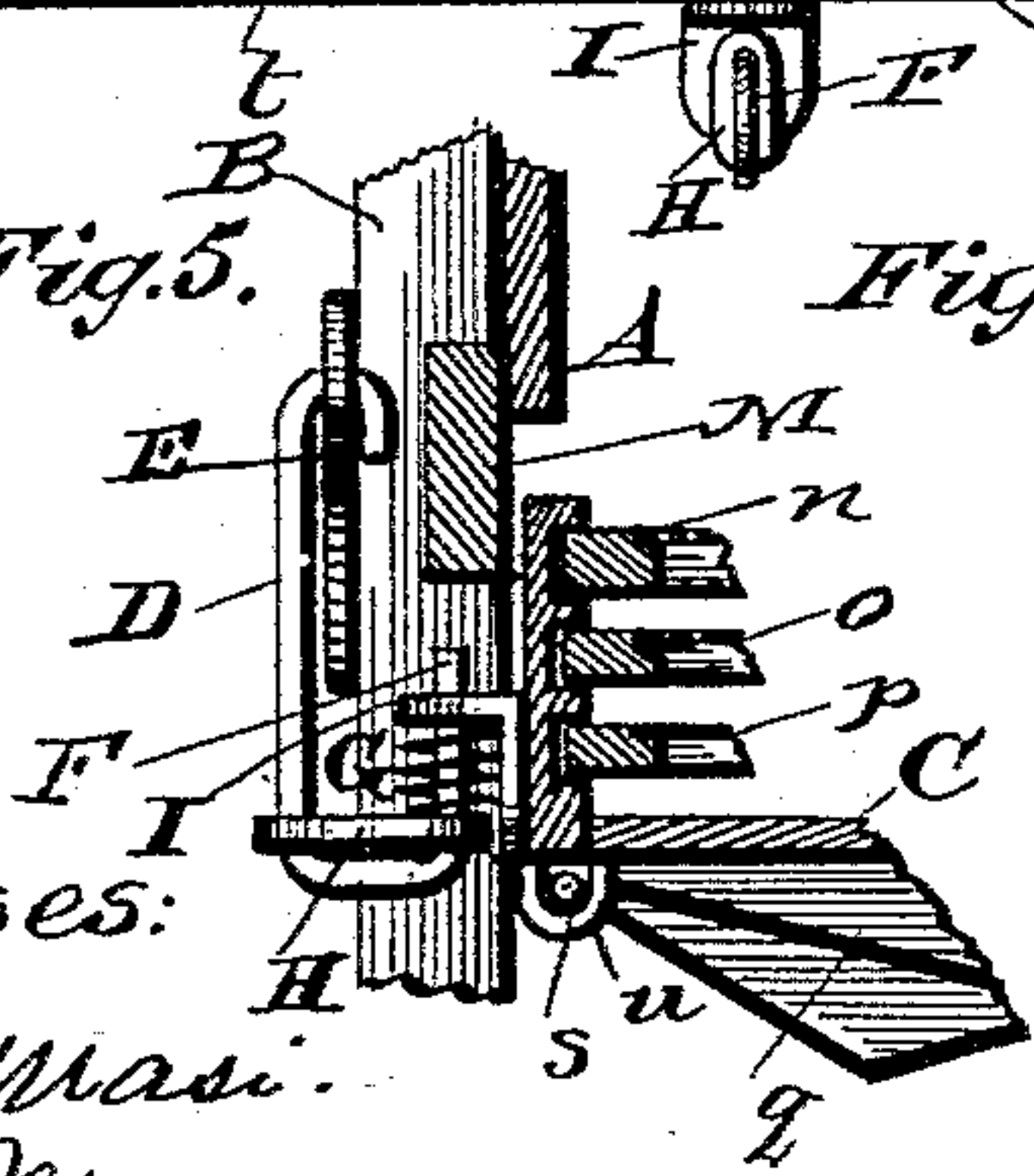


Fig. 6.

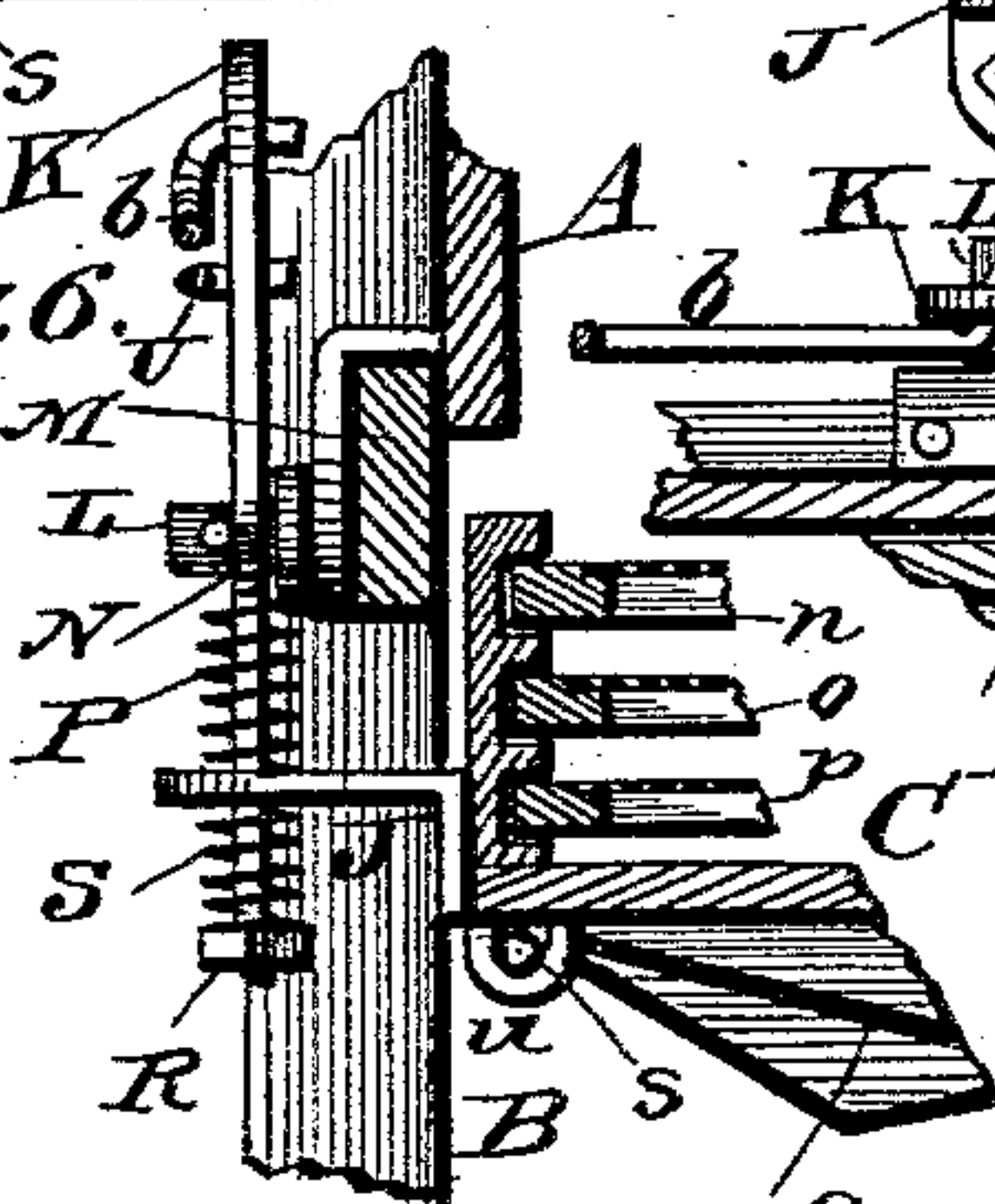
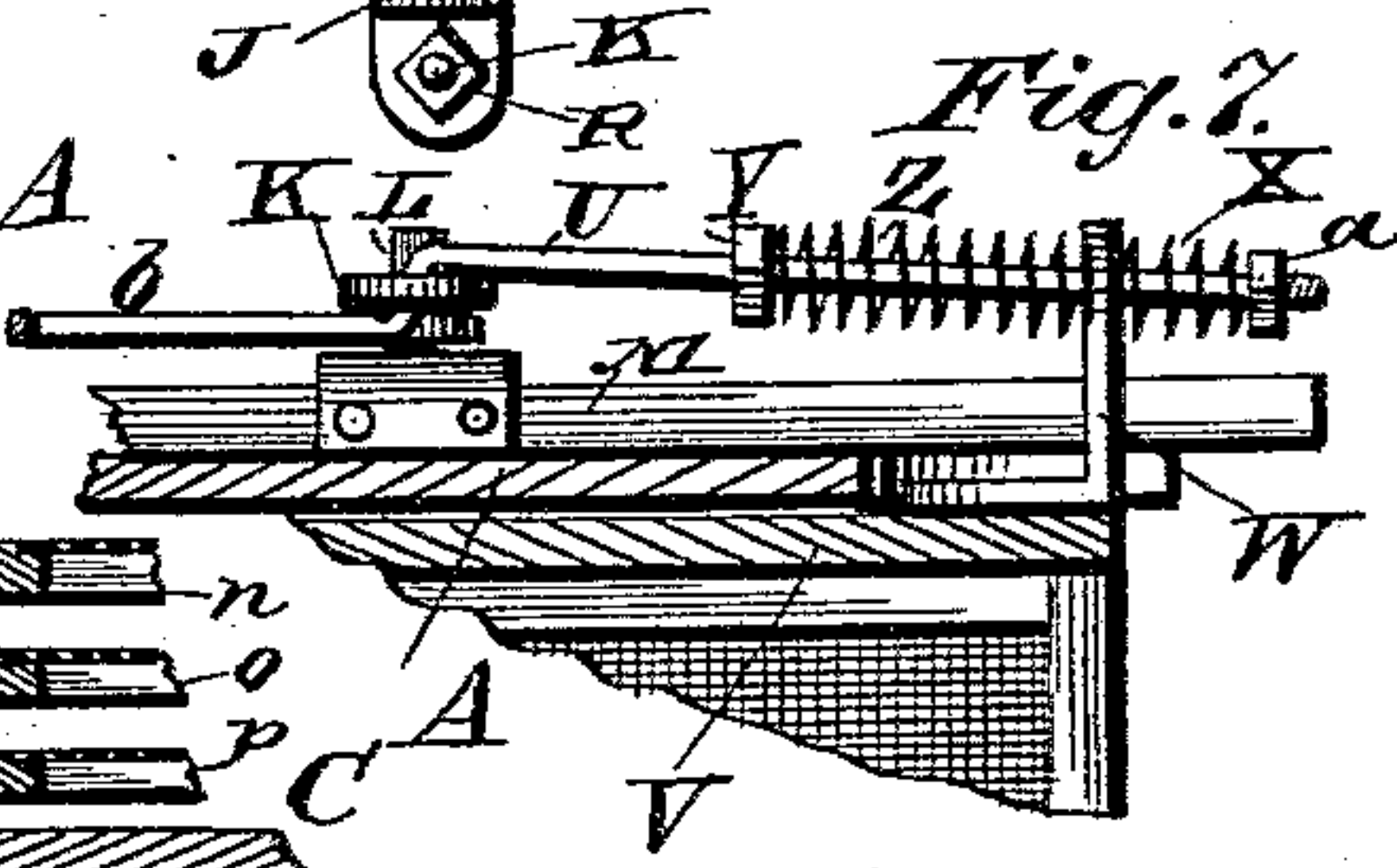


Fig. 7.



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# UNITED STATES PATENT OFFICE.

JAMES F. HATFIELD, OF DUBLIN, INDIANA.

## GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 373,737, dated November 22, 1887.

Application filed September 23, 1886. Serial No. 214,743. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. HATFIELD, a citizen of the United States, and a resident of Dublin, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Grain-Separators; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation of a side elevation. Fig. 2 is a similar view of the opposite side. Fig. 3 is a vertical longitudinal section. Fig. 4 is a bottom plan view of the grain-shoe. Figs. 5, 6, and 7 are sectional detail views showing the grain-shoe and chaff-shoe and their connections.

My invention relates to grain-separators; and it consists in the construction and novel combination of parts, as described and claimed.

Referring by letter to the accompanying drawings, A designates the casing of the separator, which casing is mounted in a suitable frame, B, portions of which form the legs or supports for the separator. The casing is supported in an inclined position, the rear end thereof, or that end at which the chaff is discharged, being the higher end.

C designates the grain-shoe, which is suspended at some distance from its lower end by hangers D D, Fig. 5, the upper ends of which are provided with hooks which engage eyes in the upper ends of upwardly-projecting metal arms E E, secured to the outer faces of the rear supports or legs of the separator, the shorter arms, F, of said hangers being encircled by springs G, which rest on bearing-plates H of the hangers. The upper ends of the arms F project through perforations or seats in the horizontal portions of the angle-irons I, the latter being secured to the outer faces of the grain-shoe C, with their horizontal portions upon the spring G. The upper end of the vibratory grain shoe C is connected by angle-irons or lugs J to the lower portions of the pivoted oscillating shaking-levers K K', said le-

vers being fulcrumed on bearings L, secured to the sill-pieces M of the casing. The levers K K' are encircled between their shoulders N below their fulcrum-points and the angle-irons J by spiral springs P. The lower ends of the springs P rest upon the horizontal arms of the angle-irons J. The lower ends of the levers K K' project through holes in the horizontal portions of the angle-irons J, and these projecting portions are threaded to receive nuts R, which regulate the tension of the spiral springs S, which springs encircle the threaded projecting ends of the levers K K'. The upper portions or arms of the levers K K' are provided with perforations T, in either of which perforations the hook ends of the shaking-rods U of the chaff shoe V may be inserted to change the length of the stroke imparted to the chaff shoe and the chaff-riddles contained therein. At its rear end, on its outer faces, the chaff-shoe V is provided with angle-irons W, through which the front ends of the shaking-rods U project.

The shaking-rods U are provided at about the middle of their lengths with rigid collars or nuts Y, against which the rear ends of the encircling spiral springs Z bear, the front ends of said springs Z bearing against the angle-irons W. The projecting ends of the shaking-rods U are threaded, and are encircled by short spiral springs X, which are held in place against the angle-irons W by tightening-nuts a, by which nuts their tension is regulated. The levers K and K' are virtually connected, as both are in connection with the chaff-shoe, and the lever K is connected by a pitman-rod, b, and a yoke, c, with an eccentric, d, on the end of the fan-shaft e. The fan-shaft is also provided with a pinion, f, which engages a gear-wheel, g, on the crank-shaft h, which is driven by an ordinary crank.

The fan itself is a rotary fan of the ordinary construction; but the fan-chamber i possesses features of construction not commonly found in this class of machines, which are as follows: j is a sliding air-valve, which is made arc shape in cross-section. This valve is located immediately forward of the hopper and chaff-screens and directly in front of the opening that leads from the fan-chamber to the chaff-screens and



works between a tie-rod, *k*, of the frame and the fan-chamber. *l* is also an air-valve, hinged near its lower edge to the casing, so that said edge impinges upon the inclined bottom board, *m*, of the fan-chamber. The casing of the separator is provided in one side with an arc-shaped slot, *X'*, and a hand-piece, *y*, is passed through the slot *X'* into the end of the hinged valve *l*, by which to adjust it to open and close said valve. The grain-shoe *C* is provided with screens *n o p*, having meshes varying in fineness for separating the grain. In the bottom of the grain-shoe, or "grain-box," as it is sometimes called, are placed the grain-spouts *q*, which are provided with partitions *r*, which are made integral with the spouts *q*. These grain-spouts and partitions are held in their seats in the grain shoe or box by slide-rods *s s*, which are provided with hooks or brackets *t* at their ends. These slide-rods are passed under said spouts near each end thereof, and the front ends of said rods are seated in staples *u u*, driven into the lower face of the grain-shoe. The brackets *t* are driven into the rear ends of the side walls of the grain shoe, so that they are removable, but are not likely to become accidentally detached from their seats. By making the partitions *r* integral with the grain-spouts both the partitions and the spouts may be removed at the same time. By making the grain-spouts and their partitions removable together a decided advantage is obtained, as the grain-spouts become frequently choked, and it then becomes necessary to clean them. By my improved construction they can be so readily removed, emptied, and replaced that but little time is lost in giving them this needed attention. The air-valves *j* and *l* are designed to regulate the blast from the fan. Thus by letting the hinged valve *l* down the fan produces a blast under the screens, provided the

slide-valve *j* is down at the same time. By raising the upper valve, *l*, to its limit and turning the hinged door up to its highest limit the fan will produce a blast over the screens. Further, by letting the hinged valve down and raising the slide-valve the fan creates a blast both over and under the screens. Then by pushing the slide-valve down and raising the hinged valve the blast from the fan will be cut off entirely from the screens.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the casing, grain-shoe, and angle-irons on the faces of the grain-shoe, of the hangers connecting the grain-shoe to the main frame, the perforated shaking-levers, the encircling springs and adjusting-nuts on said levers, the fan-shaft, the eccentric and rod connecting said shaft and a shaking-lever, the shoe *V*, the angle-irons thereon, the rods connecting the shaking-levers and said angle-irons, and the collars and adjusting springs and nuts on said rods, substantially as specified.

2. In a grain-separator, the combination, with the grain-shoe, of the grain-spouts *q*, the partitions *r*, made integral with said spouts, the rods *s*, resting under the ends of the spouts and provided at their lower ends with the hooks *t*, which are driven into the adjacent walls of the grain-shoe, and the staples *u*, through which said rods pass, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES F. HATFIELD.

Witnesses:

JACOB V. HOFFMAN,  
H. N. BROWN.