

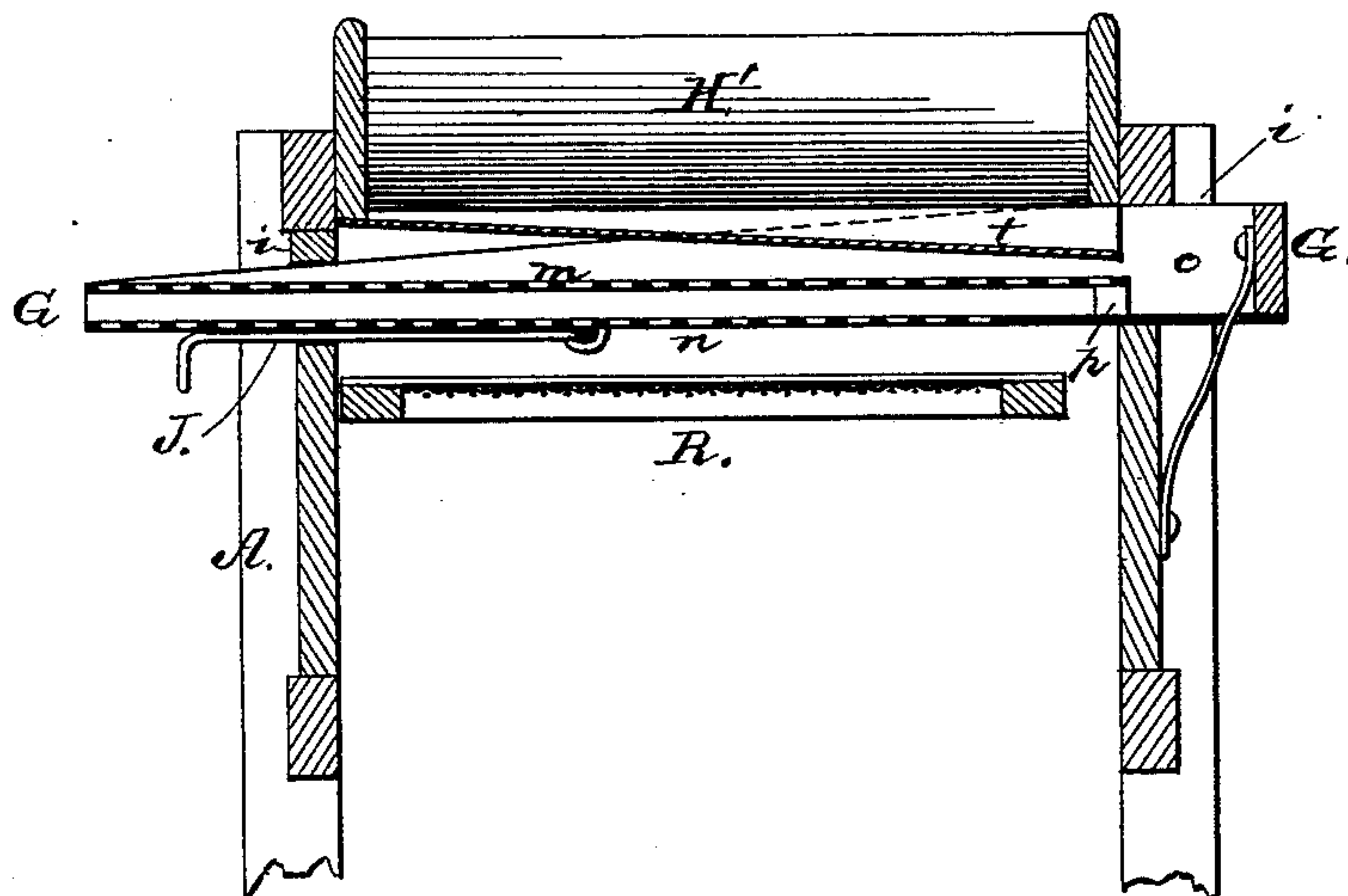
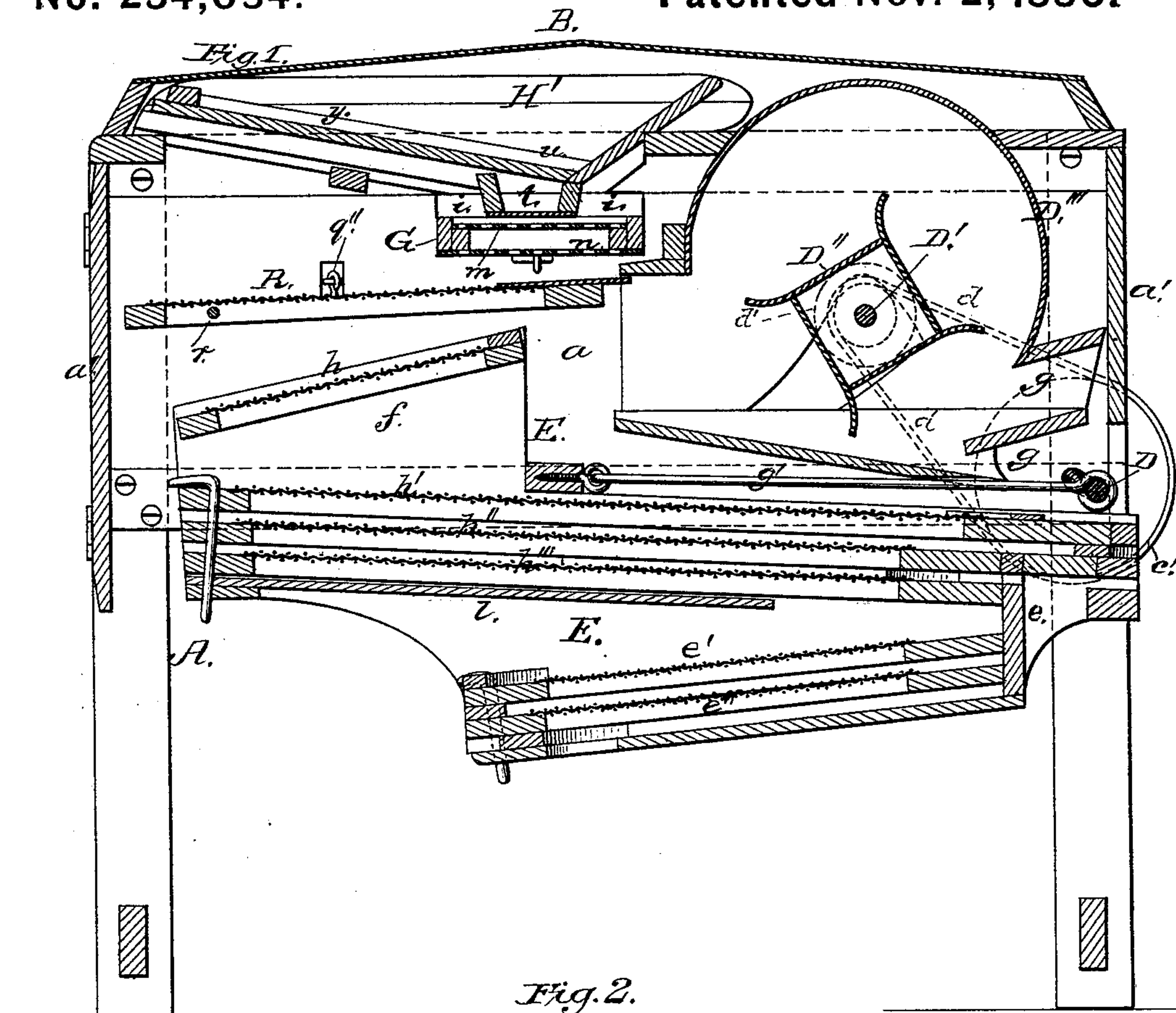
(Model.)

2 Sheets—Sheet 1.

J. F. HATFIELD.
Grain Separator.

No. 234,034.

Patented Nov. 2, 1880.



WITNESSES

John A. Ellis.
F. J. Masi.

INVENTOR

James F. Hatfield,
By E. W. Anderson
his ATTORNEY

(Model.)

2 Sheets—Sheet 2

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Fig. 3.

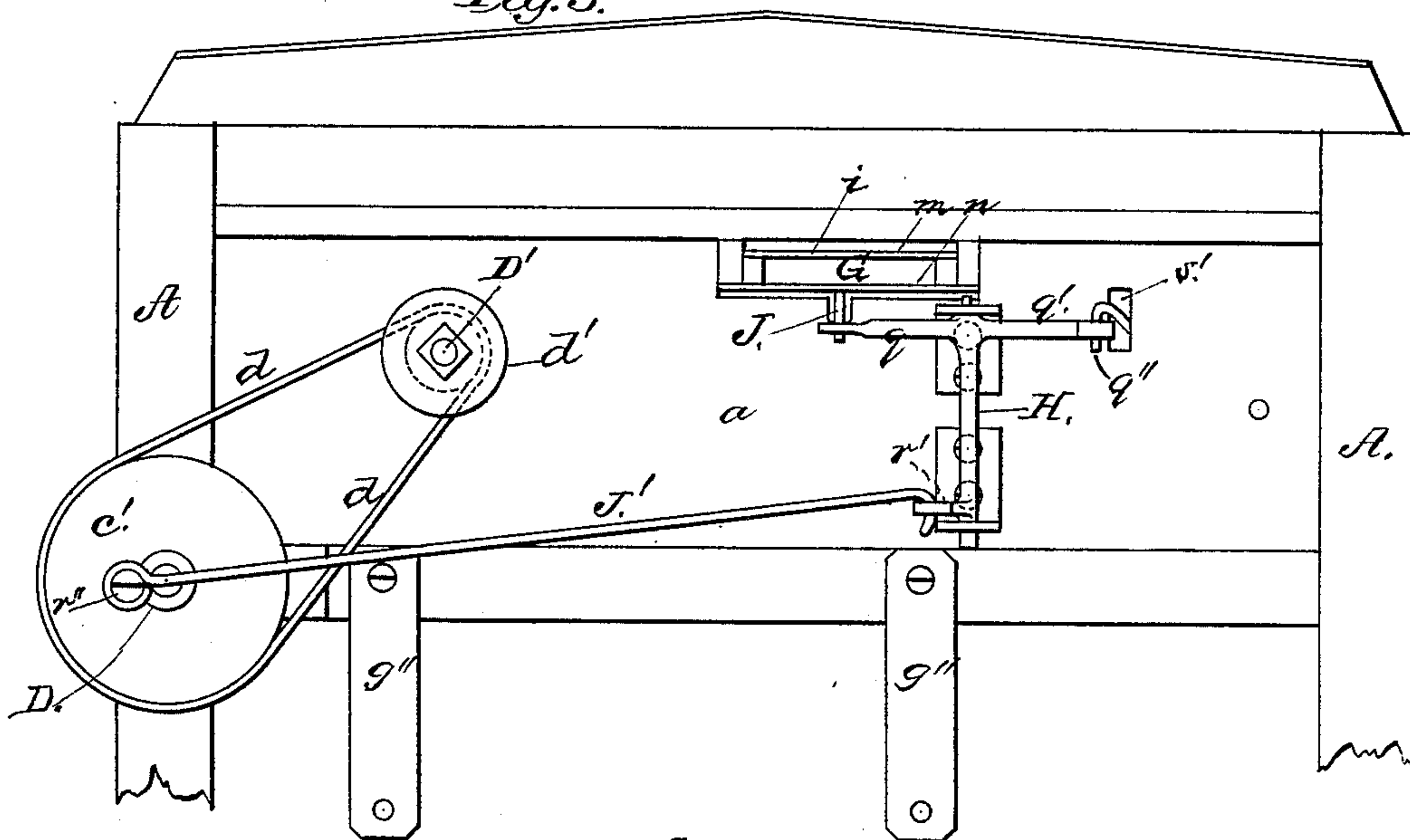
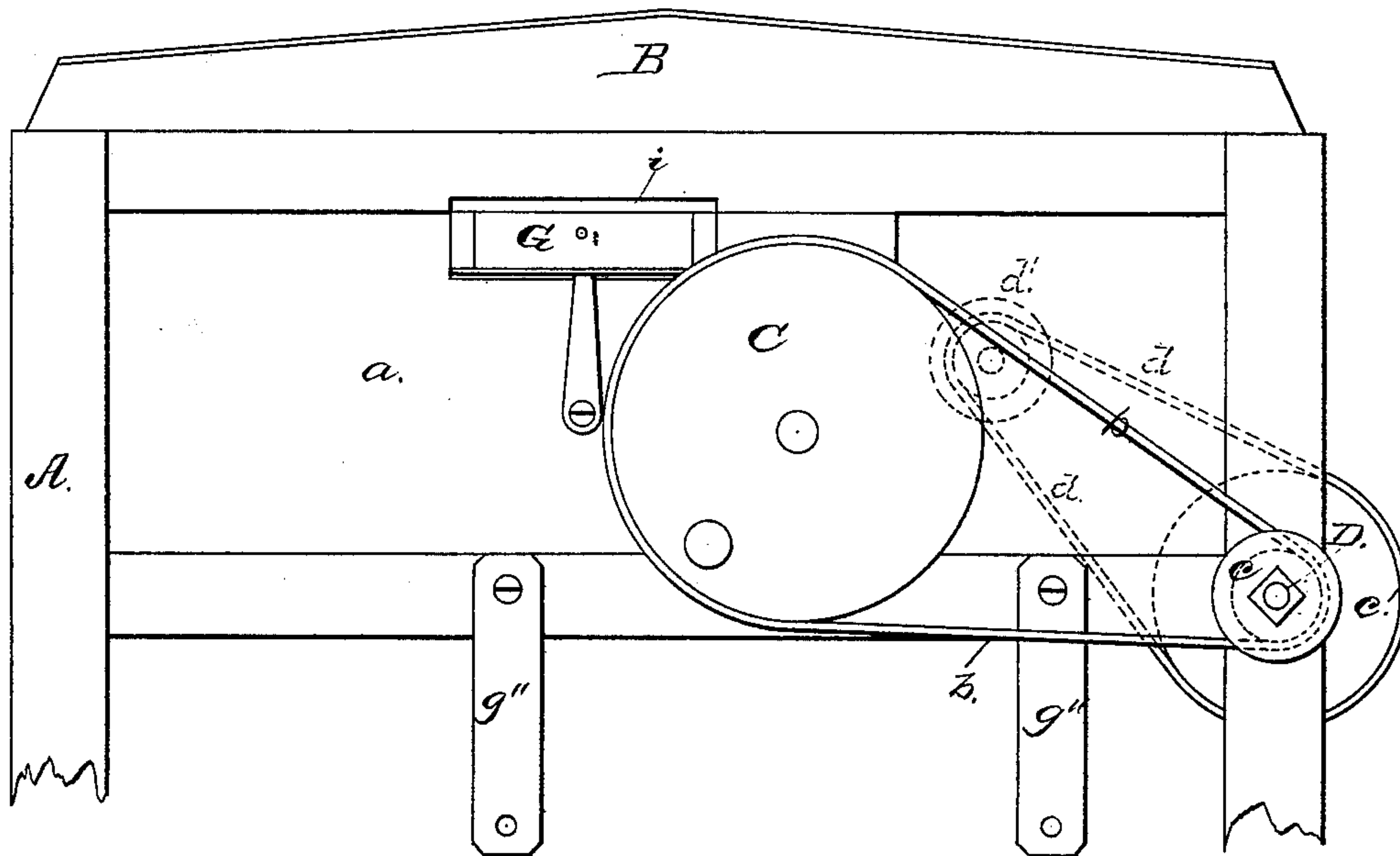


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES F. HATFIELD, OF CAMBRIDGE CITY, INDIANA.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 234,034, dated November 2, 1880.

Application filed April 9, 1880. (Model.)

To all whom it may concern:

Be it known that I, JAMES F. HATFIELD, of Cambridge City, in the county of Wayne and State of Indiana, have invented a new and valuable Improvement in Grain-Separators; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a longitudinal vertical section of my improved separator. Fig. 2 is a transverse section of the same, and Figs. 3 and 4 are elevations of opposite sides thereof.

This invention has relation to improvements in grain-separators and fanning-mills.

The object of the invention is to increase the speed of the fan and of the blast without running the screens at an undue rate of speed; to provide means for absolutely and perfectly separating the oats from the wheat, and, finally, to improve the said machines generally.

The nature of the invention consists in certain novel means whereby the said improvements are carried into effect, as will be hereinafter more fully set forth.

In the annexed drawings, the letter A designates the frame of my improved fan and separator, closed in at its sides by the boards *a*, at its ends by the hinged or removable doors *a'*, and at top by the removable cap B, the whole mechanism being thus shut in and protected from the weather. When the doors *a'* are opened a current of air is produced for chaffing, and when closed the air is entirely shut off, and the machine is thus used for separating grain that has no chaff.

C indicates the main driving-wheel, suitably journaled in the side of frame A, and coupled, by means of an endless belt, *b*, to a small pulley, *c*, usually of one-sixth of the diameter of the driving-pulley upon the end of a crank-shaft, D, arranged in suitable bearings at the rear end of the said frame, and provided on its remaining end, at the opposite side of the frame, with a pulley, *c'*, of the same diameter as the driving-pulley aforesaid or

thereabout. It should always be larger than pulley *c*.

The pulley *c'* is connected, by means of a belt, *d*, to a small pulley, *d'*, on the end of the fan-shaft D', arranged in suitable bearings near the front upper end of the casing. This shaft D' carries the fan D'', of suitable construction, and arranged in a casing, D'''. It derives its air-supply from openings *g* in the sides of the casing, instead of its ends.

The crank-shaft D is connected, by means of a pitman, *g'*, to a shoe, E, suspended by means of vibrating hangers *g''*, with its upper edge inside the casing. This shoe is provided at one end with raised sides *f*, in which is arranged a coarse screen, *h*, which allows every variety of grain to pass, but separates therefrom sticks and coarse foreign substances and discharges them at the rear end of the frame. Below this screen, and inclining from rear to front, are arranged the screens *h'* *h''* *h'''*, of which the reticulations decrease in size in the order in which they are lettered. The two screens *h'* *h''* discharge at the front end of the machine, but screen *h'''* terminates short of that point at a transverse board, *e*, which also closes the higher ends of the oppositely-inclined lower screens, *e'* *e''*, terminating about midway of the length of the casing, as shown. Between the screens *h'''* and *e'*, and parallel to the former, is a removable or adjustable guide-board, *l*, interposed between the sets of screens, which conducts the grain falling through the screen *h'''* back to the upper part of the screen *e'*, falling through which it is further subdivided as to sizes.

At the ends of the screen are arranged the usual oblique guide-strips that conduct the various qualities or descriptions of grain to different sides of the machine, where they are separately bagged.

By removing the board *l* in cleaning, wheat fragments and other small grains drop through the sieves of the upper set free of the lower set, which are relieved of unnecessary wear.

G indicates a shoe, working endwise through slots *i* in the sides of the casing above the screens aforesaid, and provided with the screens *m n*. This shoe is inclined, and has

at its upper end a well, *o*, formed by means of the transverse strip *p*, to the upper edge of which the upper screen is secured. This shoe is reciprocated by means of a rock-shaft, *H*,
 5 arranged vertically in bearings at the side of the casing, and provided with the oppositely-projecting horizontal arms *q q'*. The arm *q* has at its end an eye in which the down-turned end of a coupling-rod, *J*, is engaged. This
 10 rod passes inward through slot *i* of the casing, and is pivoted to the under side of the shoe *G*. The arm *q'* has a similar eye, and is engaged with a hook, *q''*, extending through a slot, *s'*, of the casing and pivoted to a chaff-screen, *R*,
 15 arranged upon a rod, *r*, and having lateral play thereon below the shoe *G*. The rock-shaft at its lower end is provided with a projecting arm, *r'*, to which is pivoted a pitman, *J'*, leading to a wrist, *r''*, on the pulley-wheel
 20 *c'*. The rocking of the shaft imparts endwise reciprocation to the shoe *G* and lateral reciprocation to the screen.

The grain is conducted from the hopper to the well *o* of the shoe *G* by means of an inclined spout, *t*, and while in the well is so
 25 jarred by the reciprocation of the shoe that the long grain, such as oats, turn upon their sides. When the well is filled the mixed grains pass by overflow upon the screen *m*, the oats rolling over the same, being too long
 30 to pass through its meshes and being discharged at its lower end, and the more rounded grain dropping through upon the chaffer and separating screens below. Thus it will be
 35 clear that the oats are separated from the heavier grains before they are subjected to the blast-fan and thus saved, instead of being in part blown out with the chaff.

The funnel has a sliding side, *y*, which al-
 40 lows the feeding to be regulated as to quantity by narrowing or widening the discharge-open-

ing *u*. The grain, entering the spout through this opening, is conducted thereby into the well.

What I claim as new, and desire to secure 45 by Letters Patent, is—

1. The combination, with the separator-case having the hinged or removable portions *a a'*, of the fan *D' D''*, and fan-case *D'''*, having closed ends, and supply opening or openings 50 *g*, and a discharge-opening, substantially as specified.

2. The combination of the separator-case having hinged or removable portions *a'*, a fan, *D'*, a fan-case, *D'''*, having closed ends, and 55 supply and discharge openings arranged with reference to said portions *a a'* of the casing, and a separating screen or screens arranged within the course of the blast from the fan, substantially as specified. 60

3. The combination, with the hopper *H'*, having the discharge *t*, of the transverse endwise reciprocating shoe *G*, having the bottom screen, *n*, formed with a blank or imperforate surface at its receiving end, and the upper 65 screen, *m*, cut short in order to form the well *o*, substantially as specified.

4. The combination, with the transversely-arranged reciprocating shoe *G*, having the screens *n m* arranged to form the well *o*, of the 70 hopper *H'*, having the discharging-chute *t*, and a throat opening into the chute and adjustable in width transversely to said chute, to insure the continuity and evenness of the feed to shoe *G*, substantially as specified. 75

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JAMES FREDRICK HATFIELD.

Witnesses:

ROBERT F. RYMAN,
 AARON COGAND.