

## Grain Cleaner.

No. 41,519.

Patented Feb. 9, 1864.

Fig. 3,

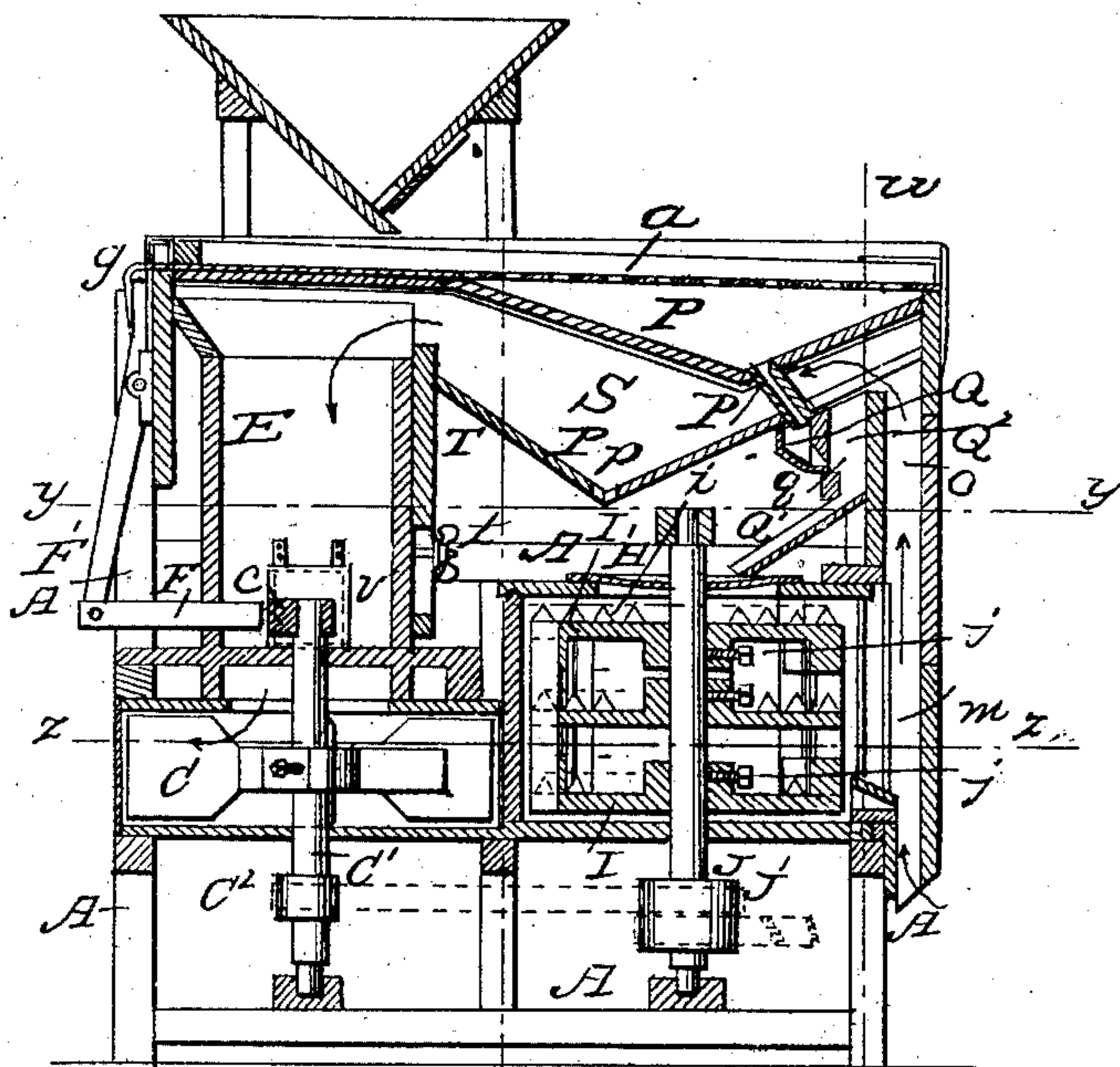


Fig. 1,

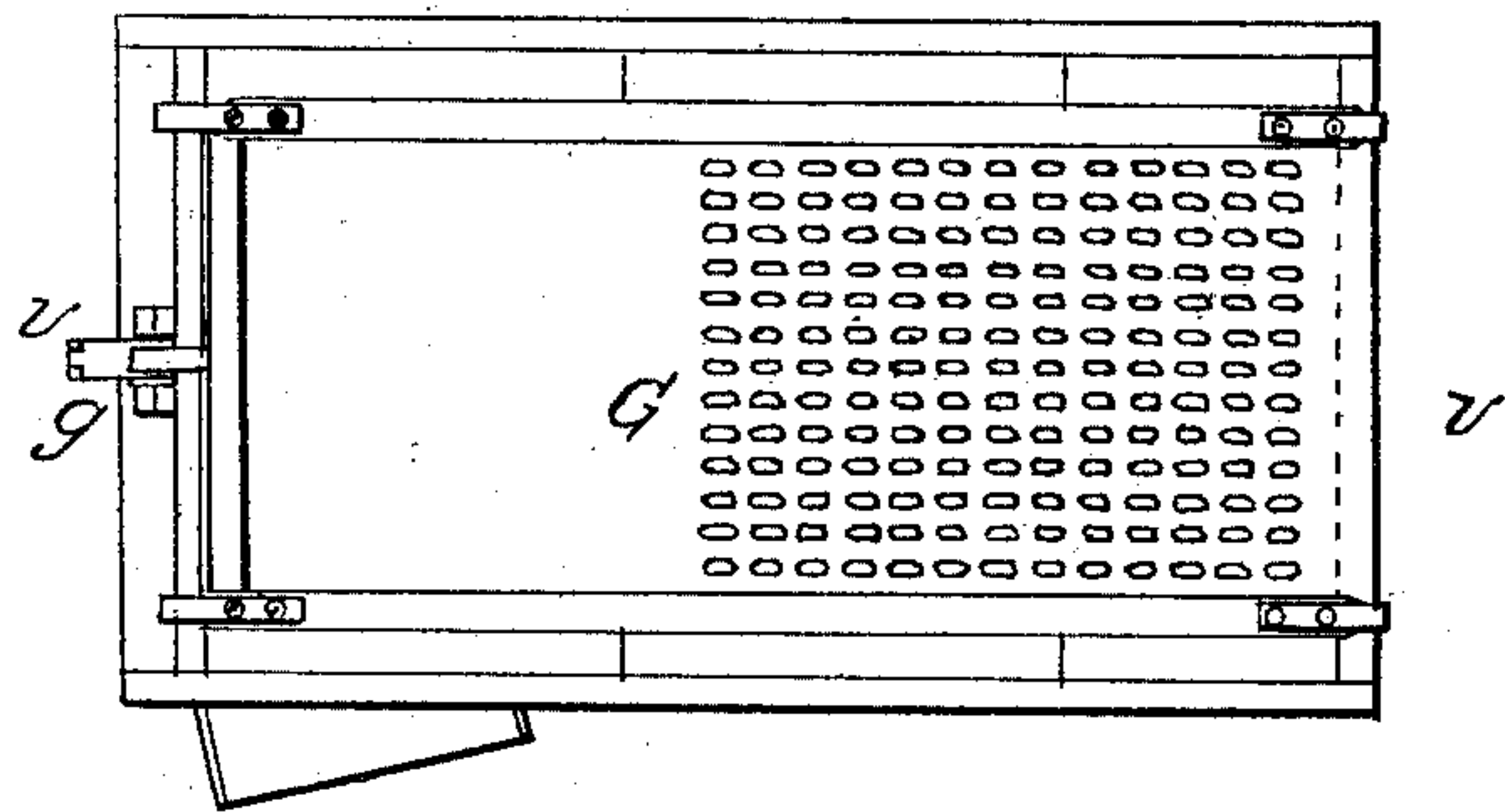
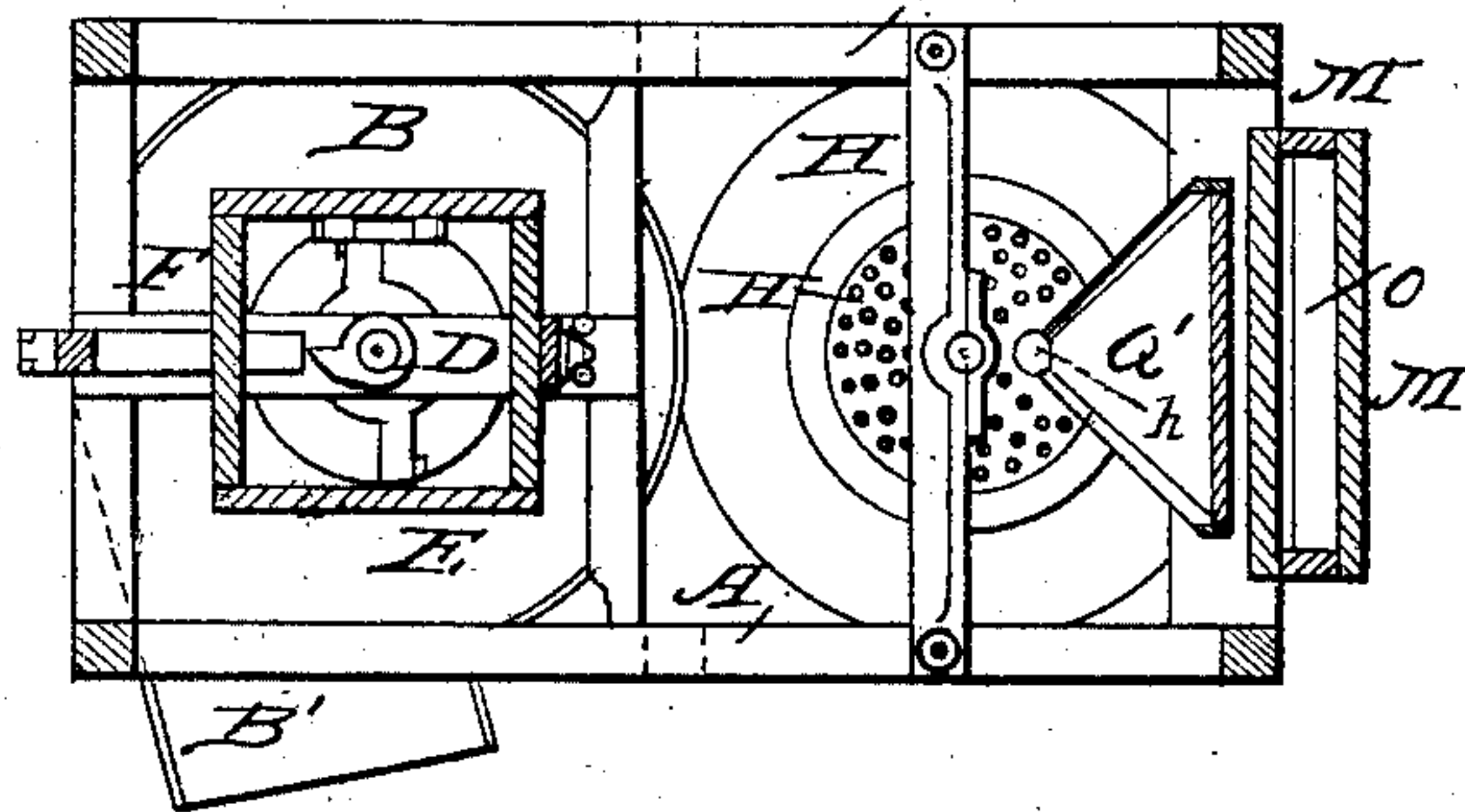


Fig. 5, A



Witnesses.  
Octavio Hughes  
J. Schmitt

F. 29. 3,

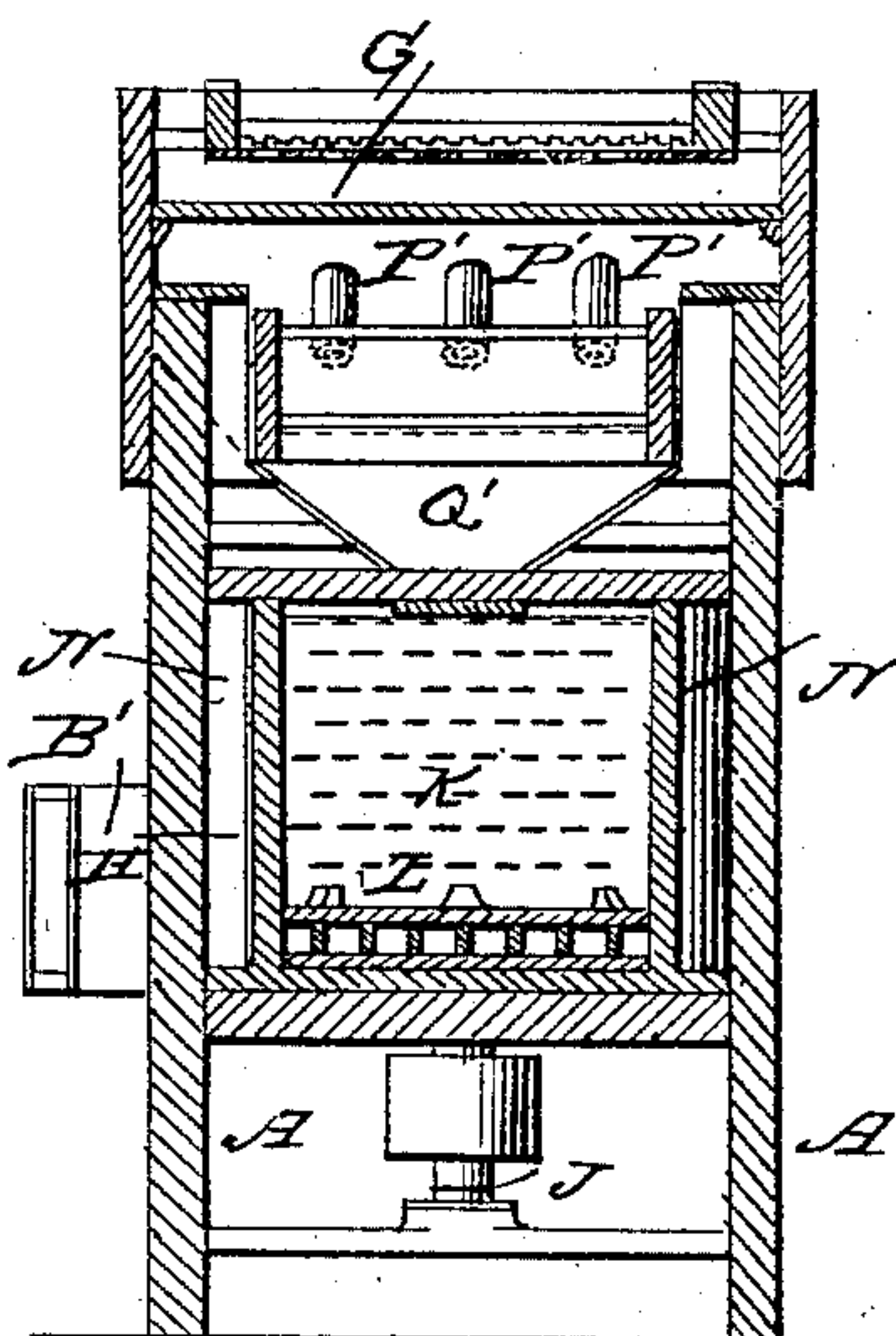


Fig. 4

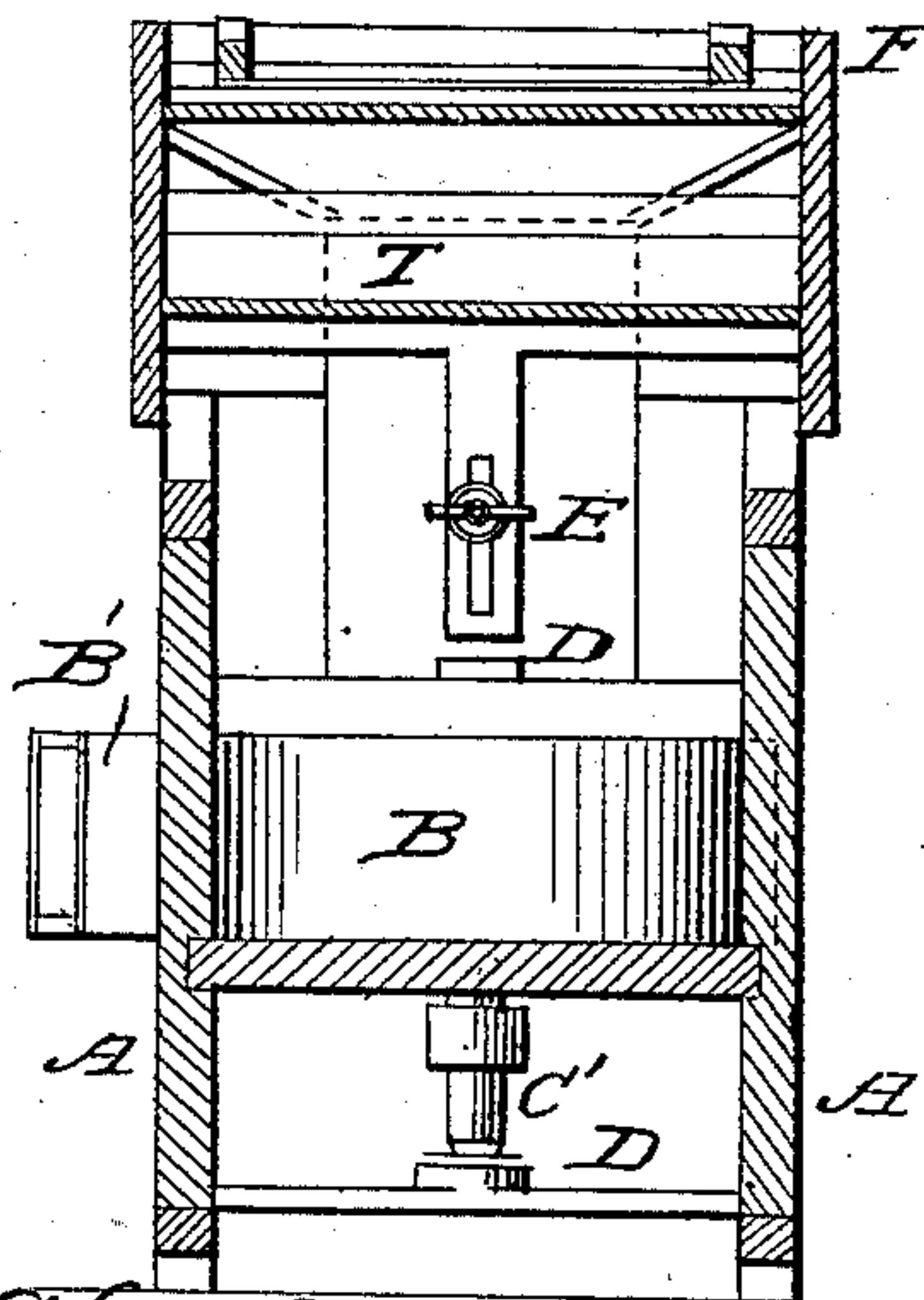
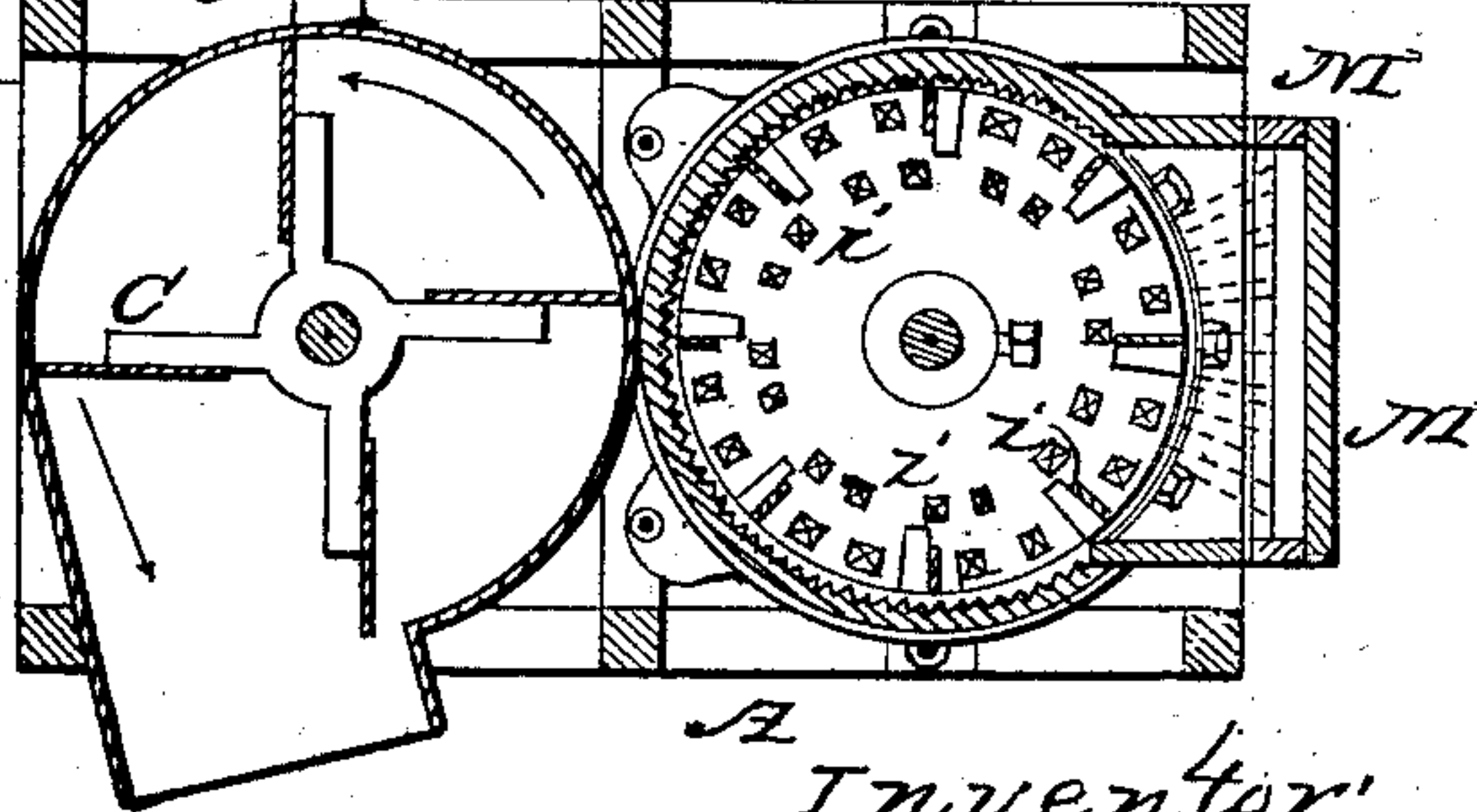


Fig. 6, A



Inventor:

E. Aarby  
Per Mervin G. Arby



# UNITED STATES PATENT OFFICE.

EMANUEL MANTZ, OF FREDERICK, MARYLAND.

## IMPROVEMENT IN GRAIN-CLEANERS.

Specification forming part of Letters Patent No. 41,519, dated February 9, 1864.

*To all whom it may concern:*

Be it known that I, EMANUEL MANTZ, of the city and county of Frederick, in the State of Maryland, have invented a new and Improved Machine for Cleaning Grain; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan or top view of my improved cleaner. Fig. 2 is a vertical longitudinal section of the same, taken in the line *vv*, Fig. 1. Fig. 3 is a vertical transverse section of the same in the line *ww*, Fig. 2. Fig. 4 is a vertical transverse section in the line *xx*, Fig. 2. Fig. 5 is a horizontal section in the line *yy*, Fig. 2. Fig. 6 is a horizontal section in the line *zz*, Fig. 2.

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

The object of this invention is to produce a machine of simple and cheap construction by which the operation of cleaning wheat and other grain and separating therefrom smut, screenings, stones, dirt, &c., may be more thoroughly and readily performed; and to this end the invention consists, first, in a novel manner of separating the loose dust from the wheat or grain at the commencement of the cleaning process by the action of the fan; second, in an improved construction of rubbing or cleaning apparatus provided with a peculiarly-formed mouth-piece, to be hereinafter described; third, in a device for regulating the force of the current of air generated by the action of the fan; fourth, in means for operating the screen; fifth, in a provision for preventing any accident which might arise from the existence of an undue vacuum within the fan-case.

In order that others skilled in the art to which my invention appertains may be enabled to fully understand and use the same, I will proceed to describe its construction and operation.

In the accompanying drawings, A may represent various parts of a frame in which the several operating members of the machine are supported.

B represents a circular casing in which a fan, C, is adapted to rotate, said fan being keyed upon a shaft, C', which is journaled in

cross-pieces D D'. The cross-piece D' has its bearings in opposite sides of a rectangular box, E, which is open at both ends and erected upon the casing B, directly over the fan, and communicates with the interior of said casing through an opening of corresponding size formed in the top thereof.

Upon the upper end of the shaft C' is formed an eccentric, *c*, which at each revolution of the fan forces outward an arm, F, which arm works through an aperture in the side of the box E, and is jointed at its outer end to a lever, F', which is fulcrumed at *f*, and connected at its upper end to a screen, G, by means of a spring, *g*, which draws the screen inward, or in the opposite direction from that in which it is forced by the eccentric *c*, acting through the arm F and lever F'. By these devices a regular reciprocating motion is imparted to the screen G.

H represents a casing within which the rubbing apparatus works. This apparatus consists of a suitable series (say three) of disks, I I I, secured upon and revolving with a shaft, J, and studded with sharp-edged projections *i*, which may be formed of hard wood or other suitable material, and in the edges of these disks a number of radial metallic scrapers, *i'* *i'*, are set.

The rubbers or disks I may be adjusted upon the shaft J by means of set-screws *j j j*, as clearly shown in Fig. 2, in order to submit the grain to a more or less vigorous rubbing, as the condition of the grain may render needful. The interior of the casing H is corrugated, as shown in Fig. 6, for allowing the grain to pass down the interstices from one disk to another. The studs upon the disks I may gradually diminish in number from the upper to the lower, as the grain will of course need less rubbing after each successive passage of the disks.

A portion of the casing in which the rubbers operate is formed by a perforated tin separator, K, through which the dust separated from the grain is drawn, as will be hereinafter described. Below this separator K is located a mouth-piece, L, through which the cleaned grain is discharged from the lower rubber. This mouth-piece is constructed with a number of radial passages, as shown by dotted lines in Fig. 6, in order to limit the quantity in which



the grain is discharged and cause it to be expelled equally the entire length of the mouth-piece L.

In the top of the casing H is set a perforated metallic disk, H', through which at the hole h the grain flows to be subjected to the treatment of the rubbers.

M M represent uprights secured to the framing of the machine at the end where the mouth-piece L is located, (one being situated on each side of said mouth-piece,) and boarded up at their outer edges, as shown at M'. Upon the inner side of the uprights is secured a secondary tin separator, m, which rests against the pieces N N, placed one at each side of the separator K, and is designed to form an even or regular surface in the passage O, which passage will be hereinafter more particularly referred to.

P represents an inclined table or floor situated beneath the screen G, and provided with a series of tubes, P' P' P', through which the grain, after passing from the screen G onto the inclined table P, flows into a trough, Q, onto an inclined conducting-table, Q', and thence into the casing H at the hole h.

Q<sup>2</sup> represents a bottomless trough, with which the trough Q communicates, as shown at q, and which constitutes the primary separating place while the machine is in operation.

P<sup>2</sup> may represent the floor of the chamber S, through which the greater part of the refuse is conducted to the fan-case E, the top of the said chamber being formed by the table P. The floor P<sup>2</sup> is provided with an aperture, p, through which the screenings or heavier part of the refuse may fall and be received into a suitable receptacle placed beneath. To regulate this I employ a sliding gate, T, by which the force of the current of air in the chamber S may be increased or lessened, as desired. This gate may be adjusted by a thumb-screw, t, or otherwise.

U is a small swinging door hinged on the inside of the box E, and adapted to be kept open while the machine is in operation by the pressure of the atmosphere from the outside. This serves to prevent any accident occurring in consequence of the powerful rush of air that would be occasioned by the continuance of a vacuum within the chamber E.

V may represent a hopper.

The fan H is designed to be rotated at a very high velocity by a band (shown by red lines in Fig. 2) from the pulley J' on the shaft J, working upon a pulley, C<sup>2</sup>, on shaft C'.

Operation: Power being applied to the shaft J, the wheat or other grain to be cleaned is allowed to flow from the hopper onto the screen G, which, being reciprocated in the manner described, separates the grain from any large stones or gravel which may be mixed therewith, and causes the grain to pass through onto the table P, whence it passes to the trough Q through the tubes P'. Meanwhile the fan C, being swiftly rotated in the direction indicated by the arrows between its

wings, causes a strong current of air to rush in an upward direction through the chamber Q<sup>2</sup>, and another and somewhat stronger current up the passage-way O. Consequently, as the grain emerges from the trough Q, all the loose refuse is separated therefrom and elevated till caught by the current from the passage O, which, with the assistance of the current from the chamber Q<sup>2</sup>, carries the refuse across the chamber S, whence it is conveyed through the box E to the fan-case B, from which it is expelled through the mouth B'. The blast or current of air may be so regulated by the gate T that as the refuse is passing through the chamber S the screenings or heavier matter will separate therefrom and fall through the opening p. The grain is conducted by the inclined table Q' to the interior of the casing H. Here the grain is subjected to the action of the entire series of rotating rubbers, passing from the higher to the one next below, between the corrugations on the interior of the casing H, in which act it receives an additional rub from the scrapers i'. Owing to the current which passes up the passage O, the casing H is being continually vacated and replenished by the air which passes out through the separator K and in through the disk H', whereby the dust, &c., as fast as rubbed from the grain, is expelled from the casing H, when it is carried up the passage O, through the chamber S, box E, case B, and discharged at the mouth D'. From the lower rubber the grain passes equally out at the mouth-piece L, and any little dust which may pass out therewith is carried off by the current in the passage O, which may extend somewhat below the said mouth-piece.

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

1. In combination with the fan C, the box E, provided with the door U, chamber S, troughs Q and Q<sup>2</sup>, conducting-table Q', and air-passage O, all constructed and arranged in the manner described, to separate the loose refuse from the grain previous to being submitted to the action of the rubbers.

2. In combination with the above parts, the rubbing apparatus H H' I I I i, constructed and operated as described, and employed, in connection with the perforated plates K and m and passage O, to carry off the dust as fast as rubbed from the grain.

3. In a machine constructed as specified, the mouth-piece L, arranged as described, for limiting the discharge of grain from the rubbers I and causing it to enter the passage-way O in a quantity equally distributed therein.

4. The combination of the eccentric c, arm F, lever F', and spring g, all arranged as described, to operate the screen G, as set forth.

EMANUEL MANTZ.

Witnesses:

JAS. MURDOCH,  
J. M. HARDING.