

(No Model.)

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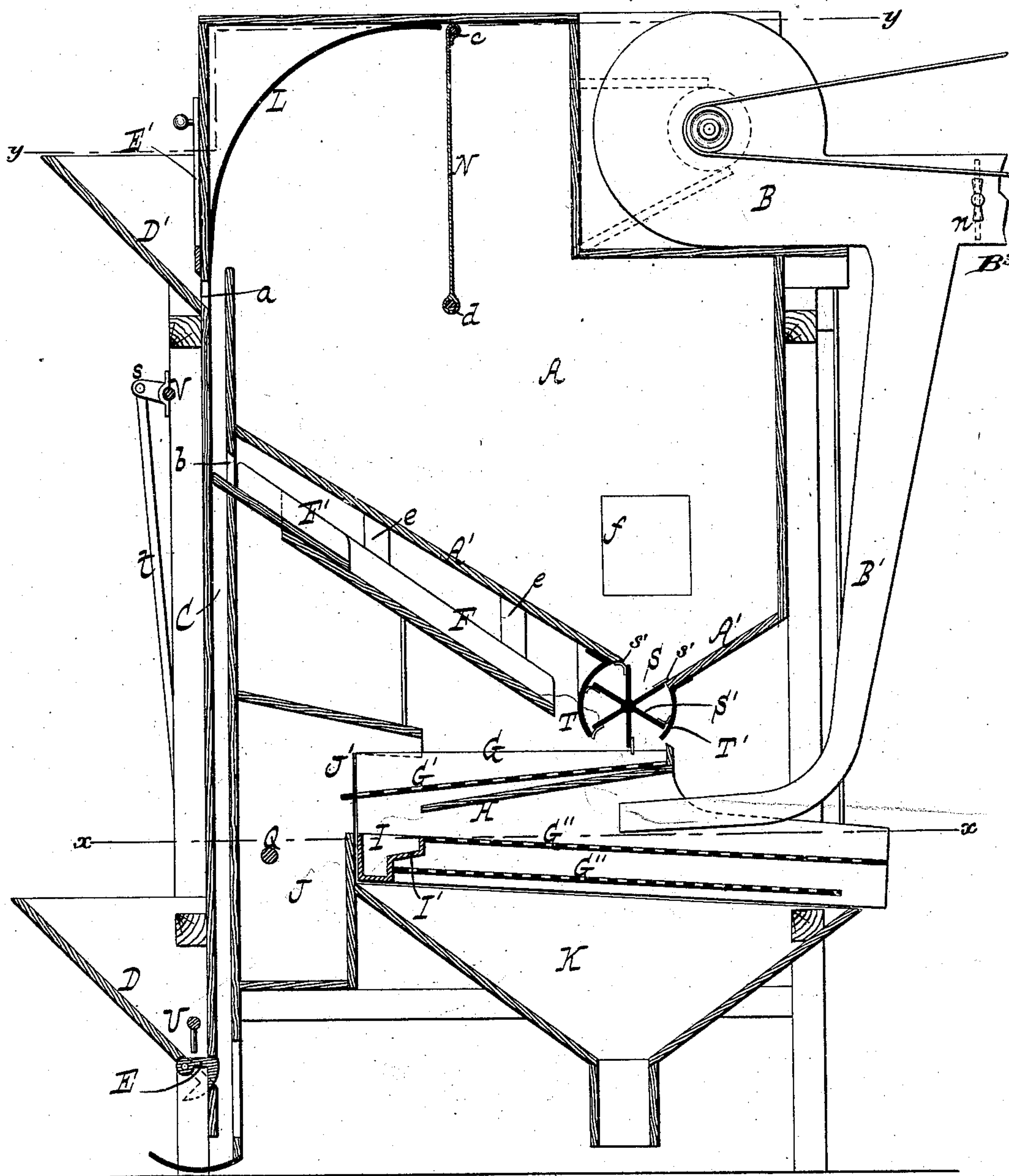
G. S. HUNGERFORD.

MACHINE FOR CLEANING AND GRADING COFFEE, &c.

No. 292,750.

Patented Jan. 29, 1884.

Fig. 1.



WITNESSES:

Chas. Wablers.
William Miller

INVENTOR

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(No Model.)

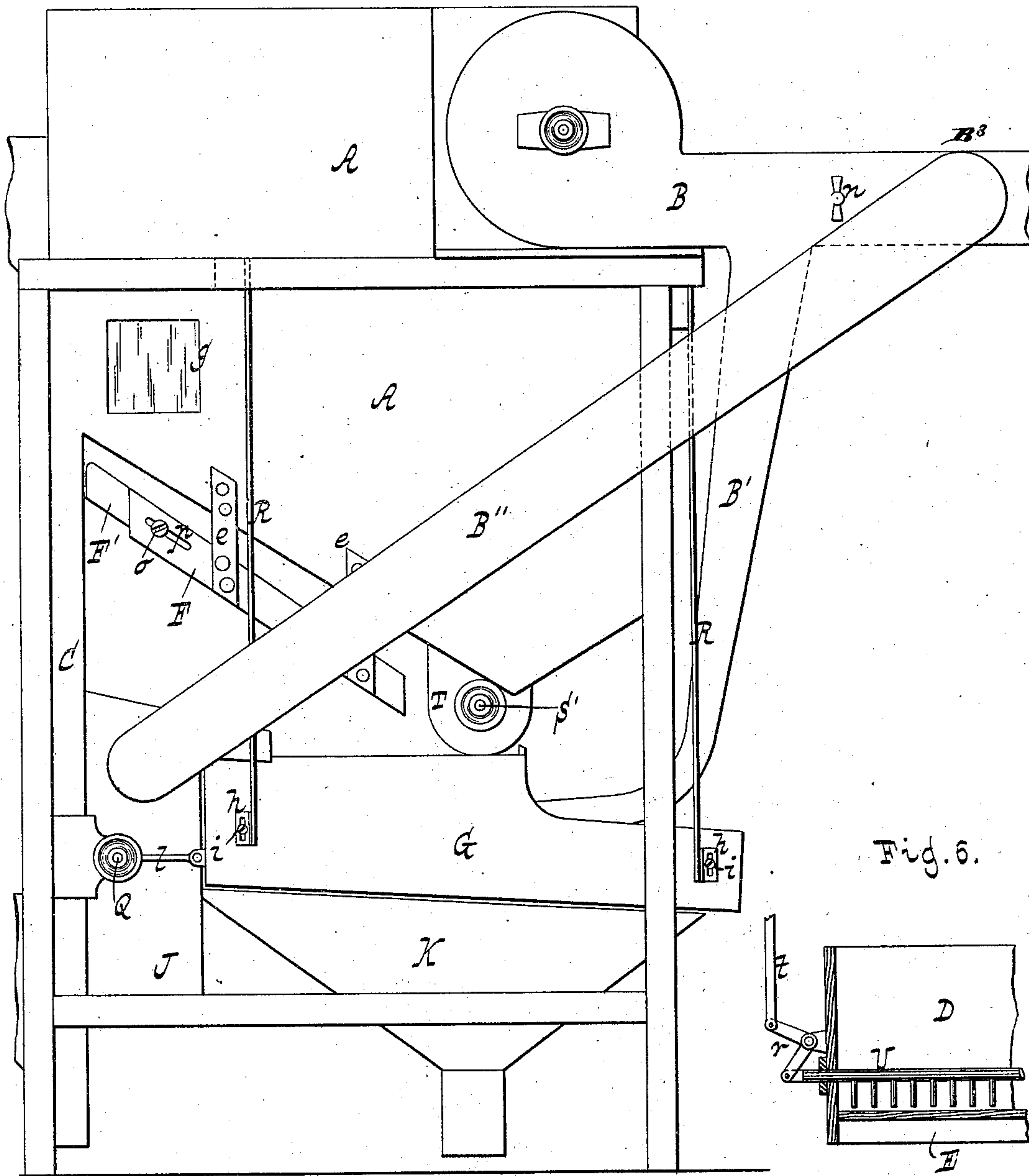
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MACHINE FOR CLEANING AND GRADING COFFEE, &c.

No. 292,750.

Fig. 2. Patented Jan. 29, 1884.



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G. S. HUNGERFORD.

MACHINE FOR CLEANING AND GRADING COFFEE, &c.

No. 292,750.

Fig. 3. Patented Jan. 29, 1884.

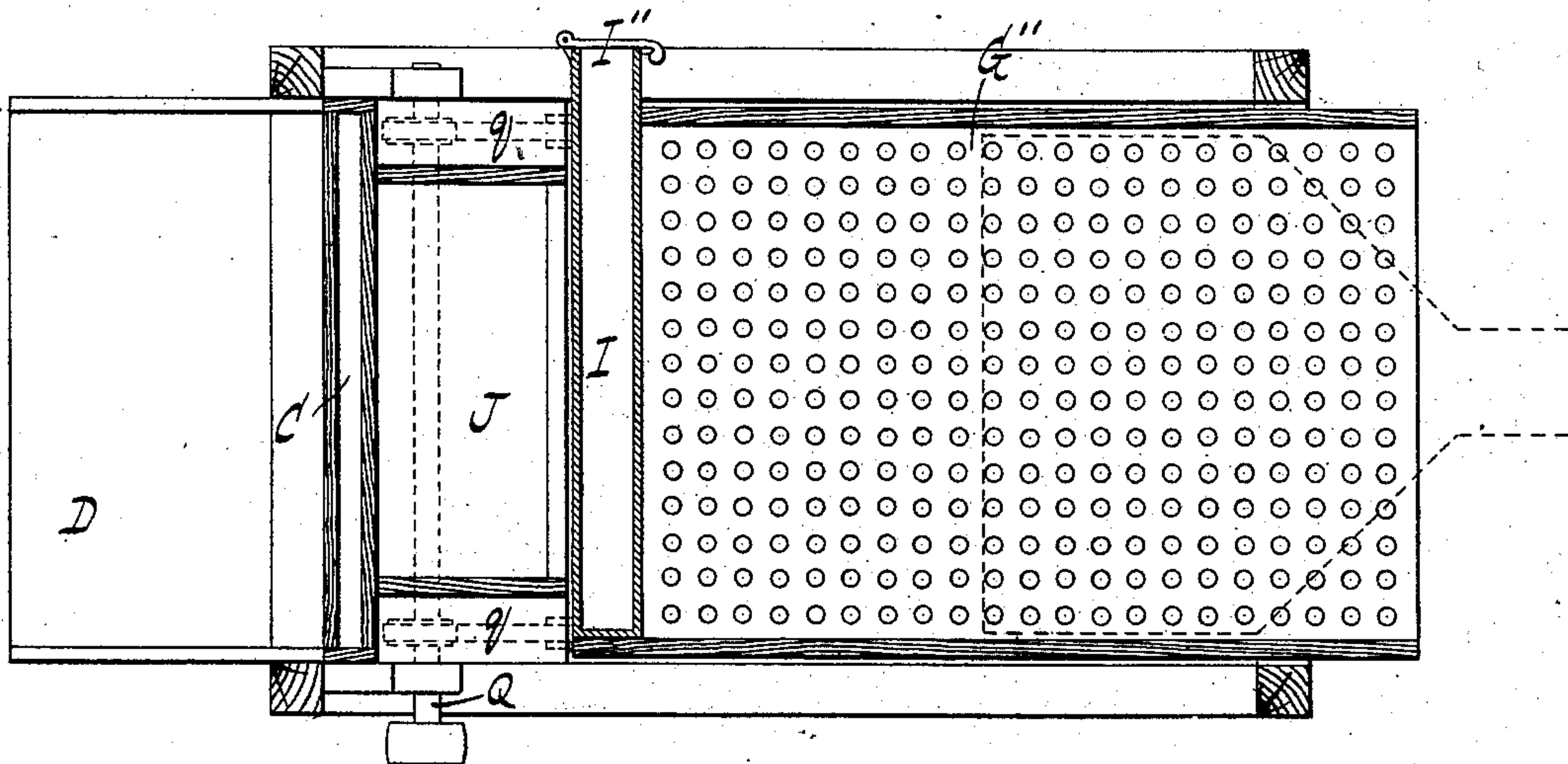


Fig. 4.

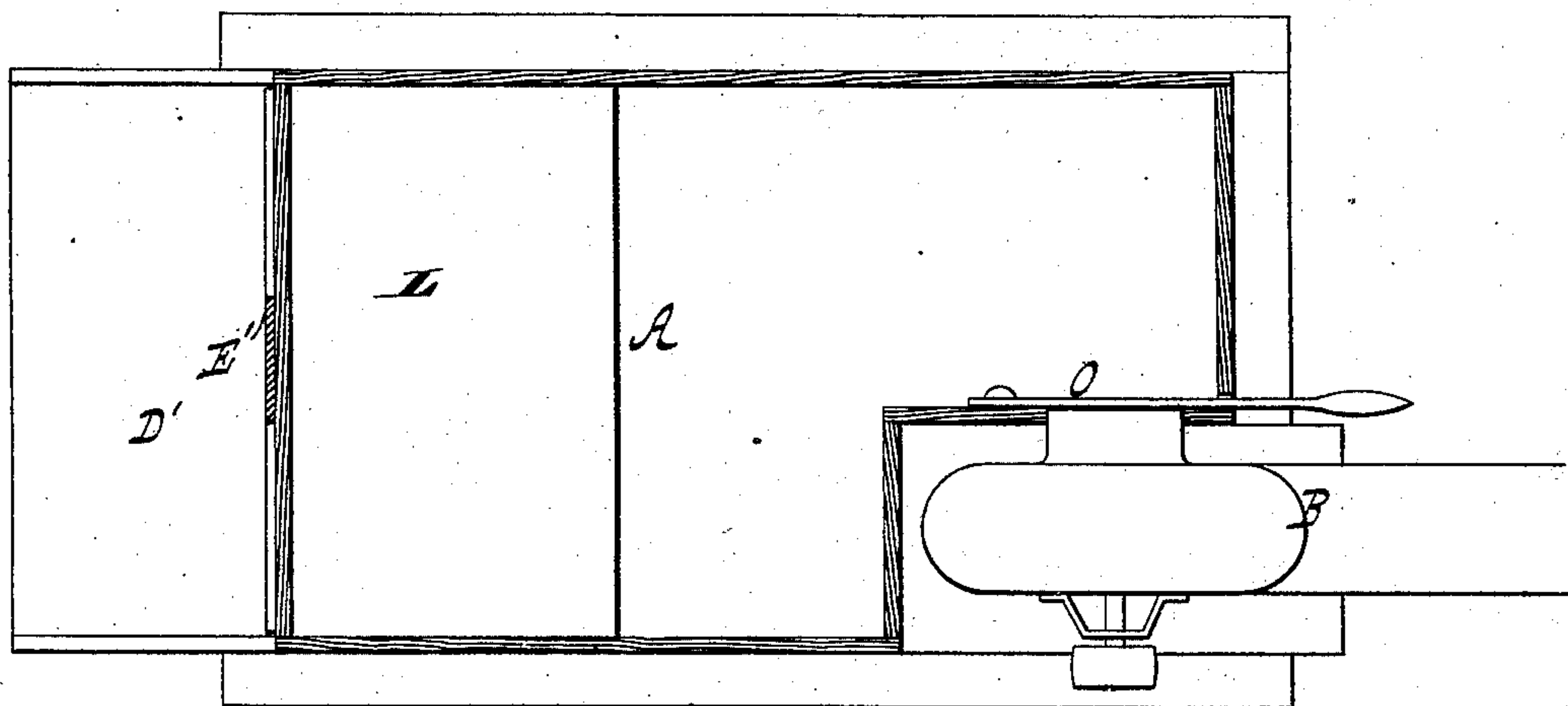
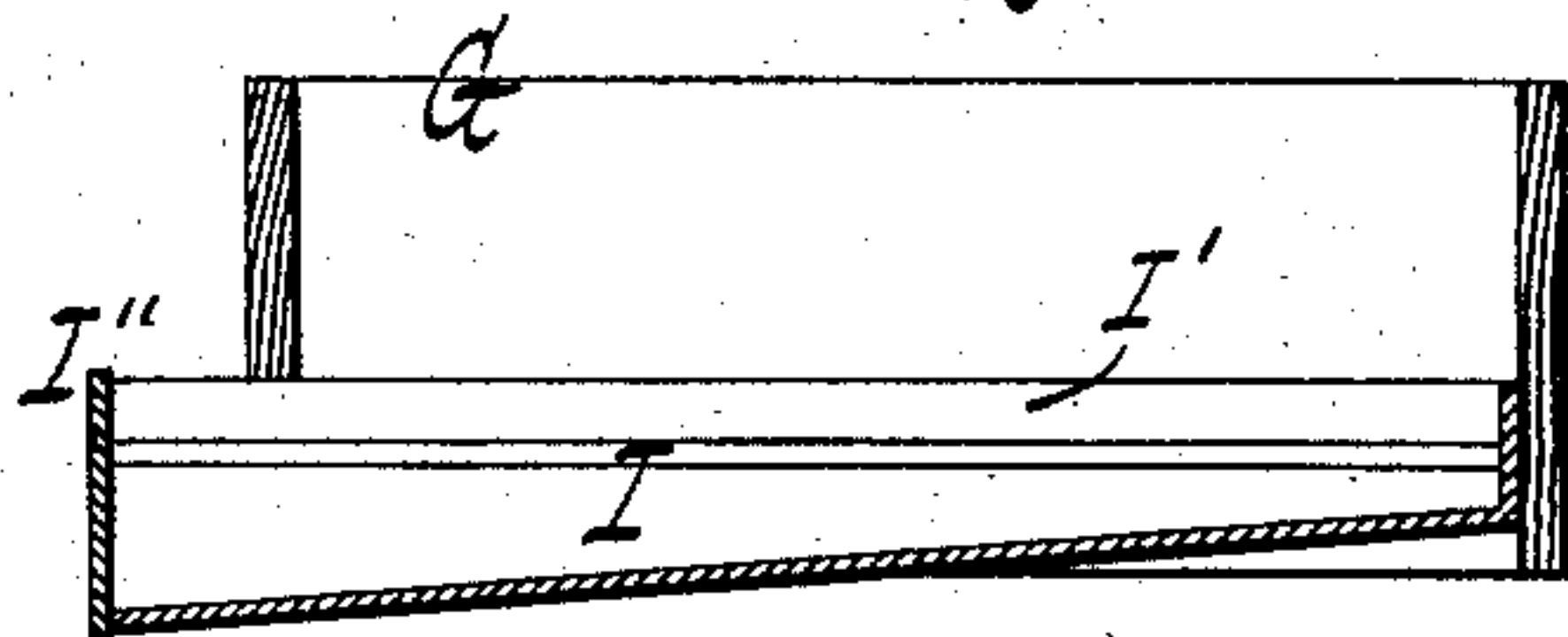


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE S. HUNGERFORD, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO HELEN E. HUNGERFORD, OF SAME PLACE.

MACHINE FOR CLEANING AND GRADING COFFEE, &c.

SPECIFICATION forming part of Letters Patent No. 292,750, dated January 29, 1884.

Application filed July 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. HUNGERFORD, a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Machines for Cleaning and Grading Coffee, &c., of which the following is a specification.

This invention relates to machines for cleaning and grading or separating coffee, grain, seed, and other similar materials; and it consists in the novel construction and arrangement of parts hereinafter described and claimed, whereby, among other things, such machines are adapted to operate alternately for separating stones or other heavy matters from the material by gravity, and for removing the light or decayed particles by suction, in addition to grading the material.

This invention is illustrated in the accompanying drawings, in which Figure 1 represents a vertical longitudinal section. Fig. 2 is a side elevation. Fig. 3 is a horizontal section on the line *xx*, Fig. 1. Fig. 4 is a similar section on the line *yy*, Fig. 1. Fig. 5 is a detail view of the shaking screen-shoe and stone-trap. Fig. 6 is a detail view of a feed-hopper.

Similar letters of reference indicate similar parts.

A indicates a suction-chamber, and B a suction and blast fan connected through the eye of the fan for creating and maintaining a suction in said chamber, a gate, O, Fig. 4, being provided to regulate the suction. The bottom A' of the suction-chamber is inclined inward and downward from both ends, and is provided with an opening, S, in which is arranged a revolving bucket-wheel, S', for discharging the material from the chamber through the opening. The bucket-wheel is inclosed by a casing, T, at one side and an apron, T', at the opposite side, which hugs the descending portion of the wheel, and is made of leather or the like, to avoid breaking the coffee or other material. The bucket-wheel is, as here shown, composed of radial flanges having their longitudinal edges provided with flexible flaps s', which serve to make the opening S airtight by coming against the edges of the in-

clined bottom A', such flaps also bearing closely against the casing T and apron T'.

The letter C denotes a vertical flue, which communicates with the suction-chamber A at the upper end, where it is open, and into which discharge two hoppers, D D', one at or near the lower end and the other at or near the upper end thereof. Both of these hoppers D D' are provided with a gate, E or E', for closing the same when desirable, and the gate E of the lower hopper is composed of a pivoted segment bearing against the curved edge of an opening in the outer side of the vertical flue, as shown in Fig. 1, to prevent the entrance of air at that place in any position of the gate. In the hopper D is also arranged, opposite to its outlet-orifice, a rake, U, to which a longitudinal reciprocating motion is imparted for agitating the material in the hopper from a shaft, V, by means of a crank, s, on said shaft, an elbow-lever, r, pivoted to the rake, and a rod, t, connecting said lever to the crank. It is evident that a gate similar to E and a rake similar to U may also be applied to the hopper D'.

On the body of the suction-chamber A is supported by straps *e* an inclined chute, F, which is provided at the upper end with a sliding section, F', which is held in the desired position by set-screws *o*, passing through slots *p*, or by other suitable means. Both the chute F and the suction-chamber discharge at the receiving-point of a screen-shoe, G, which receives a shaking motion from eccentrics mounted on a shaft, Q, through rods *q*, Fig. 3, and the chute is adapted to connect, by means of its sliding section F', with the vertical flue C, through an opening, *b*, formed in the inner side of the flue at a point intermediate of the two hoppers D D'.

When the apparatus is used for separating light or decayed particles from coffee or other material, the chute-section F' is moved up to connect with the vertical flue C, as shown in Fig. 1, and the material is introduced through the upper hopper, D', when, by the suction created in the flue from the suction-chamber, the light particles are carried up and deposited in the chamber, to be subsequently removed,

while the heavy particles fall onto the chute, and are thereby conducted to the screen-shoe. During the operation last named the delivery-wheel S' in the discharge-opening of the suction-chamber is left stationary.

When the apparatus is used for separating stones or other heavy matters from the material, the chute-section F' is withdrawn, and the opening b, together with the upper hopper, D', is closed, the hopper being closed by its gate E', and the opening b closed by a door or gate, (not shown, but which will be fitted into the opening and provided with means for fastening it.) The material is then introduced through the lower hopper, D, when the heavy matters fall to the bottom of the vertical flue C by gravity, while the pure material is carried up by suction and deposited in the suction-chamber, whence it is discharged by the bucket-wheel S', the latter having been set in motion—as, for example, by a belt-connection with the fan-shaft or the shaft Q, the connection being such that the bucket-wheel can be left stationary, which can be accomplished through the medium of fast and loose pulleys on the shaft of the bucket-wheel and a suitable belt-shipper.

As I do not confine myself to any particular means for revolving the wheel and stopping its revolution, I do not deem further illustration necessary.

It is understood that the suction in the suction-chamber should be regulated according to the operation which is to be performed.

In order to avoid the breakage of the material entering the suction-chamber from the vertical flue C, a deflector, L, is arranged in the chamber, to extend upward and inward from the upper end of the vertical flue, and a pendent apron, N, of cloth, is placed at the inner end of the deflector, so that the ascending material strikes this apron and is kept out of contact with any hard surface. The apron N is hung to a bar, c, and is provided with a weight, d, at the lower end, for keeping it taut.

The shaking screen-shoe G is provided with a receiving-screen, G', next below which is arranged a feed-board, H, serving to deliver the material passing through such screen to a stone-trap, I, in which any stones or other heavy matters still remaining in the material are collected, whence the material is received on screens G'', one of which is at the level of the mouth of the trap, the other being below that level. The stone-trap I is constructed with a transversely-inclined sill, I', and with a longitudinally-inclined bottom, to facilitate the accumulation of the stones therein, they sinking by gravity onto the sill, whence they roll onto the inclined bottom down to the lowest point of the latter, where they are removed, as through a gate, I''. The shoe G is supported on the machine-frame by spring-bars R R, which are fastened to the shoe by attaching-pieces h, the latter being slotted and provided

with set-screws i, whereby the attaching-pieces are adjustable for regulating the position of the shoe. The material passing over the screens G' G'' of the shoe is exposed to a blast of air issuing from the lower end of a pipe, B', which extends from the fan B into the shoe at a point opposite to an opening, J', in a dust-box, J, so that light impurities are carried off from the material and deposited in this box.

From the dust-box J extends an exhaust-pipe, B'', to the exit-pipe B'' of the fan B, the point at which it is connected to the latter being outward from the blast-pipe B', whereby any dust, &c., remaining in suspension in the dust-box is carried off.

Intermediate of the blast-pipe B' and exhaust-pipe B'' in the exit-pipe is arranged a damper, n, whereby the blast or exhaust of air may be regulated.

A hand-hole in the wall of the suction-chamber is provided for gaining access to the chamber, such hand-hole being closed by a door, f, and a window, g, is also provided for inspecting the material entering the suction-chamber.

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

1. A machine for cleaning coffee and other material, constructed with a suction-chamber, A, having an inclined bottom, A', provided with a discharge-opening, S, a vertical flue, C, communicating with the suction-chamber at its upper end, and provided with an intermediate opening, b, two hoppers connecting, respectively, with the upper and lower ends of the vertical flue, and an inclined chute having a sliding section adapted to move into and out of the flue at a point between the two hoppers, substantially as described.

2. The combination of the suction-chamber A, having an inclined bottom, A', the vertical flue C, communicating with the suction-chamber at its upper end, and provided with the intermediate opening, b, a hopper connecting with the upper end of the flue, a gate for opening and closing the connection between the hopper and flue, an inclined chute arranged below the inclined bottom of the suction-chamber, and a sliding section at the upper end of the chute, capable of moving into and out from the flue, substantially as described.

3. The combination of the suction-chamber, having an inclined bottom, A', provided with a discharge-opening, S, the bucket-wheel S', arranged to project into said opening, the vibrating shoe G, located below the wheel, and provided with screens, the vertical flue C, the inclined chute F, arranged between the shoe and the inclined bottom of the suction-chamber, a hopper for delivering the material into the flue, and a device for directing the material from the flue to the chute, substantially as described.

4. The combination of the suction-chamber

A, having a bottom provided with a discharge-opening, S, the bucket-wheel S', having flexible flaps s', and a shaking-screen beneath the wheel, substantially as described.

5 5. The combination, substantially as hereinbefore set forth, with the suction-chamber and the vertical flue communicating with such chamber at the upper end, of the deflector in the suction-chamber, extending upward and
10 inward from the upper end of the vertical flue, and the pendent cloth apron at the inner end of such deflector, said apron being in the suction-chamber, and weighted at its lower edge to keep it taut.

15 6. The combination, substantially as hereinbefore set forth, with the shaking screen-shoe, of the inclined feed-board, the stone-trap, arranged at a point below the delivery end of the feed-board, and the screens extending outward from the stone-trap, one at the
20 level of the mouth of such trap and the other below that level.

7. The combination, substantially as hereinbefore set forth, with the shaking screen-shoe,
25 of the inclined feed-board, the stone-trap, ar-

ranged at a point below the delivery end of the feed-board, and constructed with a transversely-inclined sill and longitudinally-inclined bottom, and the screens, one arranged at the level of the mouth of the stone-trap. 30

8. The combination, substantially as hereinbefore set forth, with the suction-chamber, and with the shaking screen-shoe and its screens, of the dust-box, arranged at one end of such shoe, and constructed with an inlet-opening
35 opposite to the screens, the fan connecting with the suction-chamber, the air-blast pipe extending from the fan into the screen-shoe at a point opposite to said opening of the dust-box, the air-exhaust pipe extending from the
40 dust-box to the exit-pipe at a point outward from the blast-pipe, and the damper arranged in the exit-pipe intermediate of the blast-pipe and exhaust-pipe.

In testimony whereof I have set my hand in
45 the presence of two subscribing witnesses.

GEORGE S. HUNGERFORD.

Witnesses:

W. HAUFF,

CHAS. WAHLERS.