

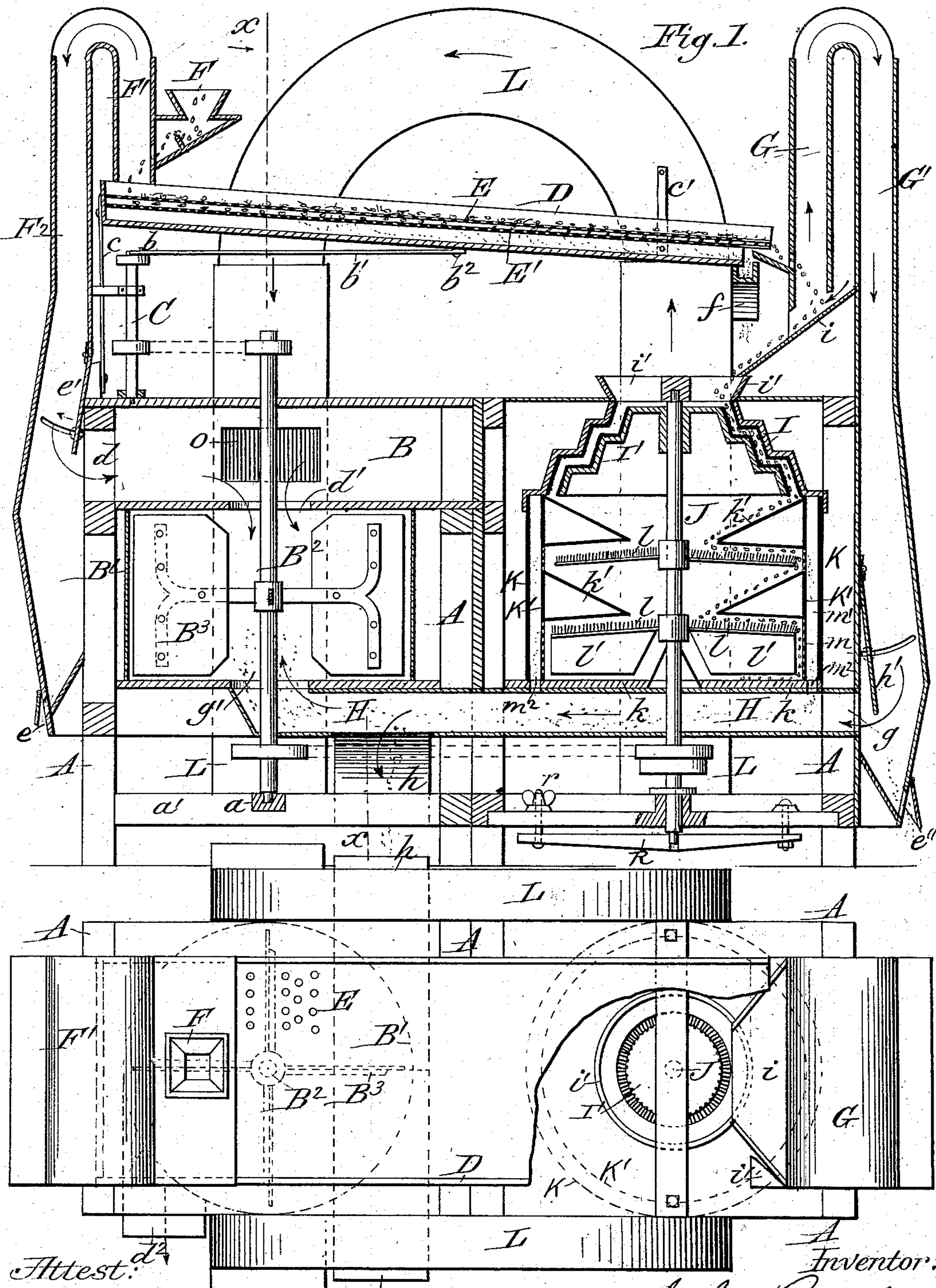
(No Model.)

2 Sheets—Sheet 1.

J. RUSSELL.
GRAIN CLEANER.

No. 284,489.

Patented Sept. 4, 1883.



Attest:
H. Schott
A. R. Brown.

Fig. 2.

Inventor:
John Russell
per J. C. Parker & Co.

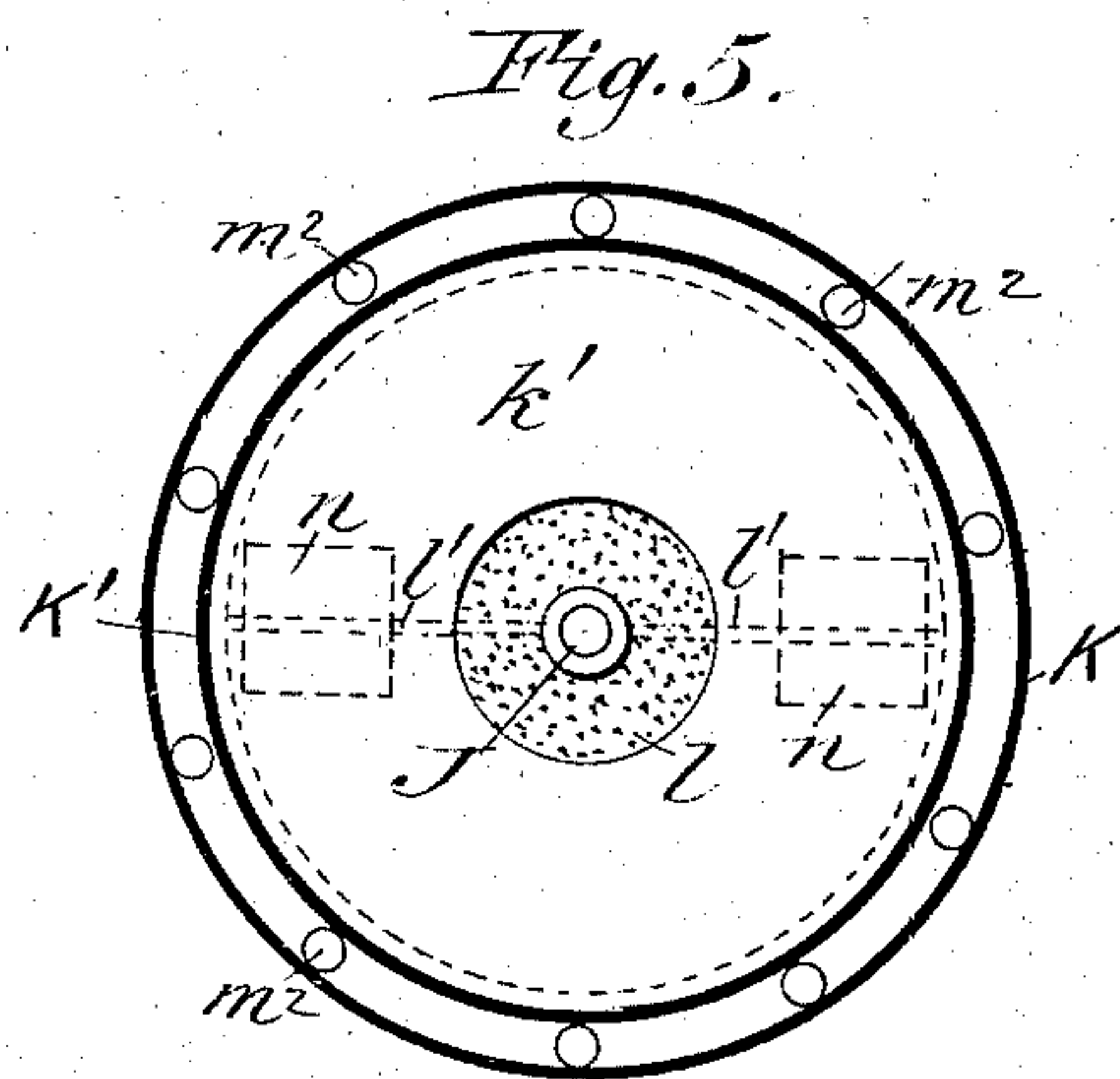
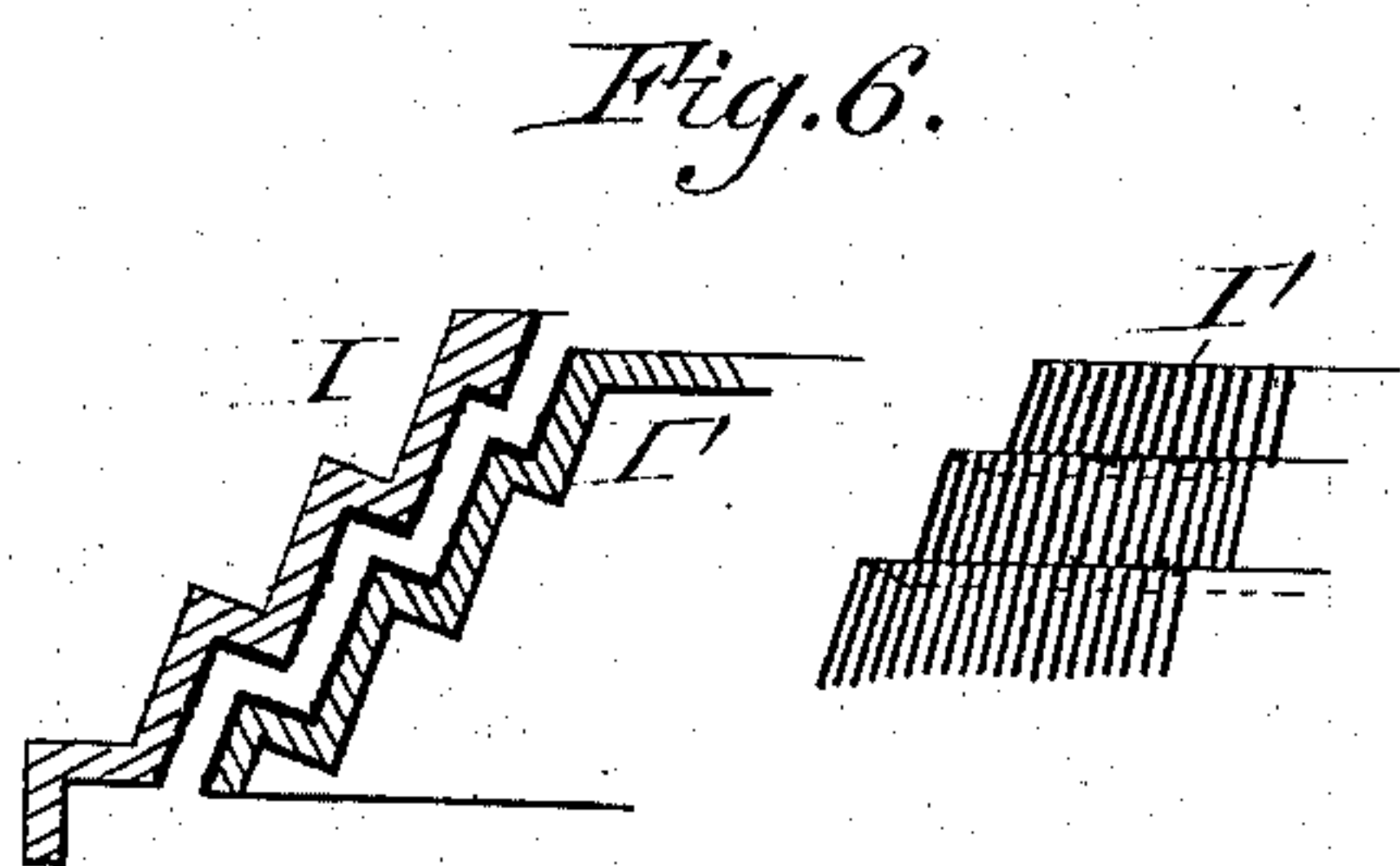
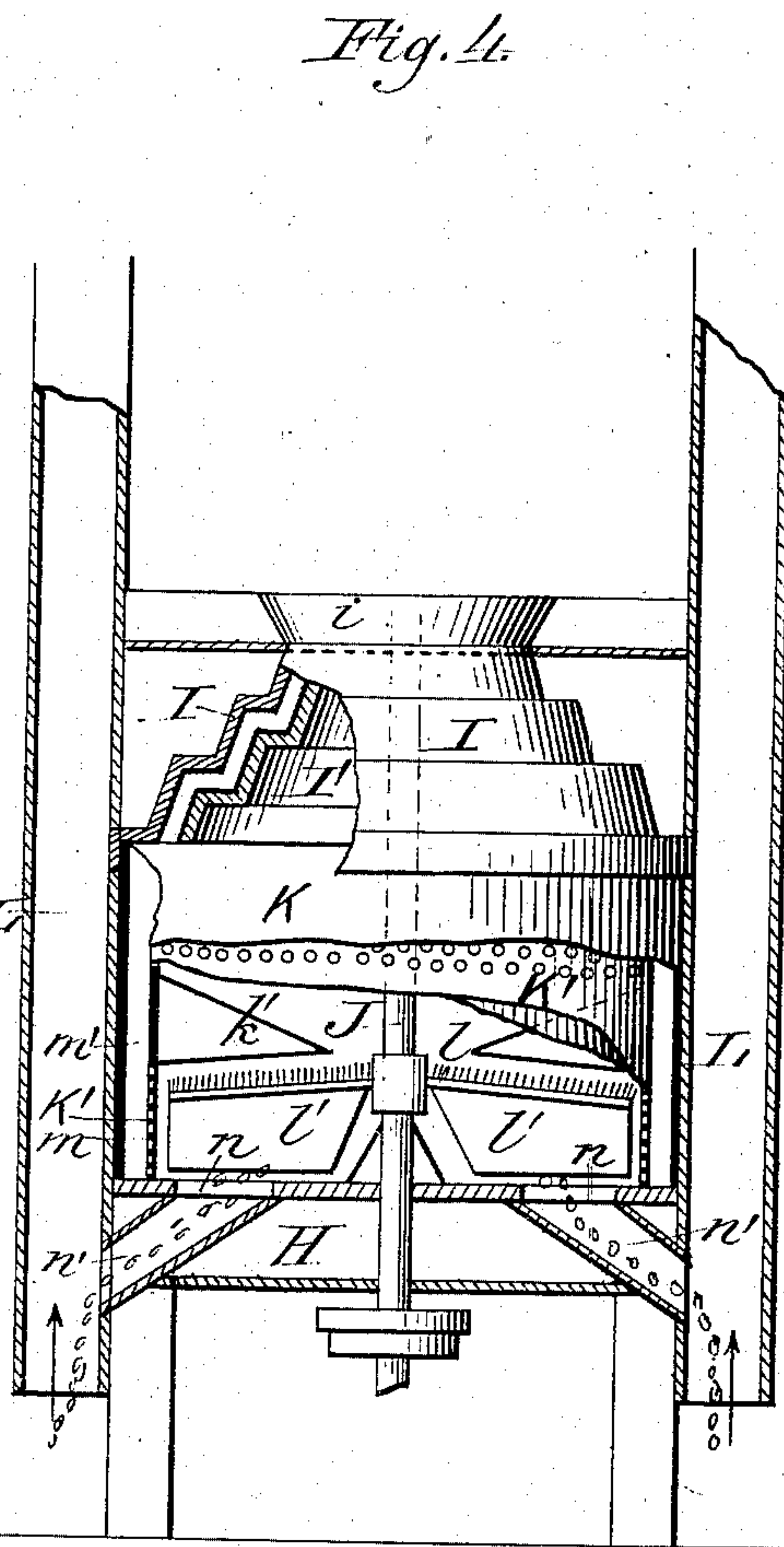
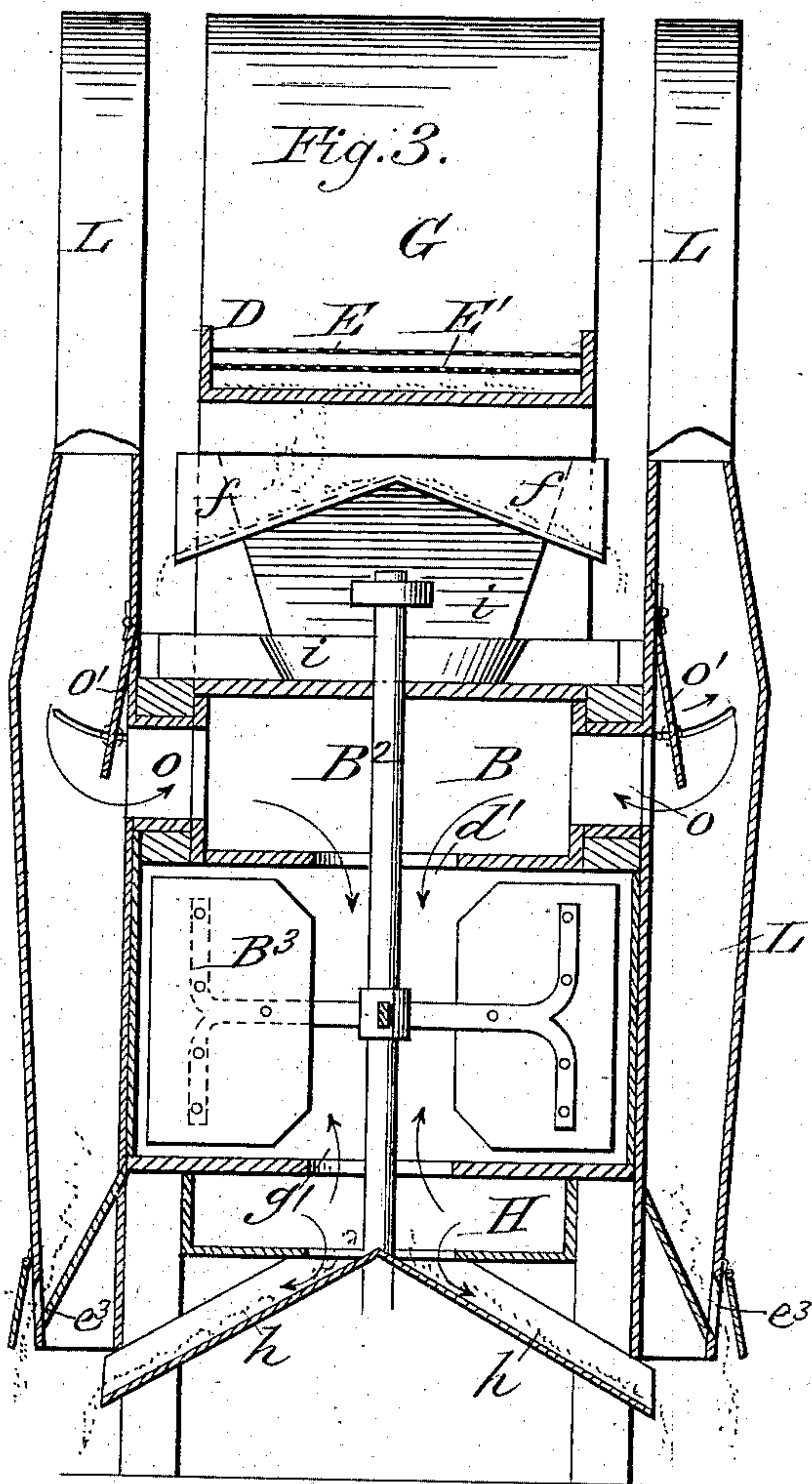
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Inventor:

John Russell.
Chas. J. Foster atty

UNITED STATES PATENT OFFICE.

JOHN RUSSELL, OF BERLIN, PENNSYLVANIA.

GRAIN-CLEANER.

SPECIFICATION forming part of Letters Patent No. 284,489, dated September 4, 1883.

Application filed February 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN RUSSELL, a citizen of the United States, residing at Berlin, in the county of Somerset and State of Pennsylvania, have invented certain new and useful Improvements in Grain-Cleaners; 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 the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to machines for cleaning grain; and it consists in the construction and arrangement of parts, as hereinafter more fully described and claimed.

In the annexed drawings, Figure 1 represents a longitudinal sectional elevation of my improved grain separator and scourer. Fig. 2 is a plan view of the same. Fig. 3 represents a transverse section on the line *xx* of Fig. 1. Fig. 4 is a partial side view and section of the scouring mechanism, and Figs. 5 and 6 are details of the same.

A represents a rectangular frame for supporting the various parts of the machine.

On one side of the machine is located the upper air-chamber, B, and below the same the fan-case B'. Through the center of the air-chamber and case passes a vertical shaft, B², journaled in a step, *a*, secured to the bridge-tree *a'*. This shaft B² carries the fan B³, which revolves in the fan-case.

Secured in proper bearings above the upper air-chamber, B, is a vertical shaft, C, which carries on its top a disk having an eccentric pin, *b*, to which is attached a pitman, *b'*, secured to the under side of the inclined shoe D at the point *b*². By means of this pitman *b'* the shoe D, which is supported by the springs *c c'*, is given a suitable vibratory motion. The shoe D is provided with two screens, E and E', the former of which is of coarse mesh.

F represents the hopper into which the grain is fed, and from which it passes into the suction-spout F' through an opening, as shown in Fig. 1. The grain as it enters the spout F'

and falls upon the shoe D is subjected to an upward current of air induced toward the air-chamber by a vacuum created by the revolutions of the fan B³, which air-current carries the dust, chaff, and screenings upward and over the arch and down the spout F² to the opening *d* in the side of the air-chamber, into which the chaff and dust are sucked by the current of air, and whence they pass through the aperture *d'* to the fan-case B', and out of the same by means of the mouth or opening *d*². (See Fig. 2.) The heavier portions or screenings pass out at the bottom of the spout F² through the valve *e*, being guided to the valve by the inclined bottom. An adjustable deflector, *e'*, hinged to the spout near the opening *d*, regulates the draft and prevents the valuable portions of the cleanings from entering the air-chamber and going to waste. The grain thus freed from dust passes down the inclined shoe D, the grain itself passing through the perforations of the coarser screen, E, while the straw, corn-cobs, and other larger substances slide down the upper surface of the screen E, and are carried off by an inclined spout to the side of the machine. This spout, being no part of the invention, is not shown in the drawings. The sand and other smaller impurities pass through the screen E', and are carried off by a spout, *f*, to the side of the machine. The grain passes from the lower screen of the shoe to a hopper and through an opening into the suction-spout G, where it is again subjected to an upward current of air induced by the fan, that carries the lighter particles—cheat, &c.—over the arch, down the spout G', to the opening *g* in the end of the lower air-chamber, H, into which the dust and chaff are carried by the draft from the fan, and pass along to the end of the air-chamber H, which communicates with the fan-case by an opening, *g'*, around the shaft B². An adjustable deflector, *h'*, is hinged in the spout G' near the opening *g*, and is for a purpose similar to that of the one before described. The grain, after being thus cleaned, is next to be freed from projecting bits of hull and fuzz, and to this end it is subjected to the action of suitable scouring and brushing devices. With this object in view, the grain is made to fall down the in-

clined spout *i* to a hopper, *i'*, that conducts it to a pair of rubbers or scourers, *II'*, one of which is stationary and the other movable. The rubber *I'* is keyed to and revolves with the up-
 5 right shaft *J*, which is journaled in a step in a bridge-tree below and in a collar-beam above. This rubber is cast in the form of a series of cones with their bases forming flanges which are either horizontal or preferably slightly
 10 elevated, as shown in Fig. 6. This rubber *I'* is arranged within and concentric with the outer stationary rubber, *I*, which is of a corresponding conical shape, the two rubbers being separated a suitable distance from each
 15 other for the passage of the grain between their adjacent surfaces, which are reeded, as shown. The rubber *I* is stationary, and rests on and is secured to a sheet-metal casing, *K*, circular in form, which rests on the bed-plate *k*.

20 Within and concentric with the case or shell *K* is a perforated case, *K'*, somewhat smaller in diameter, so as to leave a circular space between the two cases.

Secured to the cylindrical case *K'*, on its inside, are the conical projections or annular inclines *k'*, which serve the purpose of guiding the grain from the rubbers to the brushes *ll*. These brushes *ll* are secured to disks attached to the hubs that are keyed to the shaft
 30 *J* and revolve with it. The grain passes through the irregular passage-way between the rubbers *I I'*, the operating faces of which are reeded to act more effectively upon the grain, so as to remove the germs and hulls
 35 from the berries. From the rubbers the grain falls upon the upper incline, *k'*, which conducts it through a proper opening to the upper brush, *ll*, over which and between it and the under surface of the upper incline, *k'*, it
 40 (the grain) is forced by the centrifugal action of the brush, which removes all dust and fuzz from the grain as it passes beneath the several inclines and over the respective brushes, any desired number of such inclines and
 45 brushes being employed. To the under side of the lower brush-disk are secured vertical blades *l'l*, which force the dust, &c., through the perforations *m m* in the inner case, *K'*, into the space *m'* between the cases, from
 50 which it is carried by suction through the ports *m² m²* into the lower air-chamber, *H*, and thence into the fan-case. The blades *l'l* also serve to sweep the grain from the bed-plate, where it has fallen from the brushes, to and
 55 through openings *n n* in the bed-plate into spouts *n' n'*, from which it descends to the suction-spouts *L L*, as indicated in Fig. 4. The bran and dust from the scouring mechanism pass into the fan-case, and may be allowed
 60 to go to waste through the opening *d²*, or be received in suitable receptacles, while the germs and heavier portions of separated material fall upon the double-inclined spout *h*, and pass down the same to both sides of the
 65 machine, as shown in Fig. 3. The screenings descend through the opening *g* and pass out

through the valves *e''* at the end of the inclined bottom, as indicated. As the grain passes into the spouts *L L*, it is subjected to a final draft of air induced by the fan, that removes
 70 all remaining impurities, that are thus made to pass up the spouts *L L*, over the arches of the same, and down to openings *o o*, which admit the dust, &c., to the air-chamber, to be wasted. The remaining screenings pass out
 75 at the inclined bottoms through valves *E³*, there placed as seen in Fig. 3. Adjustable deflectors *o' o'* are placed in the spouts *L L*, as shown. The shaft carrying the brushes *ll* and rubber *I'* is adjustable by means of a thumb-
 80 screw, *r*, and lever *R*, as shown in Fig. 1.

It will be observed that the grain and separated impurities in their progress through the machine are subjected to the action of successive air-currents induced by and toward a
 85 single fan, and are also respectively diverted by suitable double-inclined spouts toward the opposite sides of the machine, being finally delivered in separate heaps convenient for handling and removal, the construction of the
 90 machine being such as combines large capacity with economy of space.

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

1. In a grain-cleaner, the combination, with suitable air draft or exhaust mechanism, of the external casing, *K*, stationary rubber *I*, mounted thereon, internal perforated casing, *K'*, having annular inclines *k' k'*, the shaft *J*,
 100 the rotary rubber *I'*, and brushes *ll*, substantially as described.

2. In a grain-cleaner, the combination of the fan *B³*, arched spouts *L L*, casings *K K'*, having an intermediate space, *m'*, the spouts
 105 *n' n'*, leading from the interior of the inner casing to the spouts *L L*, the annular inclines *k' k'*, stationary rubber *I*, hopper *i'*, and shaft *J*, carrying rotary rubber *I'*, brushes *ll*, and blades *l'l*, substantially as described.

3. In a grain-cleaner, the combination of the fan *B³*, lower air-chamber, *H*, having inclined spouts *h h* diverging to each side, and the arched spout *G G'*, having adjustable valve
 110 *h'*, substantially as described.

4. In a grain-cleaner, the combination, with the arched spout *G G'*, lower air-chamber, *H*, having spouts *h h*, and the fan *B³*, of the scouring mechanism, and casings *K K'*, having intermediate space, *m'*, communicating with the
 120 lower air-chamber and with the inner casing, whereby the scourings are separated and the valuable portion thereof saved, substantially as described.

5. In a grain-cleaner, the combination, with
 125 the fan *B³*, upper air-chamber, *B*, lower air-chamber, *H*, casings *K K'*, rubbers *I I'*, and brushes *ll*, of the arched suction-spouts *F' F²*, *G G'*, and *L L*, opening into the upper and lower air-chambers, and provided with suitable
 130 valves and ports, substantially as described.

6. The herein-described grain-cleaner, comprising the fan B³, upper and lower air-chambers, B H, the arched spouts F' F², G G', and L L, opening into said chambers, &c., the vi-
5 bratory shoe D, rubbers I I', casings K K', annular inclines k' k', rotary brushes l' l', and means, substantially as described, for dividing the separated materials and directing them in

diverging streams or portions to opposite sides of the machine, as set forth.

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

JOHN RUSSELL.

Witnesses:

A. R. BROWN,
PHILIP MAURO.