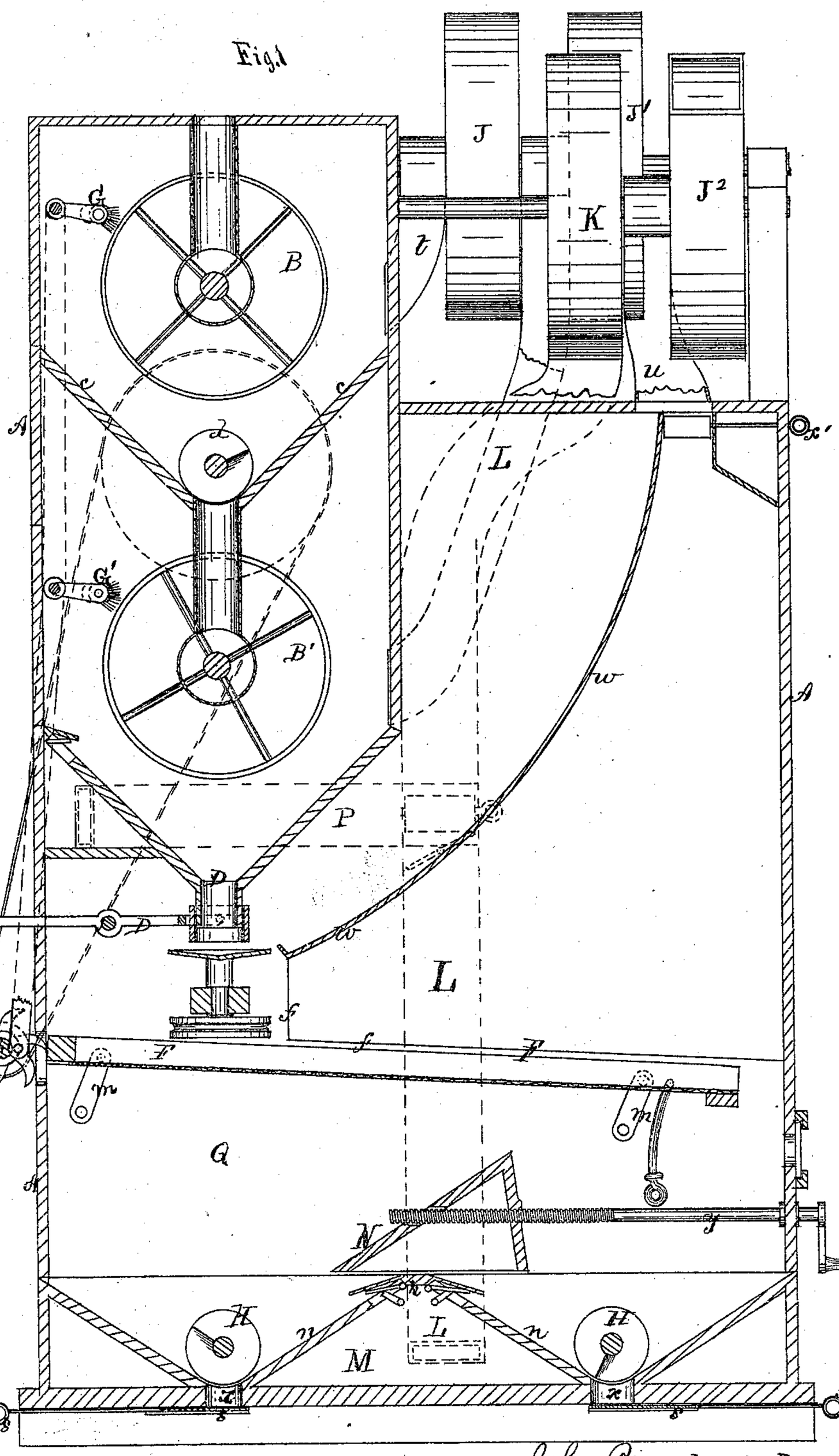
3 Sheets--Sheet 1.

J. BROWN.

Middlings-Purifiers.

No. 149,832. Patented April 21, 1874.

Fig. 1



Witnesses
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J. BROWN.

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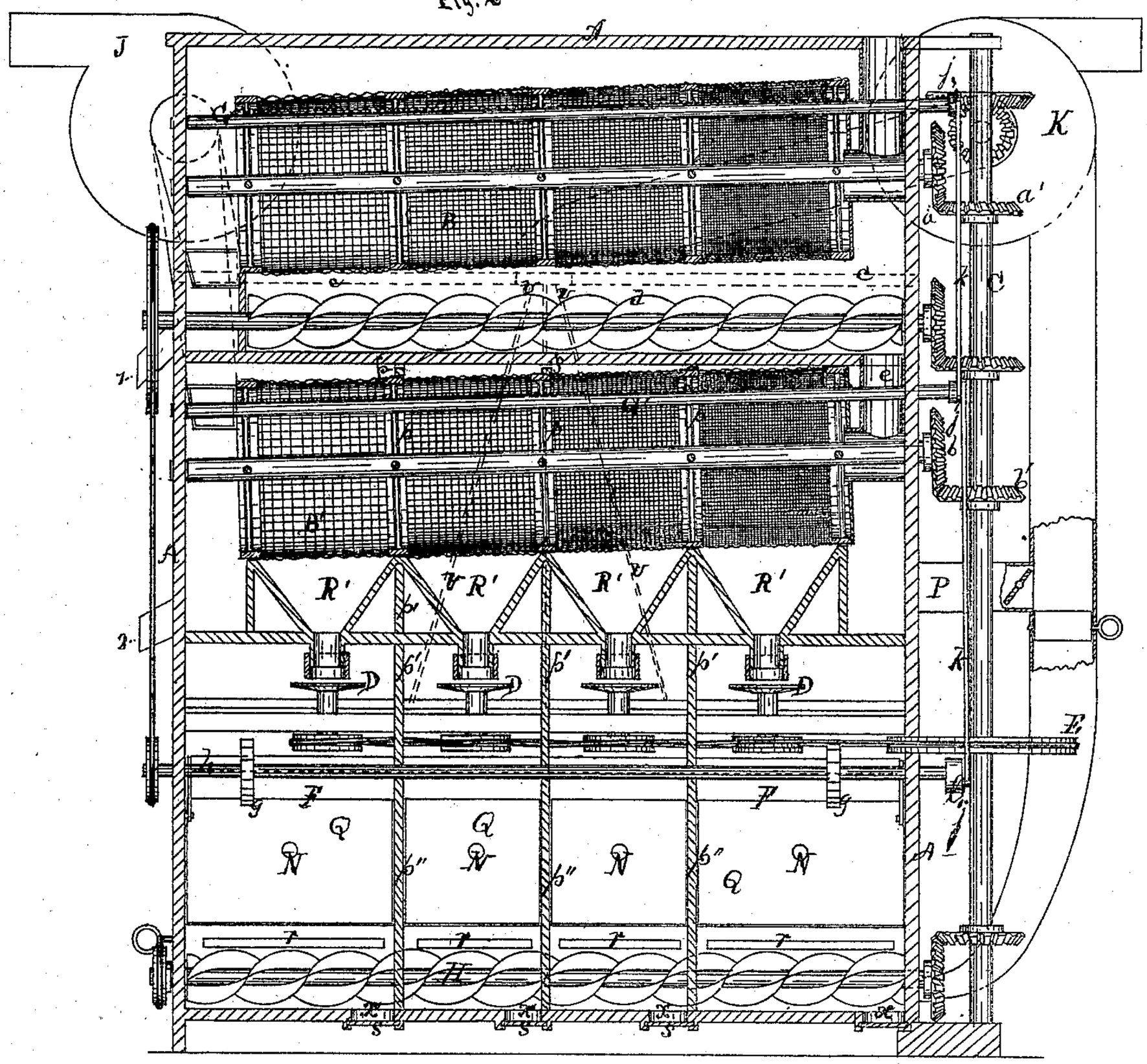
Fig. 2



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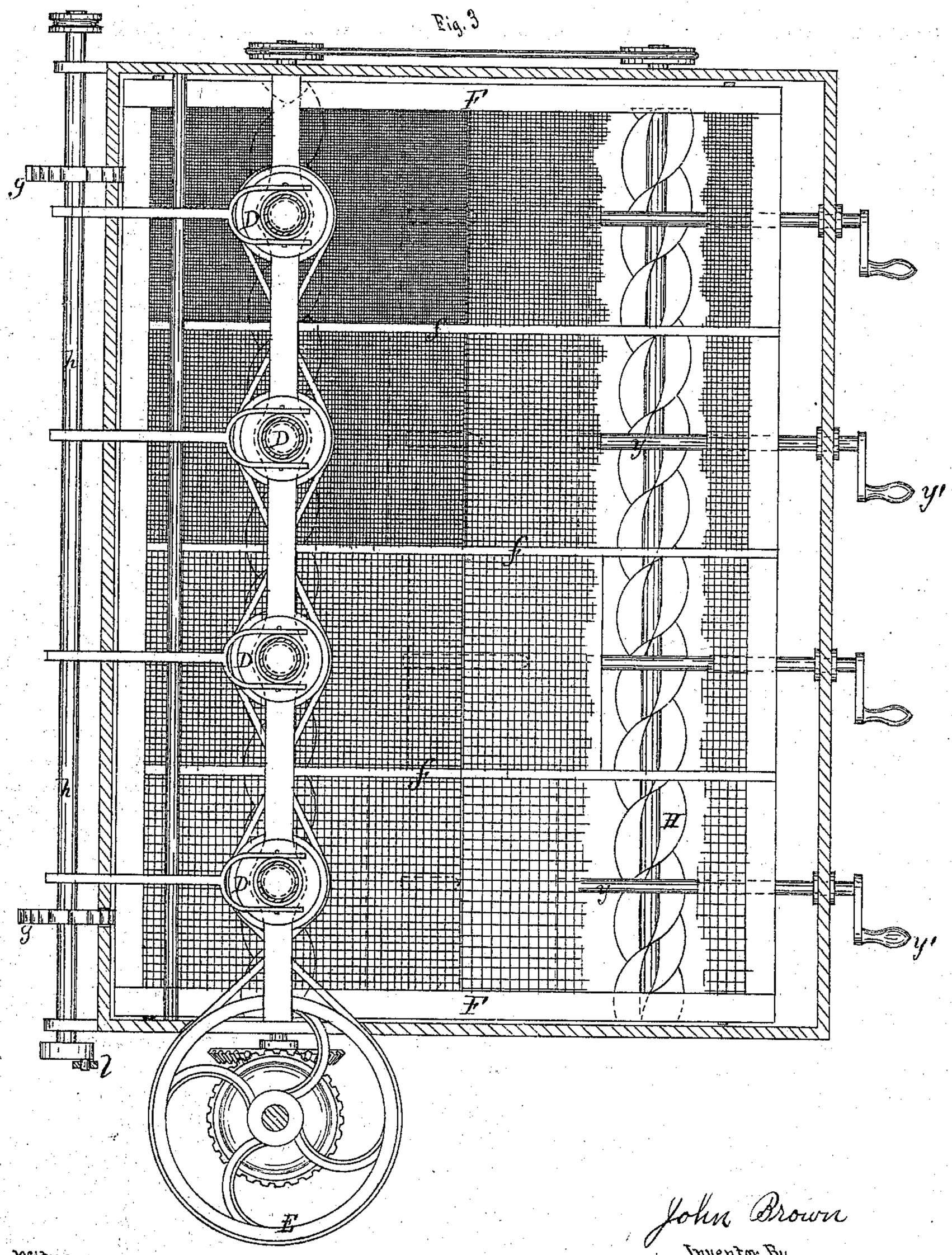
Middlings-Purifiers.

No. 149,832. Patented April 21, 1874.

Fig. 3



Witnesses.
J. R. Drake,
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UNITED STATES PATENT OFFICE.

JOHN BROWN, OF NORTH BUFFALO, NEW YORK.

IMPROVEMENT IN MIDDLINGS-PURIFIERS.

Specification forming part of Letters Patent No. **149,832**, dated April 21, 1874; application filed July 31, 1873.

To all whom it may concern:

Be it known that I, JOHN BROWN, of North Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Separators, &c., for Flour-Mills, of which the following is a specification:

This invention relates to bolting or separating machines for the bran, tailings, and other impurities from the flour, and also to divide the different grades of flour, middlings, farina, &c., from each other by one operation. To this end the invention consists in the combination of one or more reels, having supporting-rings inside of the same, and oscillating brushes operated by means of rods and cranks, in the manner hereinafter specified, for the purpose of clearing the meshes of the bolting-cloth. It further consists in combining, with the bolt and sieve, one or more silent feeders, consisting of valves, which are arranged and operated as hereinafter described. It further consists of a combination and arrangement of parts, to be hereinafter specified.

In the drawings, Figure 1 is a vertical cross-sectional view; Fig. 2, a sectional front elevation; and Fig. 3 is a plan view of the screens, &c.

A is the frame or case inclosing the machinery, and B B′ two circular bolts or reels. These reels are suspended by their journals in suitable boxes, and are revolved by means of an upright shaft, C, and beveled gears *a a′ b b′*. (See Fig. 2.) These reels have their rings inside, and are covered with the usual bolting-cloth, divided into four or more parts, the cloth on each part being of a smaller degree of fineness, or different number, than the one preceding it, by which means the flour, &c., is divided into four or more grades.

Beneath the upper reel D is the cant-board *c*, having a screw-conveyer, *d*, running therein, which conveys the flour, &c., as it falls from the reel, through a spout, *e*, into the second reel, B′. This conveyer is revolved by beveled gears from the shaft C, as shown. This reel is divided like the first, and has also a partition, *p*, between each division, but has one number finer of cloth all the way through; and beneath this second reel B is a series of hoppers, one for each section or grade of cloth, and each having a revolving distributing-valve or silent feeder, D, which are all operated by a cord from a large grooved wheel, E, on the shaft C passing around smaller grooved wheels under each of the valves. *p′ p′* are valve-divisions, dividing the compartments R R. F is a screen or sieve suspended beneath these valves D, and running back to the back part of the case A. (See Figs. 1 and 3.) This screen is divided into as many parts by partitions *f f* as there are different sizes of cloth on the reels, and each section is again divided through the center, lengthwise, into two sizes, thus making double the number of sizes that are placed upon the reels.

It is common to put different numbers of bolting-cloths on sieves, but none divided like mine, by which means a better and greater separation is had.

This screen is placed in a slightly-inclined position, and is oscillated by two or more ratchet-cams, or their equivalents, *g g*, on a shaft, *h*, extending across the front of the machine, and revolved by a cord around a grooved wheel on one end, running upward over a larger grooved wheel on the outer end of the shaft of the screw-conveyer *d*, and by which means the cams, in revolving, strike against the edge of the screen-frame, and throw it back a short distance against springs, which return it again. These give the forward and back movement. To give the screw a slight upward motion, I arrange four jumpers, *m m*, Fig. 1, attached to the sides of the screen F and frame A, which slightly raise the screen in its forward and back movements, giving it a trembling motion, which is very important. G G′ are two brushes suspended across the front of each of the reels B B′, and are oscillated by cranks *j j* and rods *k k*, worked by a small eccentric and pin, *l*, on the end of the shaft *h*, as shown. By means of these brushes the reels are kept clear from clogging, and the rings of the reels being placed inside, permit the free action of the brush on all parts of the cloth. Beneath the screen F are hoppers, divided into compartments Q Q by partitions *p″ p″*, the number of compartments corresponding to the number of sizes of cloth on the screen, thus continually keeping the grades of stuff separate, if wanted, or all run together, if desired.

The bottom of each trough is supplied with

a screw-conveyer, H, and an opening in the bottom, by which means the different grades of flour may be drawn off as desired. Each of these openings *x x* will be supplied with a slide, *s*, by which any two or more of the grades of flour may be mixed by allowing the conveyers to carry it from one compartment to the other. Between each of these partitions *p'' p''*, and underneath the screen, is a movable valve or cut-off, N N, each one moving on a screw-rod, *y*, by a crank, *y'*, outside. These valves are to cut off the brown-stuff as it collects farther forward or back on the sieve and keep it from the good, which drops through to the conveyer. Beneath these valves are narrow air-openings *r r*, with regulating-valves in each, so that each gets the necessary amount of air to pass through and separates the brown-stuff from the good. J J^1 J^2 are three suction-fans placed upon the top of the case A. The two fans J J^1 are connected to the compartments inclosing the reels B B′ by tubes or conduits *t t*, (see Figs. 1 and 2,) and serve to draw the bran and "tailings" from the reels and carry them off. The fan J^2 is connected by a conduit or tube, *u*, to an opening in the top of the case A, from which partitions *v v* are carried down and meet the small partitions *f*, dividing the screen into compartments. *w* is another partition, which is made curving forward toward the front of the machine, and ends at or near the row of distributing-valves or silent feeders D, all of these compartments formed by the partitions *v v v* and *w* ending beneath the conduit *u*, the formation of the partitions *v* being shown in dotted lines in Fig. 2. The tops of the compartments formed by the partitions *v v* are supplied with dampers or valves *x' x' x'*, to regulate the power of the suction of the fan. The object of curving the partition *w* is to give more power to the current of air, and the strength of the suction is got from the tail of the sieve. K is a blowing or blast fan, which is connected by a pipe, L, to a chamber, M, formed by the angles of the two troughs *n n*. P is a branch pipe leading from the main pipe L into a chamber beneath the trough of the reel B′, which carries a portion of the blast against the reel B′, and thus aids in the separation of the flour. The tailings of the first reel come out of spout 1, and is brown-stuff. The tailings from the second reel B′ come out of spout 2, and, together with the tailings from the sieve, are put back again on the stones and reground with the wheat, &c.

The operation of the machine is as follows: The flour is passed into the reel B at one end of the same, from which it is sifted onto the cant-board *c* and into the conveyer *d*, from which it is conducted to the end of the reel B′, and passes into the same through the opening or tube *e*. The flour is now sifted through the cloths of different fineness into the compartments R′, from which each grade of flour passes through the feeders D into the compartments of the vibrating screen F, and from this is sifted into the lower compartments Q onto the conveyer H, from which each grade of flour is conducted to the openings *x* in the floor of the machine, and through which it passes to suitable receptacles placed for its reception.

I claim—

1. In a separator, the combination of the oscillating brushes G G, operated as described, and the round reels B B′, having the supporting-rings inside, as and for the purpose specified.

2. In a separator, the combination of the bolt B′, sieve F, and silent feeders D D, as and for the purpose specified.

3. The combination of the compartments or roads Q Q under the sieve with the air-passages *r r* and cut-offs N N, as and for the purpose specified.

4. In a separator or middlings-purifier, the combination of the reels B B′, brushes G G′, silent feeders D D, sieve F, (divided and operated as described,) partitions *p p' p'' v v*, curved back *w*, movable valves N N, and air-openings *r r* with blowing and suction pipes and air-passages, arranged substantially as specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN BROWN.

Witnesses:
J. R. DRAKE,
T. H. PARSONS.