

G. H. RICH.
Middlings-Purifiers.

No. 154,565.

Patented Sept. 1, 1874.

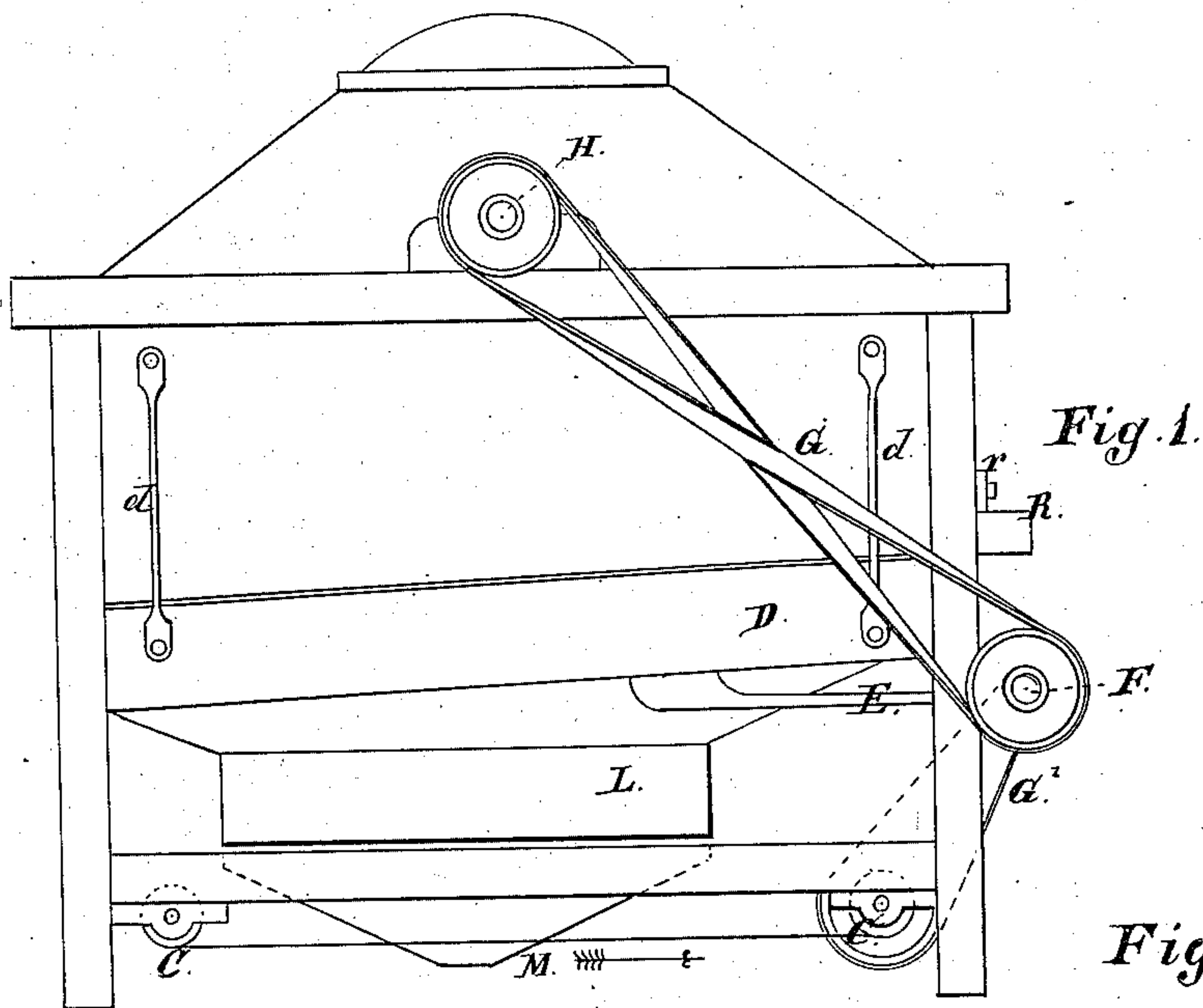


Fig. 1.

Fig. 3.

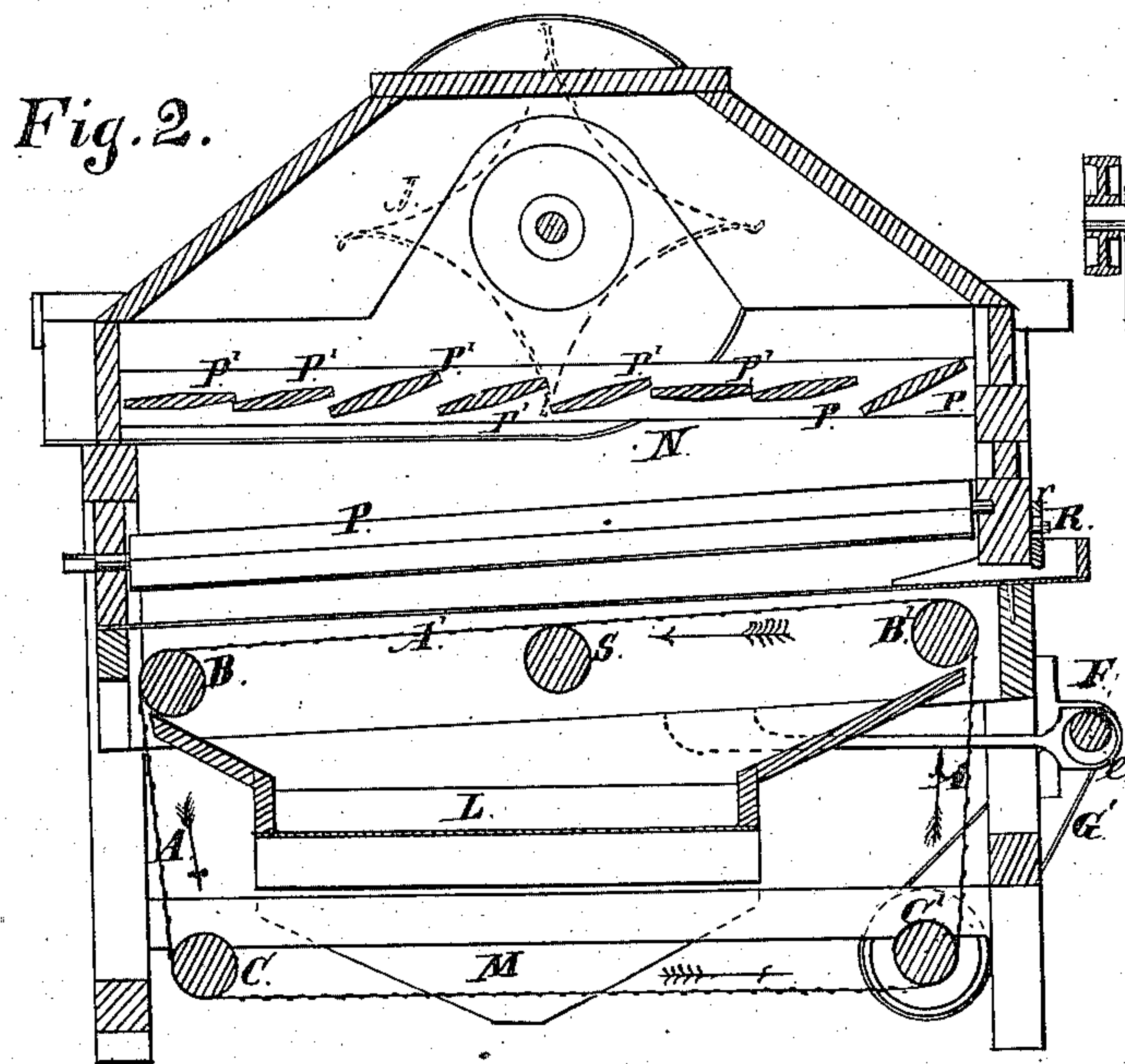
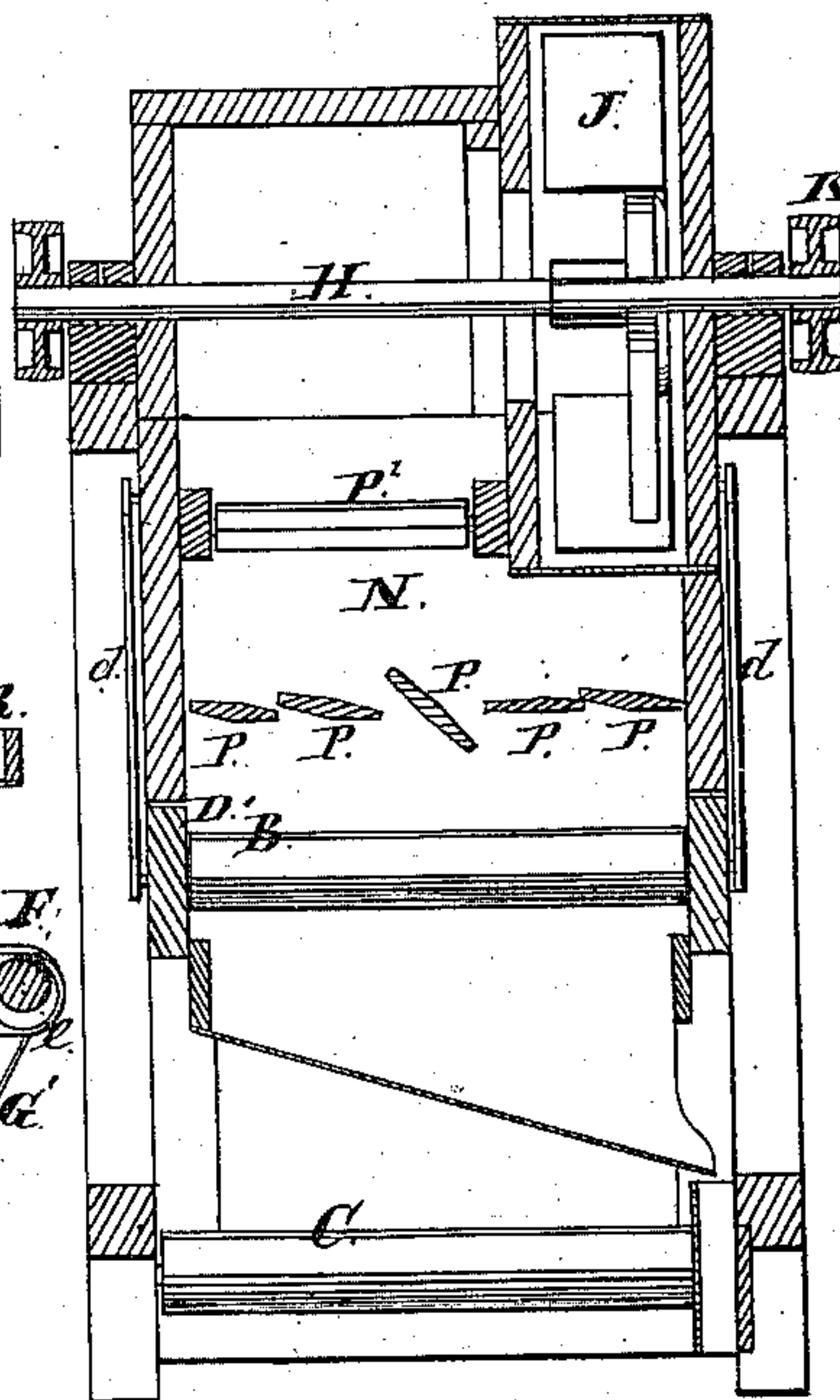


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE

GEORGE H. RICH, OF GENEVA, ILLINOIS.

IMPROVEMENT IN MIDDLEINGS-PURIFIERS.

Specification forming part of Letters Patent No. 154,565, dated September 1, 1874; application filed February 9, 1874.

To all whom it may concern:

Be it known that I, GEORGE H. RICH, of Geneva, in the county of Kane and State of Illinois, have invented certain Improvements in Machines for Purifying Middlings, of which the following is a specification:

In machines for purifying middlings a bolt-cloth separator is usually made use of, through which the middlings suitable for regrinding pass, while the light chaff and dust are drawn out by a fan. In such machines considerable difficulty has been encountered in keeping the bolt-cloth clean, as it is very apt to become clogged up with particles of the matter which should pass through the meshes, and when clogged up its efficiency is either wholly destroyed or greatly impaired in proportion to the extent of the stoppage. Various devices have been contrived for cleaning the bolt-cloth in various ways, the most efficient of which is the well-known brush which, by contact with the cloth, dislodges the entangled particles and clears the meshes; but the action of the brush upon the cloth tends to wear the cloth out rapidly, and the mechanism required to manipulate the brush is more or less expensive and complex. I propose in the present invention to employ an endless-band sieve of bolt-cloth stretched over rollers, which give it a slow motion, so that a new surface is constantly being brought into use, while the part or surface which has performed the sifting is turned the other side up in returning, and those particles of matter which have become lodged in the meshes are allowed to fall out the same way they came in. This endless apron of bolt-cloth is shaken by a vibrating shoe, which may carry two of the supporting-rollers, and the upper ply of the apron is inclined a little to cause the unpurified middlings to shake off at one end. The best manner of supporting the apron-sieve I find to be by means of four rollers arranged at the corners of a parallelogram; the upper pair being hung in a vibrating shoe, while the lower pair are borne in the framework of the machine and are stationary, except as they revolve upon their own axes. This arrangement of four rollers—an upper and a lower pair—enables me to allow sufficient space between the upper and under plies of the apron-sieve to accommodate a convey-

ing device consisting of an inclined shake-board or other contrivance for receiving the purified middlings which pass through the meshes of the sieve, and to convey the same out from between the two plies of the sieve, so that it shall not fall upon and befoul the lower ply. This arrangement also comprehends that two portions of the apron, one at each end, shall always be in a vertical position—one portion descending and the other ascending—and as the upper ply, which performs the sifting, is vibrated longitudinally through the agency of the before-mentioned vibrating shoe, these vertical end portions of the apron are “waved”, so to speak, through the air at each vibration of the shoe, which action tends to effectually clear them of dirt.

In connection with this sifting mechanism, I employ a suction-fan for lifting and carrying away the dust and lighter parts of the refuse matter from above the sifter.

This placing of a suction-fan above the sifter is not new with me, as it has been quite commonly used, and it has been common to govern and direct the draft of the fan by means of a partition lying over the sifter, fitted with movable slats or long narrow valves. But this arrangement of a single partition I find to be insufficient to properly regulate and distribute the draft as such single partition or floor operates only in one direction. I therefore employ two floors or partitions above the sifter, one lying over the other, said floors being provided with a series of long slats or valves, or being made wholly of hinged or pivoted slats arranged so that the slats or valves of one floor run at right angles to those in the other floor, which enables me to distribute and control the draft of the fan perfectly.

In the accompanying drawing, which forms a part of this specification, Figure 1 represents a side elevation of my improved machine. Fig. 2 is a central vertical longitudinal section of the same, and Fig. 3 is a central vertical transverse section thereof.

In the said drawing, A represents the endless-band or apron sieve of bolt-cloth passing around the roller B B' and C C'. This apron of bolt-cloth may be strengthened at the edges with straps of leather. And also, to secure a more perfect action, the rollers may be made

with spoke or sprocket wheels, not shown in the drawing, which may engage holes pierced through the strengthening-straps. The upper pair of rollers, B B', are borne in a vibrating shoe, D, the roller B being set a little lower than B' to give the upper ply of the bolt-cloth an incline. The vibrating shoe D is swung from the frame of the machine by pivoted arms *d*, and is caused to shake or vibrate longitudinally by means of the pitmen E, one at each side, connected by eccentrics *e* to the shaft F, which receives power at one end by the cross-belt G from the shaft H, which carries the fan J and also the power-pulley K; and said shaft F transmits from its other end, by the belt G', motion to the roller C', one of the four which sustain and circulate the apron A. By apportioning the size of the band wheels or pulleys, the fan J moves rapidly, and a rapid vibration is imparted to the shoe, while the roller which circulates the apron moves slowly. I suggest as a proper rate of speed that the roller C' be driven at such speed that the apron will be caused to make a complete circuit in about one hour, when the machine is operating at a proper rate of speed, as will be understood by those acquainted with the art. The apron circulates in the direction shown by the arrows, and at the upper ply this direction agrees with the decline, as shown. This slow motion of the bolt-cloth apron is not attended with any material strain or wear upon the fabric, as will be readily understood.

Attached to the under side of the shoe D is an inclined conveyer or shake-board, L, emptying into a narrow hopper or funnel, M, which serves to concentrate the middlings as they fall. Above the upper ply of the apron is a chamber, N, communicating with the suction-fan J. This chamber is divided by two horizontal partitions or floors, the lower of which consists of a series of longitudinal valves or slats, P, extending the whole length of the sieve, and the upper one of a similar series of transverse slats, P'. By adjusting these slats—opening and closing them—the suction of the fan may be directed to any part of the surface of the sieve.

The operation of my machine is as follows: The middlings to be purified are fed into the

hopper R, which may be caused to feed slow or fast by the slide *r*, and fall immediately upon the upper surface of the upper ply of the apron-sieve A', which, by the mechanism above-described, is caused to vibrate longitudinally. This vibration causes the middlings, chaff, dirt, dust, &c., to shake along down toward the lower end of the upper ply of the apron. During this passage, the smaller heavy particles sift through and fall upon the shake-board L and are conveyed away, while the dust and light portions are lifted by the fan and conveyed away. The coarse refuse spills over at the lower end of the incline of the apron, and is collected by any suitable means and reground.

An extra roller, S, may be inserted at the middle of the sifter to sustain it from bagging under the weight of the material being sifted.

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

1. The circulating, endless-band, vibrating bolt-cloth sifter A, constructed and operating substantially as specified.

2. The circulating, endless-band, vibrating bolt-cloth sifter A, mounted upon the rollers B B' C C', which separate the upper and lower plies of the sifter to a considerable distance, so that a portion of said sifter at each end stands vertically, substantially as specified.

3. The combination of the vibrating shoe D, carrying the rollers B B', the endless-band sifter A, and the rollers C C', substantially as specified.

4. The circulating, endless band, vibrating bolt-cloth sifter A, in combination with the rollers B B' C C', and a conveying device, L, or its equivalent, for conveying the material which sifts through the upper ply away from between the plies, substantially as specified.

5. The combination of the sifter A, the fan J, and the chamber N, divided by a double floor consisting of two series of valves, P P', running at right angles to each other, substantially as specified.

G. H. RICH.

Witnesses:

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