3 Sheets--Sheet 1.

O. A. PRAY.

Middlings-Purifiers.

No. 147,685. Patented Feb. 17, 1874.

Fig 2

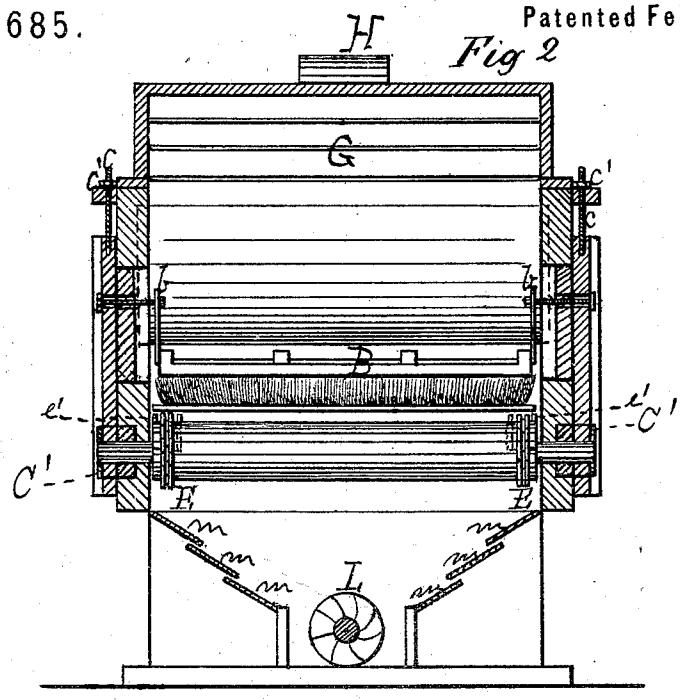

Fig 1.

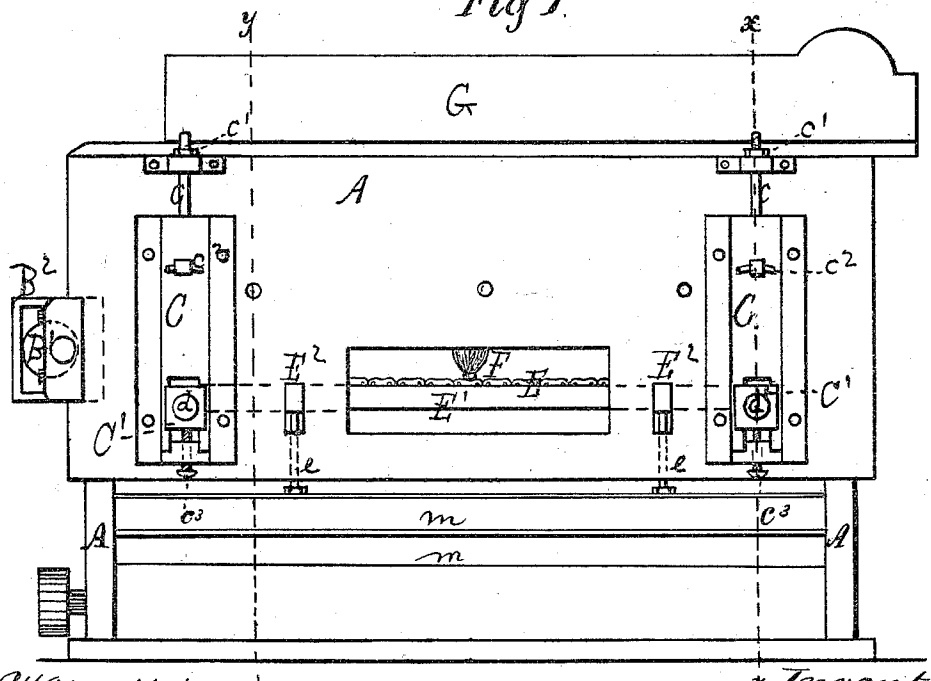

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Fig 4.

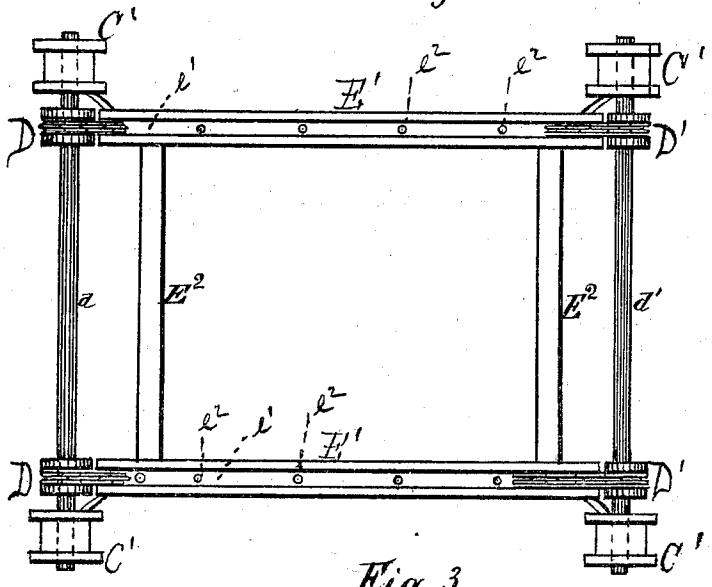
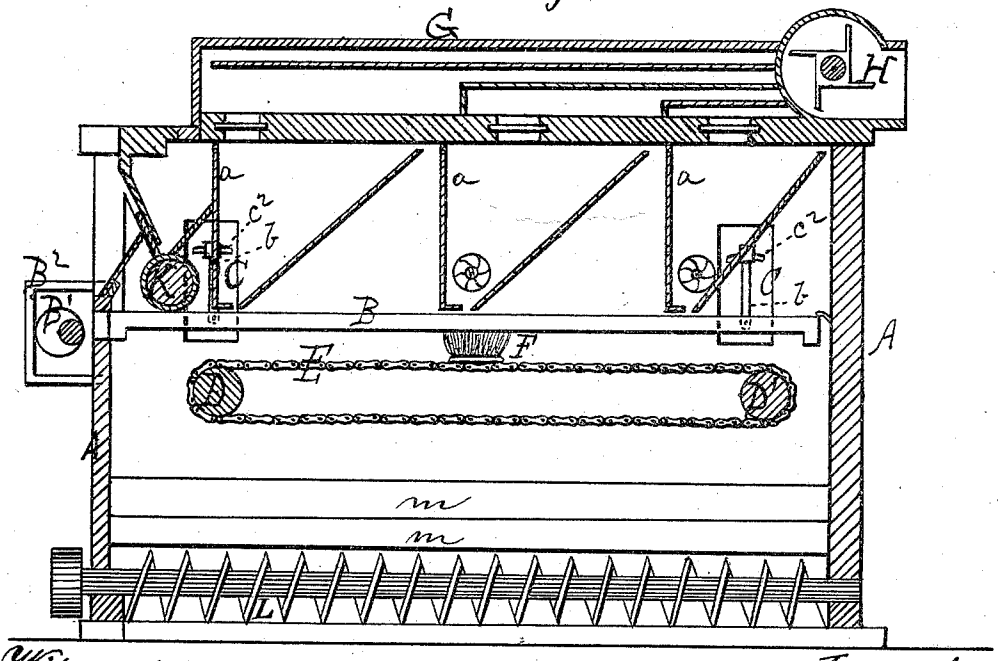


Fig. 3.



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3 Sheets--Sheet 3.

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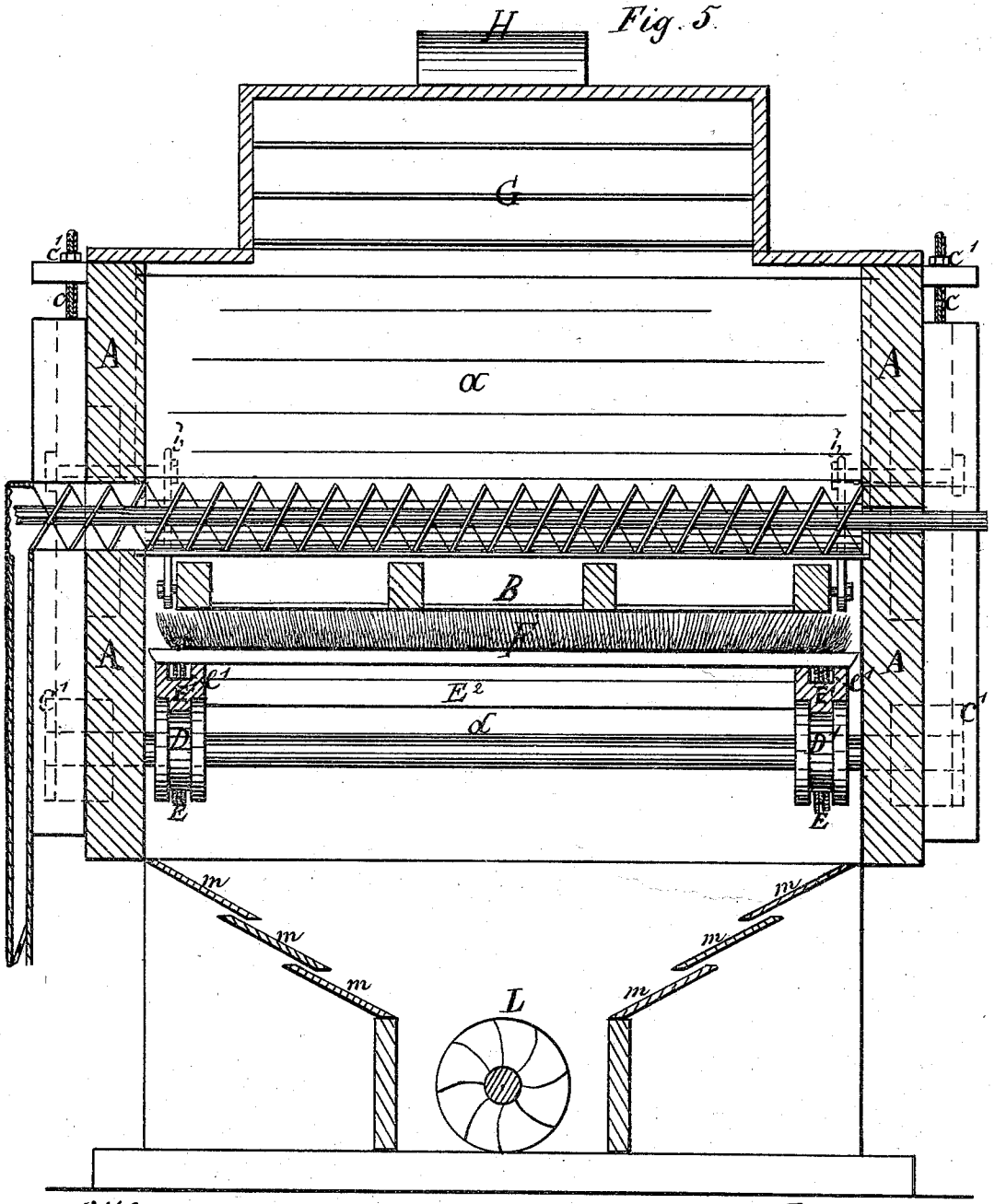
Fig. 5.



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UNITED STATES PATENT OFFICE.

OTIS A. PRAY, OF MINNEAPOLIS, MINNESOTA.

IMPROVEMENT IN MIDDLINGS-PURIFIERS.

Specification forming part of Letters Patent No. **147,685**, dated February 17, 1874; application filed July 7, 1873.

To all whom it may concern:

Be it known that I, OTIS A. PRAY, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Middlings-Purifiers; and I do hereby 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

Figure 1 is a side elevation. Fig. 2 is a vertical transverse section taken on line *x x*, Fig. 1. Fig. 3 is a vertical longitudinal section. Fig. 4 is a plan view of a modification of the brush-ways and the means of adjusting the same; and Fig. 5 is a vertical transverse section taken on line *y y*, this view being on an enlarged scale.

A A represent the inclosing frame-work or body of the machine. B is a shaker, to which a reciprocating motion is imparted by means of a cam or eccentric, B^1, and strap or yoke B^2. C C are plates sliding in suitable grooves or ways formed in or upon the sides of the machine. Plates C are suspended from the frame by the hangers *c* and nuts c^1. Thus the hangers and plates can be accurately adjusted vertically. The shaker B is suspended from plates C by pendulum-links *b*, the upper ends of links *b* being adjusted laterally in slots c^2 in plates C. Slots c^2 are made in an arc of a circle, the center of which is the pivot which connects the lower ends of the links with the shaker, in order that the upper ends of said links may be adjusted without raising or lowering the shaker. C′ are bearing-blocks, adjustable vertically in a slot in the lower ends of plates C. c^3 are set-screws. D are star-wheels mounted on shaft *d*, which revolves in bearing-blocks C′. D′ are grooved wheels or sheaves mounted on shaft *d′*, which revolves in the rearward bearing-blocks. E E are the brush-chains, driven by the star-wheels D. E^1 E^1 are the brush ways or guides. In Fig. 1 I have shown the cross-bars or girts E^2, which connect these ways, projecting through the sides of the machine, and supported in slots, in which they can be adjusted vertically by means of set-screws *e*. In Fig. 4 I have represented them (the brush-ways E^1) as being attached to the bearing-blocks in such manner that both the ways and the brush-shafts *d d′* can be adjusted by the set-screws c^3.

I regard this construction, by means of which I can adjust both the brush-ways and the brush-shafts vertically relative to the shaker, as being important, because it insures a uniformity of movement in the brush as it passes from the star-wheels to the ways, and from the ways over the sheaves, without any attention on the part of the operator.

Brush-ways E^1 are grooved upon their upper faces or edges, as at e^1, Figs. 2 and 4, to receive the upper line of chains E. The brush F is driven by the star-wheels D, and when in contact with the shaker moves from the head toward the tail of the machine; hence that portion of the upper line of each chain which follows the brush is slack, and has a vibratory motion imparted to it in passing over the star-wheel D; and in order to prevent this vibratory motion conveying a rocking motion to the brush, I place the chains in the grooves e^1. Thus the ways support them, and they produce no irregularity in the movement of the brush.

I do not claim, broadly, the employment of a grooved rib or support for the chains; but I believe that when such ways are used in combination with the brush, the shaker, and the star-wheels, they perform a special function which is new and patentable.

e^2 e^2 are holes bored through the ways E^1 from the bottoms of the grooves e^1. The middlings which would otherwise be carried from the head of the shaker toward the tail by the brush-chains fall through these holes. The air-chamber above the shaker is divided by partitions *a* (see Fig. 3) into three or more sections, each communicating through a separate outlet with the air-trunk G and fan H, and, by preference, the air-trunk is divided by horizontal partitions, as shown in Fig. 3, so as to furnish each air-chamber or section with its own flue. Sliding valves or gates are generally used in each flue to regulate the strength of the air-currents. A′ are screw-conveyers arranged transversely of the machine in the lower parts of the pockets formed by the junction of the partitions *a* and the inclined wing-

boards a^1. These conveyers A′ deliver such material as may collect in the pockets to the spouts a^2 on the outside of the machine, apertures being cut through the walls of the air-chambers for the passage of such material. Conveyers A′ may be driven by pulleys and belts, or by any other suitable gearing, from the feed-roller K, or otherwise, as may be convenient. The spouts a^2 have weighted or spring trap-valves a^3 at their lower ends, to permit any accumulation of material to escape without allowing air to pass through them into the air-chambers. L is a conveyer under the shaker, and *m m* are gather-boards to conduct the middlings which fall through the shaker to the conveyer. The boards *m m* overlap each other, and have open spaces between them, as shown plainly in Fig. 2, to permit the air to pass freely to the central portion of the shaker.

It will be readily seen that after the brushes have been once adjusted at a proper distance from the shaker by means of hangers *c* the shaker may be raised or lowered at will without disturbing the working relation of the brushes, and when the brush-ways are also connected with bearing-blocks C′ they (the ways) cannot get out of place.

I do not claim, broadly, hanging the shaker to the adjustable hanger or block C; nor the employment of the adjustable links *b* for regulating the rise and fall of the shaker; nor mounting the brush shafts or ways in the adjustable hanger C.

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

1. In a middlings-purifier, the combination of the grooved ribs or ways E^1, the brush-chains E, the star-wheels D, and the brush F with the shaker B, substantially as set forth.

2. The brush-ways E^1, provided with the holes c^2, substantially as and for the purpose described.

3. The combination of the brush-ways E^1, bearing-blocks C′, and set-screws c^3, whereby the brush-ways may be adjusted to the shaker without changing the position of the brush-shaft relative to the ways, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of February, 1873.

OTIS A. PRAY.

Witnesses:

GROVE B. COOLEY,

DANIEL C. DART.