(No Model.) 3 Sheets—Sheet 1.

W. S. PARKER, D. H. BLOOD & O. F. TOWER.

GRADING MACHINE.

No. 356,782. Patented Feb. 1, 1887.

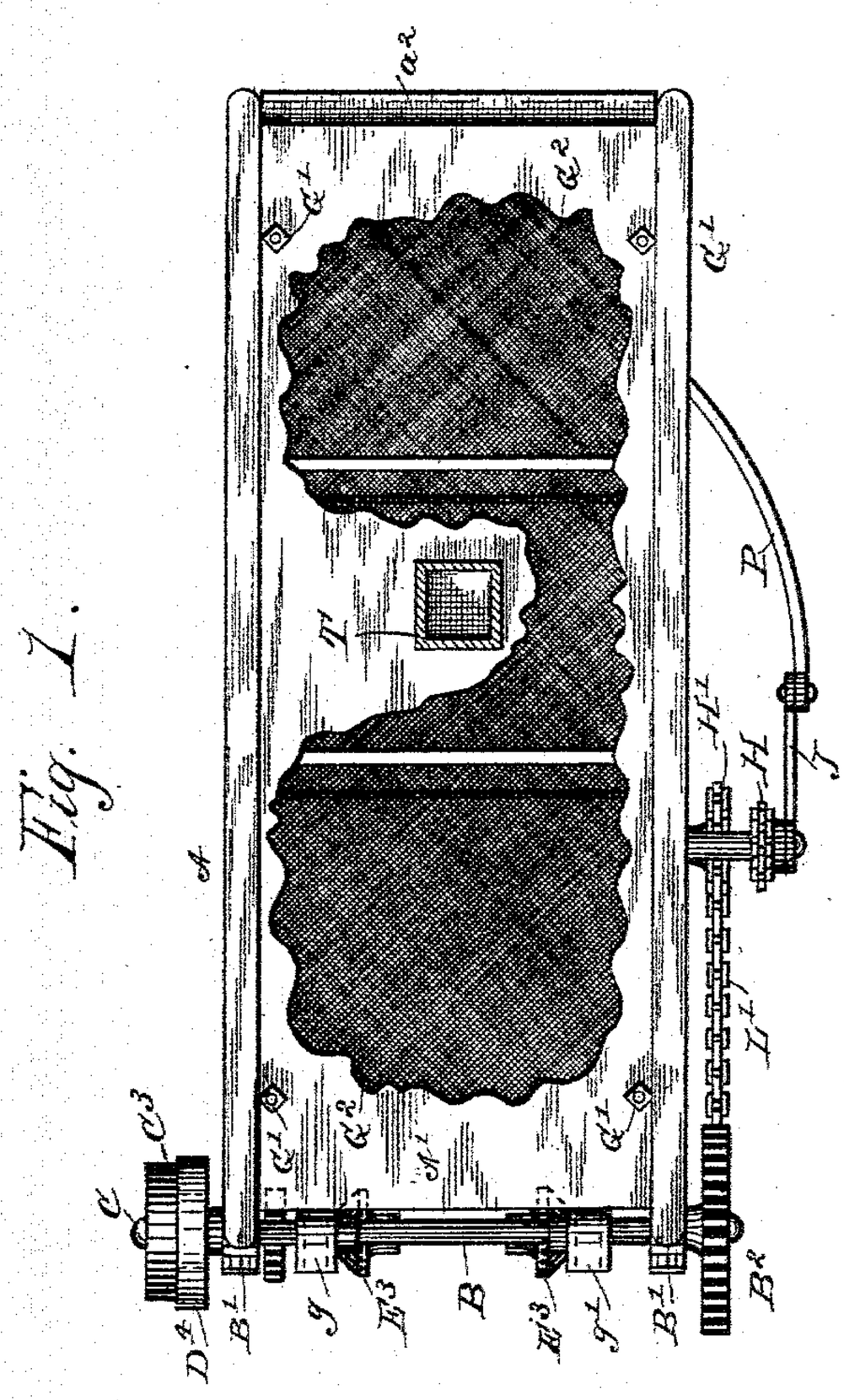

Fig. 1.

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Fig. 2.

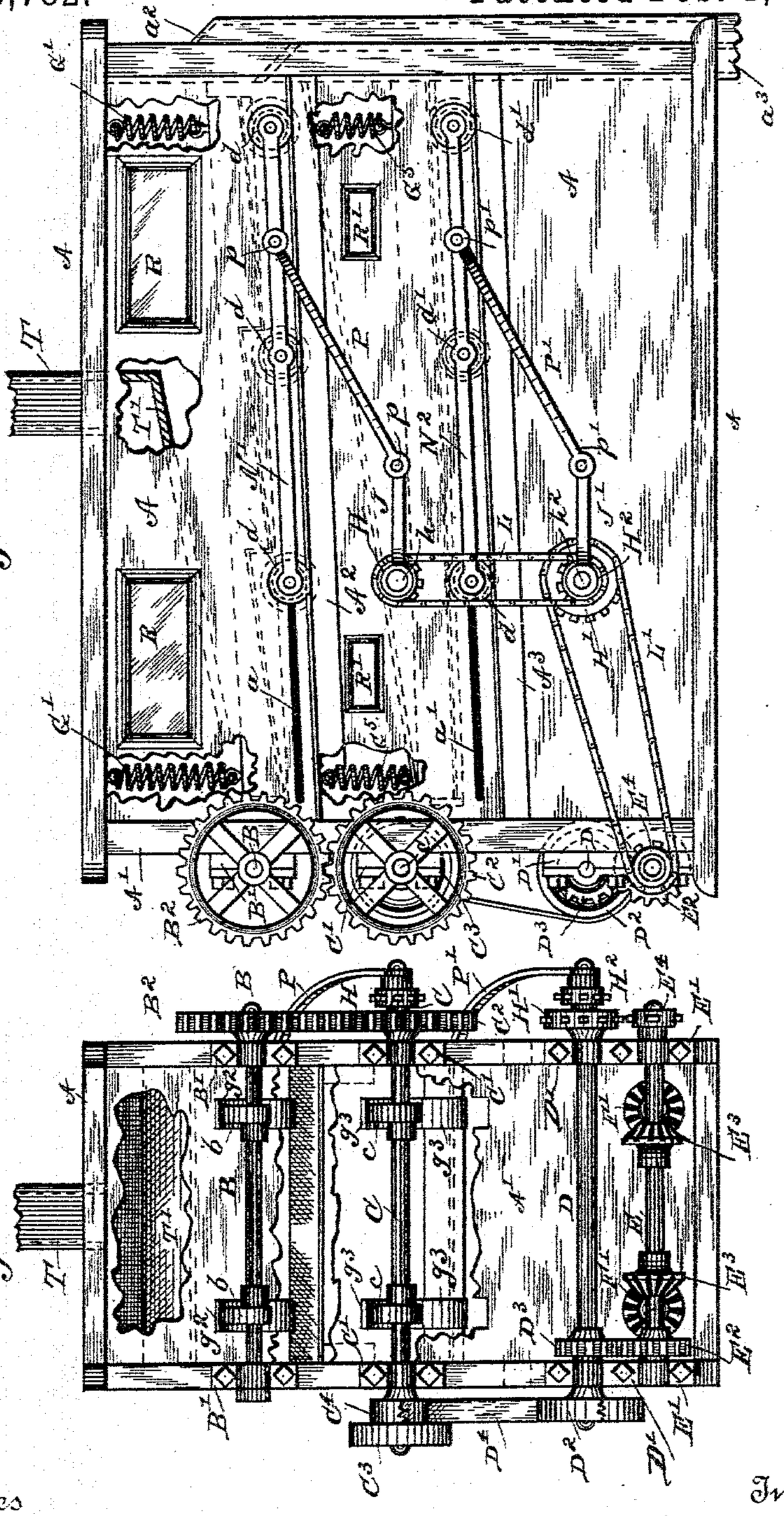

Fig. 3.

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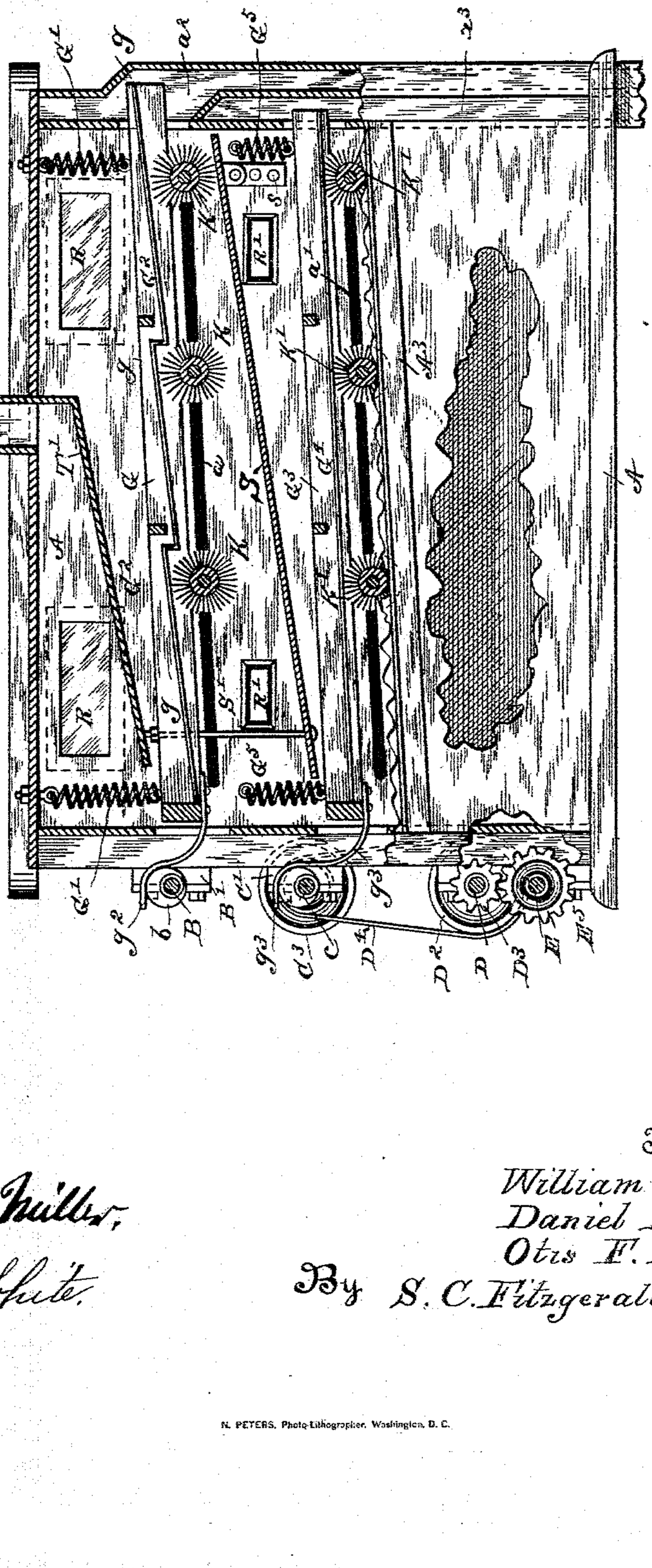
Fig. 1.



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UNITED STATES PATENT OFFICE.

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GRADING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 356,782, dated February 1, 1887.

Application filed May 3, 1886. Serial No. 200,948. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM S. PARKER, DANIEL H. BLOOD, and OTIS F. TOWER, citizens of the United States, residing at Laingsburg, in the county of Shiawassee and State of Michigan, have invented certain new and useful Improvements in Grading-Machines; and we 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 appertains to make and use the same.

The object of this improvement is a grading-machine that is adapted to scalp the middlings and flour from the broken wheat preparatory to going from one break to another for reduction; also, to grade the middlings preparatory to going to the purifiers, and thereby avoid the necessity of moving the same through conveyers, elevators, or reels to be dusted and graded before going to the purifiers. These results are attained by the means illustrated in the drawings, forming part hereof, in which the same letters of reference denote the same parts in the different views.

Figure 1 is a plan, with parts broken away, representing a machine embodying the features of our improvement. Fig. 2 is a side elevation, partly broken away. Fig. 3 is an end elevation, with parts removed and broken away. Fig. 4 is a side elevation, with parts broken away and parts shown in section.

A A′ represent the side and end walls of a suitable inclosing-frame. The side walls, A, are provided with slots (shown at *a a′*, Fig. 2) and adjacent ribbed projections A^2 A^3, and a^2 a^3 represent discharge-conduits at the rear end of the machine.

B is a shaft supported by brackets B′, fixed to the frame-posts, and provided with a gear-wheel, B^2, at one end and eccentrics *b b* intermediate of the brackets, as shown. C is a shaft supported by brackets C′, fixed to the frame-posts, and provided with a gear-wheel, C^2, arranged to mesh with wheel B^2 on shaft B, and intermediately of the brackets C′ with eccentrics *c c*, and at one end with a driving-pulley, C^3, and a counter-pulley, C^4.

D is a counter-shaft supported by brackets D′, fixed to the frame-posts, and provided with a pulley, D^2, and pinion D^3, in the positions shown in Fig. 3.

E is a shaft supported by brackets E′, fixed to the frame-posts.

E^2 is a gear-wheel on shaft E, arranged to mesh with pinion-gear D^3 on shaft D.

E^3 E^3 are bevel-gears on shaft E, arranged to mesh with corresponding gears, F′ F^2, on the shafts of conveyers (not shown) and thereby operate the same.

E^4 is a sprocket-wheel fixed to shaft E, for a purpose hereinafter set forth.

G is a sieve frame or shoe suspended at an inclination, substantially as shown, within the frame by means of steel springs G′, suitably secured to the top or to the walls of the inclosing-frame.

G^2 is the sieve proper, provided with inclinations *g*. The front end of the sieve-frame G is provided with springs g^2, arranged to bear on eccentrics *b b* of the shaft B, for a purpose hereinafter explained.

G^3 is the frame or shoe of an additional sieve, G^4, but suspended by means of steel springs G^5, fixed to the frame-walls, and at an inclination substantially the same as that of the sieve-frame G. The front end of the sieve-frame G^3 is provided with springs g^3, arranged to bear on eccentrics *c c* of the shaft C.

H is a sprocket-wheel arranged to turn on an axial bearing, *h*, projecting from a bracket fixed to the frame-wall. H′ H^2 is a double sprocket-wheel arranged to turn on an axial bearing, h^2, projecting from a bracket fixed to the side of the frame, preferably in vertical line with the sprocket-wheel H.

The machine is also provided with a series of brushes, K K′, which revolve on their axes immediately under the sieves G G^3, and arranged to move longitudinally to and fro and clean the sieves G G^3, as hereinafter fully explained. The brushes K K′ are provided with axial extensions or journals, which project through slots shown at *a a′* in the sides of the frame, and are provided at the ends of the same with grooved disks *d d′*, which support the brushes in the positions shown by reason of their bearing on the ribbed lateral projec-

tions or inclined brackets fixed to the sides of the frame-walls, as shown at A^2 A^3.

N′ N^2 are bars provided with perforations for receiving the axial projections of the brushes K K′, and thereby hold them in the relative positions to each other as shown.

J is a crank or arm fixed to and arranged to move with the sprocket-wheel H, and J′ is a crank or arm fixed to and arranged to move with the double sprocket-wheel H′ H^2, which is connected with the sprocket-wheel E^4 on the shaft E by a chain belt, E′, and with the sprocket-wheel H by a chain belt, L, as shown in Fig. 2.

P P′ represent pitman or connecting rods pivotally secured, respectively, to the bars N N′ and to the arms or cranks J J′, fixed to the sprocket-wheels H H′ H^2, as indicated at *p p′*.

R R′ are windows in the sides of the inclosing-frame. The machine is provided, intermediately of the sieves G G^3, with an inclined vibrating board, S, which is pivotally connected at one end to standards or brackets *s*, fixed to the frame-walls, and connected at its opposite end, by means of rods S′, with the sieve-frame G, and thereby arranged to vibrate with the motion of the latter.

T is a spout for introducing material into the machine, and T′ is an inclined passage for the same.

The sieve parts *g* G^4 may be of any suitable material, the sieve G^4 having the finer mesh, and the brushes shown may be made either of hair or wire, as may be deemed advisable.

Power applied to the pulley C^3 will put all the parts in motion. The eccentrics on the shafts B and C will give jarring motion to the sieve-frames, with which they are connected by the springs shown. The rotation of the sprocket-wheels H and H′ H^2 and their crank-arms J J′ will cause the brushes K K′ to be moved to and fro by reason of their connection through the rods or bars N′ N^2, and thereby made to engage the texture of the sieves adjacent to the brushes, and thus prevent the sieves from clogging, and free and rapid action of the stock through the same will thereby be secured.

In the operation of the machine the tailings and coarse middlings will be separated from the flour and fine middlings by being worked over the high ends of the sieves and through the discharge-conduits a^2 a^3. What passes through the sieve G′ drops onto the vibrating board S, and what passes to the high end of the sieve G drops through the discharge-conduit a^2, and is termed "tailings." What drops onto the board S passes to sieve G^3. What passes through the latter falls to conveyers, (not shown,) and is removed from the machine in the ordinary way, and is termed "flour and fine middlings," and what passes to high end of sieve G^3 drops through the discharge-conduit a^3, and is termed "coarse middlings."

The sprocket-wheels H H′ H^2, provided with chain belts and crank-arms, as shown, may be fixed to both sides of the machine and connected with the brushes by pitmen, if deemed advisable, for steadying or obtaining even motion for the brushes, in which case the shaft E should be provided with a sprocket-wheel at its end opposite to the sprocket-wheel E^4 thereon.

Having explained the features of our improvement, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of the frame, the sieves, the brackets secured to the frame, the vibrating board pivoted at one end to the brackets, the means at its opposite end for suspending it from the upper sieve, and the means for vibrating the sieves, substantially as and for the purpose set forth.

2. The combination of the frame, the sieves, the springs suspending the same from the frame, the shafts journaled to the frame adjacent to the sieves and provided with eccentrics, and the curved springs connected to the sieves and resting upon the eccentrics, substantially as specified, for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM S. PARKER.
DANIEL H. BLOOD.
OTIS F. TOWER.

Witnesses:
H. P. DODGE,
B. W. DENNIS.