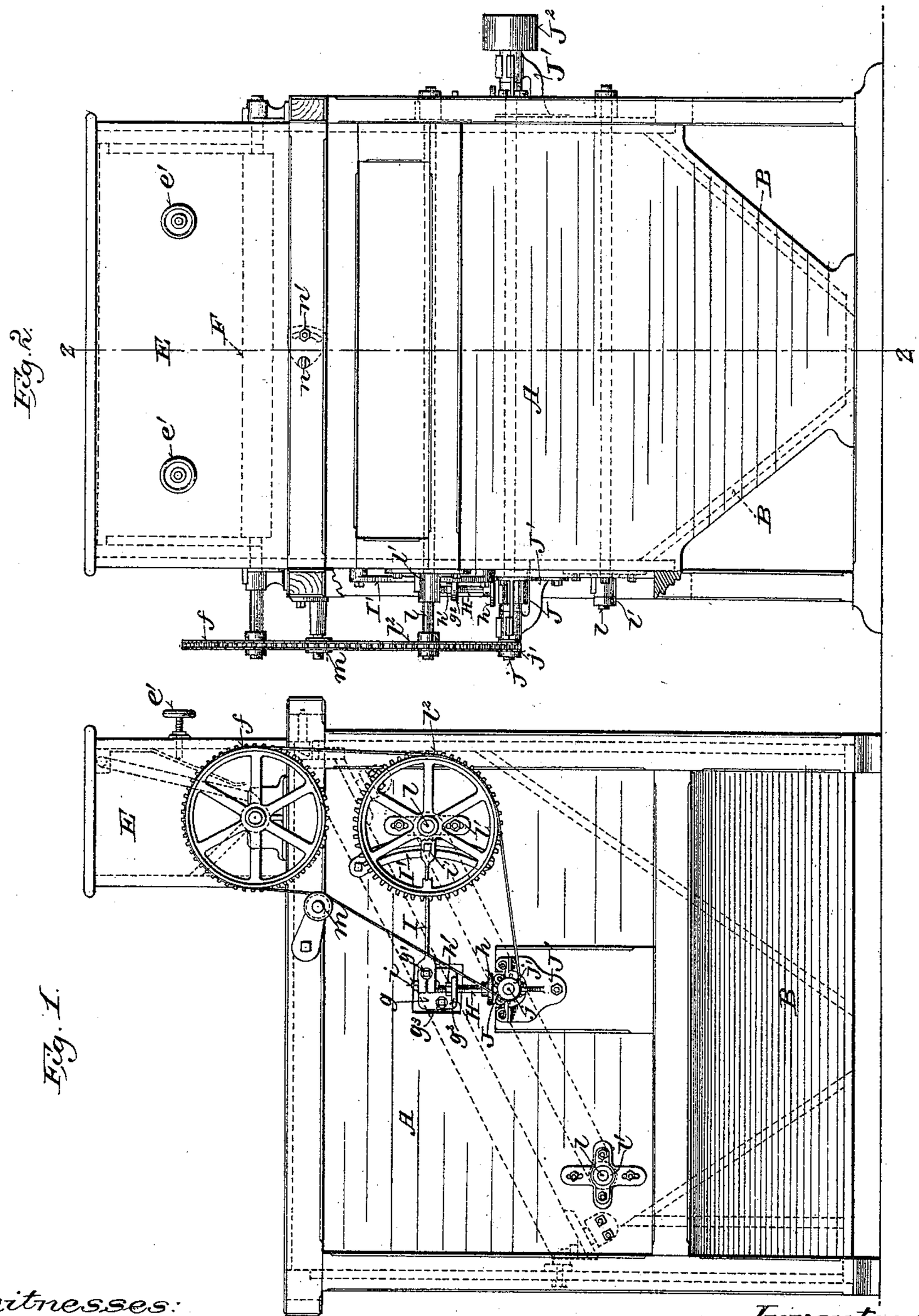
(No Model.) 2 Sheets—Sheet 1.

O. ESCHE.

BOLTING MACHINE.

No. 450,310. Patented Apr. 14, 1891.



Witnesses:
Edw. Sumner
Chas. L. Goss.

Inventor:
Otto[illegible] Esche,
By Wright Brown Quinby & Otis
Attorneys.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.

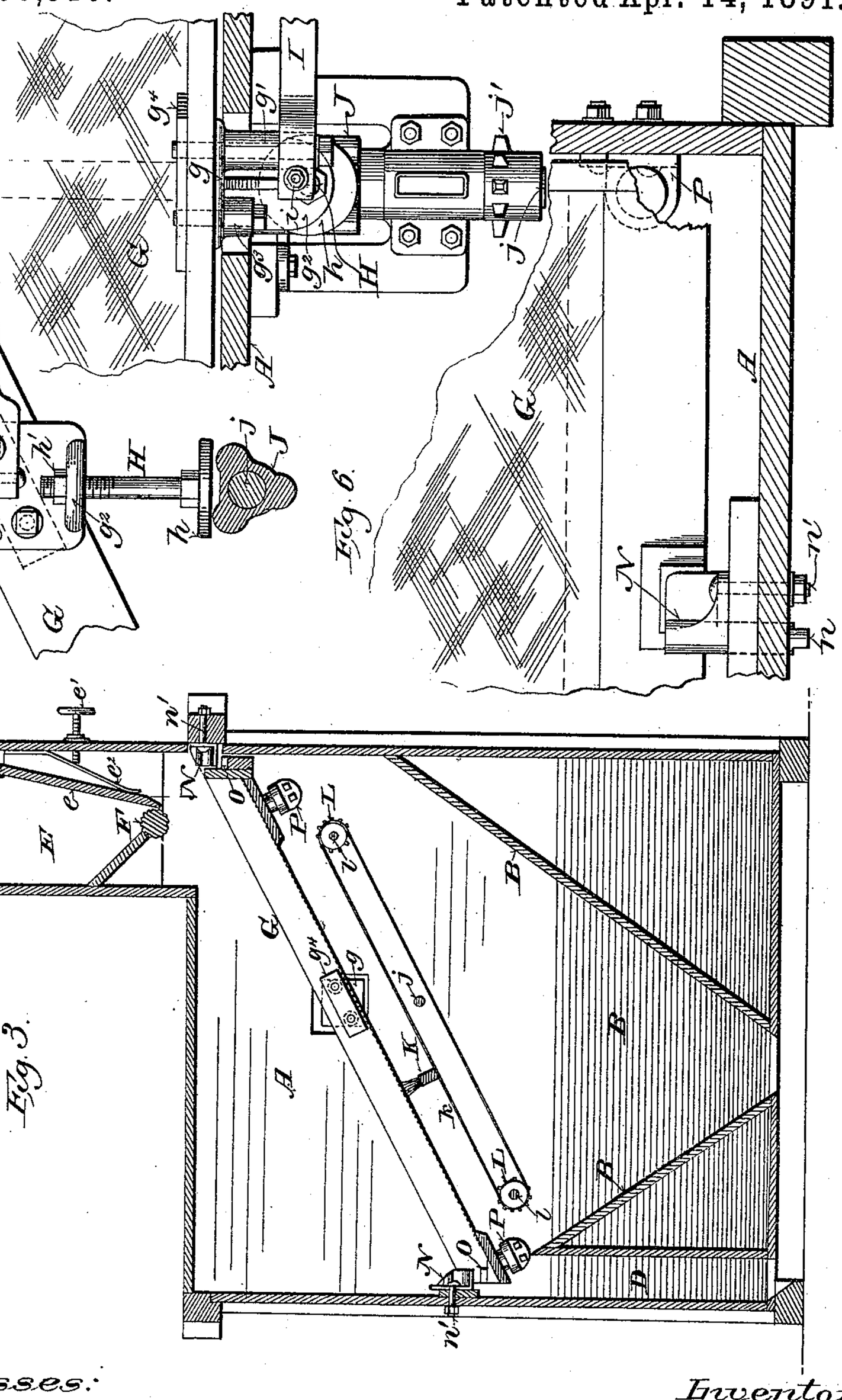

Fig. 4.

Fig. 6.

Fig. 3.

Witnesses:
C. E. Simms
Chas. L. Goss.

Inventor:
Ottomar Esche,
By Winkler, Flanders, Smith, Bottum, & Vilas
Attorneys.

UNITED STATES PATENT OFFICE.

OTTOMAR ESCHE, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO THE SUPERLATIVE PURIFIER MANUFACTURING COMPANY, OF SAME PLACE.

BOLTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 450,310, dated April 14, 1891.

Application filed October 20, 1890. Serial No. 368,626. (No model.)

To all whom it may concern:

Be it known that I, OTTOMAR ESCHE, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Bolting-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that class of machines which are commonly employed in the manufacture of flour for separating the flour and bran from the chop or meal and for grading and dusting the middlings.

It consists, essentially, of novel means of regulating the movement of the stock over the sieve, of vibrating or agitating the sieve, of adjusting its movement, and of certain other peculiarities of construction and arrangement hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a side elevation of my improved machine. Fig. 2 is an elevation of the feeding or head end of the same. Fig. 3 is a longitudinal vertical section on the line $x\ x$, Fig. 2. Figs. 4 and 5 are detail views, on an enlarged scale, of the sieve supporting and agitating devices, Fig. 4 being a partial side elevation and section and Fig. 5 a partial plan view and section. Fig. 6 is a partial plan view and horizontal section of the tail end of the sieve, showing one of each of the stops by which the vertical movement of the sieve is limited.

A represents the frame and casing of the machine, of the usual or any suitable construction, provided with the usual cant-boards B B, which form underneath the sieve a hopper for catching the screenings, and with a spout D to catch the tailings from the sieve. The casing is also provided in the usual manner over the upper end of the sieve with a hopper E, having the usual yielding feed-board e, the adjusting-screws e' and the springs e^2 for adjustably holding said feed-board, and the feed-roller F, extending horizontally through the feeding-aperture in the bottom of said hopper.

G represents a sieve comprising a frame, of the usual or any suitable construction, and a screen, of wire, silk, or other suitable material, attached to the bottom of said frame. It is supported at a suitable inclination within the casing A, with its upper end beneath the hopper E and its lower discharging end projecting over the upper end of the spout D by elastic or spring hangers I I. To the sides of the sieve-frame near the longitudinal center thereof are attached castings $g\ g$, formed with studs g' and vertically-perforated ears g^2, which project outwardly through openings formed therefor in the sides of casing A, as shown in detail in Figs. 4 and 5. The hangers I, which are formed of wood or other suitable elastic material, are split at the ends and rigidly clamped upon the studs g' by bolts $i\ i$ and are adjustably secured at their opposite ends by bolts i' to slotted arc-shaped castings I', attached to the outside of casing A, as shown in Fig. 1. The castings $g\ g$, which are attached to the sieve-frame after the latter is placed within the casing, are inserted through the openings in the sides of the casing and are preferably secured to the sides of the sieve-frame by means of bolts inserted through the studs $g'\ g^3$ and threaded into plates g^4, serving as nuts for said bolts and bearing against the inner faces of the sides of the sieve-frame. The studs g^3 are for the purpose of affording easy access with a wrench to the heads of the bolts passing through them from the outside of the casing.

H H are vertical screws threaded into and adjustably held in the outwardly-projecting ears g^2 of the castings $g\ g$. They are secured in place when properly adjusted by means of jam-nuts h' and are provided at their lower ends with striking-plates $h\ h$.

By the construction and arrangement hereinbefore described of the hangers I I, the striking-pieces $h\ h$, and their connections ready access is afforded thereto for the purpose of adjusting the same.

j represent a horizontal shaft passing transversely through the machine underneath the

sieve G and supported in bracket-bearings J′ J′, attached to the outside of casing A. Upon this shaft are fixed the cams J J underneath and in position to engage with the striking-plates *h h*. The shaft *j* is provided at one end with a driving-pulley J^2 (shown in Fig. 2) and at the opposite end with a sprocket-wheel *j′*, from which the feeding-roller and the sieve-cleaning brush are driven, as hereinafter explained.

For the purpose of keeping the sieve clear I employ the usual brush K, which is attached at the ends to link belts *k k*, mounted upon and driven by sprocket-wheels L L. These sprocket-wheels are mounted upon shafts *l l*, extending transversely through the machine and supported at the ends in bearings *l′*, adjustably attached to the outside of the casing A, so as to permit of the raising of the link belts and brush to compensate for wear of the brush. Upon the outer end of the upper shaft *l* is fixed a sprocket-wheel l^2, and a link belt passing around the sprocket-wheel *j′*, hereinbefore mentioned, engages with it and a sprocket-wheel *f* on the adjacent end of the feed-roller shaft, as shown in Figs. 1 and 2. This chain belt passes over an idler *m*, by which it is tightened and caused to run properly on the sprocket-wheels. By these connections all the operative parts of the machine are driven by and from the single shaft *j*, to which power is applied through the pulley J^2. The upward movement of the sieve is arrested by adjustable stops N N, (shown in Figs. 3 and 6,) which have the spindles *n*, upon which they turn in the frame or casing of the machine, as shown in Fig. 6. They are placed above the middle of each end of the sieve-frame, which is provided with cushioned striking-blocks O O to engage therewith. When properly adjusted to permit more or less throw of the sieve they are secured in place by the bolts *n′*, which pass through the frame or casing and through arc-shaped slots in the stops, as indicated by dotted lines in Fig. 2. The outer ends of the spindles *n n* project through the casing and are squared, so as to afford means for turning and adjusting the stops. The downward throw or movement of the screen-frame is limited by means of cushioned brackets P P, attached to the inside of the casing A, so as to engage with the cross-pieces at the head and tail ends of the sieve-frame, as indicated by dotted lines in Fig. 1 and shown in Figs. 3 and 6. The openings in the sides of the casing A through which the castings *g g* are inserted are in practice covered by slides. (Not shown in the drawings.) The sieve is set at an inclination (approximately that shown in Fig. 3 of the drawings) found by experience to produce the best results, and the movement of the stuff over the sieve is regulated by changing the direction of its vibratory movement and the amplitude of its vibration. This is effected by the adjustment of the ends of the spring-hangers I I, attached to the arcs I′, so as to give a vertical or a forward or a rearward direction to the vibration of the sieve, and by raising or lowering the striking-plates *h*, so as to produce a greater or less throw or vibration of the sieve. The relative vibration of the head and tail ends of the sieve may be regulated by means of the adjustable stops N N.

In practice I prefer to employ driving-cams J J, having three lobes or projections, and to run the cam-shaft at the rate of about two hundred revolutions a minute, so as to produce six hundred vibrations per minute of the sieve G. For some kinds of work I may employ an additional screen or sieve.

In operation the stuff to be treated in the machine is fed in the usual manner by the feed-roll F in a wide thin stream upon the upper end of the sieve and is gradually moved by the agitation of the sieve over the same, the finer portion of the stuff passing through the sieve as screenings into the hopper formed by the cant-boards B and the coarser stuff over the lower end as tailings into the spout D. A greater throw may be given to the upper end of the sieve, where the most work is done, by setting the stop N at the head end of the sieve relatively higher than the corresponding stop at the tail end of the sieve. More or less agitation is imparted to the stuff, as required, by giving a greater or less throw to the sieve. This is effected, as previously described, by turning the screws H up or down in the threaded ears g^2, and thereby raising or lowering the striking-plates *h h* from or toward the actuating-cams J J. When the hangers I I are set in a horizontal position, as shown, an approximately-vertical movement will be imparted to the sieve by the actuating-cams; but when the ends of the hangers attached to the arcs I′ are raised a forward pitch is given to the vibratory movement of the sieve, and the movement of the stock thereon is accelerated; but when the hangers I I are lowered from their middle or horizontal position a rearward pitch is given to the vibratory movement of the sieve, and the movement of the stock thereon is retarded. In this way any desired movement may be imparted to the stock, according to its nature and condition, so as to produce the most desirable results, without changing the inclination of the sieve or disturbing the position of the driving-shaft and cams. By placing the stops N N over the middle of each end of the sieve, instead of at the sides near each corner, I am enabled to accomplish the same end with a less number of stops and fewer adjustments.

Various changes may be made in the details of my machine without affecting its mode of operation or departing from the spirit of my invention.

I claim—

1. In a bolting-machine, the combination of a suitable casing having openings in the sides, a sieve inclosed therein, vertically-ad-

justable striking-pieces attached to the sides of the sieve-frame adjacent to the openings in said casing, and a transverse shaft provided with cams arranged to engage with said striking-pieces, substantially as and for the purposes set forth.

2. In a bolting-machine, the combination of a casing having openings in the sides, an inclined vertically-vibrating sieve within said casing, spring-hangers located outside of the casing and rigidly and adjustably attached at the ends to the sides of the sieve and to said casing, whereby the direction of the vibratory movement of said sieve may be adjusted to accelerate or retard the movement of the stock on the sieve and ready access is had to said hangers for the purpose of such adjustment, and suitable agitating mechanism by which the vibratory movement is imparted to the sieve, substantially as and for the purposes set forth.

3. In a bolting-machine, the combination, with a suitable casing, of an inclined vertically-vibrating sieve inclosed therein, striking-pieces attached to the sides of said sieve at or near its longitudinal center, a transverse shaft underneath said sieve, provided with cams which are arranged to engage with said striking-pieces, and adjustable stops placed one over the middle of each end of said sieve, so as to limit its upward movement, substantially as and for the purposes set forth.

4. In a bolting-machine, the combination, with a suitable frame and casing, of an inclined sieve inclosed therein, castings attached to the sides of said sieve and provided with ears, vertical screws adjustably held in said ears and provided with striking-pieces, a transverse shaft underneath said sieve, provided with cams arranged to engage with said striking-pieces, and stops for limiting the vibratory movement of said sieve, substantially as and for the purposes set forth.

5. In a bolting-machine, the combination, with a suitable casing, of an inclined sieve inclosed therein and provided at or near the center of the sides with castings having outwardly-projecting studs and vertically perforated ears, screws threaded and adjustably held in said ears and provided with striking-pieces, a transverse shaft provided with cams arranged to engage said striking-pieces and agitate the sieve, and spring-hangers rigidly secured at one end to the studs on said castings and adjustably held at the other end in arc-shaped slots in the sides of said casing, substantially as and for the purposes set forth.

6. In a bolting-machine, the combination, with a suitable casing, of an inclined sieve inclosed therein and provided on the sides with studs projecting outwardly through openings in the sides of said casing, spring-hangers split and rigidly clamped at one end upon said studs and adjustably secured at the other end in arc-shaped slots in said casing, and agitating mechanism arranged to impart a vertical vibratory movement to said sieve, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

OTTOMAR ESCHE.

Witnesses:
CHAS. L. GOSS,
E. C. ASMUS.