(No Model.) 2 Sheets—Sheet 1.

R. J. OLIVEY.

SEPARATING MACHINE.

No. 570,608. Patented Nov. 3, 1896.

Fig. 2.

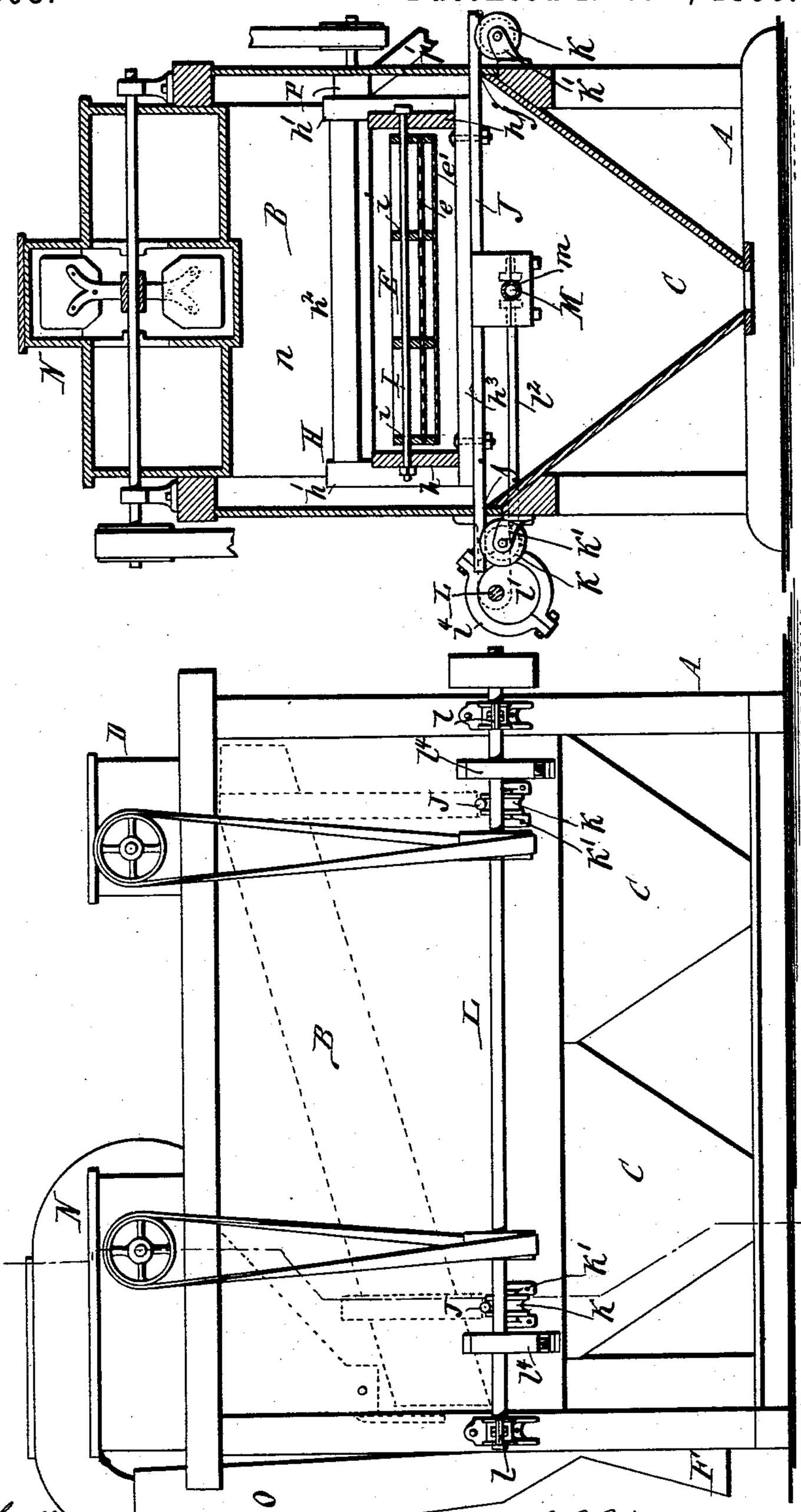

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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SEPARATING MACHINE.

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Fig. 3.

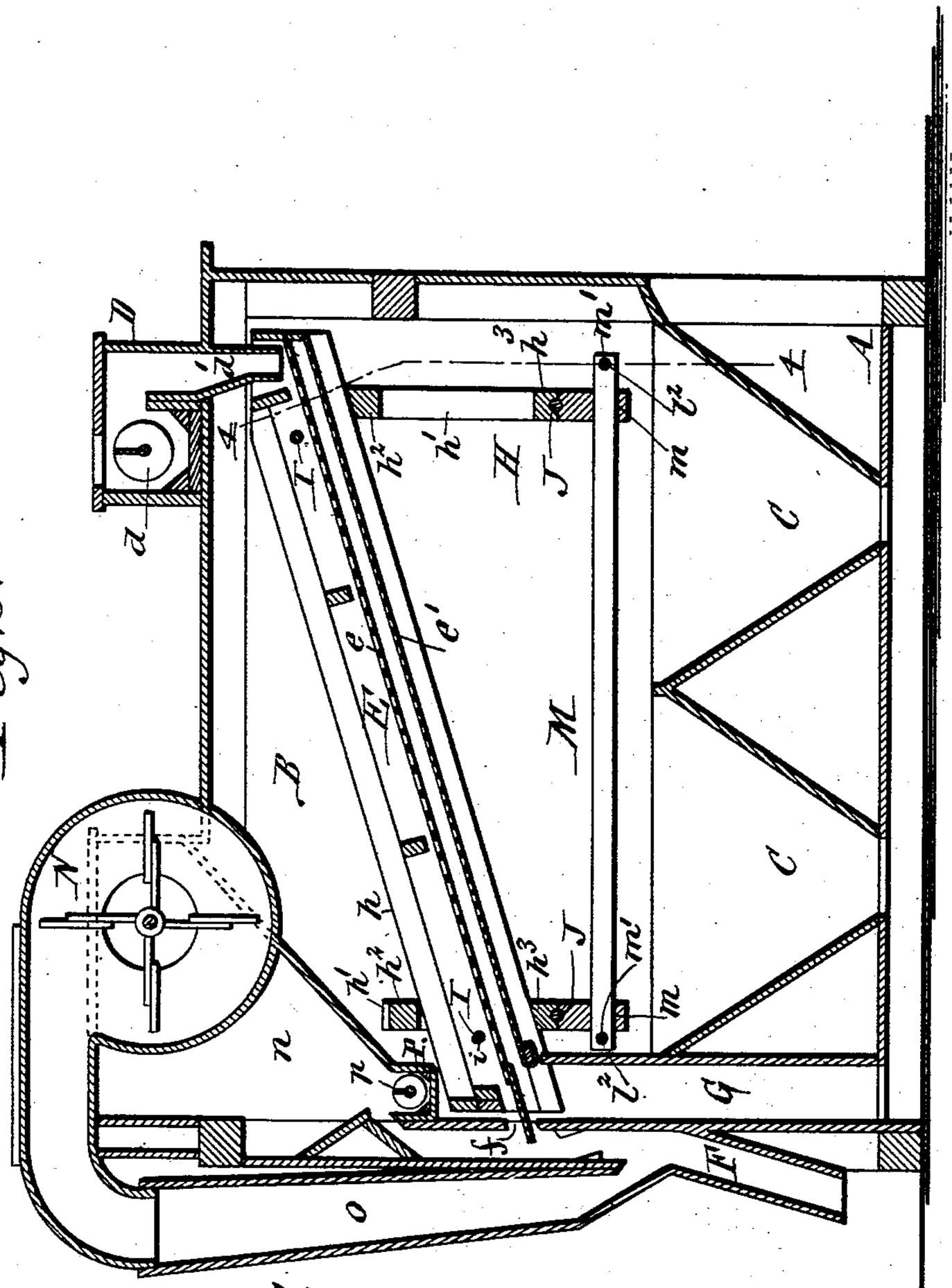
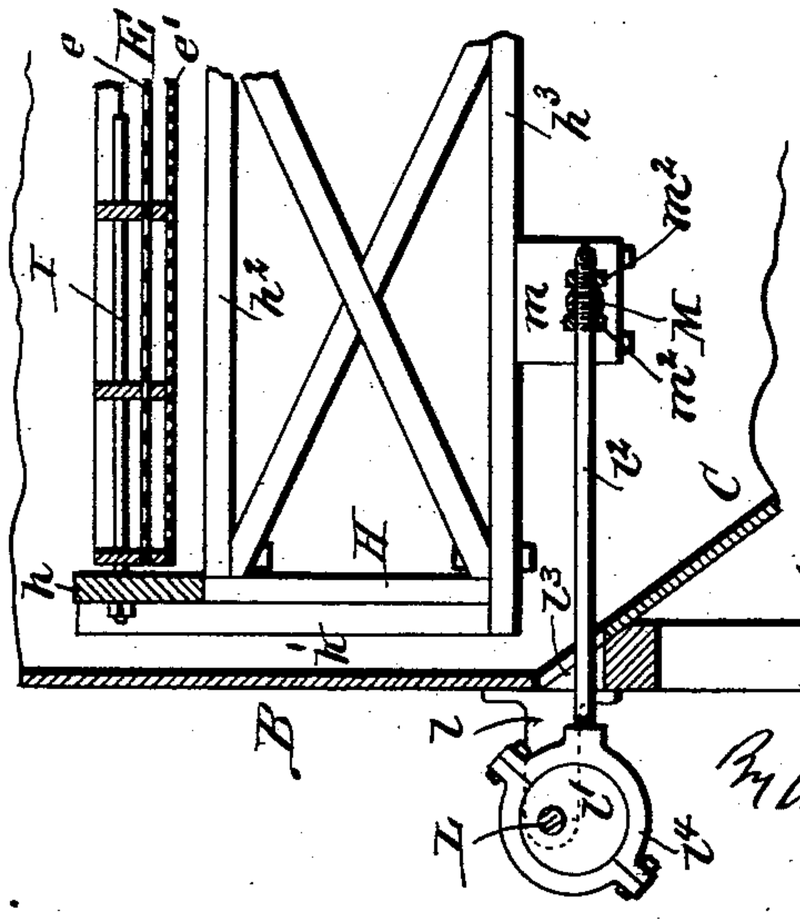


Fig. 4.



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UNITED STATES PATENT OFFICE.

RICHARD J. OLIVEY, OF BUFFALO, NEW YORK.

SEPARATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 570,608, dated November 3, 1896.

Application filed November 11, 1895. Serial No. 568,569. (No model.)

To all whom it may concern:

Be it known that I, RICHARD J. OLIVEY, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Separating-Machines, of which the following is a specification.

This invention relates more particularly to that class of sifting-machines which are used in flouring-mills for sifting the broken or crushed grain coming from the roller-mills, which operation is usually designated as "scalping."

The object of my invention is to produce a sifting-machine in which the stock or material is carried from the head to the tail of the sieve in the shortest possible time and without any jumping action, but by simply rolling the material in the plane of the sieve, thereby effecting the separation with a minimum amount of abrasion of the material, while maintaining a uniform distribution of the material over the sieve surface and keeping the meshes of the latter free from lodged material.

In the accompanying drawings, consisting of two sheets, Figure 1 is a side elevation of my improved separating-machine. Fig. 2 is a vertical transverse section thereof in line 2 2, Fig. 1. Fig. 3 is a vertical longitudinal section thereof. Fig. 4 is a fragmentary cross-section in line 4 4, Fig. 3.

Like letters of reference refer to like parts in the several figures.

A represents the main frame of the separator, and B the sifting-chamber, arranged in the upper portion of the frame and provided in its lower side with discharge-hoppers C.

D represents the feed-trough, arranged on the sifting-chamber, and provided with a feed-conveyer *d*, and a feed-spout *d'*, which passes downwardly into the front end of the sifting-chamber.

E represents a transversely-movable separating-sieve, which inclines from its head in the front of the sifting-chamber toward its tail in the rear end of the sifting-chamber. This sieve is provided, preferably, with an upper coarse screen *e*, upon the head of which the material is delivered by the feed-spout *d'*, and a lower fine screen *e'*, which is arranged below the upper sieve and which receives the material which passes through the upper sieve. The tail end of the upper sieve projects through an inlet-opening *f* in the front side of a vertical separating air trunk or pipe F, whereby the coarse material which does not pass through the upper screen is delivered into this air-trunk. The coarse part of the material which does not pass through the lower sieve is tailed off into a delivery-spout G, while the fine particles which pass through the lower screen drop into the hoppers C.

H represents a transversely-reciprocating shaking-frame, whereby the sieve is actuated, and which consists, essentially, of two side boards *h*, arranged lengthwise on opposite sides of the sieve, upright bars *h'*, secured to the outer sides of the side boards near the front and rear ends thereof, and upper and lower cross-pieces h^2 h^3, connecting the upper and lower portions, respectively, of the upright bars.

The sieve-frame is hung loosely and capable of sliding transversely on horizontal supporting or guide rods I, which are secured with their ends to the side pieces of the shaking-frame and pass transversely through openings *i*, formed in the longitudinal members of the sieve-frame. During the transverse reciprocating movement of the shaking-frame the latter also reciprocates the sieve-frame by engaging with its inner sides against the outer sides of the sieve-frame.

The sieve-frame is somewhat narrower than the space between the side boards of the shaking-frame, thereby producing a small amount of slack or dead movement during the first portion of each stroke of the shaking-frame independent of the sieve-frame, which causes the shaking-frame, upon striking the sieve-frame, to give the latter a sudden jar or blow at the end of the dead movement, after which the shaking-frame and sieve travel together to the end of the stroke. This sudden jarring of the sieve, in addition to the reciprocating movement thereof, serves to keep the meshes of the sieve thoroughly clean, thereby increasing the capacity of the machine.

The shaking-frame is movably supported and reciprocated transversely of the machine, preferably by the following mechanism:

J represents two transverse supporting or

guide bars secured to the under side of the lower cross-bars of the shaking-frame and passing with their outer portions through openings *j* in the side walls of the sifting-chamber. The projecting ends of the supporting-bars J rest upon sheaves or rollers *k*, which latter are arranged outside of the sifting-chamber and journaled in brakets *k'*, secured to the main frame. The supporting-bar is preferably made round and the supporting-rollers are provided with circumferential grooves, in which the supporting-bars J rest and whereby the latter are held against displacement on the rollers.

The rectilinear transverse shaking motion of the inclined sieve produces a rapid-rolling movement of the material from the head to the tail, which movement is greatly enhanced by the rectilinear transverse impacts which the loose sieve-frame receives from the main shaking-frame. These transverse rectilinear impulses which the material receives also maintain a uniform distribution of the material over the sieve surface, prevent the accumulation of the material in ridges along the sides of the sieve, and keep the meshes of the sieve free from clogging matter. The absence of all tossing or jumping movement of the material on the sieve surface reduces the abrasion of the material to a minimum.

L represents a longitudinal driving-shaft journaled in bearings *l* on the main frame and provided with two eccentric disks *l'* for reciprocating the shaking-frame and sieve.

l^2 l^2 are eccentric or connecting rods, which pass transversely through openings l^3 in the side of the sifting-chamber, and which are provided at their outer ends with eccentric straps l^4, which surround the eccentric disks.

M is a longitudinal rock-bar, which is journaled in bearings *m* on the under sides of the lower cross-bars of the shaking-frame, and provided at its ends with transverse openings *m'*, through which the inner screw-threaded ends of the eccentric rods pass loosely.

m^2 represents screw-nuts arranged on the inner end of each eccentric rod on opposite sides of the rock-bar. Upon turning these screw-nuts on the eccentric rods the position of the shaking-frame can be adjusted.

The rock-bar M serves the double purpose of a pivotal connection between the connecting-rods l^2 and the shaking-frame and of a brace for rigidly connecting the front and rear portions of the shaking-frame.

N represents the case of a fan arranged above the rear portion of the sifting-chamber and having its eyes connected with the upper end of the separating air-trunk F by an expansion-chamber *n*. The outlet of the fan is connected by a return trunk or pipe O with the separating-trunk F below the sieve inlet-opening *f*. Upon turning the blades of the fan in the proper direction a current of air is produced which passes upwardly through the separating-trunk F, thence through the expansion-chamber, thence through the eyes of the fan-case, and out through the outlet thereof, thence through the return-pipe to the place of beginning in the separating-trunk, thereby creating a circulation of the same air, no fresh air being taken in and no used air being discharged from the machine. The coarse material which is delivered from the tail of the upper screen into the separating-trunk is spread uniformly by the reciprocating movement of the sieve, whereby all the material in falling through the separating-trunk is subjected to the separating action of the upwardly-moving current of air and the light particles are separated from the heavier. The heavy particles escape through the lower end of the separating-trunk, while the light particles are carried upwardly by the fan into the expansion-chamber, where the light particles are permitted to precipitate into a conveyer-trough P in the bottom of the expansion-chamber. A conveyer *p* is arranged in the conveyer-trough for discharging the material from the latter through a discharge-spout *p'* at one end of the trough.

I claim as my invention—

In a sifting-machine, the combination with an inclined sieve, of a shaking-frame having transverse rectilinear ways on which said sieve is loosely mounted and on which it is capable of a limited transverse rectilinear movement within said shaking-frame, mechanism whereby a rectilinear transverse reciprocating movement is imparted to said shaking-frame, and means for delivering the material upon the upper portion of the inclined screen, whereby the material, in flowing downwardly over the inclined screen, is subjected to the long transverse rectilinear movement of the main frame and at the same time to the short transverse rectilinear movement of the screen-frame, both movements taking place horizontally in a line transverse to the inclination of the sieve, substantially as set forth.

Witness my hand this 29th day of October, 1895.

RICHARD J. OLIVEY.

Witnesses:
THEO. L. POPP,
KATHRYN ELMORE.