

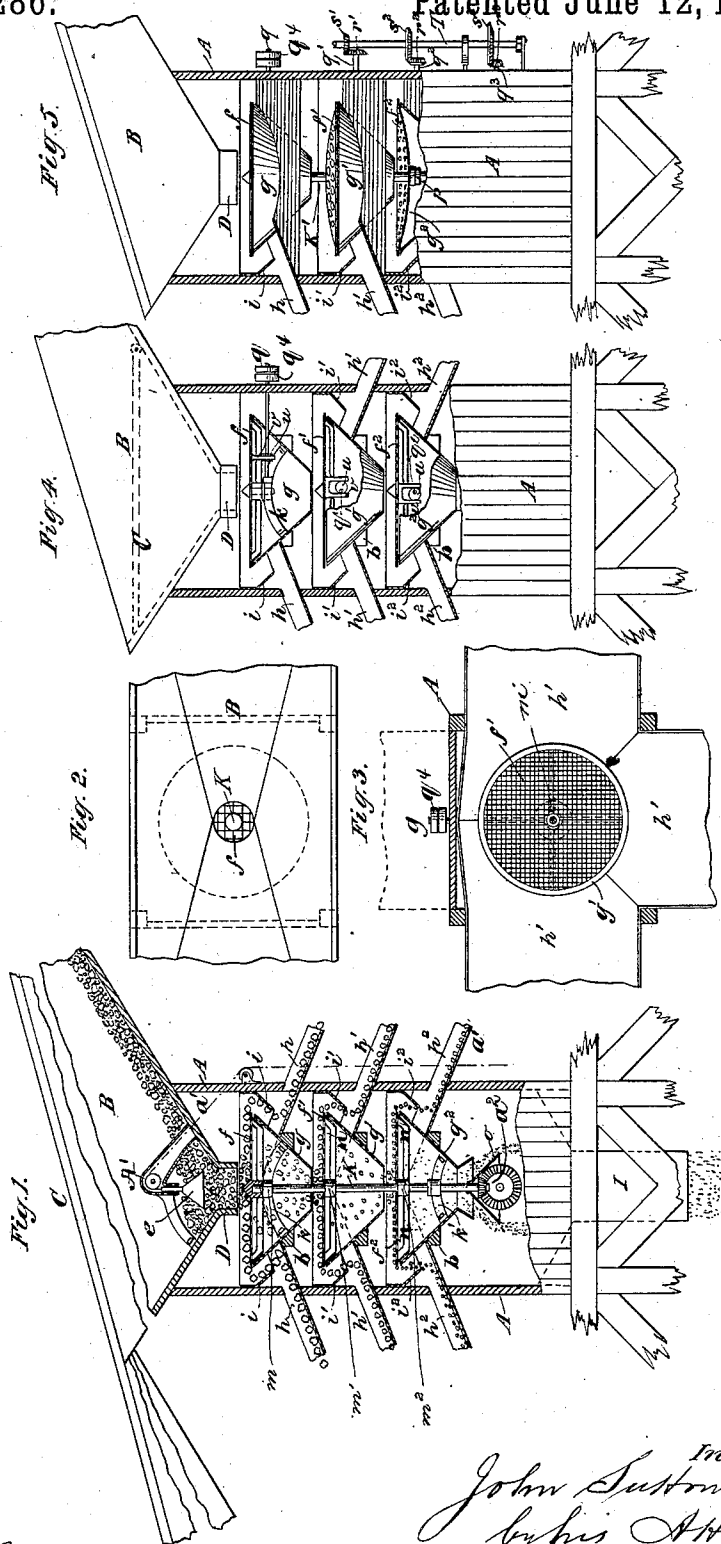
(No Model.)

J. SUTTON.

SCREENING AND SIZING MACHINE.

No. 279,286.

Patented June 12, 1883.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN SUTTON, OF ISLIP, NEW YORK.

SCREENING AND SIZING MACHINE.

SPECIFICATION forming part of Letters Patent No. 279,286, dated June 12, 1883.

Application filed January 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN SUTTON, of Islip, in the county of Suffolk and State of New York, have invented a new and useful Improvement in Screening and Sizing Machines, of which the following is a specification.

My invention relates, principally, to that class of screening-machines in which several rotary screens are arranged one above another, and in which each screen is of finer mesh than the one above it; but the invention is also applicable to machines having but a single rotary screen.

The invention is more particularly intended for screening and sizing coal, ores, gravel, &c., at the mines or pits; but it may be used for other purposes and in other localities.

The invention consists in various novel combinations of parts, which are hereinafter described, and referred to in the claims.

The accompanying drawings illustrate a screening-machine embodying my invention.

Figure 1 is a vertical section of the machine. Fig. 2 is a plan of the feeding-hopper, the stopper which controls the feed therefrom being removed. Fig. 3 is a horizontal section in a plane immediately above one of the rotary screens, and Figs. 4 and 5 are partial vertical sections of machines embodying modifications of my invention.

Similar letters of reference designate corresponding parts in all the figures.

Referring, first, to Figs. 1, 2, and 3, A designates the casing or frame of the machine, which may be of iron or wood and of any suitable construction.

B is the receiving-hopper, which may be rigidly secured to the casing A, or hinged thereto, or made entirely removable therefrom, if desired. It may have at its top a grating, C, for casting off large lumps of material which it is not desired to pass through the machine.

D is the delivery pipe or nozzle from the hopper. As here shown, the feed of material from the hopper is controlled by a stopper, *e*, of conical shape, arranged above the pipe or nozzle D, in a hood or guard, A', and adapted to be raised and lowered by a cord or chain, *a*', or other suitable means. This stopper may be released, so as to shut down on the pipe D,

and so stop the feed of material entirely; or it may be held in any desired position, and so regulate the feed and allow the material to pass with the desired rapidity.

K designates an upright shaft arranged below the pipe or nozzle D, and adapted to be rotated by means of gear-wheels *a*² from any suitable source of power. The gear-wheels may be protected by a hood or guard, *o*, secured to the shaft or frame. The shaft carries rotary screens, here shown as three in number, *f f' f''*; but a greater or less number of screens may be used. The screens are secured to the shaft by means of collars *m m' m''*, fixed to the shaft and provided with arms supporting the screens. The screens may be composed of wire-cloth, or of any suitable perforated, reticulated, or foraminated material.

Below the several screens are fixed funnels *g g' g''*, which are supported permanently on beams or cross-bars *b*, forming a part of the casing or frame A.

In the funnels *g g'* are cross-bars or bridges *k k'*, which form center bearings for the shaft K.

The screens may be flat, as shown, or concave or convex, and each screen may be provided with a flange or rim, *n*, which projects downward into the funnel below and prevents the escape of dust or particles. This rim *n* is no part of the funnel, but is a part of the screen and moves with the screen in the stationary funnel.

Just below the several screens are arranged inclined chutes or floors *h h' h''*, which extend through and are permanently fixed in the casing A. As shown clearly in Fig. 3, each chute or floor surrounds the adjacent funnel, and has three branches, or extends through three sides of the casing, so as to afford a free delivery of the material. As here shown, the interior walls of the casing are provided opposite the several screens with deflecting aprons or guides *i i' i''*, which slope inward, and by breaking the fall of the material prevent the breaking of the same and the wearing of the casing.

In some cases it may be desirable to give the screens an oscillating motion, or a rotary motion alternately in opposite directions, instead of a rotary motion continuously in one direction, and in Fig. 4 I have represented

mechanism for this purpose. Each screen has fixed to it a yoke, v , and q q' q'' designate horizontal shafts, which have fixed upon them eccentrics or cams u , which work in these yokes.

The shafts are mounted in fixed bearings, and when rotated the eccentrics will act upon said yokes and produce the oscillation of the screens. I have in Fig. 4 represented the shaft q as placed at right angles to the shafts q' q'' , so as to show both a face view and a side view of the yokes v . The shafts q' q'' may each be provided with pulleys, like the pulleys q^1 shown on the upper shaft, q , so that they may be rotated by belts. In this modification of my invention each screen may have a short shaft or journal supported in a bearing, k , in the hopper below it. If desired, I may employ a central vertical shaft or post, K' , as shown in Fig. 5. This shaft or post would be fixed, and the screens would fit the shaft loosely and would rest upon fixed collars p .

The machine shown in Fig. 5 is supposed to have four screens, the lower one being hid within the casing, and I may impart an oscillating motion to them by means of horizontal shafts q q' q'' q''' , provided with eccentrics or cams working within the yokes, like the cams u and yokes v shown in Fig. 4. In this case the upper shaft, q , is represented as provided with driving-pulleys q^1 , but the shafts q' q'' q''' are rotated through bevel-wheels s^1 r^1 , s^2 r^2 , s^3 r^3 , by a vertical outside shaft, T . As here shown, the several pairs of wheels are of different relative sizes, and hence the screens will be oscillated at different speeds, some faster and some slower.

Any other mechanism than that shown may be used for rotating or oscillating the screens.

In the operation of my machine the coal or other material or substance is delivered from the hopper B to and near the center of the upper screen, f , and by the rotary or oscillating motion thereof is carried outward over the screen. All pieces too large to pass through the screen are thrown off or fall at the periphery thereof, and are delivered by the upper chute, h , into suitable bins or receptacles. The smaller pieces pass through the screen and fall into the stationary funnel g , by which they are centralized or delivered onto the second screen, f' , at or near its center. They then pass or are caused to pass outward over the said screen f' , and smaller pieces fall through the screen and into the second stationary funnel, g' , by which they are delivered near the center of the third screen, f'' , while the larger pieces are thrown off from the periphery of the screen f' into the chute h' , and are thereby delivered. In passing over the lower screen, f'' , the coarser pieces are thrown off at the periphery into the chute h'' , while the fine pieces and dust pass through the screen

and into the lower stationary funnel, g'' , by which they are delivered into the bottom of the casing A , and thence into the pipe or chute I .

Where my machine is used for screening and sizing coal there is but little loss by the attrition of the coal due to pounding, chipping, and crushing of the coal, owing to the short distance the coal has to travel. Hence the machine produces but little dust, and is economical in its operation, much good coal of each size being saved, which would be broken up by the ordinary screening-machine.

I am aware that grain and other screening machines have been devised in which are employed a number of rotary screens, with funnels below each for concentrating the material passing through it and delivering it near the center of the screen next below, and hence I do not claim such a construction or combination, broadly. In such machines, as heretofore constructed, the funnels have been rotated with the screens, and the delivery of the material downward through the funnels by gravity has been materially impeded or interfered with by the centrifugal action produced by reason of the funnels rotating with the screens. This I prevent by making the funnels stationary and rotating the screens only, and hence the passage of material through the funnels is much expedited and a greater quantity of material may be screened in a given time.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of two rotary screens arranged one above the other, an interposed concentrically-arranged stationary conical hopper, an outwardly and downwardly inclined stationary floor or chute arranged outside of the said hopper and between said screens for the reception of the material thrown or passing over the edge of the upper screen, substantially as and for the purpose herein described.

2. The combination of two rotary screens arranged one above the other, an interposed concentrically-arranged stationary conical hopper, an outwardly and downwardly inclined stationary floor or chute arranged outside of the said hopper and between said screens for the reception of the material thrown or passing over the edge of the upper screen, and the apron or deflector arranged between the upper screen and the floor or chute and inclined inward and downward toward said floor or chute, substantially as and for the purpose herein described.

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Witnesses:

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