

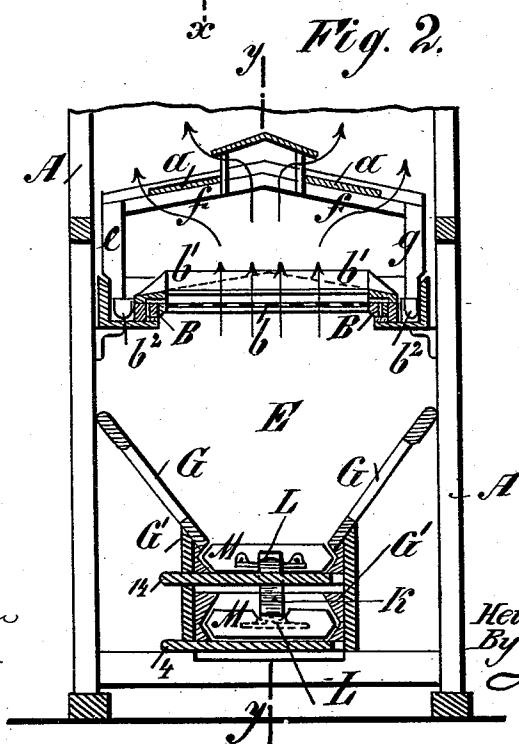
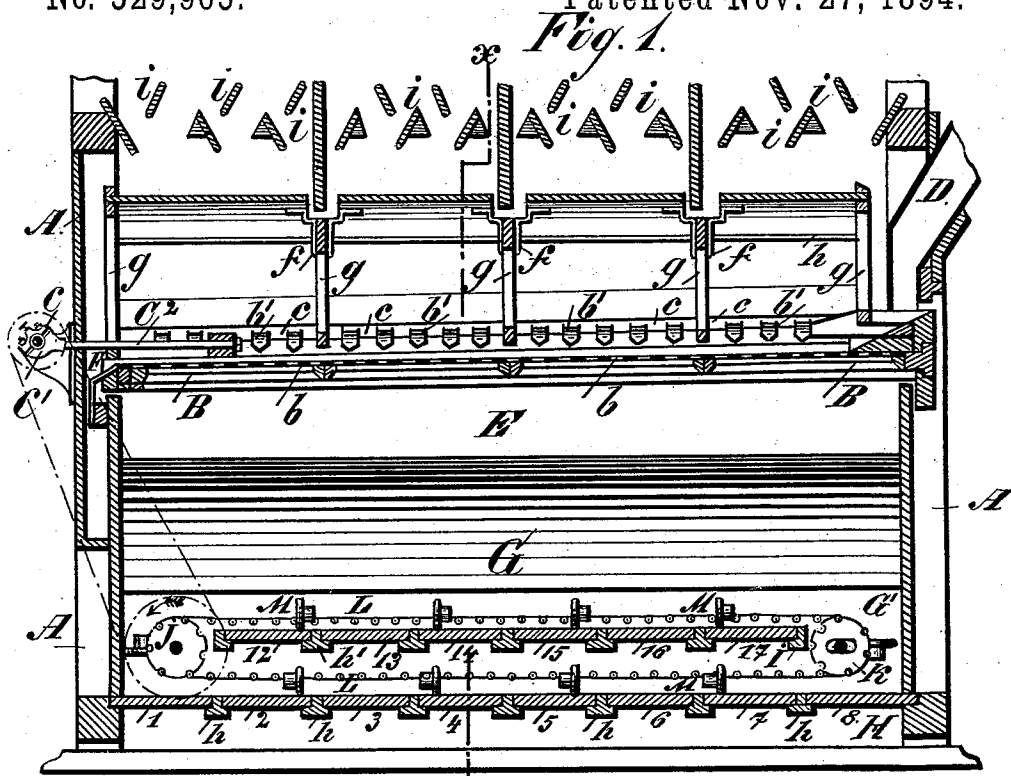
(No Model.)

2 Sheets—Sheet 1.

H. SECK.
MIDLINGS PURIFIER.

No. 529,965.

Patented Nov. 27, 1894.



Witnesses:
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Robert Smith

Inventor:
Heinrich Seck.
By Janus L. Norris.
Atty.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

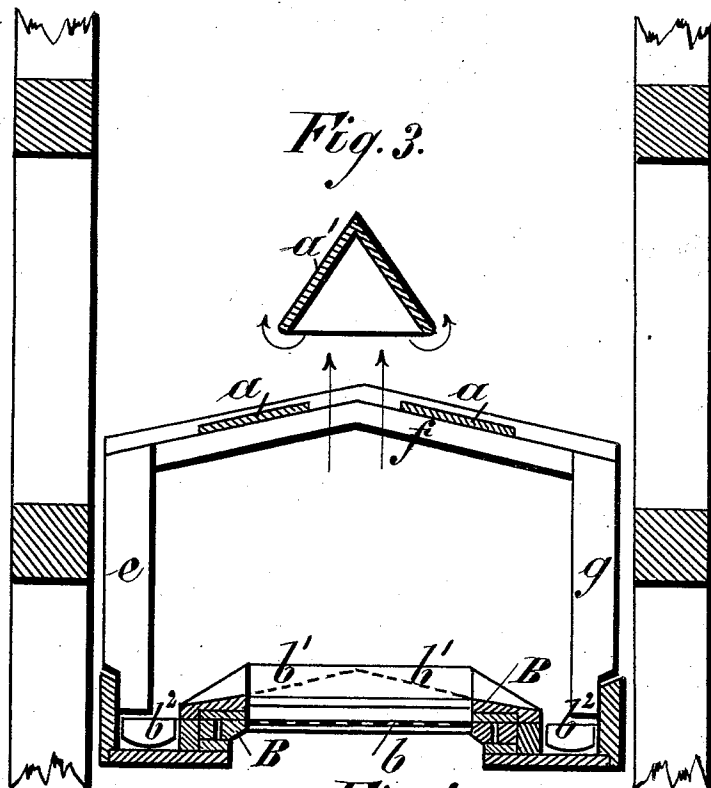
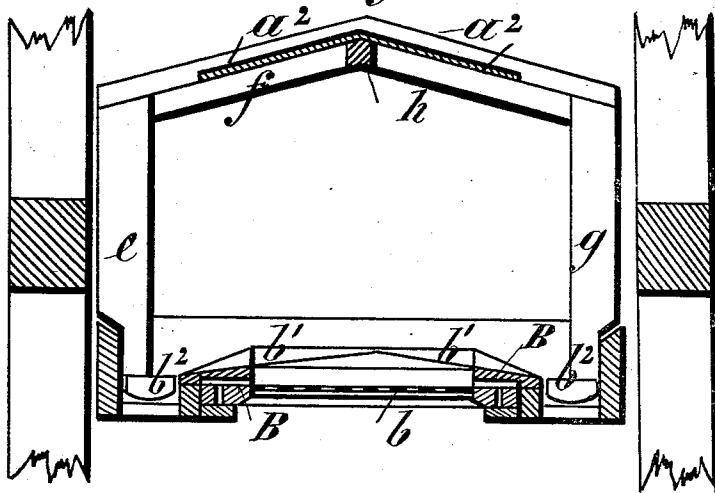


Fig. 4.



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UNITED STATES PATENT OFFICE.

HEINRICH SECK, OF DRESDEN, GERMANY.

MIDDLINGS-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 529,965, dated November 27, 1894.

Application filed April 24, 1894. Serial No. 508,872. (No model.) Patented in France May 20, 1893, No. 230,233, and in England June 6, 1893, No. 11,100.

To all whom it may concern:

Be it known that I, HEINRICH SECK, of Dresden, in the Kingdom of Saxony and German Empire, have invented a certain new and useful Improvement in Middlings-Purifiers, (for which I have obtained Letters Patent in France, No. 230,233, dated May 20, 1893, and in Great Britain, No. 11,100, dated June 6, 1893,) of which the following is a specification.

My invention relates to middlings purifiers, and one of its objects is to provide for a more speedy and efficient removal of the dust or other light particles from the material to be treated in the machine, while another object of the invention is to provide improved means for discharging the sifted material from the bottom of the machine. To accomplish these objects my invention involves the features of construction and the combination or arrangement of parts hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section on the line $y-y$, Fig. 2, of a middlings purifier and of part of a dust collector combined therewith. Fig. 2 is a corresponding vertical section on the line $x-x$, Fig. 1. Figs. 3 and 4 are sectional views of certain modifications to be hereinafter referred to, the said views being drawn to an enlarged scale and on a line similar to the line $x-x$ of Fig. 1.

A is a casing having a shaking sieve B mounted therein, the latter being, in a well known manner, reciprocated horizontally from a shaft C by means of an eccentric C' and connecting rod C², or other equivalent means. At one end of the casing A is provided an inlet D for the introduction of the material to be treated. The said material while passing over the shaking sieve B becomes freed from the dust or other light particles or impurities contained therein, the said particles or impurities being usually carried away in an upward direction by a current of air as more fully hereinafter to be described. That portion of the material the particles of which are sufficiently small to pass through the meshes of the sieve, and at the same time too heavy to be carried away with the light particles or impurities, drops through the sieve into the space E below, to be there disposed of as will be presently described. The purified middlings finally reach the other end

F of the sieve and are there discharged and collected.

Immediately above the sifting surface b of the sieve B is a kind of grate consisting of a number of transverse, laterally inclined gutters b' arranged at suitable distances apart from each other and terminating at or near the lateral edges of the sieve frame and immediately above the longitudinal gutters or canals b^2 which extend along the sides of the sieve frame B. The removal of the dust or other light particles from the material on the sieve and immediately below the grate-like gutters b' is usually effected by means of a suitable dust collector combined, in a well known manner, with the middlings purifier and mounted directly above the said gutters, the said dust-collector acting to collect the particles of dust or other impurities as they are carried upward from the sieve, by a current of air, through the interstices c between the gutters b' . An arrangement of this kind is described in the specification of my United States Patent No. 493,565, of 1893. The active element of the dust collector described and shown in that patent consists in a number of plates or webs obliquely arranged the one above the other in series within a casing or chamber, the plane of each of the said plates or webs of a series intersecting the plane of each adjoining plate or web, and the lower end of each lying directly opposite, and at a certain distance from, the full surface of the plate or web directly below, the several series being provided with means of resistance against which the current of impure air, while being conveyed through the apparatus, impinges so as to be thereby deflected and thus directed against the lower inclined surface of a higher plate of the opposite series. This causes the dust or other light particles suspended in the moving body of air to be thrown against the upper surfaces of the plates and to slide down along the same from one plate to the other, until they ultimately reach collecting gutters which correspond to the gutters b' shown in the present drawings.

I will now describe that part of my invention the object of which is to obtain a more speedy and efficient removal of the dust or other light particles from the material on the sieve. The improved construction as devised for this object consists in providing the sieve

B with a roof-like deflector *a* mounted, at a suitable distance above the sieve, on frames *efgh* rigidly connected with the said sieve as shown. The said deflector may either be
 5 formed in a number of connected roof-like sections, such as *a a* and *a'*, Fig. 2, or it may be formed in but one section such as *a*², Fig. 4, or instead of all the sections being rigidly connected, by means of the frames *efgh*,
 10 with the sieve B and moving with the latter, one or more sections, such as *a*, may be thus connected, and movable, with the sieve, while another section *a'* may be rigidly secured to some suitable stationary part of the casing,
 15 as indicated in Fig. 3. Above the said deflector, and preferably forming part of the middlings purifier, is a dust collector, such as the one described in my prior United States patent above referred to. In the drawings the
 20 upper portion of the dust-collector as well as the exhaust fan for causing the current of air are omitted, the lower end portion only of the dust collector being shown. *i* designates the obliquely arranged webs or plates intended to receive the dust or other particles thereon, and to allow the same to drop down therefrom as described in the United States patent above referred to. Such dust or other particles in thus dropping down from the said
 30 webs or plates will, according to my present invention, be received by the upper surface of the roof-like deflector and will gradually drop over the lateral edges of the same into the longitudinal gutters or channels *b*² arranged below as shown in Fig. 2. On the
 35 other hand, the current of air ascending from the sieve below will, on its way to the dust collector above, impinge against the lower surface or surfaces of the roof-like sections and will thus become laterally deflected, so that a portion of the dust or other light particles carried along by the current or moving body of air will at once be directed into, and received by, the gutters *b*² without entering
 45 the dust collector at all, and the latter will thus in a measure become relieved of part of its work. The dust or other light particles will thus be more efficiently and speedily removed from the material in the sieve.
 50 I will now describe that part of my invention the object of which is to provide improved means for discharging the sifted material from the bottom of the machine. The means heretofore generally employed for this
 55 purpose consisted of one or more screw conveyers journaled at the bottom of the middlings purifier and acting to convey the sifted material to one or the other end of the machine and there to discharge the same. This
 60 arrangement presented several objections. In the first place it was impossible by this means to separate one portion of the sifted material from the other portion, but the entire contents in the bottom portion of the machine
 65 were conveyed to one end of the machine and there discharged. On the other hand, the excessive friction due to the rotary move-

ment of the screw conveyer tended to impair the quality of the sifted material. These objections are avoided by my improved construction.

G designates the inclined sides of the space E below the shaking sieve B. The lower ends of the said inclined sides G project somewhat over the upper ends of vertical side portions G'. The latter, together with the bottom H and the end walls of the casing A, form a canal or groove which represents a lower continuation of the space E. The said bottom H is composed of a number of rigid cross-pieces *h*, extending from one side portion G' to the other, and of a number of removable sections or slides 1, 2, 3, 4, 5, 6, 7, 8, each arranged to slide, and to be guided, between two adjoining cross-pieces *h*. At a suitable distance above the said bottom H is a similar bottom, also consisting of cross-pieces *h'* and intermediate sections or slides 12, 13, 14, 15, 16, 17, the latter being directly above the corresponding slides 2, 3, 4, 5, 6, 7 of the lower bottom and each projecting with one end through an opening provided, for each of the said slides, in one of the sides G', as shown in Fig. 2. The upper bottom, designated as a whole by I, does not extend to the full length of the lower bottom but terminates at a suitable distance from the end walls of the casing A. In the open spaces thus formed are journaled the sprocket wheels J and K and around the same is passed the endless chain L, which thus extends, from the one sprocket wheel to the other, above the upper bottom I, and returns to the first sprocket wheel, below the said upper bottom I. Attached to the said chain at equal distances apart are a number of scrapers M, as shown. The latter extend from one side of the canal or groove, to the other and, upon the sprocket wheels being rotated and the chain thereby set in motion, the said scrapers will be alternately drawn over the surface of the one bottom and over that of the other bottom, and vice versa. The chains are preferably, as shown in Fig. 2, attached in the center of the scrapers and the latter are there partly cut away as shown, so as to present no obstacle to any portions of the sprocket wheels when passing over the latter with the chain. Movement may be transmitted to the shaft of the sprocket wheel J from any moving part of the machine. In Fig. 1 of the drawings it is assumed to be driven by means of a belt from the shaft C.

The operation of this part of my invention is as follows: Assuming the sprocket wheel J to be moving in the direction of the arrow, the chain will then draw the scrapers over the surface of the upper floor from the right to the left of Fig. 1 and the sifted material dropping from the sieve B upon the bottom I will be carried along by the said scrapers until it drops down from the left hand end of the upper bottom I upon the lower bottom H. Here it will again be met

by the scrapers and will be carried along by the same from the left to the right over the lower bottom until it meets a point where one of the slides has been drawn out to form a discharge opening. Thus by drawing out the slide 1, for instance, I may cause the entire quantity of sifted material to be discharged at the left end of the machine, while by drawing out the slide 8 I may cause it to be discharged at the right hand end of the machine. In some cases it may be found desirable to separate that portion of the sifted material which has passed through the sieve on the right hand side of the longitudinal center of the machine from that portion which has passed the sieve on the left of the center, and to discharge each of the two portions at different points of the machine. This may be effected by opening the slides 14 and 4 and the slide 1. The sifted material deposited on the slides 16 and 17 on the one half of the machine will then drop through the open spaces previously occupied by the slides 14 and 4 near the center of the machine and may be collected there, while the sifted material deposited on the slides 13 and 12 on the other half will be discharged from the opening previously occupied by the slide 1 at the left end of the machine and may be collected at that end. Another alternative would be to draw out the slides 15, 16, 17 and 8 on the one side and the slide 1 on the other side. In this case the material dropping from the sieve on the right hand side of the longitudinal center of the machine would be deposited directly upon the lower bottom at 5, 6 and 7, to be discharged at 8, while the material dropping from the sieve on the left hand side of the center would be discharged at 1.

It is obvious that the arrangement described admits of still further variations in the way of separating further portions of the material and effecting the discharge at different points. Besides this advantage the arrangement described possesses the advantage of causing much less friction and of avoiding the objectionable grinding action which is peculiar to screw conveyers and detrimental to the material treated.

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

1. In a middlings purifier having a dust-collector combined therewith, a casing, a sieve therein having a number of transverse gutters above its sifting surface and longitudinal gutters on its sides, supports rigidly secured to the said sieve, a roof-like deflector mounted on the said supports above the said sieve, means for imparting motion to the said sieve and connected parts, a lower bottom to the said casing having removable sections, an upper bottom within the said casing also having removable sections, a number of scrapers adapted to be moved along the upper surface of the upper bottom from one end thereof to the other in one direction and along the up-

per surface of the lower bottom in the opposite direction, driving connections and means, such as sprocket wheels and an endless chain, for moving the said scrapers over the said bottoms in opposite directions, substantially as and for the purpose described.

2. In a middlings-purifier, the combination with a casing of a movable sieve, a series of transverse gutters arranged above the same, longitudinal gutters arranged laterally with regard to said sieve, and oppositely inclined deflectors arranged above the transverse gutters and having their highest points at or near the central longitudinal line, spaces for circulation of air being provided between the said deflectors and the casing, descending impurities being carried by the upper surfaces of the deflectors into the longitudinal gutters and lighter, rising impurities being deflected by their lower surfaces to the same points, substantially as described.

3. In a middlings-purifier, the combination with a casing of a movable sieve, a series of transverse gutters arranged above the same, longitudinal gutters arranged beside said sieve, oppositely inclined deflectors mounted on supports moving with the sieve and arranged above the transverse gutters, and a roof-shaped deflector arranged longitudinally above an open space between said oppositely inclined deflectors and between the same and the transverse gutters, its ends supported by the casing and its lowest, or outer edges overhanging the deflectors below, substantially as described.

4. In a middlings purifier a casing, a sieve therein, means for imparting motion to the said sieve, a lower bottom having removable sections to the said casing, an upper bottom within the said casing also having removable sections, a number of scrapers adapted to be moved along the upper surface of the upper bottom from one end thereof to the other in one direction and along the upper surface of the lower bottom in the opposite direction, driving connections and means, such as sprocket wheels and an endless chain, for moving the said scrapers over the said bottoms in opposite directions, substantially as and for the purpose described.

5. In a middlings-purifier, the combination with a movable sieve B, arranged in a casing A, of oppositely inclined deflectors mounted on rigid frames *e, f, g*, moving with the sieve, a roof-shaped deflector *a'* arranged above an opening between said deflectors, its ends rigidly supported on the casing, transverse gutters arranged below said roof-shaped deflector, and longitudinal gutters arranged beside the sieve, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HEINRICH SECK.

Witnesses:

OSCAR KELLER,
HERNANDO DE SOTO.