

(No Model.)

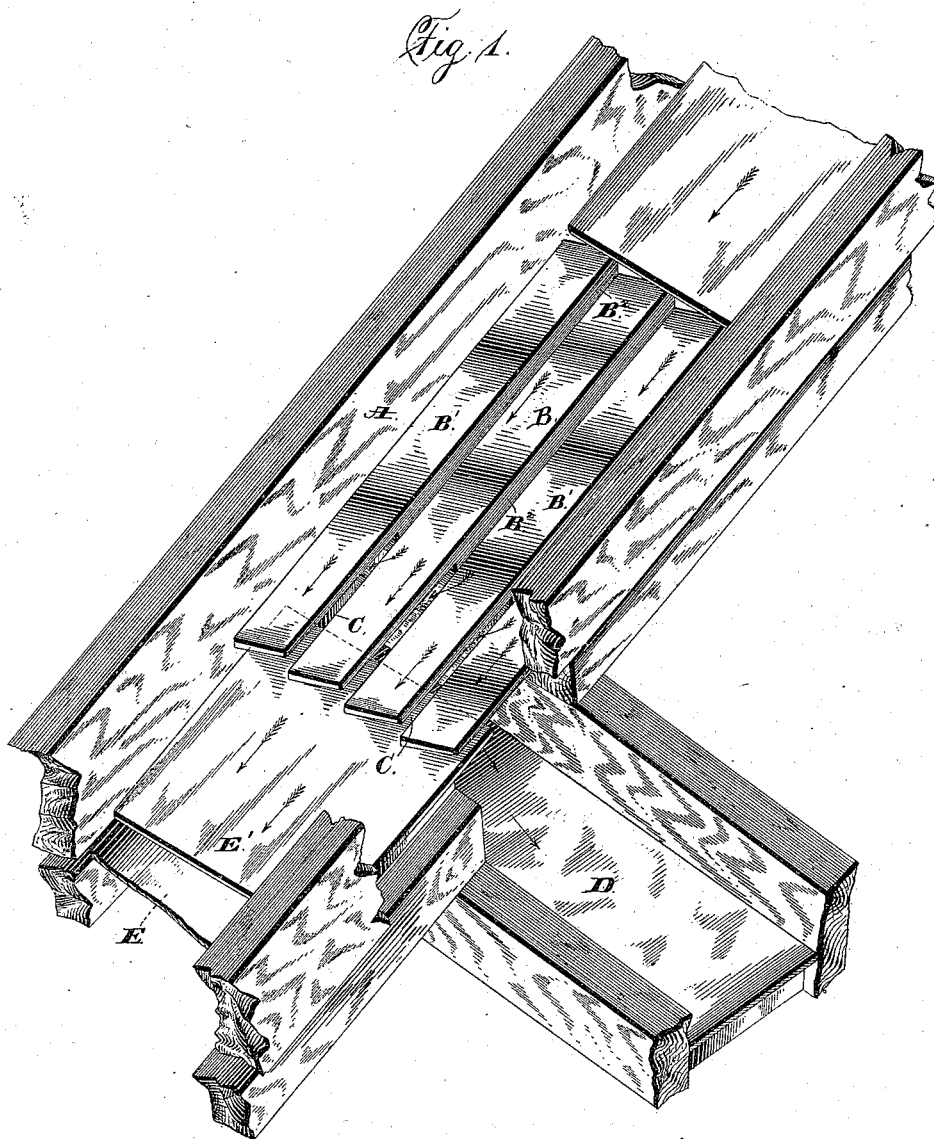
E. B. COXE & S. SALMON.

3 Sheets—Sheet 1.

AUTOMATIC SLATE PICKER.

No. 382,215.

Patented May 1, 1888.



Witnesses:

Jas. B. Hutchinson.
Henry C. Hazard.

Inventors

Ebuley B. Cox & Samuel Salmon.
by Bird & Russell
their attorneys.

(No Model.)

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3 Sheets—Sheet 3.

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Fig. 4.

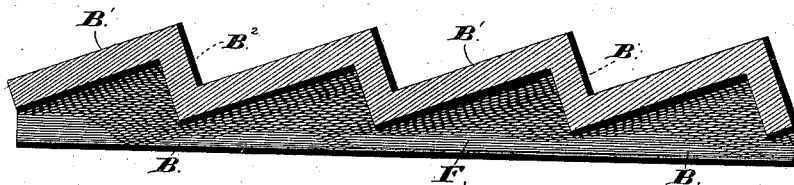


Fig. 5.

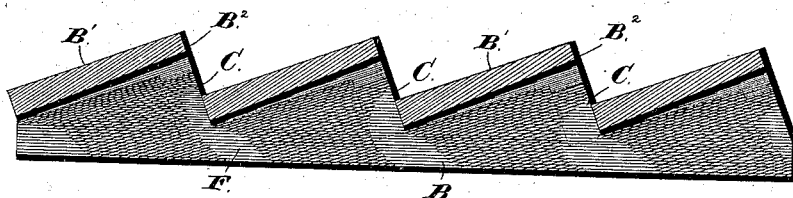
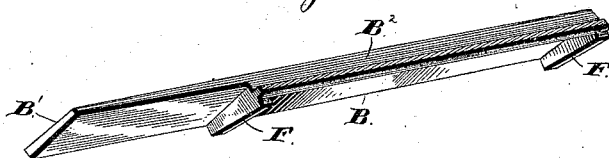


Fig. 6.



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UNITED STATES PATENT OFFICE.

ECKLEY B. COXE AND SAMUEL SALMON, OF DRIFTON, PENNSYLVANIA;
SAID SALMON ASSIGNOR TO SAID COXE.

AUTOMATIC SLATE-PICKER.

SPECIFICATION forming part of Letters Patent No. 382,215, dated May 1, 1888.

Application filed February 24, 1887. Serial No. 225,792. (No model.)

To all whom it may concern:

Be it known that we, ECKLEY B. COXE and SAMUEL SALMON, of Drifton, in the county of Luzerne, and in the State of Pennsylvania, have
5 invented certain new and useful Improvements in Automatic Slate-Pickers; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in
10 which—

Figure 1 shows a perspective view of a chute provided with our screen; Fig. 2, a vertical longitudinal section of the same; Fig. 3, a plan view of the screen; Fig. 3^a, a detail enlarged perspective view of a part of the discharge end of the screen, showing the shape of the slate-exit slots; Fig. 4, a transverse section of the same on line *x x* of Fig. 3; Fig. 5, a similar section of the screen on line *y y* of
15 Fig. 3; and Fig. 6, a detail perspective view, showing the under side of one of the screen bars or teeth.

Letters of like name and kind refer to like parts in each of the figures.

25 The object of our invention is to provide an improvement in automatic slate-pickers, adapted also for the separation of the flat or laminated portions from any mass of broken or granular material; and to this end our
30 invention consists in the construction, arrangement, and combination of the parts thereof, as hereinafter specified, and set forth in the claims.

We show and will describe our invention as
35 applied especially to a coal-chute for the separation of the slate from the coal, but desire it to be understood that it is equally applicable for the separation of flat coal from round coal, and the flatter pieces in a loose mass of any
40 material from the pieces of different form.

In the drawings, A designates the inclined chute down which the mixed coal and slate is passed. Within this chute, so that the coal and slate will slide onto and over it, we place
45 the screen B, of a peculiar shape and construction. It is preferably made of metal, as iron, and cast in one piece, though we do not intend to limit ourselves either to the material named or the way of forming it. Such screen
50 consists of a plate having longitudinal surfaces or faces B¹ B² B³, inclined toward one side of

the screen, and other more upright or abrupt surfaces or faces B² B² B³, preferably inclined slightly toward the other side of the screen, joining the lower edge of each face B¹ with the
55 upper or higher edge of the next face B¹. With this construction a series of longitudinal troughs or valleys are formed, having a saw-tooth or ratchet shape in cross-section, as shown in Fig. 4.

To suit the screen for use with any particular size of coal, the broader face, B¹, of each of these troughs or valleys is made a little wider than a single lump of coal as it slides
60 down the trough with its lower side engaging the face or trough side B².

As the mingled lumps or pieces of coal and slate (the latter being naturally, as is well known, flatter than the former) slide down the
65 troughs or valleys, each piece of slate and coal is caused by the inclination of face B¹, over which it slides, to work over against the face B² of the trough and bear against the same. The lower portions of the abrupt walls or faces
70 B² B², near the lower end of the plate, are cut away, as shown, to form the slots or spaces C C, which will allow the flat pieces of slate to pass off of the inclined faces B¹ B¹ and drop
75 through into a chute or hopper, D, below, while the thicker pieces of coal are retained on the plate and pass off of its lower end onto the apron or chute E, which projects under the lower end of the screen, to be conducted
80 away as desired. To prevent any of the pieces of slate from sticking in the slots C C and clogging, we make such slots increasing in size toward their tail ends. With this construction, if a piece of slate can not pass
85 freely through the upper or first portion of a slot, it will be moved along by the sliding coal to a wider part of the slot, which it can pass through. The bars or transverse supports F
90 F, upon which the screen-plate is sustained, are both, as shown, situated under the plate above the point at which the slots C C begin, so as to leave such slots entirely free and unobstructed.
95

The operation of our invention is as follows: As is well known, coal generally breaks into cubical and nearly spherical or rounded pieces, while slate usually breaks into flat pieces.
100 When a lot of coal and slate has been sized by

passing through square or round holes or meshes in a suitable screen, the pieces of slate, on account of their flat form, can obviously be made to pass through a slit which would not allow the passage of the coal. Such sized coal or slate we conduct by the chute A to the screen-plate B, where the pieces of coal and slate slide down the saw-toothed or ratchet-shaped grooves B' B' B' B', and arrange themselves against the sides or faces B' B' of such grooves. As the pieces of slate reach the slots C C, they, being no longer held by the faces B' B', fall through the slots and are received by the chute or hopper D, to be conducted away. The pieces of coal, as they cannot, from their shape, pass through such slots, continue on down along the screen-plate and pass onto the apron or lower chute, E. With the flat pieces of slate of course any flat coal which there may be will also drop through the slots C C. Such flat coal and slate are conducted to a picking-table, where the coal is picked out and the slate is allowed to run into the slate-pocket and is thrown away. As there is only a small amount of coal which thus passes out with the slate, it is very much easier to pick the coal from the mass of slate than it is to pick the slate from the coal, as has heretofore been done.

If it is found that the picker-screen is letting down too much coal with the slate, all that is necessary is to continue the upper portion of the chute or apron E farther up under the slotted end of the screen. We contemplate for this purpose making such apron or the upper end of the lower chute adjustable in any suitable way. We therefore place in the chute A at its rear end the plate E, as shown in Figs. 1 and 2. Such plate, forming the upper face of the chute-bottom, can be set farther up or down in the chute, as desired, or can be fixed to project more or less beyond the upper end of the chute-bottom proper under the lower end of the picker-screen.

There is, we have found, a great advantage in having the slate-exit slots or openings comparatively short and extending only part way up the valleys or troughs in the screen-plate instead of all the way up such valleys. As the mass of coal and slate slides down the upper unslotted portions of such valleys, the pieces have time and opportunity to arrange themselves against the lower or abrupt faces, B' B', so that by the time they reach the slots C C each piece of slate will certainly be bearing against one of such sides in position to drop immediately through a slot C as soon as it reaches the point at which such slot is large enough to permit its passage. With the slots extending up the whole length of the valleys the pieces of slate and coal do not have the chance to properly arrange themselves before reaching the slots, and as the increase in size of the slots must be more gradual on account of their greater length, the pieces of slate are more apt to stick in the slots and clog than

where the slots are short and the angle of the flare of the slots is greater, as in our picker.

While we contemplate sizing the mixed coal and slate before it reaches the picker, such preliminary sizing is not necessary to the action of our invention, and can, if desired to suit certain circumstances, be dispensed with.

As indicated hereinbefore, our picker is adapted for use not only for separating slate from coal or flat coal from other coal, but for separating any articles or pieces of any material of a flattened shape from other articles or pieces of different shape. It can be used, for instance, to separate pieces of shell and flat pebbles or stones from gravel, or the flat or laminated pieces of metal from ore.

Having thus described our invention, what we claim is—

1. As a means of separating flat pieces of material from other pieces differently shaped, an inclined trough having the face over which the pieces slide inclined to one side, the abrupt face on the side toward which the other face inclines, and the continuous slot or opening in the abrupt face beginning at point near the lower end of the trough, substantially as and for the purpose specified.

2. As a means of separating flat pieces of material from pieces of other shapes, a trough having the face over which the pieces of material slide made sloping toward one side and a face toward which the first face slopes provided with a continuous slot beginning near the discharge end of the trough and increasing in size toward such end, substantially as and for the purpose set forth.

3. The screen for separating flat pieces of material from pieces of different shape, consisting of a series of troughs or valleys, each having a face inclined toward one side and an abrupt face toward which the other face is inclined, and having a slot in its abrupt face beginning near the discharge ends of the troughs and increasing in size toward such ends, substantially as and for the purpose shown.

4. In combination with a suitable guiding-chute for the material to be separated, the separator-screen consisting of the plate having the series of valleys or grooves saw-tooth-shaped in cross-section and provided with the slots in the sides of such valleys, beginning near the discharge ends of the valleys and increasing in size toward and to the ends thereof, substantially as and for the purpose shown.

5. The plate for use in separating coal cast in one piece having the longitudinal faces inclined or pitching toward one side of the plate, the abrupt faces joining the lower sides of the inclined faces with the higher sides of the contiguous faces, the slots in the abrupt faces beginning near the ends thereof and increasing in size toward their ends, and the transverse bars or ribs on the under sides of the plate, substantially as and for the purpose shown.

6. In combination with the inclined plate
having the longitudinal troughs or valleys saw-
tooth-shaped in cross-section and the slots in
the abrupt sides of the valleys beginning near
5 the discharge end of the plate and increasing
in size down to such end, a receiving chute pro-
jecting under the end of the screen and made
adjustable thereunder, substantially as and for
the purpose set forth.

In testimony that we claim the foregoing we do
have hereunto set our hands this 31st day of
January, 1887.

ECKLEY B. COXE.
SAMUEL SALMON.

Witnesses:

ARTHUR McCLELLAN,
ELLIOTT A. OBERRENDER.