

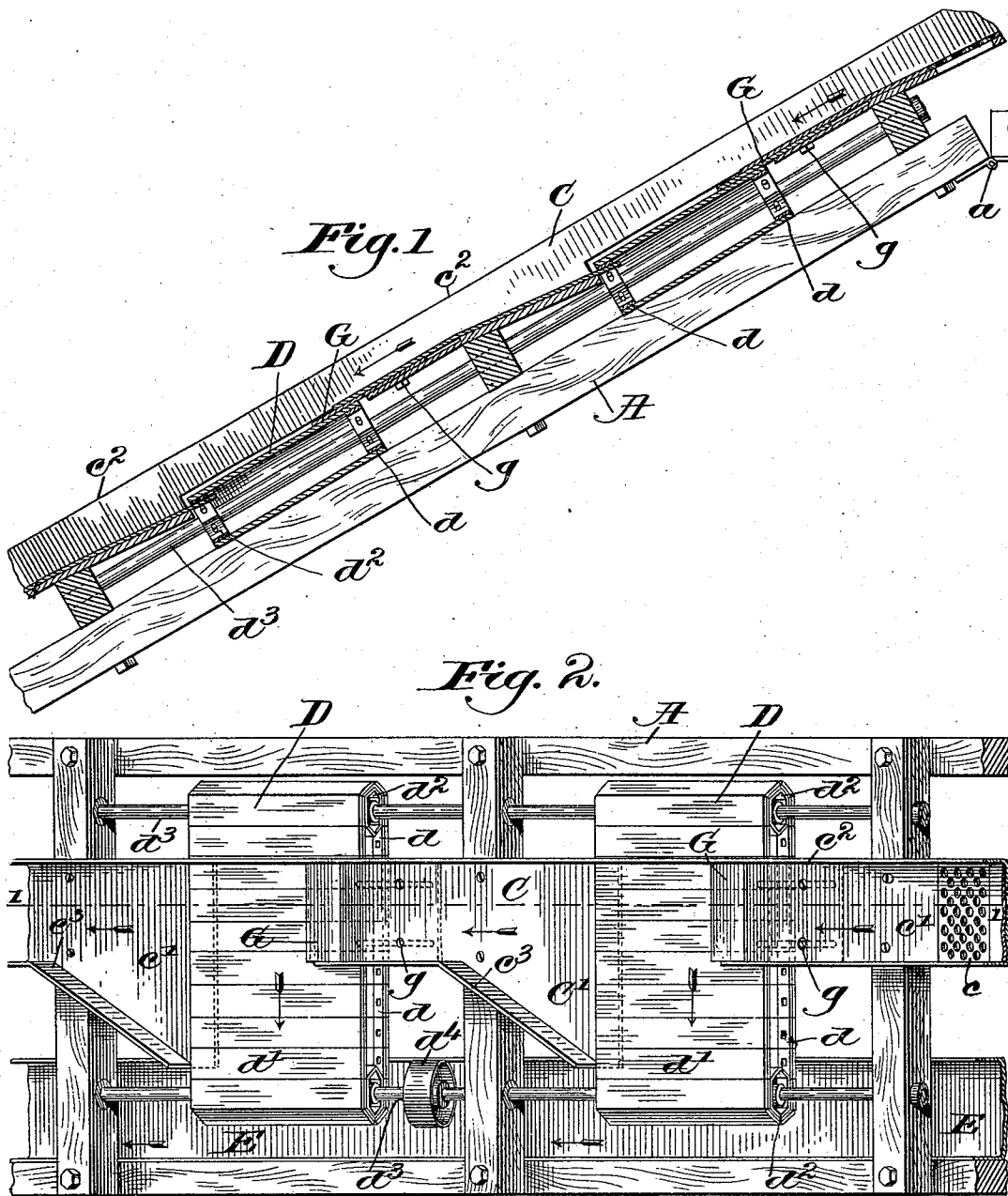
(No Model.)

3 Sheets—Sheet 1.

D. E. PHILLIPS.
SLATE PICKER.

No. 572,661.

Patented Dec. 8, 1896.



Witnesses:

A. C. Harmon,
Thomas J. Drummond

Inventor:

David E. Phillips,
by Crosby & Gregory
attys

(No Model.)

3 Sheets—Sheet 2.

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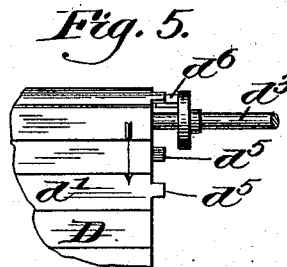
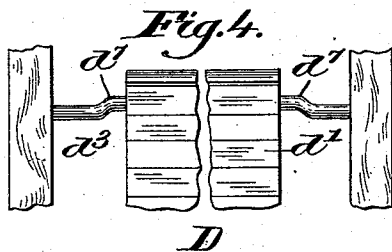
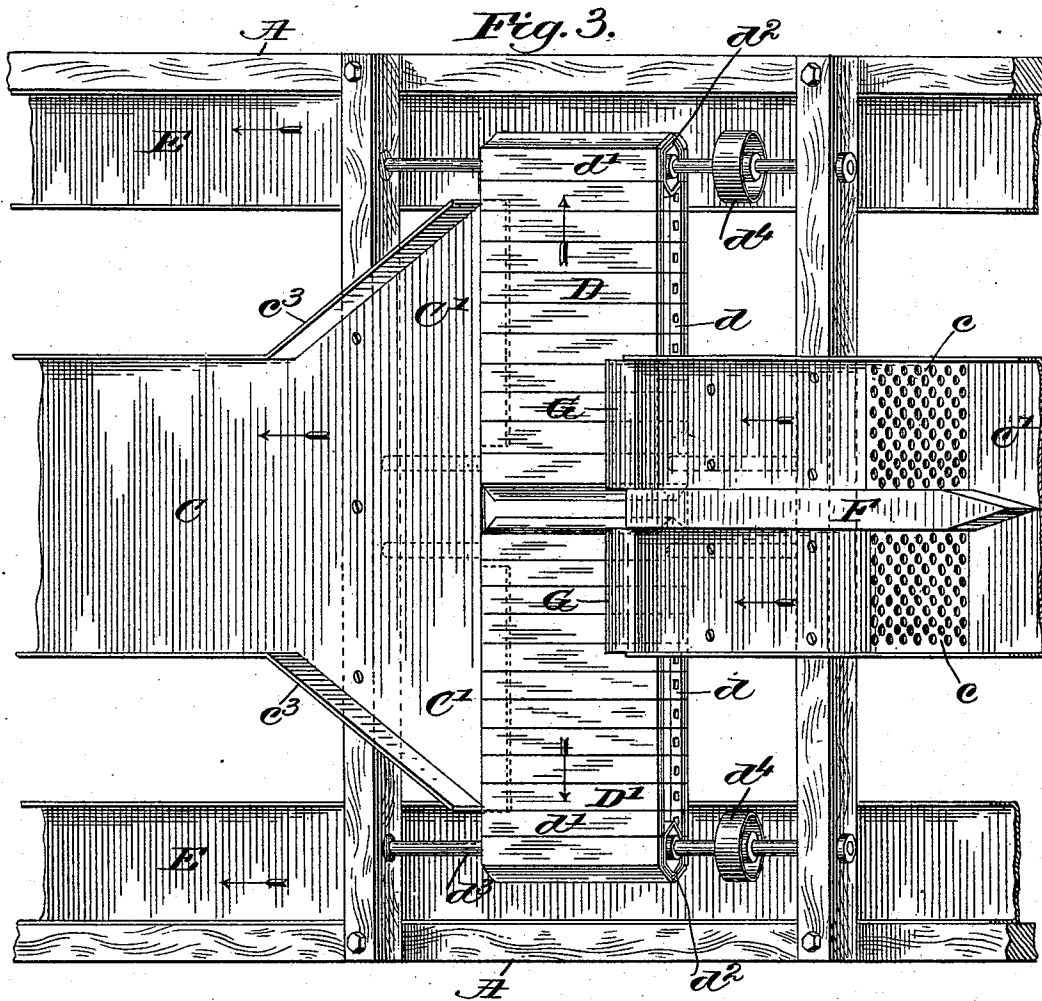


Fig. 6.

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D
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(No Model.)

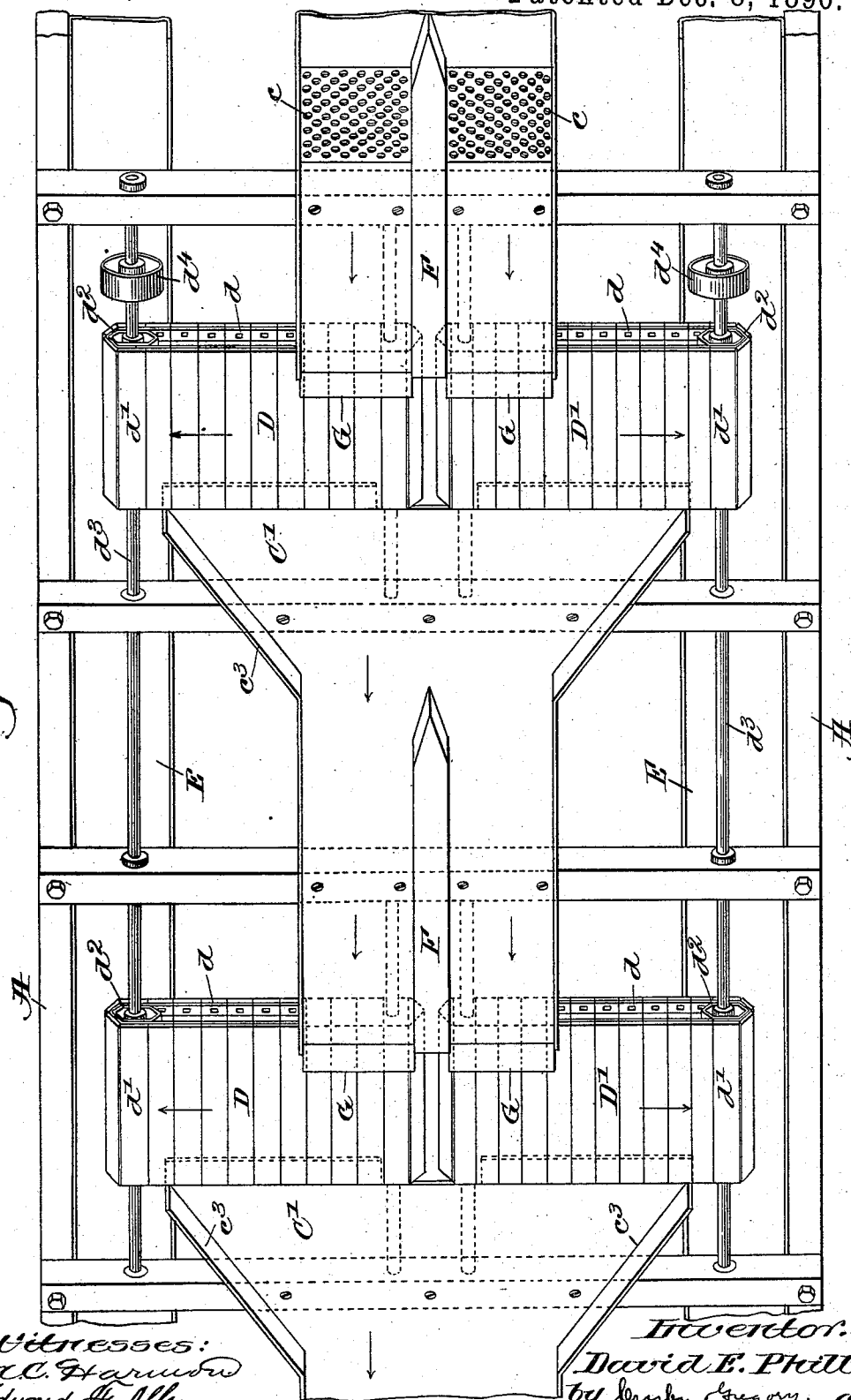
3 Sheets—Sheet 3.

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Fig. 7.



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UNITED STATES PATENT OFFICE.

DAVID E. PHILLIPS, OF MAHANOEY CITY, PENNSYLVANIA.

SLATE-PICKER.

SPECIFICATION forming part of Letters Patent No. 572,661, dated December 8, 1896.

Application filed May 13, 1896. Serial No. 591,372. (No model.)

To all whom it may concern:

Be it known that I, DAVID E. PHILLIPS, of Mahanoe City, in the county of Schuylkill, State of Pennsylvania, have invented an Improvement in Slate-Pickers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to improvements in slate and cinder pickers for removing the slate, bone, rock, cinder, &c., out of the coal as the latter comes down the chute leading from the screens to the coal-pockets. It is customary to provide a chute for this purpose having a sufficient pitch to allow the coal to slide on the sheet-iron bottom of the chute, the latter becoming extremely bright and slippery by the rapid movement thereof over of the coal. In order, therefore, to automatically remove the slate, rock, &c., from the coal, it has been proposed to insert at places in this iron bottom slabs of slate, which act to retard the objectionable slate, cinders, &c., in the coal and to allow the smaller and rounder chunks of coal to rattle on down the chute. In order to remove the slate, cinders, &c., thus collected, a slight opening has been made crosswise in the bottom of the chute just below the inserted slab of slate. However, this has proved objectionable, for the reason that it is extremely wasteful of the coal, more or less of the coal always dropping down through the opening, together with the slate, cinders, rock, &c. Accordingly I have made the present invention with the object of entirely avoiding all possibility of waste in the process of picking out the slate and other objectionable material from the coal, and have also invented improved means for removing the slate, &c.

The leading feature of my invention consists in providing a moving surface of retarding material, and this surface can be in the form of an endless belt provided with slats of slate or of any other retarding material, preferably roughened on its frictional surface, or it may be in any other form, so long as the moving surface is arranged to carry the collected slate, &c., from the chute and permit the coal to go on down to the coal-pockets. These conveyers or pickers may be arranged

along in the chute in such numbers as desired, either singly or otherwise, and may be moved at any angle preferred relatively to the general direction of the chute. The motion is preferably a continuous one, although for some purposes it is found desirable to provide an intermittent or jogging motion, or both of these.

In the drawings, Figure 1 is a vertical longitudinal section taken on the line 1, Fig. 2. Fig. 2 is a top or plan view of one form of my invention. Fig. 3 is a similar top or plan view of another form of my invention. Fig. 4 is a detail in plan of one means for providing the conveyer with a jogging motion having an intermittent velocity. Fig. 5 is a detail showing in plan one means of giving the conveyer an intermittent forward movement; and Fig. 6 is a sectional detail of one of the slats, showing one form of retarding-surface. Fig. 7 is a view similar to Fig. 2, showing the double retarding-surfaces of Fig. 3 arranged in series.

In the present embodiment of my invention A designates a suitable frame of any usual construction supporting the chute C and preferably hinged at *a* at its upper end to the coal-screen or other support. The chute is provided with usual screening-apertures *c* and sheet-metal bottom *c'* and upwardly-projecting sides *c''*. These details of construction are of any usual or preferred form and material.

At one or more suitable points throughout the length of the chute I provide a retarding surface or surfaces D, having suitable means for moving the same at an angle to the chute, these retarding-surfaces being provided to catch the slate, stone, cinders, and other refuse matter carried by the coal which it is desired shall be picked and to deliver this collected debris into suitable depositories E, preferably also in the form of chutes, as shown. I have herein shown as the preferred form of moving retarding-surfaces an endless band or chain *d*, carrying a series of slats *d'*, the latter being made of slate, metal, or other retarding-surface, either smooth or suitably roughened, as shown in Fig. 6, in order to give the desired retardation. I have herein shown these endless moving retarding-surfaces for conveyers D as mounted on sprocket-wheels *d''*, carried

by shafts d^3 and actuated by pulleys d^4 . This is a convenient means of operating the conveyers to separate the slate, &c., from the coal, although any other suitable means may be provided, inasmuch as the gist of my invention does not reside in the means of actuating the retarding-surfaces, but lies rather in the provision of the movable retarding-surfaces themselves. These surfaces may be operated to move at any desired angle to the chute, although for general purposes it is found that movement transverse to the chute is to be preferred. As the coal comes rattling down the bright slippery metallic bottom of the chute C, the chunks of coal tumble readily over the retarding-surfaces, whereas the flat and heavier masses of slate, stone, &c., intermingled with the coal, strike the retarding-surfaces with more frictional resistance than the coal and because of their shape also tumble with less freedom and are therefore caught and held by the moving retarding-surfaces D. The latter therefore carry the lodged and collected debris to one side out of the path of the oncoming coal. This lateral movement of the retarding-surfaces D tends to deflect more or less of the coal from its straight downward normal course. Accordingly I have provided the wings or extensions C' to catch the deflected coal and again direct the same into its normal course down the chute.

It is preferable to provide the retarding-surfaces in series, one below the other, so that whatever slate, stone, &c., is not caught by the first retarding-surface will be caught by the second, and so on. Therefore the wing or extension C' has preferably a converging or contracted side c^3 , in order to direct the coal back into its normal width of flow down the chute before it reaches the next moving retarding-surface D.

Referring to Fig. 3, it will be seen that for certain purposes it may be more convenient in large chutes to have the chute divided at its delivery portion adjacent the moving retarding-surfaces, a dividing-rib F, sharpened at its upper end, being preferably provided for this purpose. The moving surface in this case is preferably divided into two oppositely-moving portions D D' , cooperating with the oppositely-extended wings below the same, as shown. This construction is preferable in a large chute for the reason that one transversely-moving retarding-surface would either require an unusual width of surface or else would fail to carry the retarded slate, &c., from one extreme side to the other, inasmuch as the long rush of coal would carry much of the slate, &c., on with it off from the retarding-surface D before the latter had moved sufficiently to convey the slate, &c., out of the path of the coal.

In my preferred construction I provide an apron G, which is also preferably adjustable by suitable means, as by set-screws g . This apron extends down over the moving retarding-surface at the delivery end of the chute,

so that the extent of retarding-surface exposed to the descending coal, slate, &c., may be regulated as desired, thereby accommodating the retarding device to the particular kind of coal being picked.

While a continuous motion of the retarding-surface is usually preferable, it is desirable in some instances to provide an intermittent motion.

One means of giving the moving surfaces an intermittent motion is shown in Fig. 5, in which certain of the slides d' are provided with end extensions d^5 , arranged to be brought into contact with a lug d^6 , carried by the shaft d^3 , so that the retarding-surface D is moved ahead one notch by each revolution of the shaft.

In Fig. 4 I have shown a means of jogging the moving retarding-surface up and down as it is constantly moved forward, the shaft d^3 being offset at d^7 , as shown, so that the sprocket-wheels are not only rotated by the turning of the shaft, but they are revolved or swung around eccentrically by the offset portion of said shaft. This also gives an intermittent speed to the forward movement, inasmuch as when the said offset portion is traveling forward in its upward arc of movement it has an increase of speed over its forward rotation when the offset portion is moving rearwardly at the downward portion of its arc of movement.

The operation of my device is as follows: The adjustable apron G having been set as desired according to the quality of coal which is to be picked and also depending somewhat upon the amount of slate, &c., carried by the same, the retarding-surfaces D are set in motion and the coal is turned on. As the coal comes pouring down the chute, the heavier slate, stone, &c., hugs the bottom of the chute, and as it strikes the surfaces D, which are roughened or otherwise formed to present an unusual degree of frictional retardation thereto, the slate, &c., is momentarily held thereby, while the coal goes rattling on down the chute. These retarding-surfaces being in motion, the momentary lag given to the slate, &c., is sufficient to permit the same to be conveyed out of the path of the coal and delivered into the side chutes E, provided for the debris. All such small quantities of coal as are deflected out of their normal course and carried laterally for a short distance with the retarding-surface are caught as they roll off from the latter by the wings C' and deflected in the normal channel of the chute again to flow on down with the main body of the coal.

By the term "retarding-surface" I do not mean to include a screen as the latter term is commonly used, *i. e.*, a device that does its separating of the coal by permitting part thereof to go down through it.

While I have herein described my invention as preferably having a retarding-surface in the form of an endless belt, yet it is obvious that various other forms of construction

may be substituted therefor within the scope of my invention; nor is it necessary that the retarding-surfaces should be limited in any respect to slats, nor to the material, slate, 5 which I have mentioned, inasmuch as various other forms and constructions may be used; nor do I restrict myself to the particular forms and arrangements of the other parts herein shown, inasmuch as various changes and 10 modifications may be resorted to without departing from the spirit and scope of my invention.

What I claim is—

1. In a slate-picker, an inclined chute having a smooth bottom, combined with a suitable plane roughened -slate retarding-surface, and means to move the latter transversely to the chute, for the purpose of removing the slate, &c., collected by the retarding-surface, substantially as described. 15 20

2. In a slate-picker, an inclined chute for the coal, combined with a movable retarding-surface interposed in the chute, means to move the same at an angle transversely to the chute, and an apron in the bottom of the chute and extending over a portion of the retarding-surface, substantially as described. 25

3. In a slate-picker, an inclined chute for the coal, combined with a movable retarding-surface interposed in the chute, means to move the same at an angle to the chute, and an adjustable apron in the bottom of the chute and extending over a portion of the retarding-surface, substantially as described. 30

4. In a slate-picker, an inclined chute, having two oppositely-movable retarding-surfaces interposed opposite each other and substantially transversely therein, said chute being relatively narrow at the upper side of said retarding-surface and wide at the lower side thereof, substantially as described. 35 40

5. In a slate-picker, an inclined chute, having a plurality of movable retarding-surfaces interposed substantially transversely therein, one below another, said chute being relatively narrow at the upper sides of said retarding-surfaces and wide at the lower sides 45

thereof, and aprons secured in the bottom of the chute and extending over a portion of the upper sides of the retarding-surfaces, substantially as described. 50

6. In a slate-picker, an inclined chute having two oppositely-movable retarding-surfaces interposed substantially transversely therein, the chute being provided with two relatively narrow delivery portions to deliver the coal to said respective retarding-surfaces, and having its receiving portion below said retarding-surfaces laterally extending at either side in the direction of movement of said retarding-surfaces, substantially as described. 55 60

7. In a slate-picker, an inclined chute, a retarding-surface in and movable transversely to the direction of inclination of the said chute, and means to move said surface continuously with an intermittent velocity in one and the same direction, substantially as described. 65

8. In a slate-picker, an inclined chute, an imperforate retarding-surface interposed in the chute, means to jog said surface up and down, and means to forwardly move the same, substantially as described. 70

9. In a slate-picker, an inclined chute, an imperforate retarding-surface interposed in the chute, means to jog said surface up and down, and means to forwardly move the same, with an intermittent velocity, substantially as described. 75 80

10. In a slate-picker, an inclined chute, pivotally secured at its upper end, combined with a plane retarding-surface of slate interposed within the chute, and means to move the latter laterally relatively thereto, substantially as described. 85

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

DAVID E. PHILLIPS.

Witnesses:

JOSEPH G. MORGAN,
BENJAMIN MORGAN.

It is hereby certified that in Letters Patent No. 572,661, granted December 8, 1896, upon the application of David E. Phillips, of Mahanoy City, Pennsylvania, for an improvement in "Slate-Pickers," an error appears in the printed specification requiring correction, as follows: In line 16, page 3, the hyphen between the words "roughened" and "slate" should be stricken out; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 12th day of May, A. D., 1908.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.