

Nov. 30, 1926.

1,608,640

F. N. WILSON

MATERIAL SCREENING DEVICE

Filed June 5, 1926

FIG. I

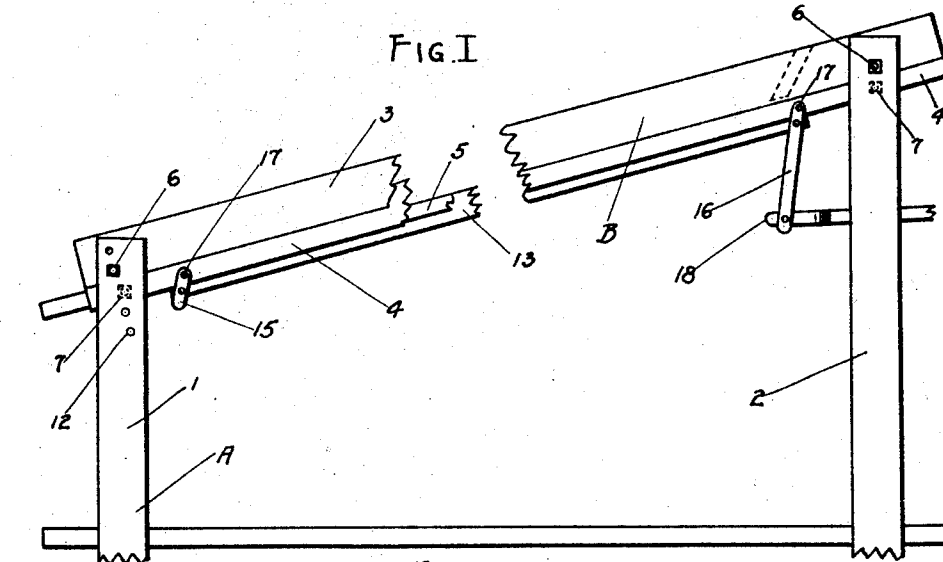
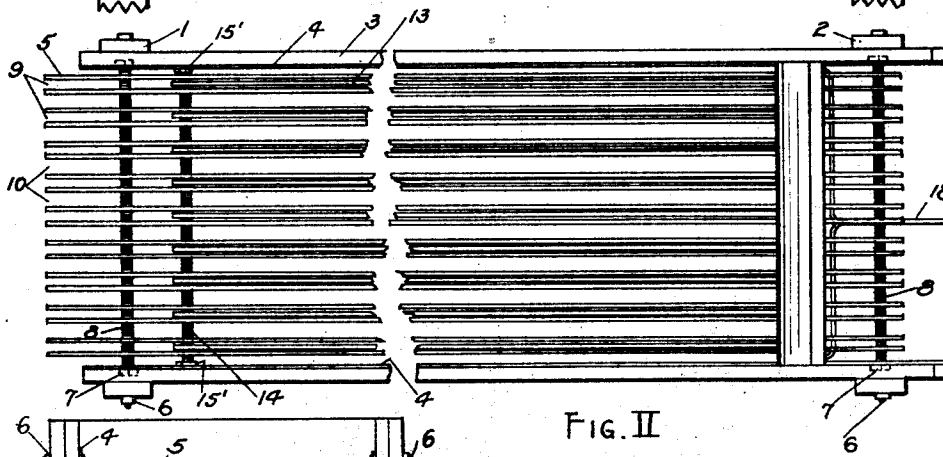


FIG. II

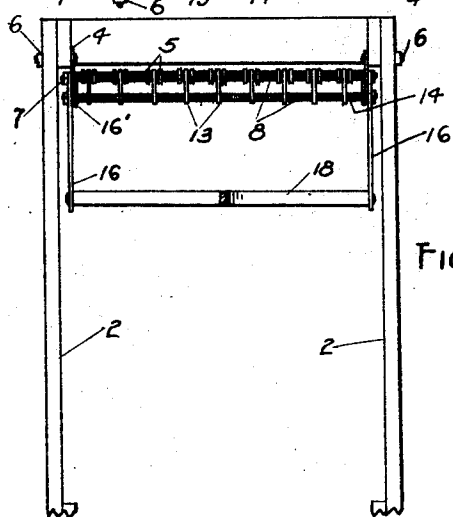


FIG. III

Inventor
FRANK N. WILSON
By: Ben T. Zillman
Attorney

UNITED STATES PATENT OFFICE.

FRANK N. WILSON, OF WEBSTER GROVES, MISSOURI.

MATERIAL-SCREENING DEVICE.

Application filed June 5, 1926. Serial No. 113,860.

My invention relates to improvements in screening devices and particularly to devices for screening coal.

In the usual practice of screening coal, the pieces of coal together with the pieces of slate and the like found therewith, are screened for the various sizes, it being understood that it is the desire to screen out all of the slate if possible. The usual practice is to load the mined material including the slate, onto inclined screens, these screens being either stationary or rocked to and fro, and as the material travels along the screen, all of the pieces under a certain size (determined by the size of the screen openings) are supposed to fall through the screen, while those pieces over the desired size are discharged at the lower end of the screen.

It is a well-known fact, however that such a desideratum is not fully reached in these types of screens. The openings of the screens tend to clog during the passage of the coal thereover and the pieces of slate are usually of such a shape that they slide along the screen without falling through the screen openings. Although the coal itself, as mined, breaks away from the vein in lumps and cubes, the pieces of slate break away in slabs or layers on account of their peculiar line of cleavage. Hence it is easy to see that many of the pieces of slate, on account of their flat shape, do not stand upon edge as they move down the screen, but tend to slide therealong on their flat sides, and hence are not screened out.

The main object of my invention is to provide a screen wherein means are provided for positively turning the pieces of material that are upon the screen upon edge or end during their passage over the screen, whereby those pieces of material, especially slate, that are thin and flat will be tilted to fall through the screen openings, dropping to the refuse pile, and will not be discharged at the delivery end of the screen.

Another object of my invention is to provide a screen of the kind described, wherein the screen will remain stationary and means will be provided for positively actuating the pieces of material intermittently as they pass along the length of the screen, not only advancing the pieces forwardly of the screen but lifting them so as to tilt

them or turn them upon edge so that the thinner pieces will fall through the openings of the stationary screen.

Another object of my invention is to provide a screen of the kind described wherein the screen proper will be formed of a plurality of longitudinally extending bars, up-ended to form what may be termed a "grizzly", this type of structure being extremely durable in service. Other objects of my invention include the provision of means whereby this grizzly may be adjusted relatively to the supporting framework therefor so as to vary the degree of inclination of the screen, and also the provision of means whereby the spacing between the separate bars of the screen may be varied or adjusted so as to space for screening different sizes of material.

The invention has among its other objects the provision of a screen of the kind described, which shall be simple, convenient, economical, reliable, and efficient and satisfactory for use wherever found applicable.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art to which this invention appertains, from the disclosures herein given.

To this end, my invention consists in the novel construction, arrangement, and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like parts are indicated by like reference characters throughout the views,

Figure I is a side elevation, certain of the parts being broken away in order to show the invention more clearly;

Figure II is a top plan view of the same; and

Figure III is an end elevation thereof.

In the drawings, wherein I have illustrated the preferred embodiment of my invention, A indicates a supporting framework, upon which the screening device B is adapted to be mounted, the forward and rear uprights of the frame-work being indicated at 1 and 2. The side walls 3 of the screen are secured at their ends to the uprights by means of bolts 6, these side walls forming a trough or chute upon which the pieces of material are loaded for screen-

ing. In order to reinforce the chute liners of steel, or wear plates, are provided as at 4, these plates being suitably connected to the side walls 3 and depending downwardly therefrom.

The screen proper consists of the plurality of bars 5, these bars being spaced apart and extending longitudinally parallel to each other to form a grizzly. Tie-rods 7 pass through the wear plate 4 and the bars 5, one rod at each end of the screen, and upon these tie-rods are arranged relatively thin washers, so as to adjustably space the bars apart, these washers being indicated at 8.

The spaces or openings between each pair of bars are indicated at 9, and the other spaces between the bars, namely the spaces between the adjacent pairs of bars are indicated at 10, the latter spaces being those through which the pieces of material under a certain size are intended to fall, while the rest of the material moves down the screen to the discharge end.

In order to provide for the adjustment of the degree of inclination of the screen a series of openings 12 may be provided in the lower uprights 1, as shown, and through which the bolts 6 may pass.

A series of movable bars 13 are arranged to cooperate and coast with the stationary bars 5, in a manner to be more clearly hereinafter described, one of these bars 13 being interposed in one or more of the spaces 9 so as to be vertically slidable there-through. These movable bars are connected together so as to be actuated in unison, the tie-rods 14 passing through the bars 13, one tie-rod at each end of the screen. Thin washers, similar to those between the bars 5, space the bars 13 apart adjustably.

The forward tie-rod 14 is pivotally connected to the lower ends of a pair of links 15—15', one pair of links at each end of the tie-rod as shown, the links being pivotally connected at their upper ends to the wear plates 4 so as to be suspended therefrom at the points 17.

The rear tie-rod has a pair of links 16—16' pivotally connected at its ends, and in the embodiment shown, the links 16 of each pair are longer than the links 16' and project downwardly therebelow, said longer links being pivotally connected at their lower ends to the yoke 18. All of the links 16—16' are pivotally connected at their upper ends to the wear plate 4 so as to suspend therefrom in the same manner as the forward links 15—15'.

The bars 13 are preferably of a greater depth than the bars 5 and are so positioned that when the former are in their lowermost position they will have their upper edges substantially flush with the upper edges of the fixed bars 5. It is obvious that, as the

yoke 18 is moved forwardly, the links carrying the movable bars will swing about their pivotal points 17, thus swinging the movable bars upwardly and forwardly relatively of the fixed bars, the movable bars always being parallel with the fixed bars in their entire path of movement. The movable bars engage with any pieces of material that may happen to be upon the screen, gives them a forward and upward movement, and tilts them so as to turn them upon edge or end, and causes the thin pieces to fall through the openings 10 of the screen.

The yoke member 18 may be given a reciprocatory movement by any desired means, as for example by attaching its rear end to a crank (not shown).

The material is loaded upon the chute adjacent the rear thereof, and as the movable bars are oscillated they engage with the pieces of material with a forward and lifting movement. The material is thus given a step-by-step movement down the screen, and those pieces smaller than the spacing between the bars of the screen are screened out and are dropped to the ground, while the larger pieces of usable material continue in their travel toward the discharge end of the screen. The pieces of slate are screened out exceedingly well, because they are up-ended or tilted intermittently, and as they are very much thinner than broad they will easily fall through the openings of the screen when tilted.

Thus it is seen that I have provided a device, which although particularly adapted for screening the smallest usable sizes of coal, yet may be efficiently used for screening of larger sizes of coal and for any other materials.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact construction, form, arrangement and combination of parts herein shown and described, or uses mentioned, except as limited by the claims.

What I claim as new and desire to secure by Letters Patent is:

1. A device of the kind described, comprising a plurality of fixed bars forming a screen along which pieces of material are adapted to be moved, movable bars arranged parallel to and intermediate alternate pairs only of the fixed bars, and means for intermittently actuating the movable bars forwardly and upwardly of the fixed bars to engage with the pieces of material.

2. A device of the kind described, comprising a plurality of spaced, longitudinally-extending bars, forming a screen inclined downwardly toward its discharge end, and adapted to receive pieces of mate-

rial thereupon, movable bars arranged parallel with and substantially filling the space between intermediate of pairs of adjacent fixed bars and normally having their upper edges substantially flush with the upper edges of the fixed bars, and means for intermittently actuating said movable bars forwardly and upwardly of said fixed bars to advance the pieces of material along the screen and tilt them to cause some of the pieces to fall between the spaces between adjacent fixed bars. 10

FRANK N. WILSON.