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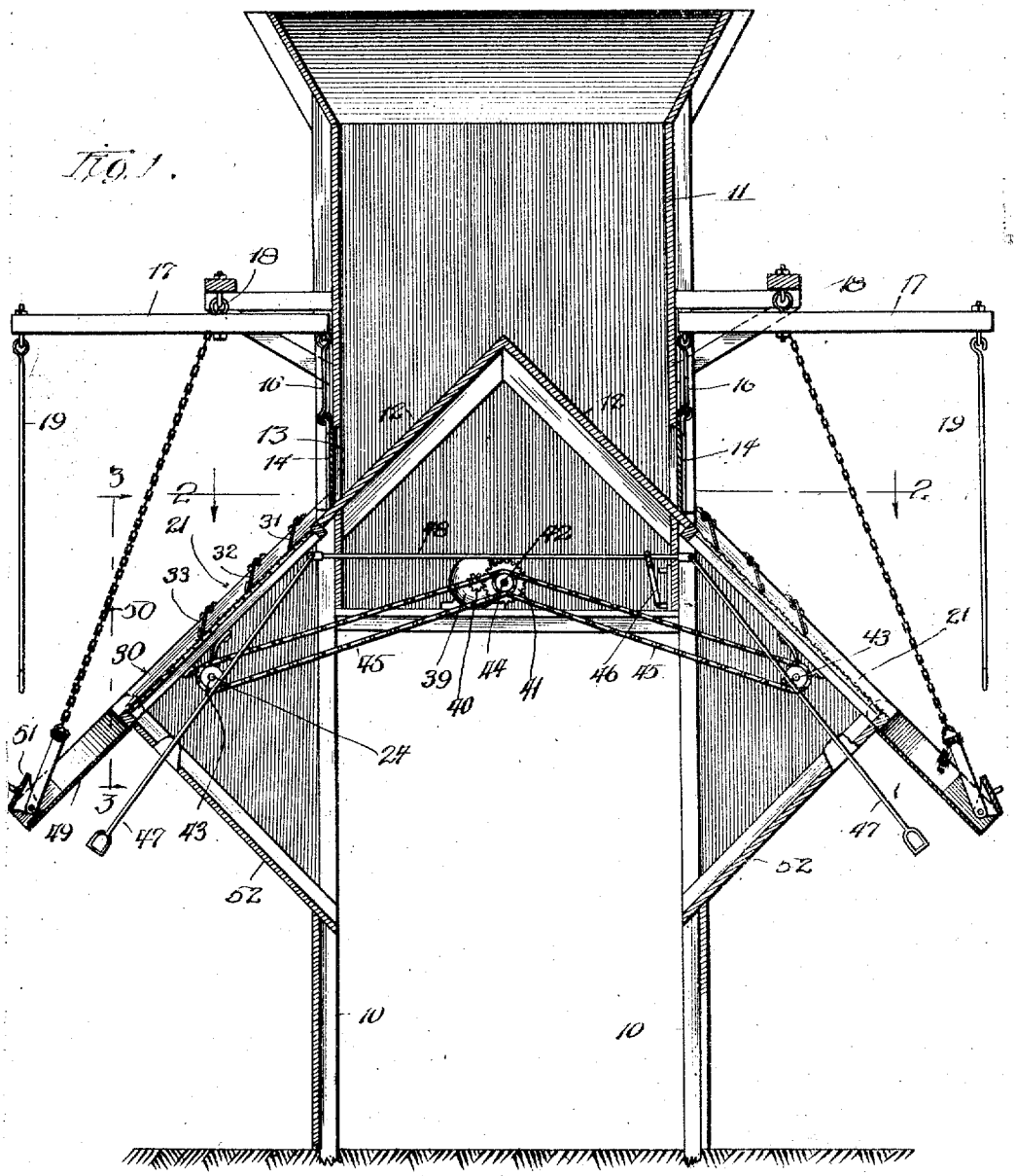
COAL SCREEN.

APPLICATION FILED JUNE 7, 1916.

1,207,262.

Patented Dec. 5, 1916.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

FIG. 2.

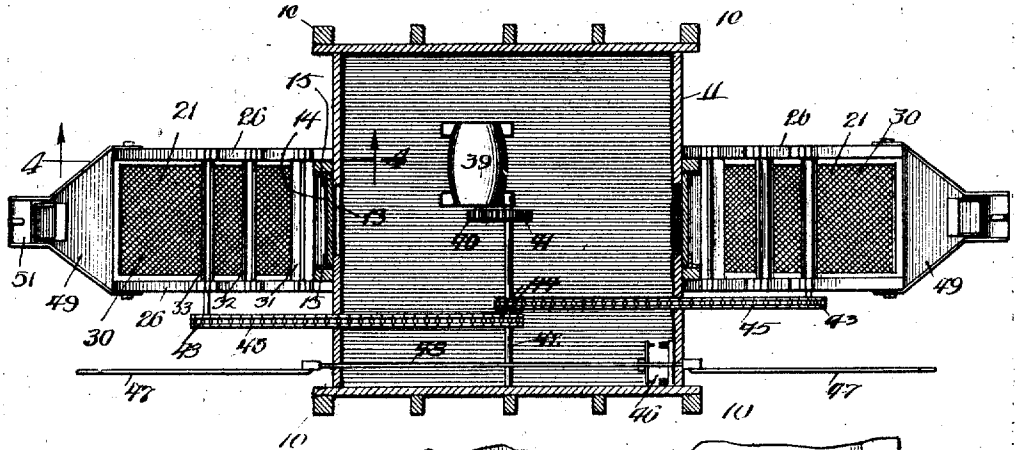
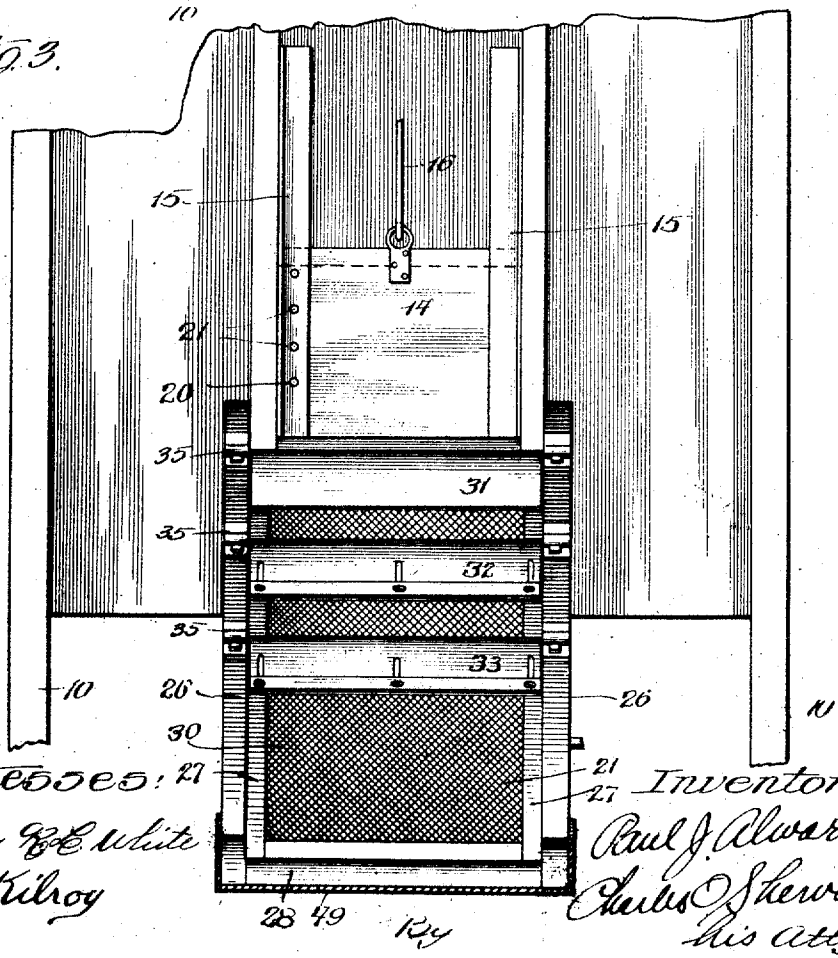


FIG. 3.



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3 SHEETS—SHEET 3.

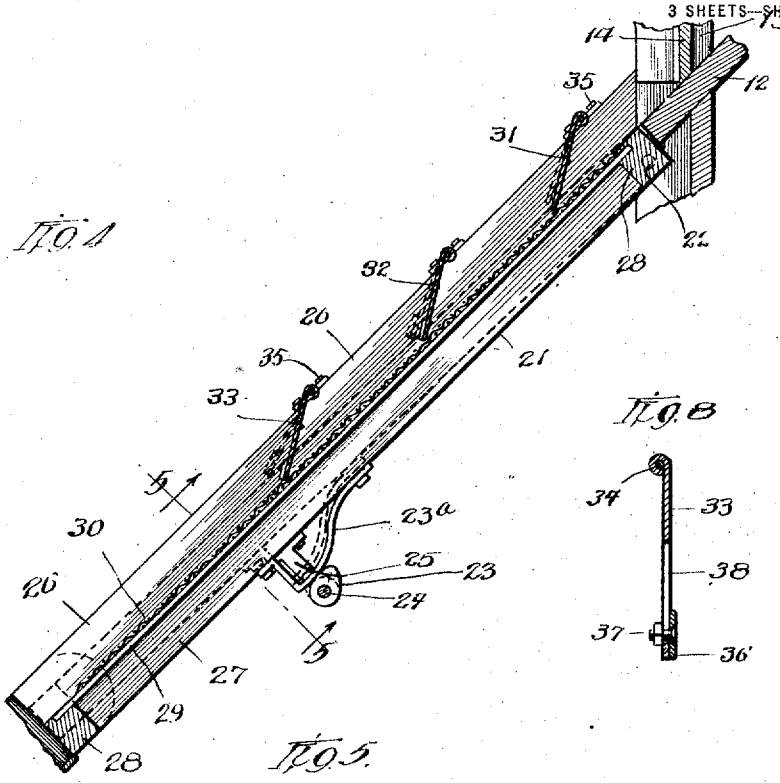


FIG. 4

FIG. 5

FIG. 8

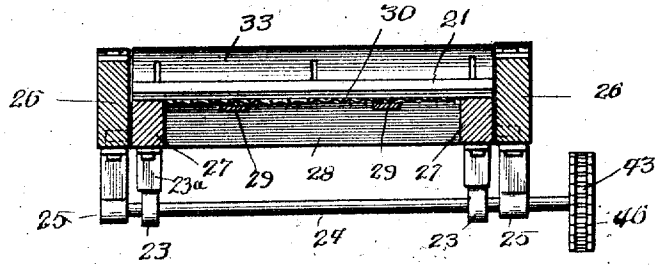


FIG. 6

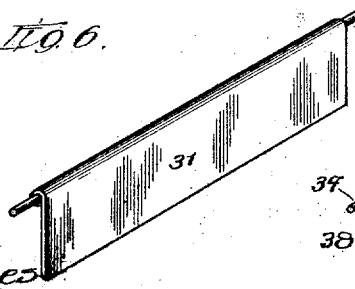
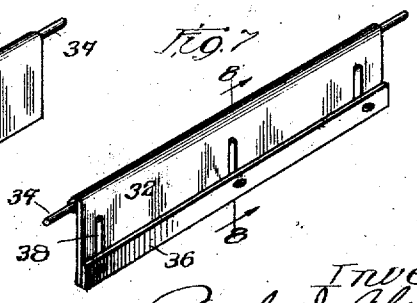


FIG. 7



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COAL-SCREEN.

1,207,262. Specification of Letters Patent. Patented Dec. 5, 1916.

Application filed June 7, 1916. Serial No. 102,128.

To all whom it may concern:

Be it known that I, PAUL J. ALWART, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Coal-Screens, of which the following is declared to be a full, clear, and exact description.

This invention relates to coal screens, and its principal object is to provide a screen of simple and efficient construction for removing dust, small particles of coal and foreign matter from coal, either in a wet or dry condition. Many forms of screening devices have been devised for screening coal, but they are ineffective for removing as much as 75 per cent. of the smaller particles and dust, especially when used to screen washed coal.

This invention consists in the several novel features of construction, arrangement, and combination of parts set forth in the following specification, and particularly pointed out in the claims.

The invention is clearly illustrated in the drawings accompanying this specification, in which:—

Figure 1, is a vertical, central, longitudinal section through a coal screening mechanism, embodying a simple form of the present invention; Fig. 2, is a view partly in plan, and partly in horizontal section, the line of section being indicated by 2—2 in Fig. 1; Fig. 3, is a vertical section, partly broken away, taken on the line 3—3 of Fig. 1; Fig. 4, is a vertical, longitudinal section taken on line 4—4 of Fig. 2; Fig. 5, is a transverse section, taken on line 5—5 of Fig. 4; Fig. 6, is a perspective view of a certain gate, forming a part of the present invention; Fig. 7, is a perspective view of another gate, forming part of the invention; Fig. 8, is a vertical cross-section taken on line 8—8 of Fig. 7.

Referring to said drawings, 10, designates the uprights of a framework, which supports the various parts of the apparatus, and 11, a hopper located at the top of the structure, and into which the coal to be screened is deposited. The bottom 12, of said hopper is inclined and in the preferred form of construction, said bottom inclines in two directions as is clearly shown in Fig. 1, so as to provide for two screens in the one apparatus, although this arrangement is immaterial so far as the invention, broadly considered, is concerned.

In this specification only one of the screening devices and its connections will be described in detatil, since it is to be understood that said description applies to both. At the lower end of either inclined bottom 12, is a discharge opening 13, which is covered by a door 14, guided in ways 15, secured to upright members of the framework and said door is supported by a link 16, secured to one end of a lever 17, fulcrumed to the framework of the apparatus at 18. A rod having a handle 19, is secured to said lever 17, and extends down to within reach. In the operation of the device, said door 14, is raised partly and held in such raised position by a pin or bolt 20, which is insertible in any one of a number of holes 21, formed in the guide 15 (see Fig. 3). When the device is used for screening small, washed coal, the door 14, is raised but a short distance, whereas if larger coal is to be screened, the door is raised considerably higher. At the lower end of the inclined bottom 12, is the screen 21, which is pivotally connected at its upper end as at 22, to the framework of the apparatus. Its other end is supported and actuated by oval cams 23, that engage shoes 23^a, mounted on the under side of the screen. The cams are rigidly mounted upon a shaft 24, journaled in bearings 25, secured to the under side of the stationary side frame members 26 that run parallel with the screen 21, and form the sides of the screening mechanism. The screen itself has longitudinally extending side members 27, connected by transverse end members 28; besides this there are a plurality of reinforcing bars 29, underlying the wire mesh screen 30, which is secured to said lengthwise and transverse members 27 and 28. Said screen is of fine enough mesh to separate from the larger pieces of coal, the coal dust and small chips which are intermingled with the coal before it is screened.

Pivotally supported upon the stationary side members 26, of the screening device are transversely extending gates 31, 32, 33, the lower edges of which, when the screen is stationary, rest on the wire mesh screen. In the simple form of construction shown, each gate consists of a sheet-metal body portion, the upper edge of which is curled

around a rod 34, which rod projects beyond the ends of the gate and is pivotally secured on the side members by bearing brackets 35. One or both of the gates 32, 33 may be weighted in order to obtain a more effective separation of the dust and smaller particles from the coal, and such a construction is shown in Figs. 7 and 8, where a bar 36, is shown as secured near the lower edge of the gate by bolts and nuts 37, the bolts extending through vertically extending slots 38, in the gate in order to afford adjustment of said weight toward or away from the pivot thereof.

At the lower end of the screen is a hopper portion 49, which may be used when bagging the coal, and said hopper may be supported by a chain 50, running to some stationary portion of the structure. A swinging gate 51, at the lower end of the hopper 49, serves to check the flow of coal when one bag is removed and another one is replaced on the end of the hopper. Below each screen is a chute 52, for conveying the fine particles away from the clean coal.

The cam shafts 24, of the screens may be driven from a suitable motor 39, by any suitable form of gearing and as shown in the drawings, said gearing comprises a pinion 40, upon the motor shaft, a gear wheel 41, upon a shaft 42 journaled in bearings secured on the framework of the device. Upon each cam shaft 24, and on the shaft 42, are sprocket wheels 43, 44, which are connected by sprocket chains 45. For controlling the motor 39, I provide a knife switch 46, which is operated by operating handles 47, and a connecting rod 48, as clearly shown in Fig. 1, of the drawings.

In the operation of this device, the hopper 11, is filled or partially filled with coal, the door 14, of the screen or screens to be used is raised sufficiently to permit a free flow of the coal to the screen; the screen being stationary, the coal runs down to the first gate 31, where it is checked. When however, the motor 39, is started and the screen is vibrated, the gates 31, 32, 33, are swung upward each time the screen moves upward, and this action upon said gates, together with the shaking of the coal and weight thereof causes the upper gate to open slightly, permitting a quantity of the coal to run down to the next gate where it is held back momentarily, after which said gate opens under the influence of the vibrating action of the screen and the weight of the coal as it accumulates. This same action takes place at the third gate. By reason of the gates, the coal is retained on the screen for a greater length of time than it would be if the coal were to run down the screen unprovided with gates, and in this way as much as 75 per cent. of the dust and fine particles of coal are separated from the larger pieces, and practically clean coal is delivered from the screen. To stop the flow of coal the motor is stopped, and as soon as the screen ceases to vibrate, the coal above the gates remains on the screen and does not run down.

I am aware that shaking screens are old, and also stationary screens with gates are old, but these screens do not accomplish the result which I am able to accomplish with my vibrating screen and swinging gates. When this device is properly set for operation, it does not require a skilled attendant to handle it, since all that is necessary for the driver to do is start the motor by means of the handle 47, and the coal will run down the screen, but will be held back between the gates long enough to free itself of the coal dust and fine particles.

More or less variation of the exact details of construction is possible without departing from the spirit of this invention, and I desire, therefore, not to limit myself to the exact form of construction shown and described, but intend in the following claims to point out all of the invention disclosed herein.

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

1. Screening apparatus, comprising a hopper having a discharge opening, a steeply inclined screen extending away from said opening, means for vibrating said screen, stationarily supported side frame members extending along the sides of said screen, and a plurality of transversely extending material retarding and arresting gates formed of inflexible material hingedly supported on said side frame members above the screen with their lower edges adapted to rest on said screen, said gates operating to retard the flow of material while the screen is being vibrated, but operating to arrest the flow when the vibrating means are stopped.

2. Screening apparatus, comprising a hopper having an inclined bottom, a discharge opening at the lower end of said bottom, a door for regulating the size of said opening, a steeply inclined vibratory screen, projecting from said opening, power driven means for vibrating said screen, stationarily supported side frame members extending along the sides of said screen, and a plurality of transverse material retarding and arresting gates formed of inflexible material hingedly supported on said side frame members above said screen with their lower edges resting thereon, said gates being adapted to hold back the material to be screened, when the screen is stationary.

3. Screening mechanism, comprising a steeply inclined screen hingedly supported at its upper end, a cam adjacent its lower end for vibrating said screen, a power driven shaft for the cam, stationarily sup-

ported side frame members extending along the sides of said screen, and a transversely extending gate formed of inflexible material hingedly supported on said side frame members above the screen with its lower edge resting on the screen, said gate being arranged to arrest the coal when the screen is stationary.

4. Screening mechanism, comprising a hopper having an inclined bottom and a discharge opening at the lower end of said bottom, an inclined screen hingedly secured at its upper end, a power driven shaft under the lower end of said screen, cams on said shaft supporting said screen and adapted to vibrate it, stationary side members for said screen, and transversely extending material retarding and arresting gates formed of inflexible material hingedly secured to said side members with their lower edges resting on said screen, the lowermost gate being weighted.

5. Screening mechanism, comprising a hopper having an inclined bottom and a discharge opening at the lower end of said bottom, an inclined screen hingedly secured at its upper end, a power driven shaft under the lower end of said screen, cams on said shaft supporting said screen and adapted to vibrate it, stationary side members for said screen, transversely extending material retarding and arresting gates formed of inflexible material hingedly secured to said side members with their lower edges resting on said screen, and an adjustably mounted weight on the lowermost gate.

PAUL J. ALWART.