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SEPARATOR.

APPLICATION FILED JUNE 26, 1912.

1,067,088.

Patented July 8, 1913.

3 SHEETS—SHEET 1.

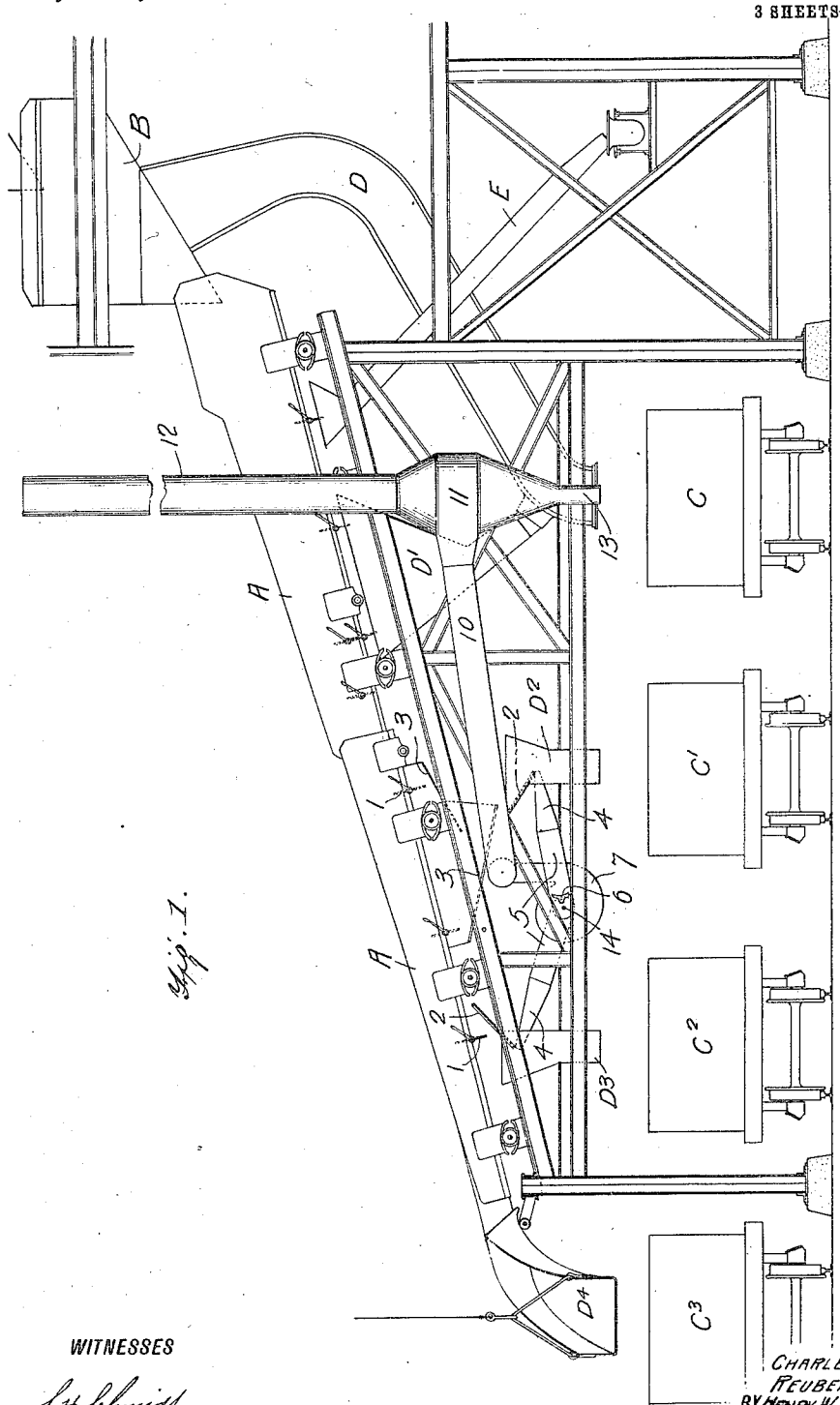


Fig. 1.

WITNESSES

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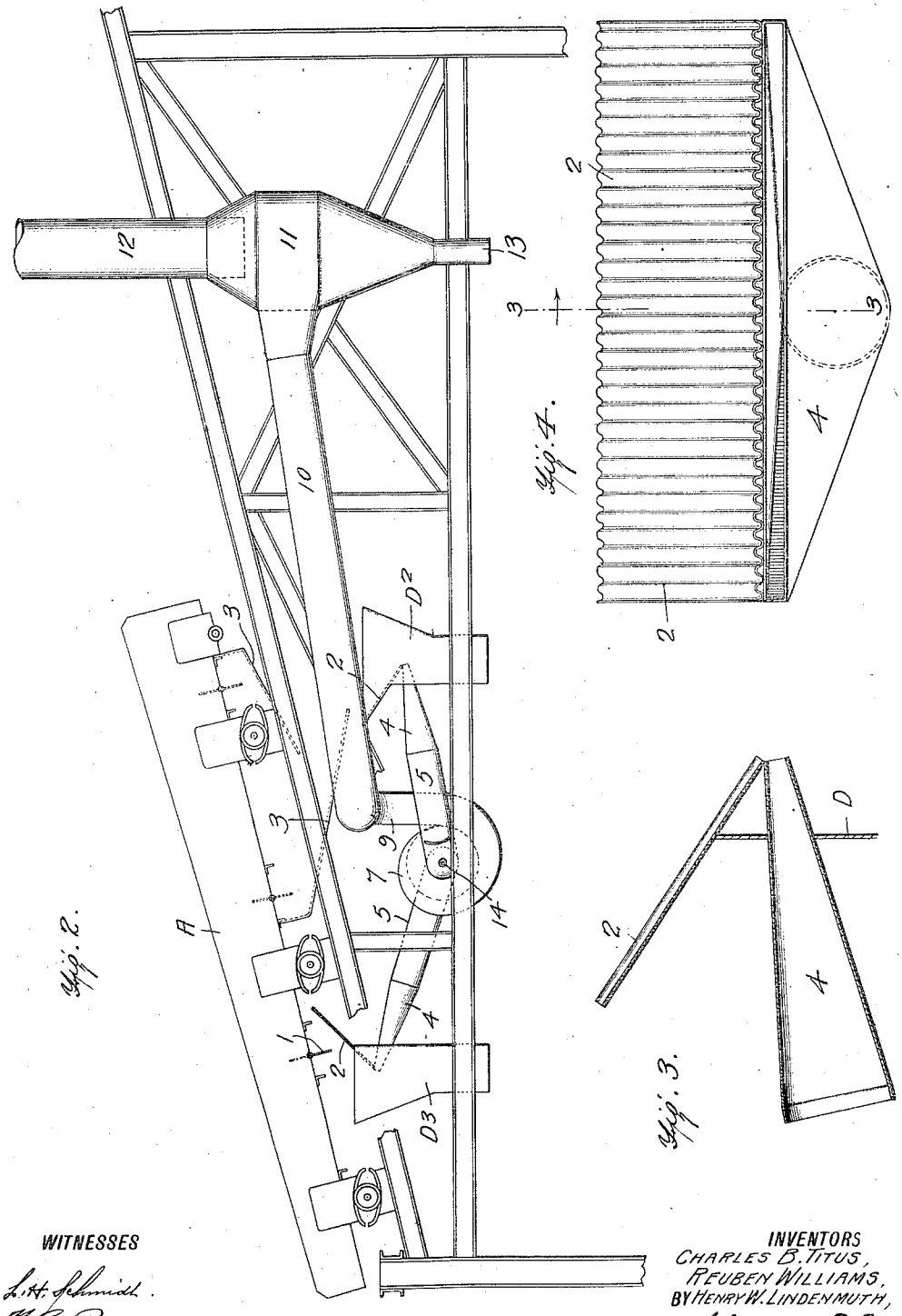


Fig. 2.

Fig. 4.

Fig. 3.

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3 SHEETS—SHEET 3.

Fig. 6.

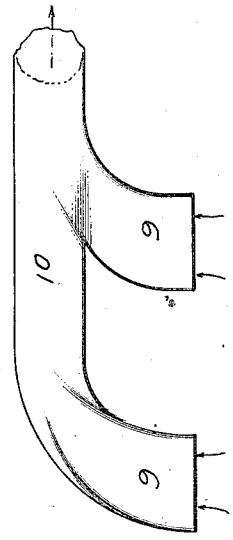


Fig. 5.

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1,067,088. Specification of Letters Patent. Patented July 8, 1913.

Application filed June 26, 1912. Serial No. 705,987.

To all whom it may concern:

Be it known that we, REUBEN WILLIAMS, CHARLES B. TITUS, and HENRY W. LINDENMUTH, citizens of the United States, and residents of Harrisburg, in the county of Saline and State of Illinois, have invented certain new and useful Improvements in Separators, of which the following is a specification.

This invention relates to coal separators and embodies the use of a suction apparatus for the purpose of cleaning and conveying small coal or coal dust from the larger sizes, and depositing the screenings or fine stuff in a car or other receptacle. The suction apparatus is used in connection with vibrating screens which effect a preliminary separation or grading of the sizes of coal, but such separation has been found to be incomplete or defective because the smaller screens are often not capable of completely separating the small coal or coal dust, in which event the latter is carried over with the better grades or larger sizes of coal. To remedy this defect means are provided for subjecting the screened coal of the various sizes to the action of an air suction apparatus which cleans the larger sizes and conveys the small stuff back to the screenings car.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of the apparatus. Fig. 2 is an enlarged side elevation of part of the same apparatus. Fig. 3 is a sectional detail of one of the air suction nozzles and chute leading thereto. Fig. 4 is a front view of the parts shown in Fig. 3. Fig. 5 is a plan of the suction devices. Fig. 6 is a detail showing the connections from the fans to the return conveyer pipe.

The structure shown in Fig. 1 shows the apparatus constructed to suit a four railroad track screen. Obviously the parts may be varied according to local conditions.

A indicates a series of screens of the shaking type provided as usual with perforated plates running from fine to coarse. These screens receive the coal from the hopper B, and the screens are suitably constructed to deliver various sizes of coal to the successive cars C, C′, C^2 and C^3, the first mentioned receiving the screenings and dust, the second the nut size and so on. The "mine run" chute D leads to the first car, as also does the "screenings" chute D′; the nut chute D^2 leads to the car C′, the egg chute D^3 to the car C^2 and the tail chute D^4 to the car C^3. These parts are erected upon a suitable frame work which need not be particularly described, and the shaking screens are operated by any suitable or known mechanism. The air suction cleaner and conveyer is applied particularly to the nut and egg sizes, which pass through the chutes D^2 and D^3. The screens have appropriate doors 1 in the bottom thereof, which control the delivery of the sizes to the appropriate chutes.

E is a chute for boiler coal for use at the plant.

Under the doors of the screens are plates 2 and 3 leading to the respective chutes, and the plates 2, as shown particularly in Figs. 3 and 4 are corrugated lengthwise, and the ends of these plates terminate directly over the mouths of the suction nozzles 4. The purpose of corrugating the plates is to separate the small particles of coal or coal dust as the coal passes over the same. The smaller particles will naturally drop into the grooves, and so are partially separated, and the small coal or dust so separated slides down in the grooves and is brought into close proximity to the mouth of the suction nozzles. These nozzles are expanded laterally to extend the full width of the plates 2 and are connected by pipes 5 to the fans 7. Valves 6, in the pipes, control the flow. Two fans 7 are shown, with one shaft 14 driven by an electric or other motor 15. The outlets 9 from the fan casings discharge into a conveyer pipe 10 leading to a so called "cyclone" or centrifugal hopper 11 resulting in a vortex from which the air escapes upwardly through a vent pipe 12 and the coal dust and small stuff discharges downwardly through the pipe 13 into the screenings car C. The mouths of the nozzles 4 are disposed directly under the lower edge of the plates 2, over which the coal flows, and as it passes the said mouths, the fine stuff and dust are separated from the coal by the suction and are conveyed back to the screenings car as stated. This effectively cleans the coal, removing therefrom all the dust and particles which may have adhered to or been mixed with the larger sizes and which fail of separation by the shaking screens. This gives very clean and satisfactory grades of coal and removes the objections and com-

plaints incident to imperfect separation. This is particularly advantageous in the treatment of coal containing an excessive amount of small stuff and dust.

The invention is not limited to the construction or embodiment shown and described above, but obviously may be modified in various ways within the scope of the following claims.

What is claimed as new is:

1. In a coal separator, the combination of separating and grading screens running from fine to coarse, a separate delivery chute for each of the screens, a suction separator having separate inlets, one of which is arranged at each of the delivery chutes for the coarse grades, and also having an outlet arranged to discharge with the material from the chute delivering the fine grade.

2. In a coal separator, the combination of a coal chute comprising an inclined plate, and a suction dust and fine stuff separator coöperating with the plate, the said chute having corrugations running from top to bottom thereof and into which the dust and fine stuff settles, and said separator comprising a suction nozzle having its mouth arranged at the lower end of the chute and coincident with the bases of the corrugations, whereby the dust and fine stuff moving downwardly within the corrugations will pass directly over the said mouth.

3. In a coal separator, the combination of elevating, separating and grading screens which are longitudinally alined and form a conveyer, a supporting structure therefor, a dust chute, intermediate chutes extending downwardly below the conveyer for various sizes of coal, a tail chute at the lower end of the conveyer for coal which passes over the screens, suction nozzles coöperating with the intermediate chutes to separate dust and fine stuff therefrom, and a suction fan having an inlet communicating with each of the said nozzles and having an outlet arranged to discharge with the material from the said dust chute.

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