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H. LUCKENBACH.

ROCK PULVERIZER.

(Application filed Dec. 19, 1900.)

(No Model.)

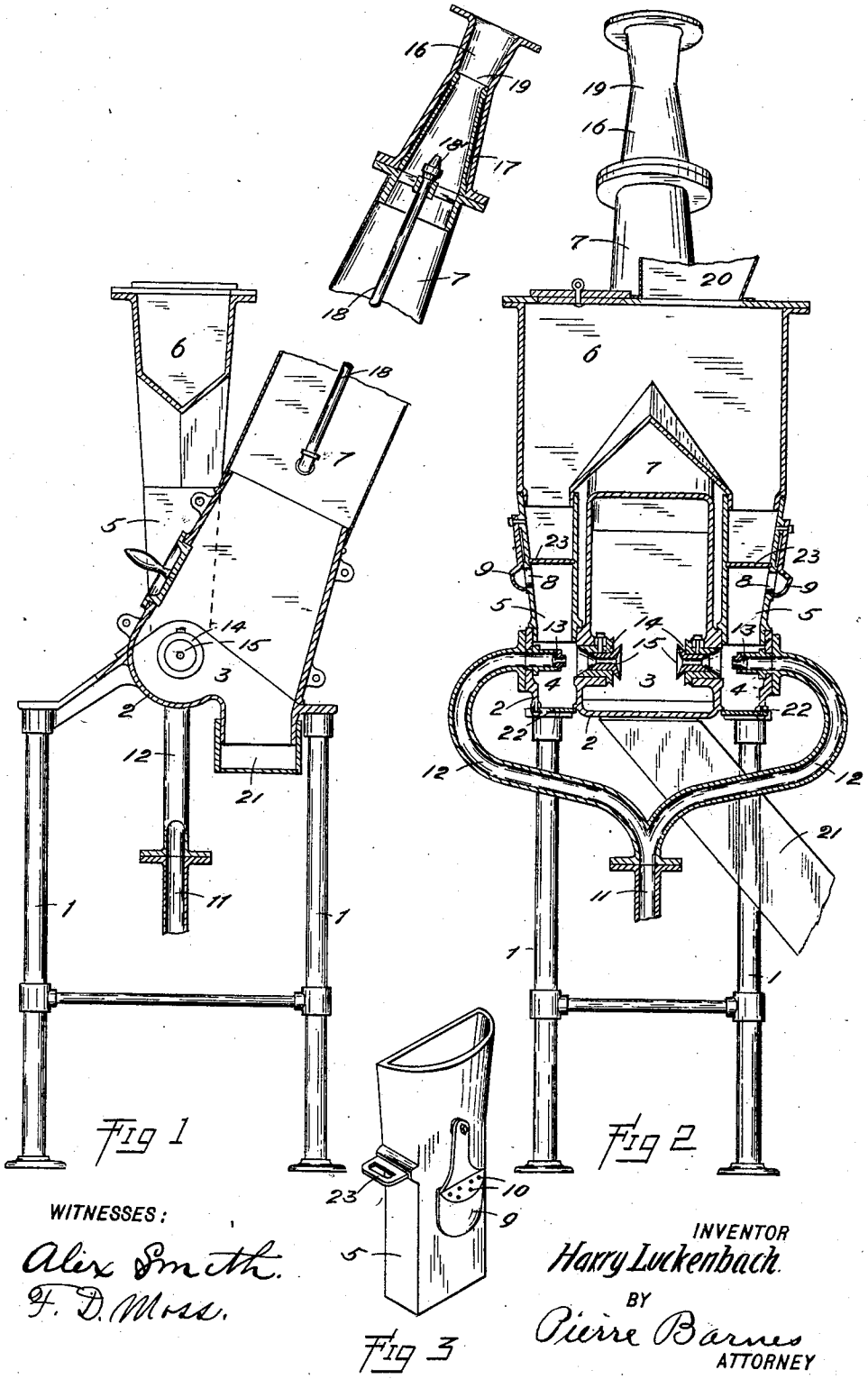


Fig 1

Fig 2

Fig 3

WITNESSES:

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HARRY LUCKENBACH, OF SEATTLE, WASHINGTON, ASSIGNOR OF ONE-HALF TO JAMES A. ELWELL, OF SEATTLE, WASHINGTON.

ROCK-PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 697,505, dated April 15, 1902.

Application filed December 19, 1900. Serial No. 40,426. (No model.)

To all whom it may concern:

Be it known that I, HARRY LUCKENBACH, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Rock-Pulverizers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to rock-pulverizers, and particularly to that class where the granulated rock is propelled to a focal point by opposing jets of steam, air, or both combined and there ground to an impalpable dust by the attrition of the particles among themselves at the said focal point and the pulverized material separated by gravity and an upcast of air or steam.

The objects of this invention are, first, to construct a machine of this character where each part of the pulverizer will perform its function to the best advantage that is accomplished by the novel construction of the several ducts and passage-ways, so that the vacuum required to operate the machine may be attained and at the same time give accessibility to the interiors needing attention, and, second, to provide an exhauster that will separate all of the lighter from the heavier particles. I attain these objects by means of the novel construction of certain parts of the machine, the use of gates, and the improved exhauster, all of which I will proceed to describe, and point out in the claims.

In the accompanying drawings, where like numerals of reference denote corresponding parts in all of the views, Figure 1 is a vertical longitudinal section of a pulverizer embodying my invention. Fig. 2 is a vertical transverse section of the same, and Fig. 3 is a perspective view of one of the side duct-pipes 4 in Figs. 1 and 2.

1 is the stand, supporting the body of the pulverizer 2, which is formed with a central chamber 3 and wing-compartments 4, which are conducted by the side ducts 5 to a hopper 6. The connections between the aforesaid parts, as well as between the chamber 3 and the exhauster lead-pipe 7, are close-fitting joints to exclude all air at such points, and thereby permit the forming of a vacuum, which is essential to operate the machine. I provide, however, upon the side ducts 5 air-holes 8, with covers 9, that for certain classes of work, notably cement-rock, are perforated with small holes 10. The holes 8 are hand-holes for removing lumps of the charge too large to pass through the jet-nozzles and also for the passage of air admitted by perforations 10 of the hand-hole cover 9. These perforations are positioned in the upper inclined part of the said cover in order that none of the material being treated will sift therethrough when the machine is stopped. Unless air is admitted in close proximity to the nozzle a vacuum will form to prevent the even distribution of the material and smooth running.

11 is a pipe leading from a steam-boiler or air-compresser and connected with the wing-compartments 4 by two or more goosenecks 12 and end nozzles 13, so disposed as to concentrate the emitted steam or air to a focal point within the chamber 3.

14 and 15 are respectively bushings and wearing-tubes to direct the currents passing between the wing-compartments 4 and the chamber 3. The exhauster 16 upon the extremity of the lead-pipe 7 has a contracted throat 19, intermediate of its length, with oppositely-flaring bell-mouthed ends, and the lower one or that adjacent to the lead-pipe is preferably protected from abrasion by a hard-metal liner 17.

18 is a pipe connecting the source of air or steam supply to the jet-nozzle 18′, projecting within the said exhauster to a point below the throat 19. The axis of the exhauster and the pipe leading thereto are in the same straight line to produce the suction required to impel the lighter materials upward through the exhauster.

The operation of the machine is as follows: The rock to be pulverized is delivered, crushed to a granulated state, through a chute 20, to the hopper 6, and from thence it passes, through the side ducts 5, to wing-compartments 4, where it is entrained by the steam or air jets passing therethrough and carried therewith into the chamber 3 to be pulverized by attrition of the opposing jets. The pulverized material is separated, the lighter particles being drawn through the lead-pipe

7 and discharged from the exhauster 16 by the upcast formed by the jet therein, and the heavier particles drop to the bottom of chamber 3 and thence through chute 21 to a conveyer or bins provided. If any pieces of rock should have reached the wing-compartments 4 that are of great specific gravity or too large to pass through the orifice or wearing-piece 15, they fall into pockets beneath nozzle 13 and are removed from said compartment by gates 22 at the bottoms thereof.

23 represents feed-regulating gates.

In some cases the pulverizer instead of being formed with two entraining-jets may be made with three or more having a corresponding number of ducts and compartments and all arranged about a focal point, as described herein and shown in the drawings.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the character described, a central chamber, wing-compartments, oppositely-disposed nozzles discharging the contents of the wing-compartments into the central chamber, each of said wing-compartments having an opening above the nozzle and a pocket beneath the nozzle, and covers for the openings provided with perforations in their upper parts, substantially as described.

2. In a device of the character described, a feed-compartment, a nozzle projecting therethrough, said compartment having an opening above the nozzle and a pocket beneath the nozzle, and a cover for the opening provided with an inclined perforated portion, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY LUCKENBACH.

Witnesses:
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JAMES G. GIVENS.