

No. 719,942.

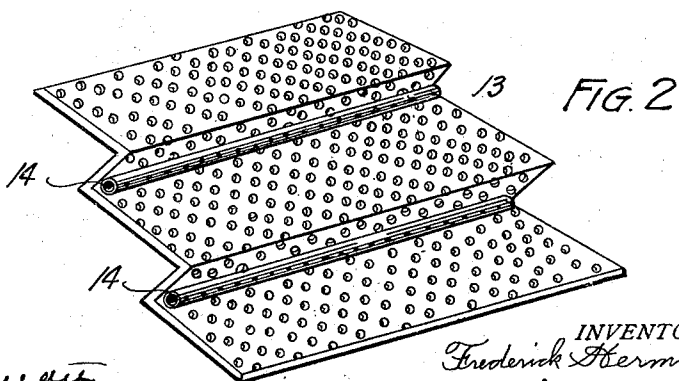
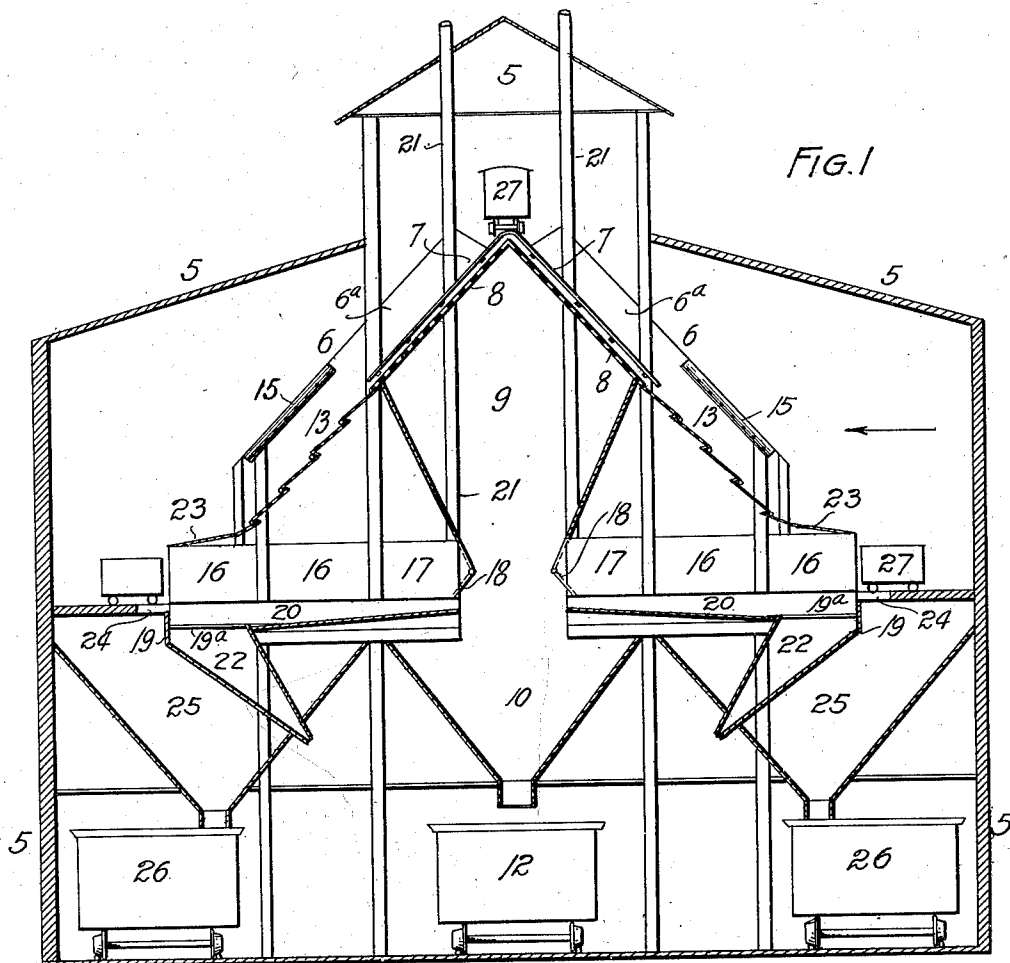
PATENTED FEB. 3, 1903.

F. HERMANN.
APPARATUS FOR SCREENING, WASHING, AND ASSORTING ORES.

APPLICATION FILED DEC. 23, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



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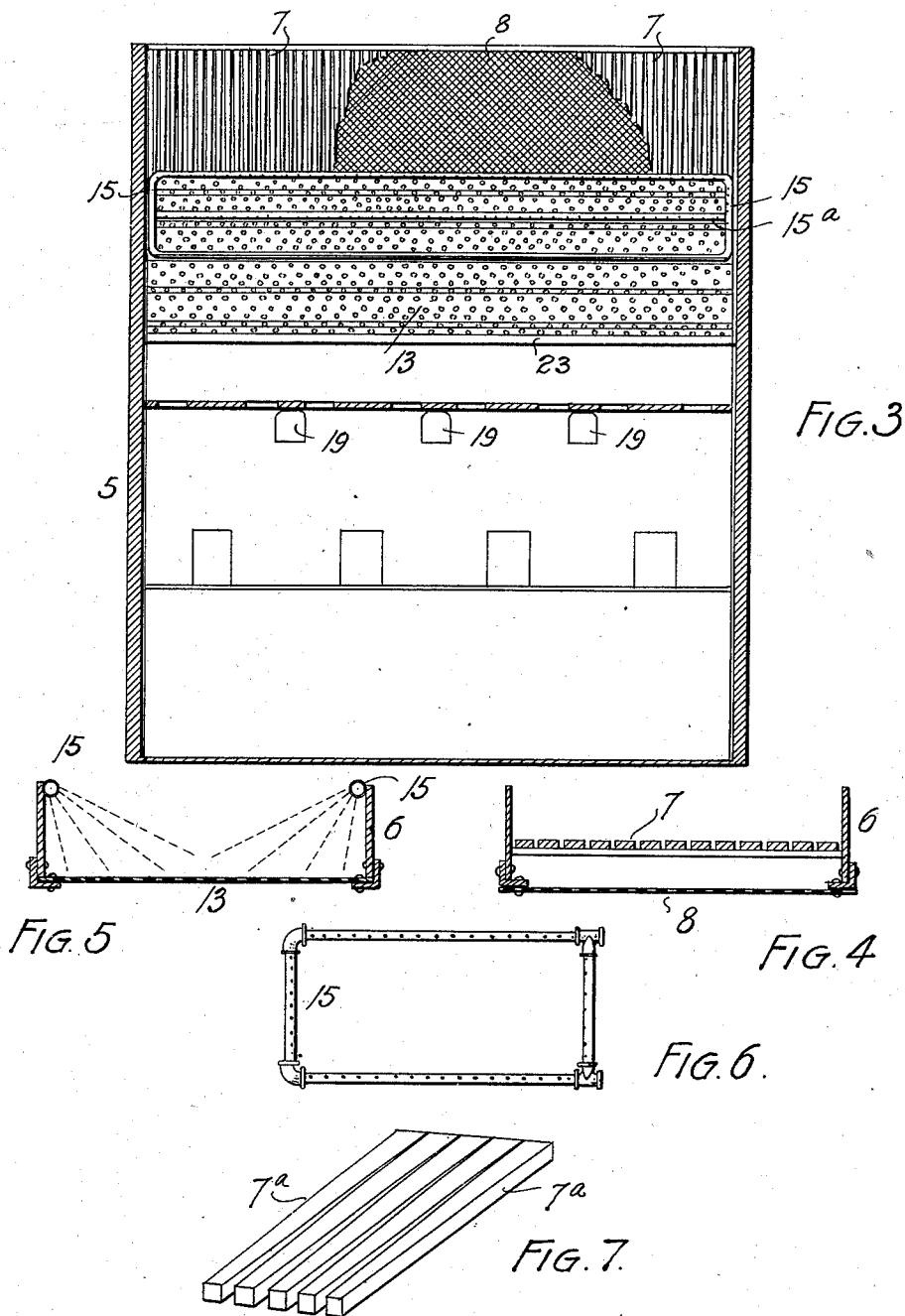
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FREDERICK HERMANN, OF VICTOR, COLORADO.

APPARATUS FOR SCREENING, WASHING, AND ASSORTING ORES.

SPECIFICATION forming part of Letters Patent No. 719,942, dated February 3, 1903.

Application filed December 23, 1901. Serial No. 86,970. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK HERMANN, a citizen of the United States of America, residing at Victor, in the county of Teller and State of Colorado, have invented certain new and useful Improvements in Apparatus for Screening, Washing, and Assorting Ore; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in apparatus for screening and washing ore preparatory to sorting, including means for separating the dry from the wet screenings, together with apparatus for drying the latter. The ore when taken from the mine is coated with fine or pulverized material which has naturally adhered thereto during the operation of mining and handling the ore. This fine material contains values, and it adheres to the worthless rock as well as to the rich ore. To avoid the waste of the valuable material adhering to the worthless rock and to remove the coating of fine material from the ore in order that it may be intelligently sorted is the object of the screening and washing operation which will be described in this specification.

The invention will now be described in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a vertical section illustrating an ore-house equipped with my improvements. Fig. 2 is a perspective view of a perforated plate forming a part of my improved apparatus. Fig. 3 is an elevation of the apparatus looking in the direction of the arrow in Fig. 1. Fig. 4 is an end view of the chute containing a perforated plate bottom. The chute in this view is shown on a smaller scale than in Fig. 3, being but half the width of the last-named figure. Fig. 5 is a similar view showing the sides of the chute equipped with perforated pipes for discharging jets of water upon the ore as it passes down the inclined chute. Fig. 6 shows

another arrangement of the pipes. Fig. 7 illustrates the construction of the grizzly.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the framework of an ore-house in which are arranged two inclined chutes 6, having side pieces 6^a. The upper extremities of these chutes unite to form an apex at the track upon which the loaded ore-cars are run from the mine. These chutes are so arranged that the ore may be discharged from the car on opposite sides. By this arrangement it becomes practicable to construct the chutes with less inclination than would be necessary if all the ore were discharged to one chute. The greater the inclination the higher the chute must extend and the greater the required height of the ore-houses. As high ore-houses are not desirable, I construct two chutes of less inclination and upon which the ore travels more slowly than on steep chutes; but the two chutes give the required capacity and are found satisfactory in practice. The upper portion of each chute, upon which the ore is first discharged, consists of a grizzly 7, composed of flat bars 7^a, the space between the bars increasing in width from the top downwardly. (See Fig. 7.) Underneath these bars is located a screen 8 in the usual manner. In Fig. 3 the bars 7^a are partly broken away to show the screen underneath. The fine material which passes through the screen is in a dry state and falls into a bin 9 underneath, thence into a hopper 10, and finally into a car 12 below. Below the screen 7 and forming a continuation of the inclined chute is a perforated plate 13, which may be either plain or stepped. The latter form is shown in the drawings and is preferred, since it causes the ore to roll over a number of times on its way down, thus better exposing it to the action of the water. This construction also permits of locating a perforated pipe 14 below each step, but protected from the falling ore. These pipes 14 discharge jets of water on the ore as it falls and facilitates the operation of washing the ore clean for the purpose heretofore stated. Above the stepped perforated plate and mounted on the sides 6^a of the chute are perforated water-pipes 15, arranged in any suitable manner to discharge jets of water on the ore as it passes down-

wardly over the perforated plate. If the chute is narrow, as shown in Figs. 4 and 5, a single water-pipe extending along each side of the chute may be employed. (See Fig. 5.)

5 These single side pipes may be connected by a cross-piece at the top and bottom. If the chute is constructed as shown at Fig. 3, it is preferred to connect the side pipes 15 with intermediate cross-pipes 15^a, any desired
10 number of which may be employed.

The fine material washed from the ore and passed through the perforated plate 13 passes into settling-tanks 16, from which it may be removed to a drying-tank 17, adjacent the
15 bin 9 and communicating therewith by an opening normally closed by a hinged door 18, which may be opened for the purposes of throwing the dry ore into the hopper 10. Furnaces 19 may be constructed underneath
20 the tank 16 for the purpose of drying the ore. From the fire-boxes of these furnaces hot-air flues 20 pass underneath the tanks 16 and 17, their inner extremities communicating with upright pipes 21, forming stacks for the es-
25 cape of the products of combustion. Beneath each fire-box 19^a is located a downwardly-inclined ash-chute 22. It is evident that steam-pipes or any other suitable drying apparatus may be employed.

30 At the lower extremity of the perforated plate 13 are located ore-assorting tables 23. In practice a person stands on each side of each of the tables and sorts the ore, dropping it into a hole 24 in the floor. Hence it passes
35 to a hopper 25 and finally into cars 26. The worthless rock passes from these tables into cars 27.

From the foregoing description the operation of my improved apparatus will be readily
40 understood. The ore discharged from the car 27 as it is run out upon the apex of the structure passes downwardly first over the grizzly and then over the stepped inclined perforated plate 13. While passing over the
45 latter it is subjected to the water discharged from the pipes 14 and 15, whereby it is thoroughly washed and the fine material normally clinging thereto removed, the ore finally passing to the tables and disposed of as heretofore explained.

50 Having thus described my invention, what I claim is—

1. In means for screening and washing ore, the combination of a grizzly, a suitable screen
55 located underneath the grizzly, the screen and grizzly being inclined in the same direction, a receptacle below the screen for receiving the dry screenings, an inclined device located below the screen and provided with openings
60 to allow the finer material washed from the ore to pass through the said device, the latter being located to receive the discharge from the grizzly, suitable means mounted above the said device for discharging water

upon the ore as it passes downwardly there- 65 on, and a receptacle located beneath the said device for receiving the wet material which passes therethrough, whereby the wet and dry screenings are separated from each other, substantially as described. 70

2. In means for screening and washing ore, the combination with a suitable supporting structure, of a stepped perforated plate mount- 75 ed thereon, and a perforated water-pipe extending crosswise of the plate at each step, and arranged to be protected from the falling ore, substantially as described.

3. In apparatus of the class described, the combination with a suitable supporting struc- 80 ture, of a suitable inclined perforated plate provided with steps as described, and perforated water-pipes located above the plate and at the various steps thereof, substantially as described.

4. In apparatus of the class described, the 85 combination with a suitable supporting structure, of a grizzly located at the top, an inclined perforated plate forming a continuation of the grizzly, an ore-assorting table at the lower extremity of the said plate, means 90 for spraying water upon the ore as it passes downwardly over the perforated plate to the table, suitable bins below for receiving the dry and wet screenings, and means for drying the latter, substantially as described. 95

5. In an apparatus of the class described, the combination with a suitable supporting structure, of two oppositely-inclined chutes which approach each other at the top so that ore may be discharged from the same car to 100 both, the upper part of each chute consisting of a grizzly, the part below the grizzly, consisting of an inclined perforated plate, means for discharging water upon the ore as it passes over the perforated plate of each chute, an 105 ore-assorting table at the lower extremity of each chute, bins located below the chute for receiving the wet and dry screenings respectively, and means for drying the wet screenings, substantially as described. 110

6. In an apparatus of the class described, the combination with a suitable supporting structure, of two oppositely-inclined chutes which approach each other at the top so that ore may be discharged from the same car to 115 both, the upper part of each chute consisting of a grizzly, the part below the grizzly consisting of an inclined perforated plate, means for discharging water upon the ore as it passes over the perforated plate of each chute, and 120 an ore-assorting table at the lower extremity of each chute, substantially as described.

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

FREDERICK HERMANN.

Witnesses:

CARL MCADAMS,
M. W. O'CONNELL.