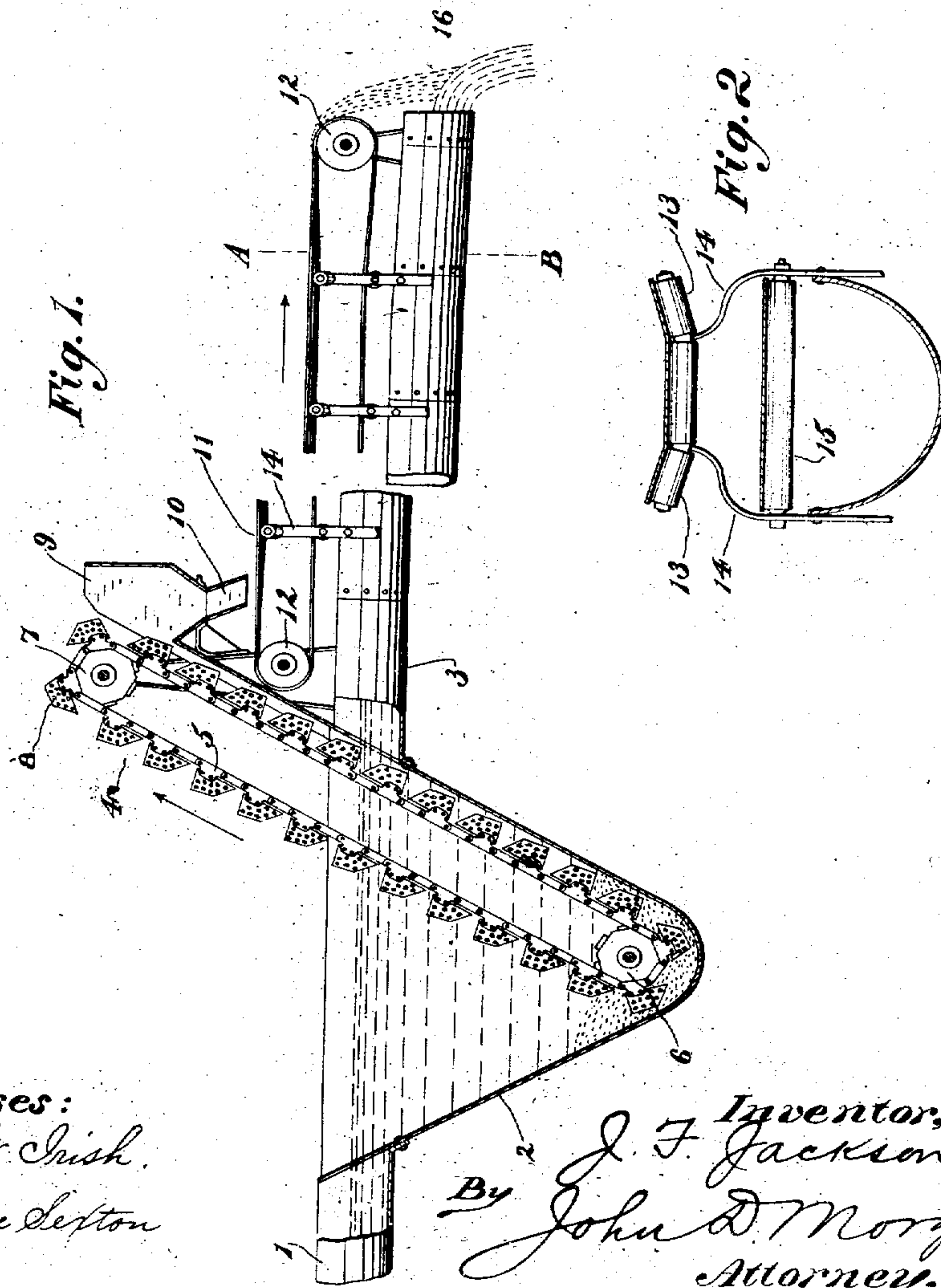


J. F. JACKSON.
 PROCESS OF DISPOSING OF TAILING SAND AND THE LIKE.
 APPLICATION FILED OCT. 3, 1908.

918,054.

Patented Apr. 13, 1909.



Witnesses:
 William H. Irish.
 Katharine Lepton

Inventor,
 J. F. Jackson
 By John D. Morgan
 Attorney.

UNITED STATES PATENT OFFICE.

JOHN F. JACKSON, OF HOUGHTON, MICHIGAN.

PROCESS OF DISPOSING OF TAILING-SAND AND THE LIKE.

No. 918,054.

Specification of Letters Patent.

Patented April 13, 1909.

Application filed October 3, 1908. Serial No. 456,006.

To all whom it may concern:

Be it known that I, JOHN F. JACKSON, a citizen of the United States, residing at Houghton, in the county of Houghton and State of Michigan, have invented a new and useful Process of Disposing of Tailing-Sand and the Like, of which the following is a specification.

The invention relates to the handling of tailing sand and more especially to securing an economical and efficient distribution of the sand by the water used in milling and separating, especially in cases where the available fall between the mill and the distributing point for the sand is relatively small in proportion to their distance apart.

Objects of the invention are to provide a process of handling the material which will bring the mixed sand and water to the point of distribution with the utilization of but a small part of the fall between the mill and the point of distribution thus leaving the greater part of this height available for the gradually accumulating pile of tailing sand and at the same time securing a relatively rapid current so that both the speed of flow and the volume of water will be favorable for spreading out the sand over a wide area and thus retarding as much as possible the vertical growth of the deposit at the point of distribution.

Other objects of invention will in part be obvious to those skilled in the art and will in part be more fully set forth herein.

The drawings herewith illustrate a form of apparatus suitable and convenient for carrying out certain steps of the process although it will be understood that the process is not dependent thereon nor upon any particular form of apparatus.

In the accompanying drawings, Figure 1 is an elevation, partly in section of the herein-before-mentioned apparatus; and Fig. 2 is a vertical section on the reference line A-B of Fig. 1.

In the separation of metals from their ore or rock by which they are carried, especially in the case of free milling ores, it is customary to crush the ore or rock into fine sand and to mix therewith large quantities of water. The metals are then separated, by a gravitation system or otherwise, from the sand and water leaving this sand and water then as refuse to be gotten rid of. It has been the practice to carry the sand away in

suspension in the water by means of sluices or launders to the place of distribution, and there depending on the force of flow of the water to distribute the suspended sand over a wide area in order that the vertical accumulation at the point of distribution may be as small as possible. The inclination to the horizontal of these sluices or launders for carrying the sand and water must be relatively much greater than that necessary for flowing the water alone, in order that the current may be sufficiently strong to prevent the sand from settling along the sluice or launder and thus gradually filling it. It will thus be seen that if the sand is to be so conveyed for a long distance, considerable fall is required and thus the height available for the gradually growing pile of sand at the distributing point is lessened. It frequently happens that the adoption of some other mode of distribution is offered as the only alternative for removing a mill to another location, which is naturally a serious and costly undertaking.

The pumping of the sand and water to an elevation greater than that of the point of discharge from the mill could of course be used, but as there are frequently thirty or forty tons of water used for each ton of rock crushed it is seen that the expense of such a procedure is practically prohibitive.

The present invention provides a method whereby a much greater height at the point of distribution may be obtained, or made available, without handling or lifting the water, or the application of mechanical force or energy to it, is avoided while at the same time a strong current and also a sufficient volume of water for efficient and satisfactory distribution of the sand at the point of distribution is secured.

By my process the crushed rock or sand and water which have been mixed together in milling and separating out the metal are received at or near the mill, preferably contiguous to the place where the separating process is completed and are separated from each other, and causing the water alone to flow by gravity to the place of distribution for the sand, a very small gradient being necessary for this purpose and therefore only a slight fall being consumed in going relatively long distances. The sand which has been separated from the water is conveyed mechanically to the place of distribution, or a

point near the place of distribution, and the sand and water are there recombined so that the flow of the water may be utilized in getting a wide distribution of the sand.

5 Referring to the accompanying drawings, 1 represents a sluice way conveying the water and sand from the mill and 2 represents a setting pool where the sand is permitted to settle from the water. A suitable sluice or
10 launder 3 then conveys the water by gravity toward the place of distribution. For conveying the sand mechanically away from the place of separation to the point where it is desired to recombine the sand and water,
15 there is shown in the illustrated apparatus a mechanism 4 comprising a sprocket chain 5 passing over suitable wheels 6 and 7, one of which is driven by suitable power, said chain 5 carrying pockets 8 for conveying the sand.
20 The said pockets may, if desired, be foraminated in order to drain the sand to some extent. As shown herein the pockets 8 deliver into a suitable hopper or receiver 9 having an outlet 10 above a belt conveyer 11 which may
25 be conveniently carried upon sheaves 12. The conveying portion of said belt is shown supported upon rolls 13 so as to give a concave surface in order to better carry the material, in a well-known manner. The said
30 belt is shown conveniently mounted above the launder 3, the rolls 13 being carried by standards 14. The returning portion of the belt is shown working over rolls 15 likewise carried by the standards 14. Just as the
35 water leaves the end of the launder, or at a point more or less contiguous to that point, as may be found best suited to the particular case, the sand and water are recombined, as at the point 16 in the accompanying drawings which show the sand and water mixing
40 just at the end of the launder. The sand is thus spread out over a great area at the place of deposit and the growth of the pile is relatively very slow.

45 The manner of carrying out the process of the invention and the advantages accruing therefrom will be clear to those skilled in the art from the foregoing specification.

The apparatus shown herein is claimed in

my co-pending application Serial No. 449,910, 50 filed August 24, 1908.

What I do claim as my invention and desire to secure by Letters Patent, is:

1. The process of disposing of tailing sand and the like, which comprises taking the 55 crushed ore and water after the metal has been separated out, separating the crushed ore, or sand, and water from each other and conveying them so separated to the place of distribution, then recombining them to effect 60 the spreading out of the sand by the flow of the water.

2. The process of disposing of tailing sand and the like, which comprises separating the sand and water from each other, conveying 65 the water by gravity for a distance from the point of separation and at a gradient less than sufficient to transport the sand by the water flow, there recombining the sand and water so as to utilize the water flow in spread- 70 ing out the sand at the place of deposit.

3. The process of disposing of tailing sand and the like, which comprises separating the sand and water, conveying the sand mechanically and the water by gravity and at a 75 gradient less than sufficient to transport the sand by the water flow to, a point distant from the said point of separation, and there recombining the sand and water so as to utilize the water flow in spreading out the 80 sand at the place of deposit.

4. The process of disposing of tailing sand and the like, which comprises separating the sand and water from each other, conveying the water by gravity for a distance from the 85 point of separation and at a gradient less than sufficient to transport the sand by the water flow, then accelerating the water flow and recombining the sand with the water to utilize the water flow in spreading out the 90 sand at the place of deposit.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOHN F. JACKSON.

Witnesses:

MICHAEL CULLINCY,
JAS. OSBORNE.

It is hereby certified that in Letters Patent No. 918,054, granted April 13, 1909, upon the application of John F. Jackson, of Houghton, Michigan, for an improvement in "Processes of Disposing of Tailing-Sand and the Like," an error occurs in the printed specification requiring correction, as follows: In line 77, page 2, the comma after the word "to" should be stricken out and inserted after the word "flow;" and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of May, A. D., 1909.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

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C. C. BILLINGS,

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