

(No Model.)

C. R. TOWNSEND.
ORE CONCENTRATOR.

No. 474,272.

Patented May 3, 1892.

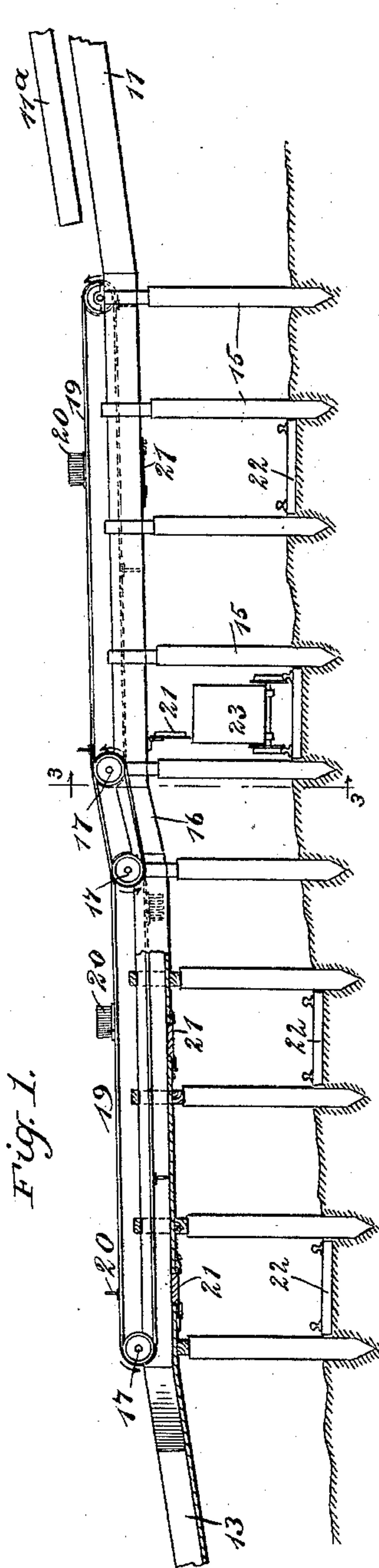


Fig. 1.

WITNESSES:

J. B. Griswell.
C. Sedgwick

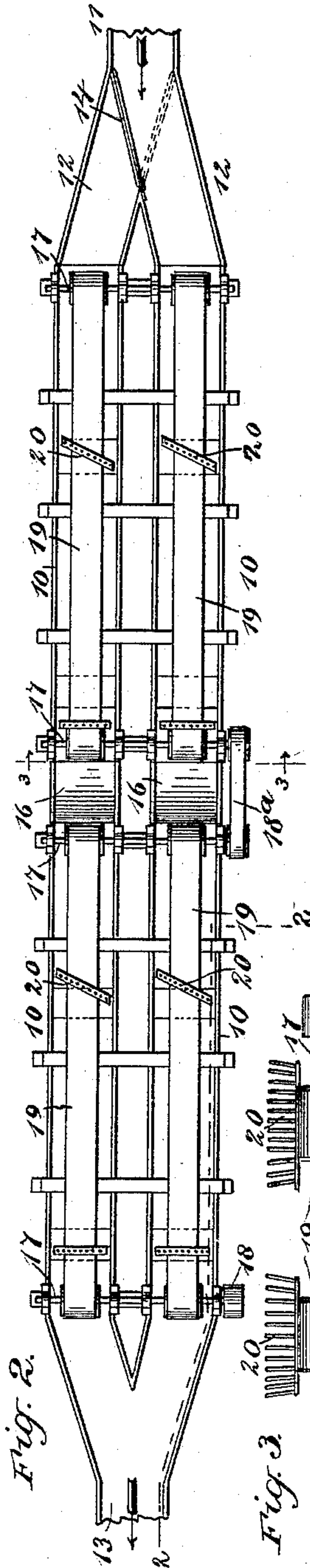


Fig. 2.

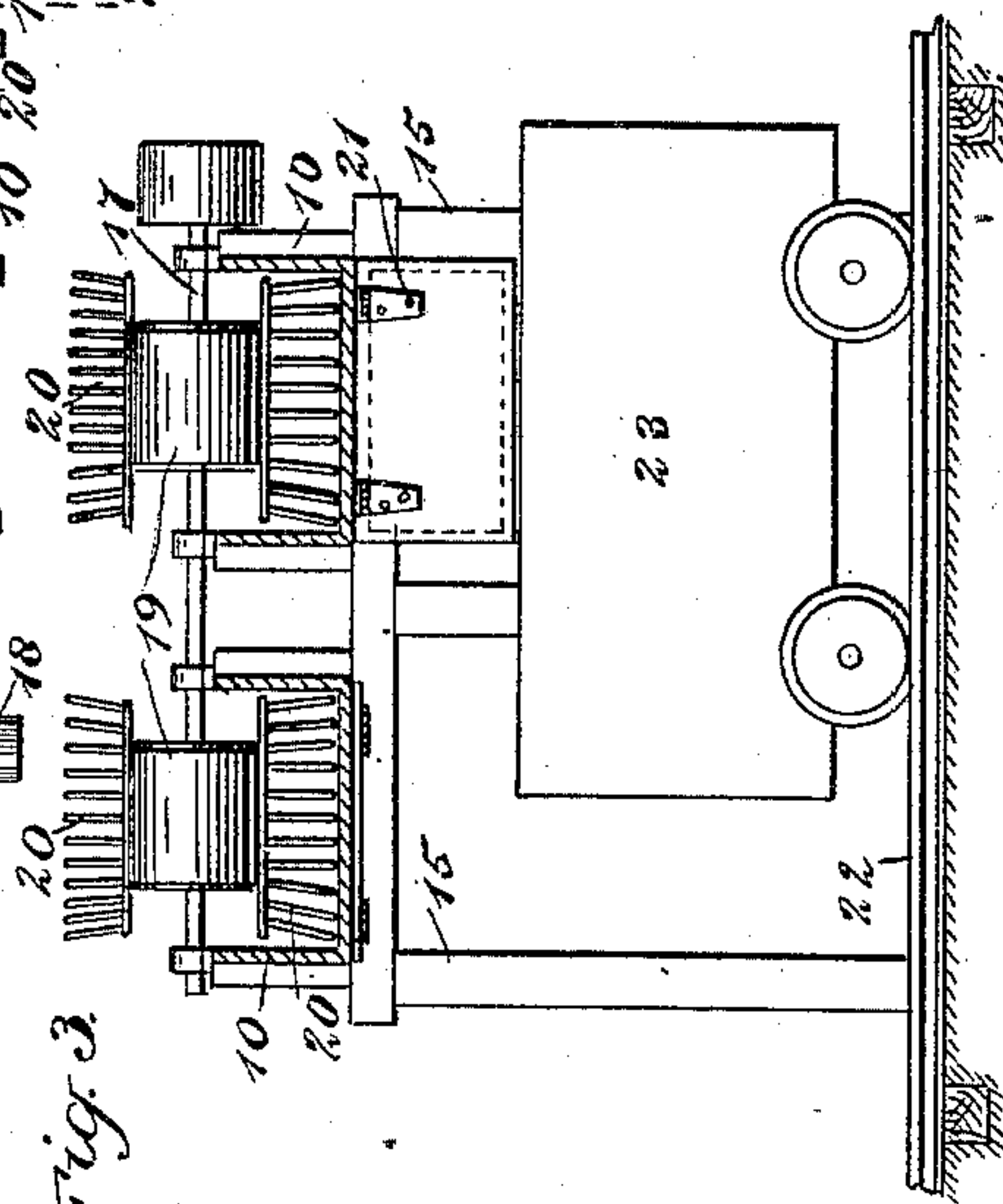


Fig. 3.

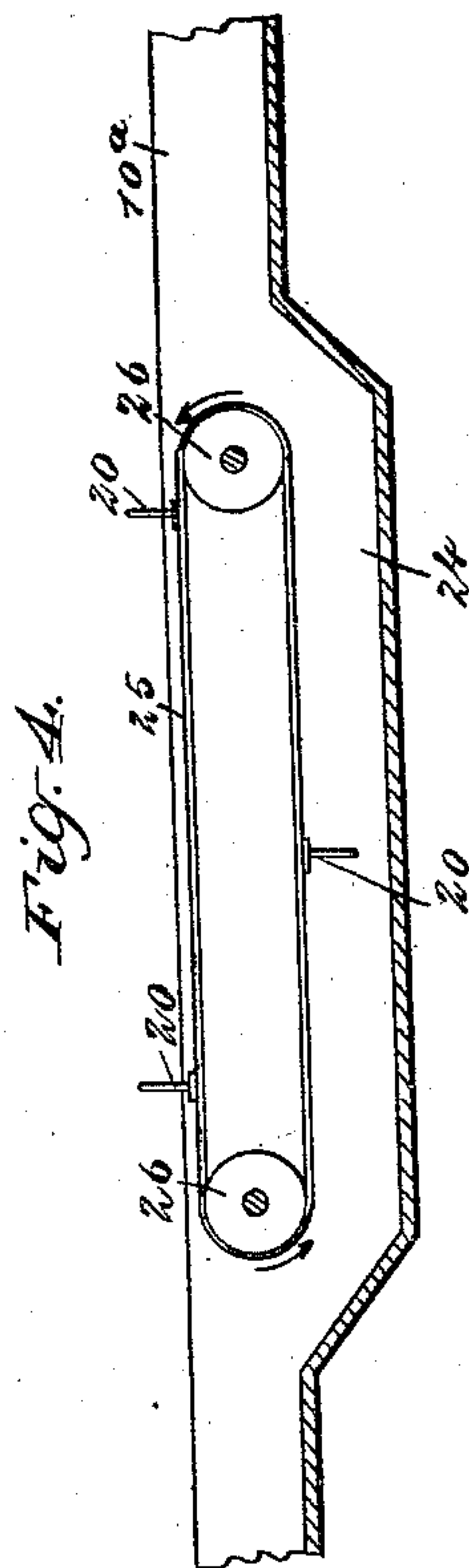


Fig. 4.

INVENTOR

C. R. Townsend

BY

Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

CRIGHTON RICHARD TOWNSEND, OF IDAHO SPRINGS, COLORADO.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 474,272, dated May 3, 1892.

Application filed September 2, 1891. Serial No. 404,541. (No model.)

To all whom it may concern:

Be it known that I, CRIGHTON RICHARD TOWNSEND, of Idaho Springs, in the county of Clear Creek and State of Colorado, have invented a new and Improved Ore-Concentrator, of which the following is a full, clear, and exact description.

My invention relates to improvements in ore-concentrators; and the object of my invention is to produce a cheap and economically-operated machine which will practically take care of itself, which will run a long time without being cleaned up, which will handle a very large quantity of material in proportion to its size, which will thoroughly concentrate the metal, and which is especially adapted for use in saving gold, quicksilver, and amalgam, and concentrating crushed or ground rock, sand or earth tailings, and similar material.

To this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a broken side elevation, partly in section, on line 2 2, Fig. 2, of the concentrator embodying my invention. Fig. 2 is a broken plan of the same. Fig. 3 is an enlarged vertical cross-section on the lines 3 3 in Figs. 1 and 2, and Fig. 4 is a broken detail vertical longitudinal sectional view of a modified form of the device.

The machine is provided with a pair of flumes 10, which are placed side by side and given an inclination more or less steep, according to the nature of the work to be performed, and the flumes are supplied from the main flume 11, which connects with the flumes 10 by means of the branch flumes 12. A fresh-water flume 11^a is arranged above the main flume 11, so as to provide clean water when necessary. The flumes 10 are again united at their lower ends to form another flume 13, which may be given a greater inclination, and the water in which may be used for running a water-wheel. The water from the main flume 11 is switched into either of the flumes 10 by means of the swinging gate 14, arranged

at the entrance to the branch flumes 12. The flumes may be supported in any convenient way; but usually they are mounted on a frame-work which is supported by posts 15. Each flume 10 is given a sharp pitch in the middle, as shown at 16, and this steeper portion forms a chute which delivers into the lower portion of the flume, so that each flume forms practically a double machine. The object of this arrangement is to increase the capacity of each flume, so that when the upper portion of the flume has filled up the concentrates will continue to accumulate in the lower portion, and as a result the machine need not be cleaned up very often.

At each end of the flumes 10 and at each end of the inclined portion 16 is a transverse shaft 17, the shaft at the lower end of the flumes being provided with a driving-pulley 18. The two upper shafts in each flume and also the two lower shafts therein are connected by a belt 19, which runs in the flume and is carried by suitable pulleys, each belt having thereon a series of rakes 20, the teeth of which are adapted to contact with the floor of the flumes, and the rakes are preferably placed obliquely on the belts. The rakes and belts are arranged so that the rakes will travel against the water as it flows through the flumes, as indicated by arrows, and consequently the concentrates will not be drawn down the flumes, but the sand and material in the bottom of the flumes will be gently agitated, so that the lighter and worthless portions will flow off and the heavier and more valuable particles will settle. The two central shafts of the flumes are connected by means of a belt 18^a, so that all the belts may run in unison.

At intervals in the floors of the flumes are trap-doors 21, which may be dropped when the flumes are cleaned up, and these doors are arranged above tracks 22, adapted to carry cars 23, which may thus be brought beneath the doors, so that the concentrates will be washed into them. In Fig. 4 I have shown a modified form of the flume, the floor 10^a having a sink 24 produced in its bottom, and a belt 25 runs above the sink and over pulleys 26, the belt carrying rakes 20 like those already described; but in this case the teeth of the rakes do not reach the bottom of the sink. The

heavier sand and other material will settle in the sink, and the rakes will constantly stir the upper portion of the sand, so that the metal will readily drop into it and settle to the bottom.

In practice the rake-teeth used in flume 10 should be long enough so that the water will flow freely through the upper portion of the rake-teeth. When the machine is operated, the tailings are thrown into the flumes in the usual way, and an advantageous method of working the machine is to run the tailings as they come from the mill through one flume until the heavy material has accumulated sufficiently, then change the gate 14 and let the tailings run into the other flume and turn clean water into the first flume from the flume 11^a, so that both parts of the machine will be run, one cleaning and the other accumulating. When cleaned, the upper portion of the flumes may be raised by any suitable lever mechanism, so that the concentrates may be easily rinsed out. If desired, instead of washing the concentrates into the cars the flumes may be arranged to deliver to any ordinary form of concentrators or accumulators.

It will be understood that one, two, or any number of these flumes may be used, and in case the flumes are very large two or more belts may be used instead of one, as shown and described.

Having thus fully described my invention,

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

1. The combination, with the two longitudinally-inclined stationary flumes 10 10, one in advance of and below the other, and an inclined connecting portion 16, of the transverse shafts at the ends of the two flumes, the adjacent shafts being connected, an endless belt mounted on each pair of shafts and provided with transverse rakes having spaced teeth to stir the solid contents of the flumes and permit a free flow of water therethrough, and doors in the bottoms of the flumes, substantially as set forth.

2. An ore-concentrator consisting of two parallel pairs of flumes 10, each pair having a connecting incline 16, shafts crossing the two pair of flumes at their ends, a belt 18^a, connecting the middle shafts at the said incline, an endless belt within each flume and provided with rakes to stir the ore and permit a free flow of water, doors in the bottoms of the flumes, a main flume 11, having branches 12 12 connected with the upper ends of flumes 10, and provided with a gate 14 to direct the water through either branch, and a common offtake 13 at the lower ends of flumes 10, substantially as set forth.

CRIGHTON RICHARD TOWNSEND.

Witnesses:

J. H. MORRIS,
JAMES G. SMITH.