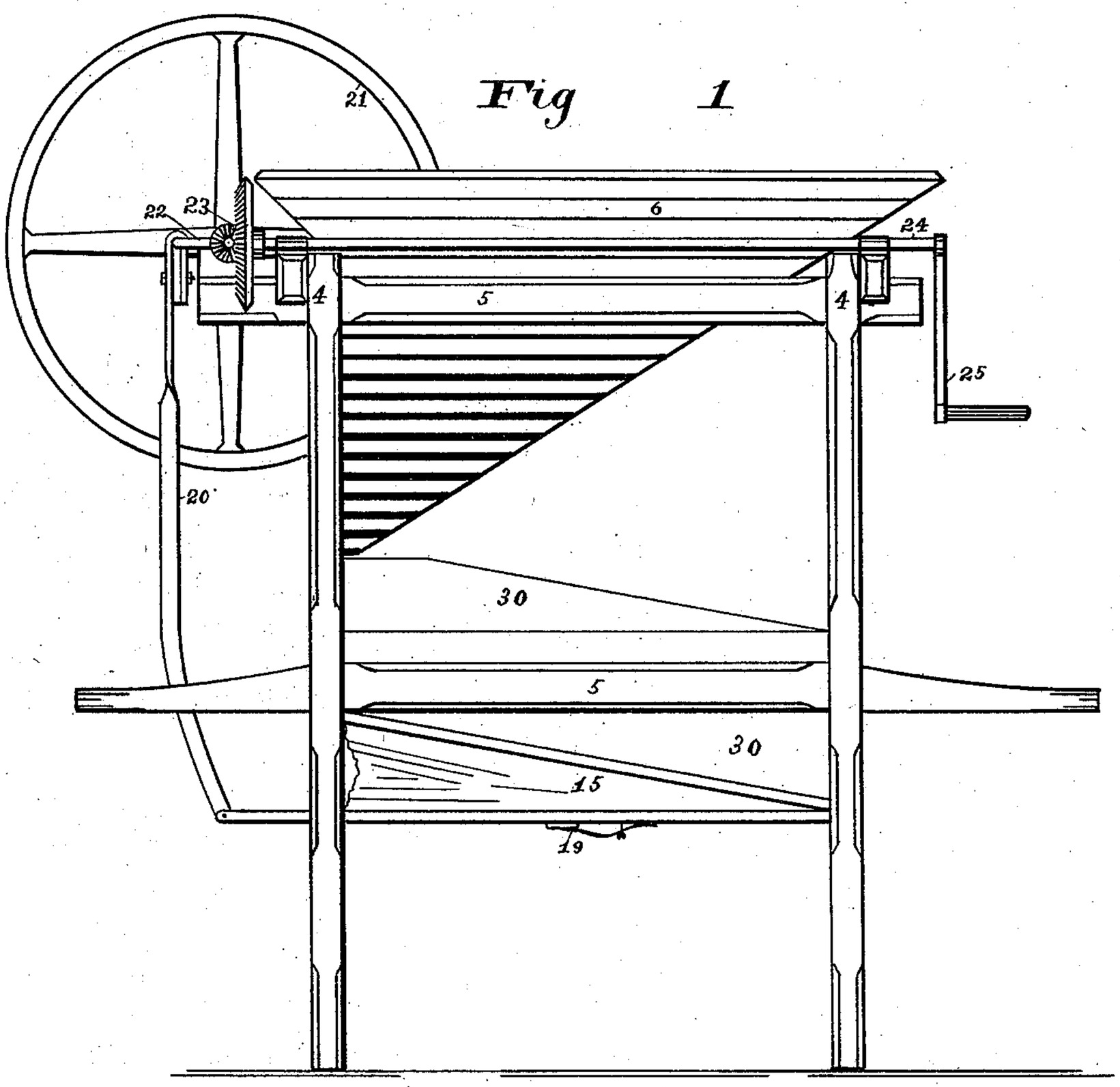
(No Model.) 2 Sheets—Sheet 1.

W. H. MEGINNESS.

ORE CONCENTRATOR.

No. 402,094. Patented Apr. 23, 1889.

Fig 1



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(No Model.) 2 Sheets—Sheet 2.

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Fig 2

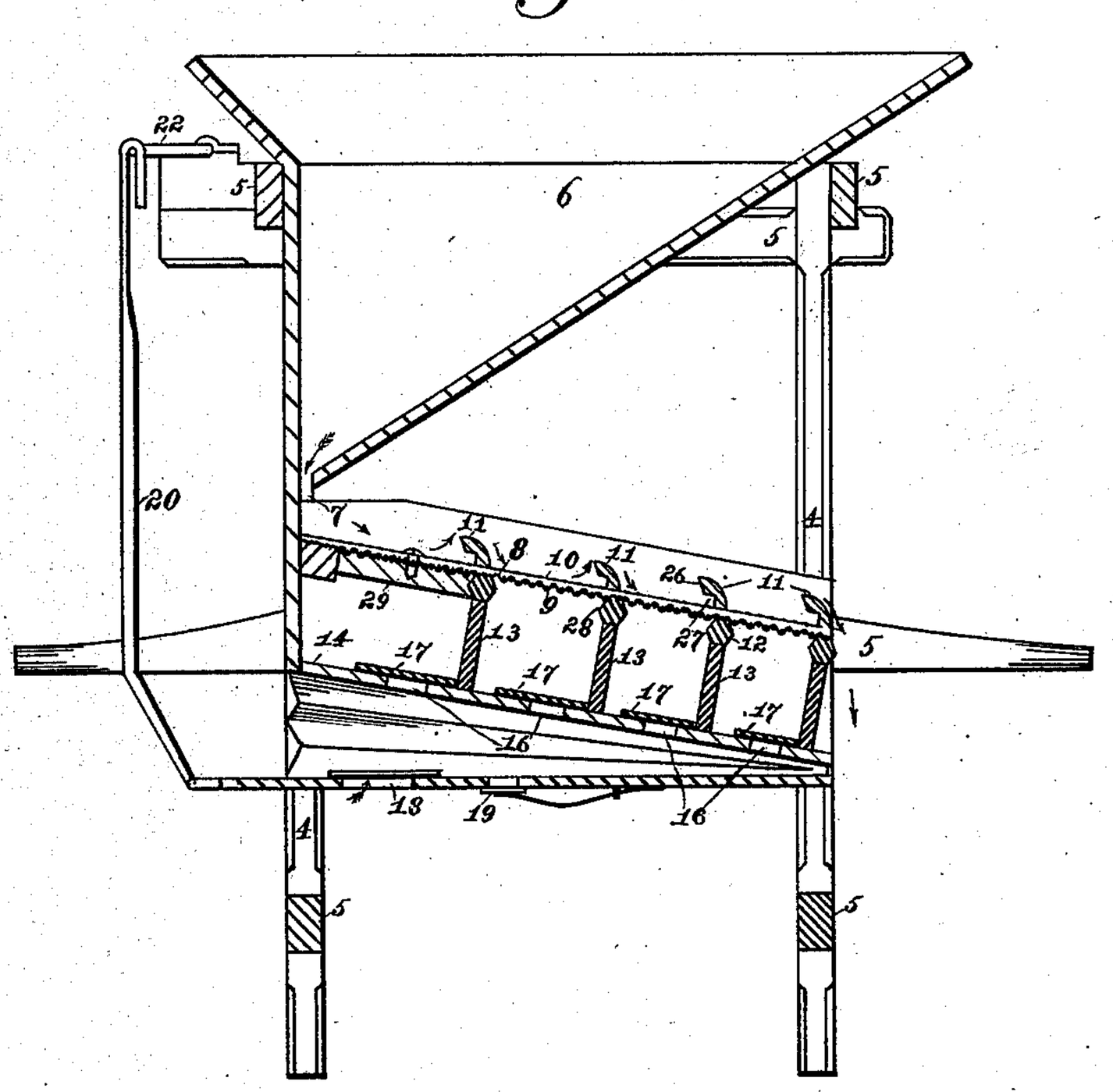
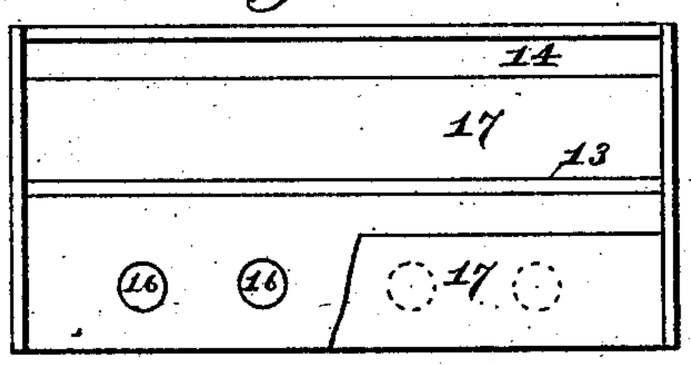


Fig 3



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WILLIAM H. MEGINNESS, OF DENVER, COLORADO.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 402,094, dated April 23, 1889.

Application filed March 31, 1888. Serial No. 269,176. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. MEGINNESS, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Ore-Concentrators, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to that class of ore-concentrators known as "dry concentrators," in which the concentration is effected by distributing the crushed ore upon a horizontal or inclined table or trough having transverse riffles and a perforate or reticulated bottom, the separation of the heavier and metal-bearing particles from the lighter portion or gangue being accomplished by a blast or blasts of air passing up through the bottom of the table or trough and lifting or blowing the latter off from the table or trough, while the former—the heavier and metal-bearing portion, too heavy to be removed by the blast—is caught by and lodges against the riffles; and the objects of my invention are to furnish a dry concentrator of economical construction, durable and reliable in operation, obviating waste of valuable ore, and capable of easy transportation from place to place, to which ends it consists in the features and combinations more particularly hereinafter described and claimed.

An embodiment of my invention is illustrated in the drawings, in which—

Figure 1 is a side view of such a concentrator; Fig. 2, a central longitudinal section thereof; Fig. 3, a top view of part of the bellows.

In the figures the reference-numerals 4 4 indicate the corner-posts of the framing of the machine, and 5 5 the cross-timbers, braces, or framings therefor. The framing, composed of these parts 4 5, preferably is bolted or screwed together, so that the parts thereof may be readily taken apart and as readily reassembled, thus permitting ready transportation, and that also over roads or trails where the transportation of the complete machine would be impossible. In the upper part of this framing is mounted the hopper 6, contracting to its discharge-mouth, where is placed the deflecting-plate for distributing the material issuing from the hopper upon the head of the screen 10, which is of such fine mesh as not to permit any material to pass therethrough, but pervious enough to permit the blast of air to be forced up through its interstices and the material upon it. When desired, this screen of fine mesh may be supported by a coarser one, 9, of perforated or reticulated metal, the two, when used together, being secured at their edges to the frame 8. Transversely across the screens and secured in or to the sides of the framing thereof are the riffle-bars 11, clamping the screens upon coinciding bars 12 beneath the screens.

The riffle-bars 11 and supporting-bars 12 are in such relation in the riddle 8 that when the latter is placed in position they coincide with and lie over or upon walls 13, secured transversely across the top 14 of bellows 15, so that between the top of the bellows and the bottom of the riddle a series of transverse chambers is formed, these chambers being closed at their ends by the side pieces, 30. In the top 14 of the bellows several series of apertures, 16, are formed, one series for each chamber. Such apertures may be a number of perforations, as shown, some in full and some in dotted lines, in Fig. 3; or each aperture may be a single slot, or several slots may be used beneath each chamber.

Within each chamber and covering the aperture or apertures is a valve-strip, 17, made of rubber, leather, or other suitable material, and secured at its lower edge to the base of the chambers and top 14 of the bellows.

Inasmuch as the entire material to be treated falls upon the first compartment of the screen or riddle, counting from left to right, and a lessened amount passes over each succeeding compartment, the greater blast (or blast greater than for any succeeding compartment) should be sent through the first chamber; hence in such chamber the valve is so constructed or so weighted as to require less force to open it than does the valve in any other chamber. The valve in the next lower chamber is constructed or weighted to require a somewhat greater pressure to raise it, the valve in each succeeding chamber be-

ing somewhat heavier weighted, either by reason of its own construction or by reason of weight added thereto, than is its predecessor. By this construction or arrangement the amount of blast in any chamber is proportioned to the material to be there acted on. Upon some part of the bellows—as, for instance, the bottom—is located a regulable outlet-valve, 19, with which is combined some means of adjusting the pressure with which it is held to its seat—as, for instance, a spring and an adjusting-screw therefor, as shown. If, now, the bellows be worked at such speed or with such force as to exceed the desired pressure at which the valve 19 has been set, the valve 19 is opened until the pressure be reduced to the desired and determined degree. This permits, after the valve has once been set according to the requirements of the ore to be operated on, the concentrator to be run and operated by inexperienced or unskillful labor without danger of a harmful or wasteful blast through the material.

For operating the bellows an arm, 20, is attached at one end to the lower or movable part of the bellows and at its other end to a crank formed in or on the shaft 22, journaled in suitable bearings upon the framing. To equalize the motion of such shaft 22, a fly-wheel, 21, may be mounted on one end thereof, while at the other end is the bevel-gearing 23, connecting shaft 22 with a shaft, 24, carrying at its other end either a crank-handle, 25, for manual operation, or a band-wheel or other device for receiving motion from a suitable prime motor. The bevel-gears 23 are so constructed and adjusted relatively to each other that the movements or reciprocations of the arm 20 and bellows 15 shall be much more rapid than those of the crank-handle 25 or equivalent device, so that the intermittent blasts from the bellows shall be very frequent and issue into the chambers as rapid percussive blows of air.

The riffle-bars are constructed or formed as shown in section in Fig. 2. Upon their lower sides they are rounded or convexed, while upon their upper sides they are first undercut, as shown at 26, and then cut inwardly to form recesses 27, which are in effect covered pockets, from which the blast is deflected and eddied (so to speak) through the material in the chamber, and in which also the heavier or valuable part of the material may lodge and be collected. The upper portion of the side toward the head of the screen of each bar 12 is inclined or beveled, as shown at 28, to form ways or surfaces, aiding in conducting the blast into recesses or pockets 27.

In practice it is preferable that the upper or first compartment or chamber receiving the material from the hopper should be larger than the succeeding ones. In addition to receiving all the material primarily, it also receives the strongest blast. In order, therefore, to keep the textile fabric when used in place and prevent it from being bowed outward by the blast, a supplementary cross-rib, 29, is placed transversely across the center of such chamber, and the metal bottom and superincumbent fabric secured thereto by a screw passing therethrough and into such rib, a washer being interposed between the screw-head and the metal bottom.

In operation all the material is fed from the hopper into the first or upper chamber, where it meets the strongest blast, which, striking the material in concussive blasts or puffs, forces all but the heaviest material over the riffle-bar to the second chamber. In doing this the blast in this chamber and in all the others first strikes the upper wall of the chamber, whence it is deflected in the other direction, striking into or upon the beveled surface 28 and into the recess 27, whence it is thrown through the mass in the chamber. As the very heaviest material has remained in the first chamber, that passing into the second is of less specific gravity and less in amount, so that in such chamber it is met by a blast of both less force and less quantity, but which is sufficient to cause the lighter material to pass over into the third chamber and the heavier and more valuable to be retained. This is repeated in as many chambers as may be deemed necessary, though in practice I have found that four or five chambers are sufficient to separate very thoroughly the heavy and ore-bearing material from the lighter material or gangue.

Having thus described my invention, what I claim is—

1. The combination of a single-blast apparatus, a series of transverse walls directly upon the stationary side thereof, forming with side walls a series of chambers directly upon the blast apparatus, a series of outlet-valves for the blast apparatus, one for and opening into each chamber, the valve in any one chamber being weighted to require a different degree of pressure to raise it from that required by the valves in adjacent chambers, an inclined riddle lying directly over the chambers, and means for operating the blast apparatus, substantially as set forth.

2. The combination of a single-blast apparatus, a series of transverse walls projecting from the stationary side thereof and forming with side walls a series of chambers directly upon the blast apparatus, a series of outlet-valves for the blast apparatus, one for and opening into each chamber, an ordinary inlet-valve for such apparatus, an extra outlet-valve therefor having means for adjusting it to any desired pressure, an inclined screen lying directly over the chambers, and means for operating the blast apparatus, substantially as set forth.

3. The combination, in an ore-concentrator, of a screen having transverse riffle-bars, a perforated or reticulated metal base secured

to a frame, transverse clamping-bars beneath such base, a bellows having walls or partitions upon its upper side coinciding with the riffle and clamping bars, forming chambers between the bellows and the riddle, and a valve in each chamber, the valve in any one chamber being weighted or constructed to require a different degree of force to raise it from that required by the other valves, substantially as set forth.

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

WILLIAM H. MEGINNESS.

Witnesses:

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B. L. POLLOCK.