

No. 831,681.

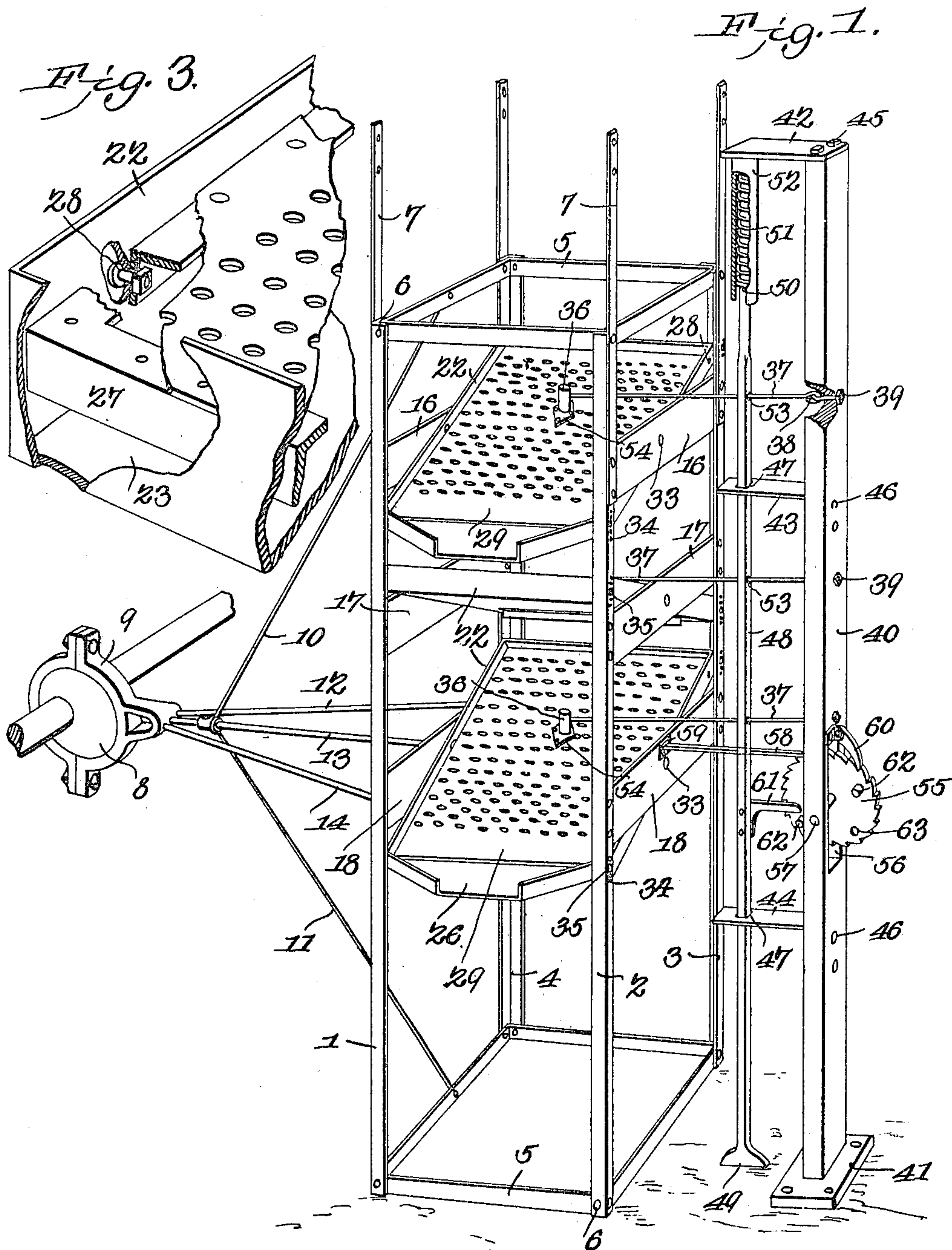
PATENTED SEPT. 25, 1906.

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ORE SIZING SCREEN.

APPLICATION FILED FEB. 9, 1906.

2 SHEETS—SHEET 1.



WITNESSES:  
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INVENTORS,

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*C. A. Snow & Co.*

ATTORNEYS.

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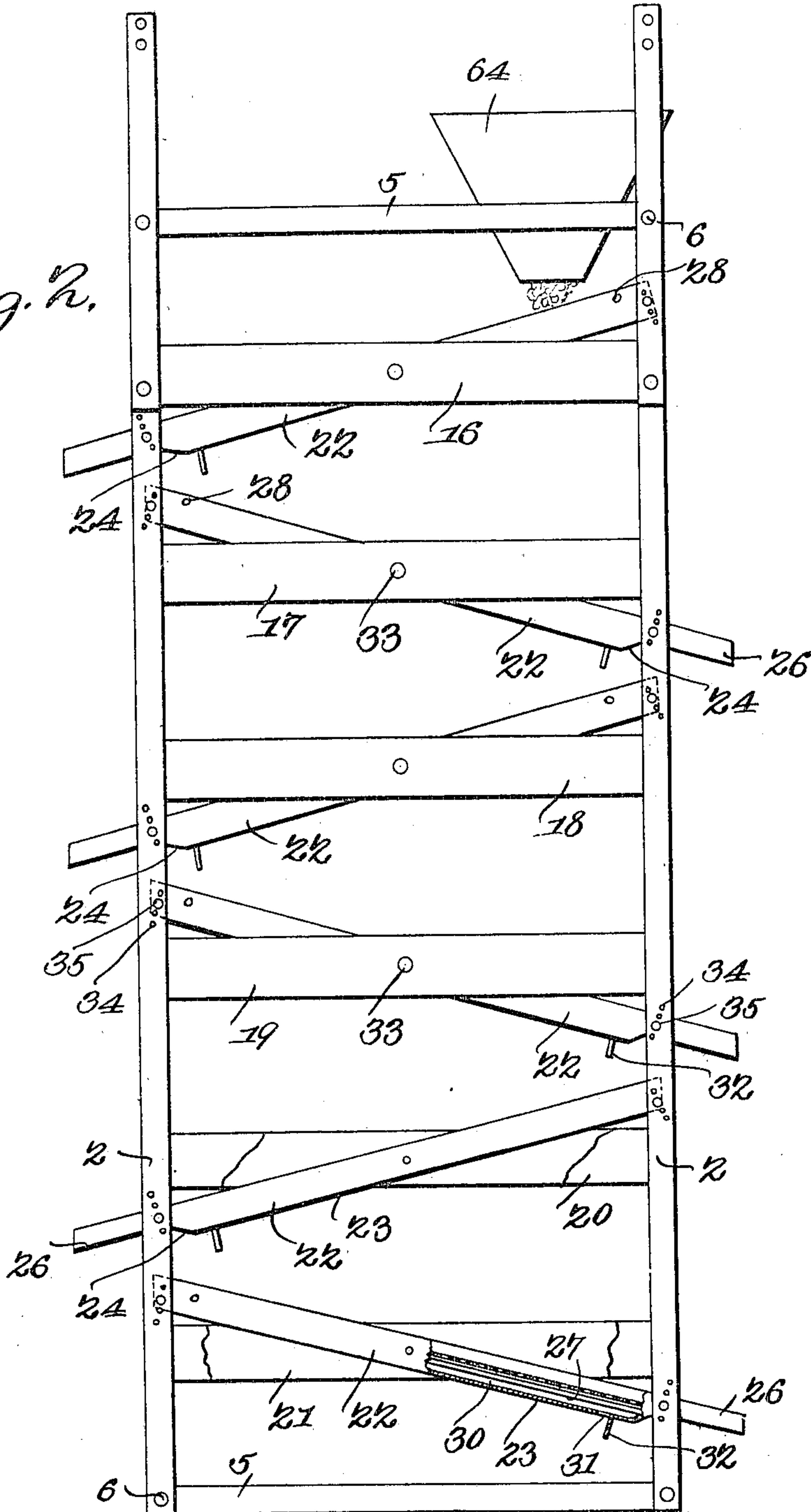
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2 SHEETS—SHEET 2.

*Fig. 2.*



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# UNITED STATES PATENT OFFICE.

CLARENCE E. RATCLIFF AND JACOB A. COHENOUR, OF SALEM,  
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## ORE-SIZING SCREEN.

No. 831,681.

Specification of Letters Patent.

Patented Sept. 25, 1906.

Application filed February 9, 1906. Serial No. 300,311.

*To all whom it may concern:*

Be it known that we, CLARENCE E. RATCLIFF and JACOB A. COHENOUR, citizens of the United States, residing at Salem, in the county of Livingston and State of Kentucky, have invented a new and useful Ore-Sizing Screen, of which the following is a specification.

This invention relates to ore-sizing screens.

The object of the invention is to provide a thoroughly efficient form of apparatus having a novel arrangement of mechanism for clearing the meshes or orifices of the screens from any accumulated matter, whereby the utility of the apparatus shall be largely increased; furthermore, to simplify the construction and increase the durability of such apparatus practically to eliminate danger of derangement in use, and to reduce wear of the parts to a minimum.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of an ore-sizing screen, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts, Figure 1 is a view in perspective, partly in section, of an ore-sizing screen constructed in accordance with the present invention. Fig. 2 is a view in side elevation, partly in section. Fig. 3 is a perspective detail view in section of a portion of one of the sizing-pans.

The frame of the machine comprises in this instance four vertically-disposed angle-iron frame-beams 1, 2, 3, and 4, which are connected and rendered rigid at their upper and lower terminals by brace-irons 5, that are connected with the angle-irons, preferably by rivets 6. The frame has connected with the upper portions of its vertical members metallic straps or hangers 7, that are resilient and are adapted to be secured to an overhead support, thus to allow the frame as a whole to have requisite lateral swinging motion. Any suitable mechanism may be employed for imparting this motion, that in this instance being exhibited as a suitably-driven eccentric 8, with the strap 9 of which

is connected a series of rods 10, 11, 12, 13, and 14, the rods 10 and 11 being secured to one of the upper and lower brace-irons 5 and the rods 12 to 14 being secured to an intermediate portion of the supporting-frame in any suitable manner.

Riveted or otherwise combined with opposite pairs of the frame-beams are pairs of plates 16, 17, 18, 19, 20, and 21, only three pairs—namely, 16, 17, and 18—being shown in Fig. 1, the remaining pairs being omitted, as they are clearly shown in Fig. 2. Arranged between each pair of plates is a combined screen and pan, and as each is a counterpart of the other a description of one will serve for all. The pan 22, which may be made of any suitable material, preferably of metal, has its bottom 23 near one end upwardly inclined to present an end wall 24, and from this wall outward the edges of the bottom converge inwardly and are upturned to present flanges which, in conjunction with the sides 25 of the pan, form a constricted discharge-mouth 26, as clearly shown in Fig. 1. Arranged within the pan is a screen which comprises a supporting-frame 27, preferably made of L-angle iron and which is secured within the pan by bolts or rivets 28, which pass through the vertical flanges of the frame 27 and through the sides of the pan, adjacent to its rear end. The forward portion 29 of the screen, which may be either reticulated or foraminous, is devoid of openings and bears upon the mouth portion of the bottom, defining thereby a space or chamber 30 between the screen and the bottom of the pan into which the finer particles of ore pass and thence out through a transverse slot 31, arranged adjacent to the inclined wall, and thence to the highest part of the next lower screen. In order to direct the material downward through the slot 31, there is a guard 32 arranged in advance thereof, as clearly shown in Fig. 2.

As is usual with apparatus of this character, it is essential that the screens and pans be adjusted to different inclinations for the purpose of properly operating upon different grades of ores, and to effect this result in the present instance each of the pans is pivoted intermediate of its ends between the plates 16 to 21 by bolts or rivets 33, and in



order to hold a pan in its adjusted position the opposite pairs of the frame-beams are provided with a plurality of orifices 34, arranged at the front and rear ends of the pan, and which are adapted to be engaged by a bolt or pin 35, that enters appropriate openings in the side walls of the pan and thus secure the objects sought.

As stated, it is one of the objects of the invention to provide means for clearing the meshes or openings of the screens from any accumulated matter, whereby the operation of the machine may be continuous. To effect this result, there is combined with each screen a hammer or weight 36, which is carried by one end of a resilient rod 37, the other end of which is provided or formed in an eye 38 to engage an eyebolt 39, carried by an upright 40, provided with a base 41, that is adapted to be bolted or otherwise secured to the floor of a building in which the machine is located. The upright carries a plurality of laterally-disposed arms 42, 43, and 44, which are projected at right angles to the upright, the arm 42 being secured to the upper end of the upright by bolts 45, and the arms 43 and 44 being secured to the upright by bolts 46. Each of the arms 43 and 44 is provided with a rectangular orifice 47, in which orifices is mounted for reciprocation a rectangular slide rod or bar 48, having its lower end provided with a foot 49 to rest upon the floor of a building, the upper end of the rod being provided with a head 50 to engage the lower end of a thrust-spring 51, that is housed in a cylindrical chamber 52, secured to the under side of the arm 42. The slide-rod is provided with a plurality of horizontally-disposed orifices 53, through which project the rods 37, that constitute the handles of the hammers 36, it being understood that there is one hammer for each of the screens. In order to protect the screens from the percussive action of the hammers, each is provided with a wear-plate 54, upon which the hammers strike, as clearly shown in Fig. 1.

The means for imparting vertical reciprocatory motions to the sliding bar 48 in order to cause the hammers to impact the wear-plates, and thus free the screens from any material that may be lodged in the meshes or orifices thereof, comprises a ratchet-wheel 55, that is disposed in a longitudinal opening 56 in the upright 40 and is mounted upon a shaft 37, that passes through the upright. This ratchet-wheel is engaged by a thrust-pawl 58, which is secured to a plate 59, carried by one of the plates 18. In order to prevent backlash of the ratchet-wheel, there is a pawl 60 provided, which is carried by the upright 40 and engages with the ratchet-wheel, as clearly shown in Fig. 1. Projecting rearwardly from the slide-bar 48 is a toe 61, that is adapted to be engaged by one or more lifters

62, that project laterally from one face of the ratchet-wheel. Where it is desired that the hammers shall strike but one blow during the rotation of the ratchet-wheel, only one lifter will be employed, and where two strokes of the hammer are desired two of the lifters will be combined with the ratchet-wheel, or if a greater number of strokes be desired additional lifters may be employed by furnishing the ratchet-wheel with orifices 63 for the purpose, it being understood that the lifters are to be detachably combined with the ratchet-wheel for the purpose. The materials may be supplied to the upper pan and screen in any preferred manner, a hopper 64 being shown in this instance in Fig. 2 for the purpose.

It will be seen from the description thus given that upon the eccentric being rotated a lateral vibratory motion will be imparted to the supporting-frame that will cause the pawl 58 to actuate the ratchet-wheel, and thus through the medium of the lifters and the toe to reciprocate the rod 48, and thereby cause the hammers to perform their functions.

While the apparatus herein shown is adapted to be suspended upon an overhead support, it is to be understood that it may be combined with a suitable framework mounted upon a truck, thereby to permit of the apparatus being moved from point to point. Furthermore, in order to adapt the screen to be used in working upon either dry or wet ore where the former is being treated there may be provided suitable removable hoods to be hooked or buttoned onto the swinging frame and to cover all openings between the screens to prevent dust and the like from escaping, and where the latter is being treated suitable water-spraying pipes may be employed to keep the smaller particles thoroughly washed loose from the larger ores, so as to secure the perfect sizing of all particles.

We claim—

1. In an ore-sizing screen the combination with a plurality of rigidly-connected screens, and means for vibrating them in unison; of a rotatable ratchet-wheel, means for holding the wheel against movement in one direction, a lifter extending from said wheel, a spring-pressed rod disposed adjacent the wheel and springs, a toe extending from said rod and into the path of the lifter, hammers extending through the rod and above, and adapted to strike the screens, and means actuated by the vibration of the screens for rotating the ratchet-wheel to trip the toe and hammers after a predetermined number of vibrations.

2. An ore-sizing screen comprising a suspended frame, means for imparting lateral vibratory motions thereto, a pan combined with the frame, a screen carried by the pan, a vertically-disposed spring-pressed bar located adjacent to the frame, a hammer dis-



posed over the screen and having its handle  
projecting through the bar, a toe carried by  
the bar, a ratchet-wheel carrying a lifter dis-  
posed to engage the toe, and a pawl carried  
5 by the frame and engaging the ratchet-  
wheel to cause the lifter to engage the toe and  
thus reciprocate the bar.

In testimony that we claim the foregoing

as our own we have hereto affixed our signa-  
tures in the presence of two witnesses.

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JACOB A. COHENOUR.

Witnesses:

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J. D. THRELKELD.