

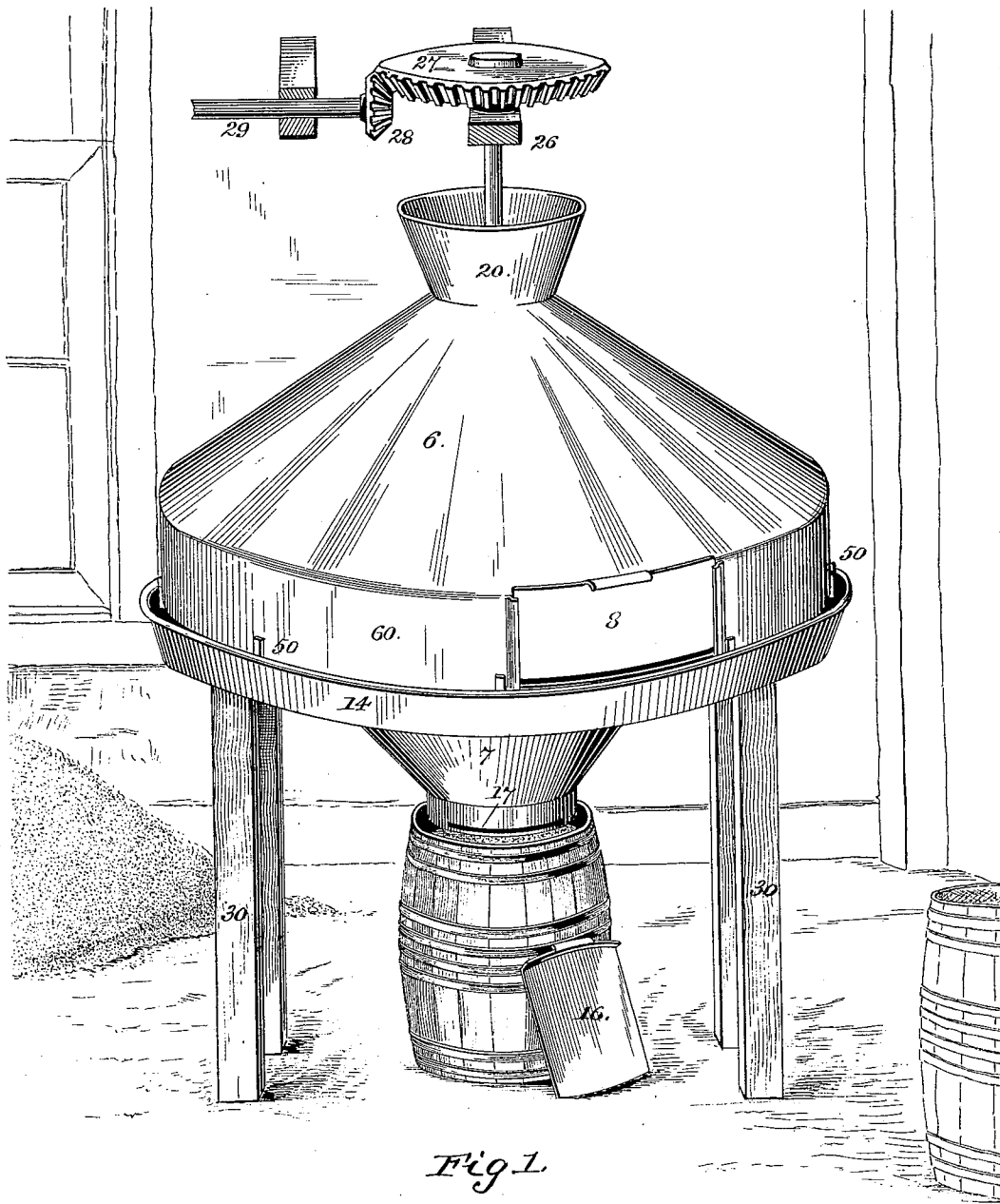
(No Model.)

3 Sheets—Sheet 1.

J. J. NEWMAN.
ROTARY SCREEN.

No. 546,899.

Patented Sept. 24, 1895.



WITNESSES:
J. E. Luckett
M. C. De Moll.

INVENTOR
John J. Newman
BY
Wm. G. Dieterich & Co.
ATTORNEYS.

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Fig. 2.

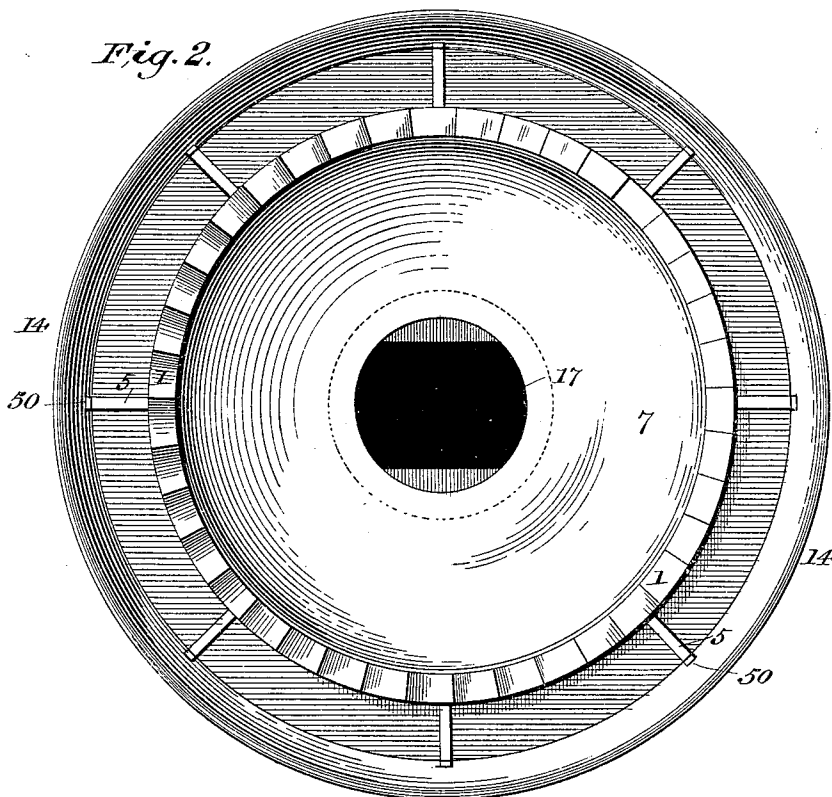
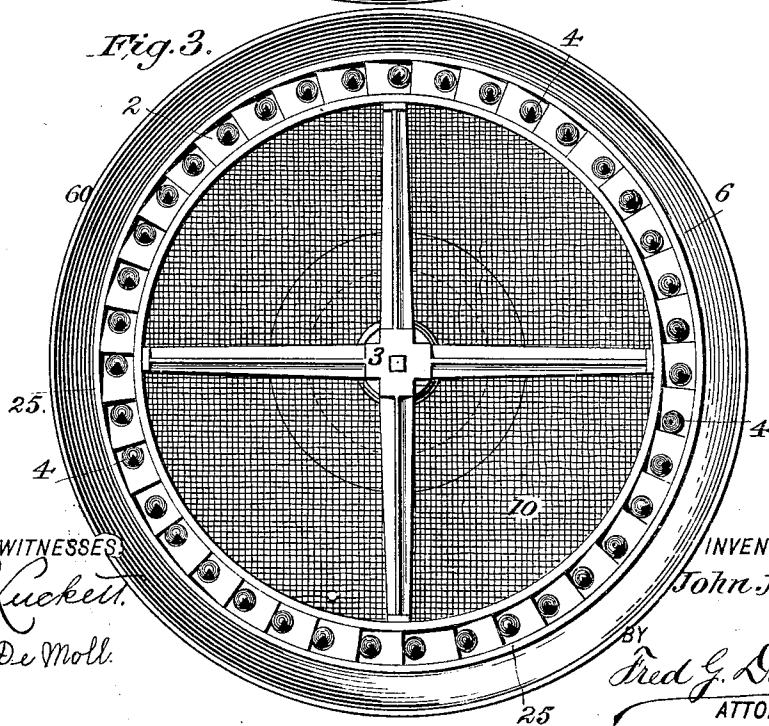


Fig. 3.



WITNESSES
J. E. Kuckett.
M. E. De Moll.

INVENTOR
John J. Newman
BY
Fred G. Dieterich
ATTORNEYS.

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3 Sheets—Sheet 3

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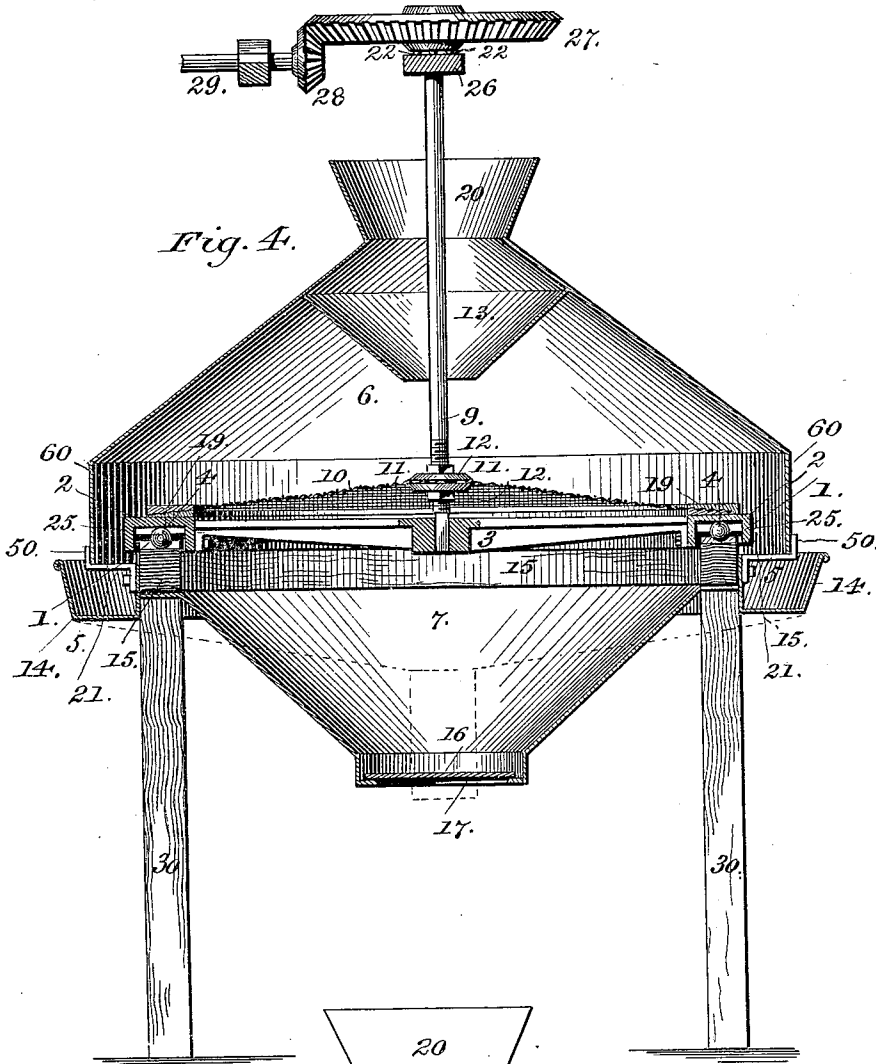
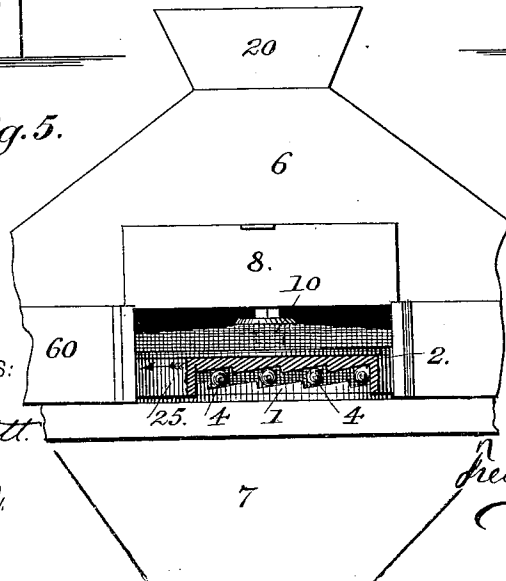


Fig. 5.



WITNESSES:

J. E. Luckett.
M. E. DeMoll.

INVENTOR

John J. Newman

BY *Fred G. Dietrich & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN J. NEWMAN, OF ELKHART, INDIANA.

ROTARY SCREEN.

SPECIFICATION forming part of Letters Patent No. 546,899, dated September 24, 1895.

Application filed June 8, 1895. Serial No. 552,082. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. NEWMAN, residing at Elkhart, in the county of Elkhart and State of Indiana, have invented a new and Improved Rotary Screen, of which the following is a specification.

My invention is in the nature of an improved machine for screening sand, cement, plaster-of-paris, bone-dust, and other similar material, and it primarily has for its object to provide a machine of this character of a simple and inexpensive construction, which can be easily manipulated, and which will effectively serve for its intended purposes.

My invention also has for its object to provide a screening-machine of the character stated having a combined rotary and vibratory motion of such a nature that the material will be subjected to a combined centrifugal and irregular vibratory action and be thereby thoroughly and positively separated in a minimum amount of time.

A further object of my invention is to provide a rotary screen having the screen so attached that it can be quickly adjusted from the outside without disconnecting the several parts of the machine, and in which the said screen is secured by simple fastening means, which can be readily adjusted when it is desired to replace a worn screen by a new one.

With other objects in view, which will hereinafter be referred to, my invention consists in the peculiar combination and novel arrangement of parts, such as will be first described in detail, and then specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved screening-machine as set for actual use. Fig. 2 is a plan view of the lower or bed portion of the machine. Fig. 3 is an inverted plan view of the rotary-screen carrier and the hood or casing, the friction-balls being shown in position in the corrugated or ratchet-like slide or bearing face. Fig. 4 is a vertical longitudinal section of the complete machine; and Fig. 5 is a partial side elevation, the door or slide in the casing being raised to the more clearly illustrate the interior construction.

Referring to the accompanying drawings, in which like numerals indicate correspond-

ing parts in all the figures, 1 indicates a circular bed-plate, which is bolted or otherwise secured to bed-timbers 15, which are suitably mounted on the leg or supporting members 30 30, as most clearly shown in Fig. 4. This bed-plate has its upper face formed with a ratchet-like trackway upon which are held friction balls or rollers 4, which are held in position by the pendent flanges 25 of the top plate 2, which is also provided on its under face with a ratchet-bearing face, the teeth of which, however, incline in a direction similar to the teeth on the bed-plate, as shown most clearly in Fig. 5, such upper and lower ratchet-faces and the balls 4 being relatively of such a size that the said ratchet-faces will be held from engaging each other. The upper plate 2 is also circular, and is connected to a spider-frame 3, secured to the lower end of the drive-shaft 9, the upper end of which is guided in a cross-timber 26 and has secured on its upper end a large drive-gear 27, the hub of which has antifriction-balls 22, which rest on the timber 26, such gear 27 meshing with the gear 28 on the main or drive shaft 29.

By referring more particularly to Figs. 2 and 4, it will be seen outwardly-extending bracket members 5 are secured to main or bed timbers 15, which terminate at the outer ends in upwardly-extending flanges 50. These brackets form the support for the hood or casing 6, the lower portion of which is formed with vertical sides 60, while the upper portion is cone-shaped and terminates in an outwardly-flared mouth or hopper 20, below which, on the interior of the said hood, is formed a breaker 13, the contracted mouth of which is centrally over the screen, for a purpose presently described.

7 indicates a receiving-hopper disposed under the screen, the lower end of which has a gate or slide member 16, adapted when fitted in place to close the discharge-mouth 17 of the said hopper.

8 indicates a slide-gate formed in the vertical wall 60 of the hood or casing 6, which when raised allows free access to the screen and screen-clamping devices without removing the said hood.

14 indicates a trough which surrounds the timber 15 and is disposed under the opening

21 to catch the rough or coarse material thrown off by the screen, such trough in the practical construction having a sufficient fall or slant to convey the material to the floor or a bin arranged to receive it, as indicated by dotted lines in Fig. 4.

By supporting the hood in the manner described and shown, the same will remain stationary as the screen is revolved, and as the vertical sides 60 fit against the outer or up-turned ends of the brackets a circular space 21 is provided, the purpose of which will also presently appear.

10 indicates the screen-body, which extends entirely over the internal space between the bed-plates 1 and 2, the outer ends thereof being lapped onto the upper face of the plate 2, where it (the body) is secured by a clamp-plate 19, which may be formed of a single circular plate or a series of plates, which may be secured to the top plate 2 by set-screws or otherwise.

The screen-cloth is centrally held by fitting over the shaft 9 and clamped between the plates 11, which are tightened by means of the nuts 12 12, as clearly shown.

The manner in which my improved screening-machine operates is best described as follows: The material to be screened is dumped into the hopper-top of the hood 6, and as it falls engages the breaker 13, which serves to collect, guide, and discharge it centrally onto the screen. The screen revolving will serve, by centrifugal action and the slant thereof from the center outward, to move the larger or coarse particles to the periphery of the screen, over the edges thereof and through the space 21 into the trough 14, from which such coarse stuff will pass onto the floor or into a bin arranged to receive it. While the material is thus treated by the centrifugal action of the screen a quick discharge of the coarse material is arrested by the continuous vertical vibrations imparted to the screen by the ratchet-like bearing-faces, which serve to effectively separate the finer from the coarse particles before such coarse particles are discharged from the screen. By providing ratchet bearing-faces and intermediate antifriction-balls, arranged as shown, it will be manifest I obtain all the advantages of the vibratory movements incident to the travel of one ratchet-face over the other with a minimum amount of friction and practically without noise. Furthermore, by providing ratchet and antifriction-ball devices, as stated, the machine can be operated much more rapidly and with much less power than would be the case were ordinary ratchet-faces used. It should also be stated that the ratchet-faces of the upper and lower plates are so arranged that, in rotating, the vertical edges of the ratchets on plate 2 approach the similar edges on plate 1. (See Fig. 5.) By this arrangement it will be manifestly clear a compound intermittent vibration is continuously imparted to the screen. Thus, as the

plate moves in the direction indicated by arrow in Fig. 5, the balls, as they are brought against the vertical faces of the lower ratchet, will serve to produce a jar on the rotary screen provided by the, as it were, momentary stoppage of the screen before the said upper ratchet rises up over the ball to produce the vertical vibration. The screen thus receives, as it is rotated, a wave-like motion, a constant series of sudden jars and vertical vibrations, thereby positively separating all the finer grade of the material from the coarse or rough stuff. The screened material, as it passes into the hopper 7, can escape into a barrel, as shown, or other receptacle. When one barrel is filled, the gate 16 is pushed in place to close the discharge-mouth 17, while the filled barrel is removed and an empty one is brought into position.

From the foregoing description, taken in connection with the accompanying drawings, it is thought the complete operation and the advantages of my invention will be readily apparent to those skilled in the art to which it appertains. It will be noticed the top or casing can be easily lifted, as also the spider-frame, the screen, and the drive-shaft 9. Furthermore, as the casing is conical in shape and held to project down lower than the screen, and as it has an inverted conical internal breaker, the machine will be practically dustless.

By connecting the screen-body in the manner stated when it is desired to put in a new screen it is only necessary to raise casing 6, loosen clamp 19, remove lower clamp and nut 11 and 12, raise shaft 9 (which has a square end) from spider and pull out the worn screen. The new screen is then slipped over the end of the shaft and clamped there to the lower clamp and nut. The shaft is then fitted back into the spider-frame and the ends of the screen secured by the clamps 19.

The screen can be tightened or be set to have its center elevated more or less above its outer edges by adjusting the clamps 11 and nuts 12 on the threaded-end shaft 9, as will be obviously understood by referring to Fig. 4 of the drawings.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A screening machine comprising a fixed bed having ratchet guide or bearing portions a revolving screen body having similar ratchet like bearing portions held to travel over the bed ratchet portions and intervening anti friction balls engaging such ratchet bearings and means for revolving the screen body substantially as and for the purposes described.

2. A screening mechanism comprising a fixed bed having ratchet like guide or bearing portions, and a screen body revolving upon the said bed having ratchet like bearing portions arranged to oppose the bed ratchets

such ratchets being arranged to have their straight faces oppose each other, and anti friction balls held between such ratchet faces, all arranged substantially as shown and described.

3. In a rotary screen, the combination with a fixed or bed guide having a circular ratchet face, ball bearings held thereon and a rotary screen body having a circular ratchet bearing face adapted to rest on the said balls and having pendent flanges adapted to hold the balls in place between the said ratchet faces as specified.

4. In a rotary screen the combination with the circular bed having ratchet teeth of the surrounding trough, the hood or cover carrying a hopper, the revolving screen having an outer rim provided with ratchet teeth upon the under side thereof, the interposed anti friction balls between the two ratchet faces and means for revolving said screen substantially as shown and described.

5. As an improvement in rotary screens, the combination with a circular bed frame and a screen body held to rotate on the circular frame having vertically extending drive shaft, said bed frame having laterally extending brackets and spaced apart from the circular bed frame, the hood supported by said brackets said hood having its upper portion cone shaped and terminating in a hopper like mouth, and a trough or collecting member

secured to the bed frame and extended under the space between the bed frame and the hood as set forth.

6. The combination with the bed frame, the rotary screen having a screen body inclined down from the center to the periphery a drive shaft connected therewith extending upward, the clamp devices for securing the screen, and the trough 14 all arranged substantially as shown, of the hood 6 having a straight portion 60 held over the trough 14 and bed frame, said portion 60 having a slide door, the upper end of which hood being conical and terminating in a hopper like mouth, and having an inverted cone shaped breaker on the inside below such mouth as set forth.

7. The combination with the ratchet bed plate 1, the frame 15, the hopper 7, the balls 4, the trough 14, and brackets 5 all arranged substantially as shown, of the spider frame 3, having an annular ratchet bearing plate 2, adapted to rest on the balls 4, the clamps 19, the shaft 9, the clamp nuts 11 and 12 the screen body 10 held thereby, and the hood 6 held on the brackets 5, having a conical upper end terminating in a hopper mouth, and provided with a breaker 13, as described and for the purposes set forth.

JOHN J. NEWMAN.

Witnesses:

JAMES H. STATE,
ELLIOTT CRULL.