J. W. PETTIBONE.

SCREENING APPARATUS.

APPLICATION FILED MAR. 8, 1913.

1,108,616. Patented Aug. 25, 1914.

Fig. 2.

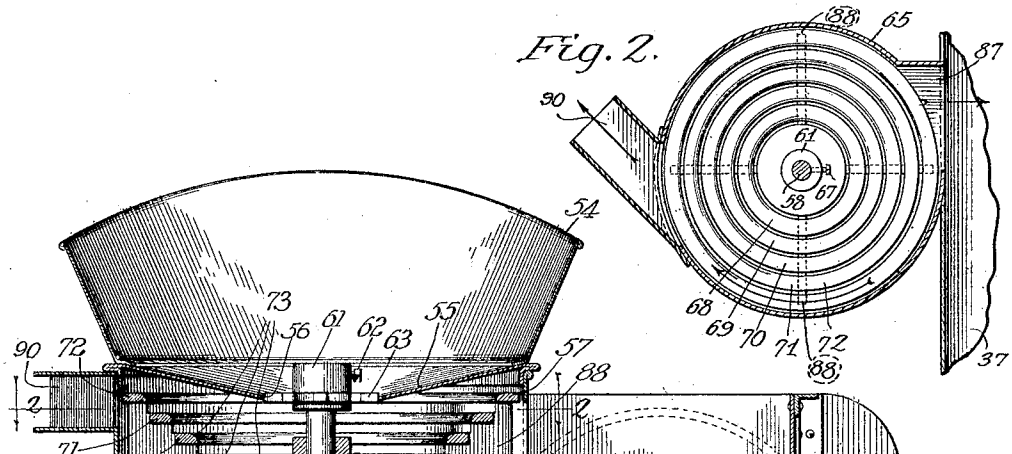


Fig. 1.

Witnesses:
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JAMES W. PETTIBONE, OF MUSKEGON, MICHIGAN, ASSIGNOR TO PHILIP P. SCHNORBACH, LOUIS E. SCHNORBACH, AND JAMES W. PETTIBONE, OF MUSKEGON, MICHIGAN, COPARTNERS DOING BUSINESS AS MIXER MACHINE COMPANY.

SCREENING APPARATUS.

1,108,616. Specification of Letters Patent. **Patented Aug. 25, 1914.**

Application filed March 3, 1913. Serial No. 753,072.

To all whom it may concern:

Be it known that I, JAMES W. PETTIBONE, a citizen of the United States, residing at Muskegon, in the county of Muskegon and State of Michigan, have invented certain new and useful Improvements in Screening Apparatus, of which the following is a specification.

My invention relates to improvements in screening apparatus and particularly to that form of screen which is adapted for use in connection with mortar mixing machines.

One of the objects of my invention is to provide a centrifugal screen in which the larger lumps or masses are rejected and delivered through an opening whereas the screened material is positively discharged through a separate opening.

Other objects of my invention are to provide a rugged, indestructible, centrifugal screen, efficient in its operation and not liable to get out of order.

The machine is extremely simple, requiring practically no skill on the part of the operator, and all of its moving parts are made strong and serviceable and cheap of construction and protected against flying sand, grit, or stone.

Other objects of my invention and benefits of my machine will become readily apparent to persons skilled in the art from a consideration of the following description when taken in conjunction with the drawings, wherein—

Figure 1 is a vertical, sectional view, through my improved screen, showing its application to a portable, concrete mixing plant; and Fig. 2 is a horizontal section through the sand screen, taken on the line 2—2 of Fig. 1.

In all the views the same reference characters are employed to indicate similar parts.

In the exemplification which I have chosen for a clear disclosure of my invention, I have illustrated the centrifugal screen as applied to a portable concrete mixer, the side sills of which are indicated by the numerals 10 and 11. Bearing brackets 12 and 13 are secured to the sills and have at their lower ends, bearing caps 14 and 15, carrying the axle 16, upon the ends of which are mounted the traction wheels 17 and 18.

It is common practice in portable concrete mixing outfits to provide a source of power, such as a gas engine, electric motor or the like, and in the construction illustrated the numeral 29 indicates a longitudinal power shaft driven by such a motor, connected through suitable clutching mechanisms with a beveled gear 48. A handle 52 is shown extending to the left for operating the clutch mechanism.

The sand screening apparatus consists of a sand receiving hopper 54, having slightly tapered side walls and having a downwardly tapering bottom 55. The bottom contains a central axial opening 56, through which the sand is discharged onto the screen 57. The vertical shaft, 58, supported in brackets 59 and 60, which are properly secured to the frame of the mixer outfit, carries on its upper end a spider 61, secured thereto by a set screw 62, or the like. The spider is provided with a series of radial arms which serve as agitators to prevent packing of the sand and to loosen it up so that it will readily fall through the opening 56. By this means, I am enabled to screen wet sand, and even frozen sand may be readily screened. Within a casing, providing a bottom wall 64 and a substantially circular side wall 65, is a rotary screen 66, which is secured to the shaft 68 by means of set screws 67 or the like. The screen members 66 consist preferably of a series of annular, concentric rings, 68, 69, 70, 71 and 72 spaced apart so as to provide openings therebetween, of such size or dimension as to permit the passage of sand or gravel that may be desired to be passed into the mixing hopper. These screen rings gradually increase in diameter, so that the rear edge of the lower ring is substantially in the vertical plane of the front edge of the next succeeding ring thereabove, thereby to provide an inclined path, over the inner confronting surfaces of the rings for the easy passage of gravel, stone, or other material too coarse or too large to pass through the intervening screening spaces. To facilitate the movement of the stone or coarse gravel I prefer to round off or taper the inner surfaces of the ring, as at 73, to provide a more gradual path for the ascending stones or gravel. The beveled gear wheel 48 is in driving relation with a similar gear

wheel 74 secured to the shaft 75. The transverse shaft 75 is supported on similar bearings 80 and 81 that are secured to transversely extending cross pieces such as 82, which in turn are connected to the side frame members 10 and 11. The outboard bearing of the shaft 75 carries beveled pinion 84, secured thereto by a set screw 85, or other like means, and has intermeshing driving relation with a similar, but somewhat larger, gear wheel 86 which is secured to the shaft 68 by means of a set screw 87.

By the shaft and gear connections heretofore described, the screen is driven by the engine at a rate of preferably about 225 to 250 revolutions per minute which is sufficient velocity to accomplish the object desired.

The screen casing is provided, near its upper edge, with a tangentially disposed spout outlet for the rejected stone and gravel and with a substantially radial outlet 87 through which to deposit the sifted sand into the mixing trough, 37.

The rings of the screens 68 to 70 inclusive are cast integral with the hub which surrounds the shaft 58 and with radially extending angular scrapers 88, of which there may be any desired number, four being shown in the drawing. These scrapers are rectangular at their lower edges so as to correspond with the shape of the lower corner of the sand receiving casing. The tangentially arranged discharge spout 90 is positioned at a point on the periphery of the screen casing remote from the radial opening 87 communicating with the mixing trough 37.

In the operation of the device, when the sand has been dumped into the hopper 54, it will find its way down the incline 55 and through the opening 56. The agitator, consisting of a spider 63, which is connected to the rotating shaft 58 that serves to rotate the screen, will agitate the sand, wet or frozen, and will cause it to drop through the inclined wall 5 at the axis of the rotating screen. The centrifugal action will immediately cause the fine particles of sand to pass through the intervening spaces between the annular rings 68 to 72 inclusive and the larger portions of material or gravel, which cannot pass through these spaces will gradually roll up the inclined surfaces of the rings, by the effect of centrifugal force, and pass out of the tangential opening or discharge spout 86. The sand having fallen on the floor of the casing containing the screen will be scraped by means of the rectangular rotating scrapers 88 toward the discharge openings 87, and thereby it will be dumped into the mixing trough and mixed with the putty, cement, or like material, that may have been previously deposited in the trough. The rotating screen 66 is made of relatively large, strong parts, that are designed to stand wear and abuse and will last for a long time without material change.

It is of course apparent that many changes may be made in the construction of the screen, as by varying the intervening spaces between the rings through which the sand passes, by operation of centrifugal effect, imparted to it by the rotating screen for the purpose of regulating or controlling the fineness of the sand to be deposited in the mixing trough, and it is, of course, evident that changes may be made in other parts of the specific structure illustrated and still embody the general idea involved in this construction and covered by the appended claims.

While I have herein described in some particularity a specific embodiment of my invention for the purpose of clear disclosure, it is evident that other changes than those mentioned may be made within the scope and intendment of the appended claims without departing from the spirit of my invention.

What I claim is:

1. A screen of the character described comprising a vertically disposed shaft; a series of concentric rings spaced apart and gradually increasing in diameter as they approach the top portion of the screen, thereby providing an inclined perforate wall; a plurality of angularly formed scrapers comprising integral parts of said rings, and an integral hub for attaching said frame to a vertically disposed shaft; a casing, surrounding said screen, having a discharge opening for the screened material near its bottom and a tangentially disposed opening near its top for discharge of the rejected material.

2. A screen of the character described, comprising a vertically disposed shaft; a series of concentric rings spaced apart and gradually increasing in diameter as they approach the top portion of the screen, thereby providing an inclined perforate wall; a plurality of angularly formed scrapers comprising integral parts of said ring, a casing, surrounding said screen, having a discharge opening for the screen material near its bottom and a tangentially disposed opening near its top for discharge of the rejected material.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

JAMES W. PETTIBONE.

In the presence of—

PHILIP P. SCHNORBACH,

FRED L. TROTT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."