Feb. 10, 1925. 1,525,622

F. STOCKER

GRAVEL WASHER

Filed Dec. 5, 1921 2 Sheets-Sheet 1

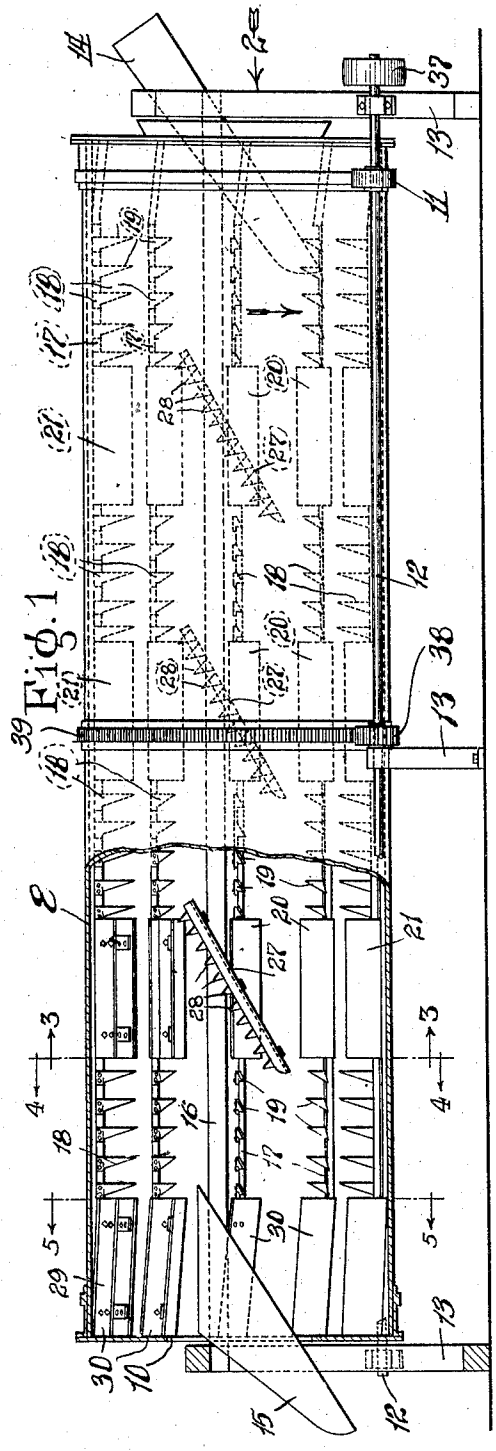


Fig. 1

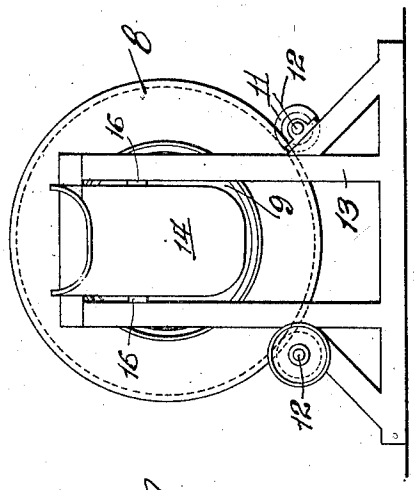


Fig. 2

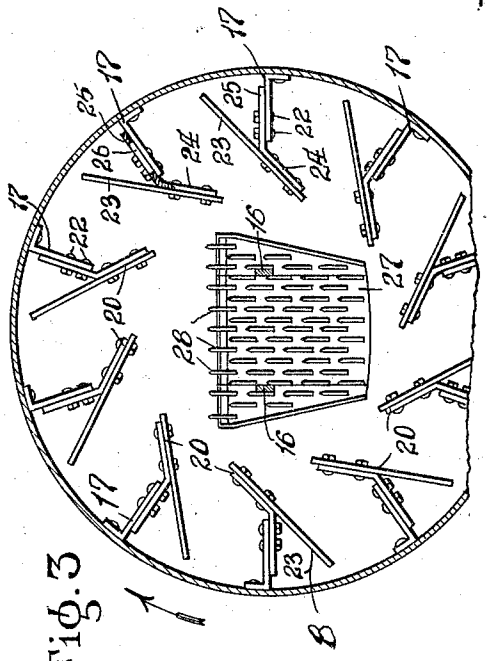


Fig. 3

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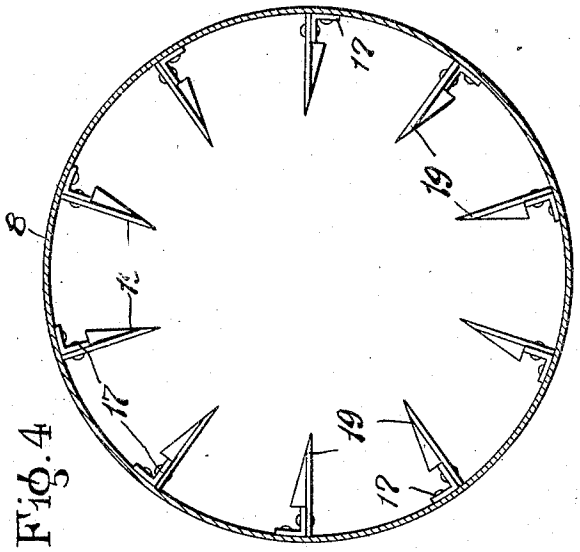


Fig. 4

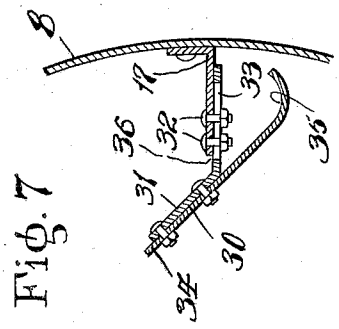


Fig. 7

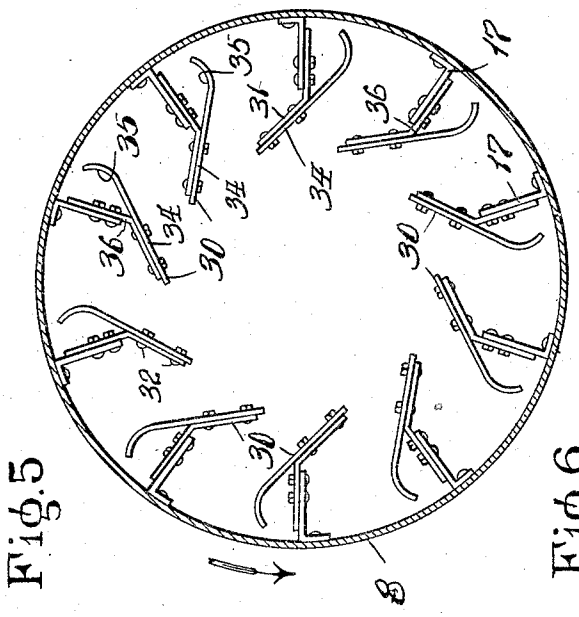


Fig. 5

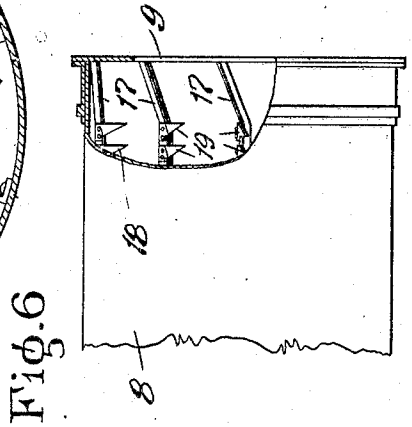


Fig. 6

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Patented Feb. 10, 1925. 1,525,622

UNITED STATES PATENT OFFICE.

FREDRICH STOCKER, OF HIGHLAND, ILLINOIS.

GRAVEL WASHER.

Application filed December 5, 1921. Serial No. 519,932.

To all whom it may concern:

Be it known that I, FREDRICH STOCKER, a citizen of the United States of America, and a resident of the city of Highland, county of Madison, and State of Illinois, have invented certain new and useful Improvements in a Gravel Washer, of which the following is a specification.

This invention relates to a device for washing sand, gravel, crushed rock and other material, and has for its primary object the purpose of providing improved means in the device for breaking up and separating the material to be washed from the base materials to which they adhere.

Another object of the invention is to provide a material washing apparatus with an improved form of separating or breaking up means upon which the material falls or is thrown against.

A further object of the invention is in providing an improved form of adjustable cup or bucket.

A still further object of the invention is in providing an improved form of final delivery bucket with improved means whereby the maximum amount of water will be drained from the material back into the washer before the discharge of the washed material from the washer.

Other and further objects will appear in the specification and be specifically pointed out in the appended claims, reference being had to the accompanying drawings exemplifying the invention, and in which,

Figure 1 is a side elevation, partly in section of this improved washing device.

Figure 2 is an end elevation of Fig. 1, taken in the direction of the arrow 2.

Figure 3 is an enlarged transverse vertical section taken on the line 3—3 of Fig. 1.

Figure 4 is an enlarged transverse vertical section taken on the line 4—4 of Fig. 1.

Figure 5 is an enlarged transverse vertical section taken approximately on the line 5—5 of Fig. 1.

Figure 6 is a view of a fragmentary portion of the feeding end of the drum, partly in section.

Figure 7 is an enlarged fragmentary vertical section, taken on the line 7—7 of Fig. 1.

Referring by numerals to the accompanying drawings, 8 designates a cylinder or drum which is open at its feeding end at 9, and at its discharge end at 10, said drum being turnably supported by pairs of opposing rollers such as 11 which are mounted on horizontally disposed shaftings 12, said shaftings being supported in brackets or framings 13.

An inclined feeding chute 14 is extended into the drum 8, through the opening 9, whereas a discharge chute 15 is extended from the drum at its opposite end through the opening 10, said chutes 14 and 15 being supported between spaced apart parallel members 16, which extend lengthwise through the drum, said members being supported at their ends from the end frames 13.

Secured to the inner wall of the drum 8 and arranged radially therearound are a series of spaced apart angle members 17, and secured to said members in groups 18 are a series of agitating fingers 19.

As shown in Fig. 1, the finger groups 18 are spaced apart lengthwise of the drum 8, the fingers 19 of each group 18 being arranged in approximate diametrically opposed positions, and arranged between each finger group 18 are a series of buckets 20 which are also arranged in groups 21, each bucket 20 of each group being adjustably and demountably secured to a respective angle member 17 by bolts 22 which are supported from the angle member.

Each of the buckets 20 is comprised of a lifting plate 23 having a pair of brackets 24 secured thereto, each bracket having an angularly disposed portion 25, bearing a slot 26 through which the respective pairs of bolts 22 pass, and in the adjustment of each of the plates 23, the plates and their respective brackets are moved inwardly or outwardly on the angle members 17 towards and away from the inner wall of the drum 8.

Arranged approximately concentric with the drum 8 and within said drum are a series of deflecting plates 27, each being inclined towards the discharge opening 10, each of said plates bearing a series of horizontal rows of upwardly pointing projections 28, the projections of each row being staggered to the projections of an adjacent row.

Each plate 27 is arranged in diametric disposition to a respective bucket group 21, said plates being supported by and between the pair of parallel members 16, as shown in Figs. 1 and 3.

Arranged within the drum 8, adjacent the discharge opening 10 is a group 29 of discharging buckets 30, said buckets being inclined away from the discharge opening 10,

Each bucket 30 is adjustably secured by a pair of brackets 31 to a respective angle member 17, by bolts 32, which are passed through a respective slot 33 of each bracket 31. Each bucket 30 is further comprised of a material lifting scoop 34, to which each pair of brackets 31 are secured; the inner end of each scoop 34 being provided with a gutter 35, and in which each gutter will receive the inclination given to each bucket, each scoop 34, of each bucket being separated from its respective angle member 17 by a gap 36.

In the operation of a device of this improved character, revolving motion is imparted to the pulley 37, which is mounted on one of the shafts 12, and the pinion 38, which is secured to said pulley shaft will impart motion to the spur gear 39 with which it is in mesh, thereby revolving the drum 8 on the rollers 11.

Material such as gravel, which is to be washed, is discharged through the chute 14, through the opening 9 into the drum, said material falling onto the agitating fingers 19 of the first finger group 18, and on account of the angular disposition of said fingers, the revolving of the drum in the direction shown by the arrows in Figs. 1, 3 and 5, will cause said fingers to tend to feed the material towards and onto the buckets 20 of the first bucket group 21.

It is to be noted that the angle members 17 adjacent the feeding opening 9 are each bent in the same direction, this being for the purpose of feeding the material that piles backwardly from the chute 14, forwardly, so that the material cannot accumulate near the opening 9 and fall therethrough.

The material upon being thrust on the buckets 20 of the first bucket group 21 will be elevated thereby on one side of the drum until said buckets reach a position above a respective projection holding plate 27, and from this position the material will fall from the buckets onto the projections 28, the falling of the material on said projections tending to break material clogs.

On account of the angular disposition of the plates 27, the material from the first plate will be discharged onto the agitating fingers 19 on the second finger group 18, said second group of fingers forcing the material forwardly onto the second bucket group 21, where the material will be elevated and forced to fall upon the second projection holding plate 27, where the lumpy material will be again attacked by the projections 28 of said second plate, and from which the material will be discharged onto a third group of agitating fingers 18, and from where the material will be carried to and received by a third group of buckets 21 to discharge onto a third projection holding plate 27 to a last group of agitating fingers 18, and from where the material will be received by the buckets 30.

The material which has now reached the final state of washing, in which the refuse material has been broken away and washed from the gravel, by water which is supplied into the drum by a source not shown, is elevated by the discharging buckets 30 and as said buckets ascend, the water contained in the gravel of the ascending bucket will entrain through the gap 36 of each bucket into a respective gutter 35, thereof, and on account of the angular disposition of each bucket, which is away from the discharge opening 10, the water draining from the gravel contained in each bucket will be discharged from each respective gutter 35 back into the drum and not into the discharge chute 15 to which the washed gravel will fall, thereby making a discharge of gravel from the drum with a minimum amount of water contained therein.

From the aforesaid operation of the peculiarly disposed parts of this improved apparatus, a thorough and fast operating washing device is provided, and for regulating the feed of the material through the drum from the receiving end to the discharge end, provision is provided by the adjustable buckets 20 and 30, in which the plates 23 of the buckets 20 and the scoops 34 of the buckets 30 can be moved inwardly or outwardly towards regulating the scooping area of the buckets.

What I claim is:—

1. In a washing apparatus, a revoluble drum having a series of agitating fingers arranged in groups on its inner wall, a series of buckets arranged between each finger group, said fingers being shaped so as to serve as propelling members towards feeding the material to an adjacent bucket series, and means related to each bucket series for discharging the material therefrom to adjacent finger groups.

2. A washing apparatus comprised of a horizontally revoluble drum having a receiving end and a discharging end, a series of spaced apart agitating fingers arranged in groups on the inner wall of said drum, each of said fingers having a portion which is angularly disposed so as to provide driving members for feeding the material within the drum towards the discharging end, and a series of buckets arranged within said drum between each of said finger groups.

3. In a washing apparatus comprised of a horizontally revoluble drum having a receiving end and a discharging end, a series of spaced apart agitating fingers arranged in groups on the inner wall of said drum, each of said fingers having a portion which is angularly disposed so as to provide driving members for feeding the material within the drum towards the discharging end, and a

deflecting member located adjacent each of said finger series for receiving material therefrom.

4. In a washing apparatus, a revoluble drum having a series of groups of agitating fingers arranged on its inner wall, and a deflecting member arranged within said drum adjacent each of said finger groups, each of said deflecting members having a series of upwardly projecting members.

5. In a washing apparatus, a horizontally revoluble drum having a series of buckets arranged on its inner wall, and a stationarily held deflecting member provided with a series of upwardly projecting members arranged within said drum for receiving the material from said buckets.

6. In a washing apparatus, a horizontally revoluble drum having a receiving end and a discharging end, a series of buckets borne by the inner wall of said drum, and a deflecting member located within said drum and inclined toward the discharge end thereof, said deflecting member being provided with a series of upwardly pointed elements.

7. In a washing apparatus, a bucket therefor having a longitudinally extending drain opening, and a gutter leading from said drain opening.

8. In a washing apparatus, a bucket therefor having an adjustable longitudinally extending drain opening, and a gutter leading from said drain opening.

9. In a washing apparatus, a horizontally revoluble drum having a discharge end, a bucket arranged within said drum and secured thereto, said bucket being provided with a draining means, and a gutter leading from said draining means adapted to discharge in the direction opposite from the discharge end of said drum.

10. In a washing apparatus, a revoluble drum having a series of agitating fingers arranged on its inner wall, said drum having a discharge end adjacent which are arranged a series of discharging buckets, each of said buckets being provided with a drain opening and a gutter for receiving the drain from each opening, said gutters of said buckets being inclined away from the discharge end of said drum, said fingers being disposed so as to provide driving means for feeding the material within the drum to said buckets.

11. In a washing apparatus, a revoluble drum having a series of agitating fingers arranged on its inner wall, said drum having a discharge end adjacent which are arranged a series of discharging buckets, each of said buckets being provided with a drain opening and a gutter for receiving the drain from each opening, said gutters of said buckets being inclined away from the discharge end of said drum, said fingers being disposed so as to provide driving means for feeding the material within the drum to said buckets, a suspended deflecting member for delivering material to said fingers, and a series of buckets cooperable with said deflecting member.

12. In a washing apparatus, a bucket having adjustable draining means within the material supporting bottom thereof, and a gutter related to said draining means being disposed so as to discharge inwardly of the drum of the apparatus and away from the discharging end thereof.

13. In a washing apparatus, a bucket therefor secured to the inner wall of said drum having a scooping portion which is to be adjusted relative to scooping smaller or larger quantities of material, and drainage directing means related to said bucket.

FREDRICH STOCKER.