J. J. McMANAMEN, C. F. SMITH AND A. L. MUNRO.

SAND AND GRAVEL WASHER.

APPLICATION FILED DEC. 21, 1917.

1,392,779. Patented Oct. 4, 1921.

3 SHEETS—SHEET 1.

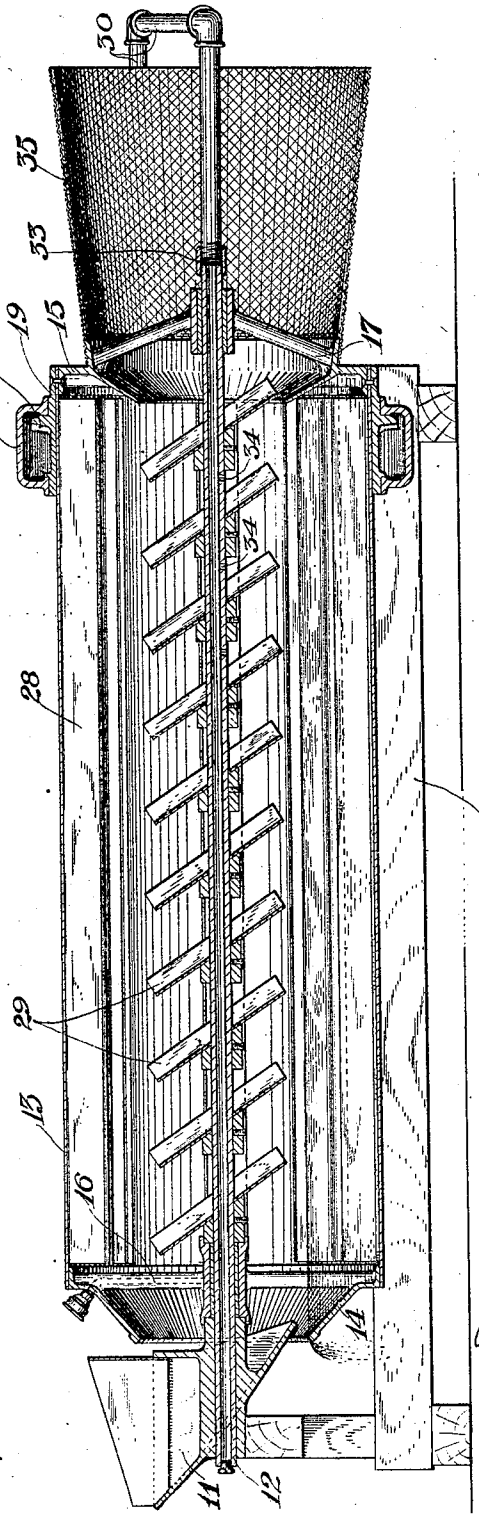


FIG. 1.

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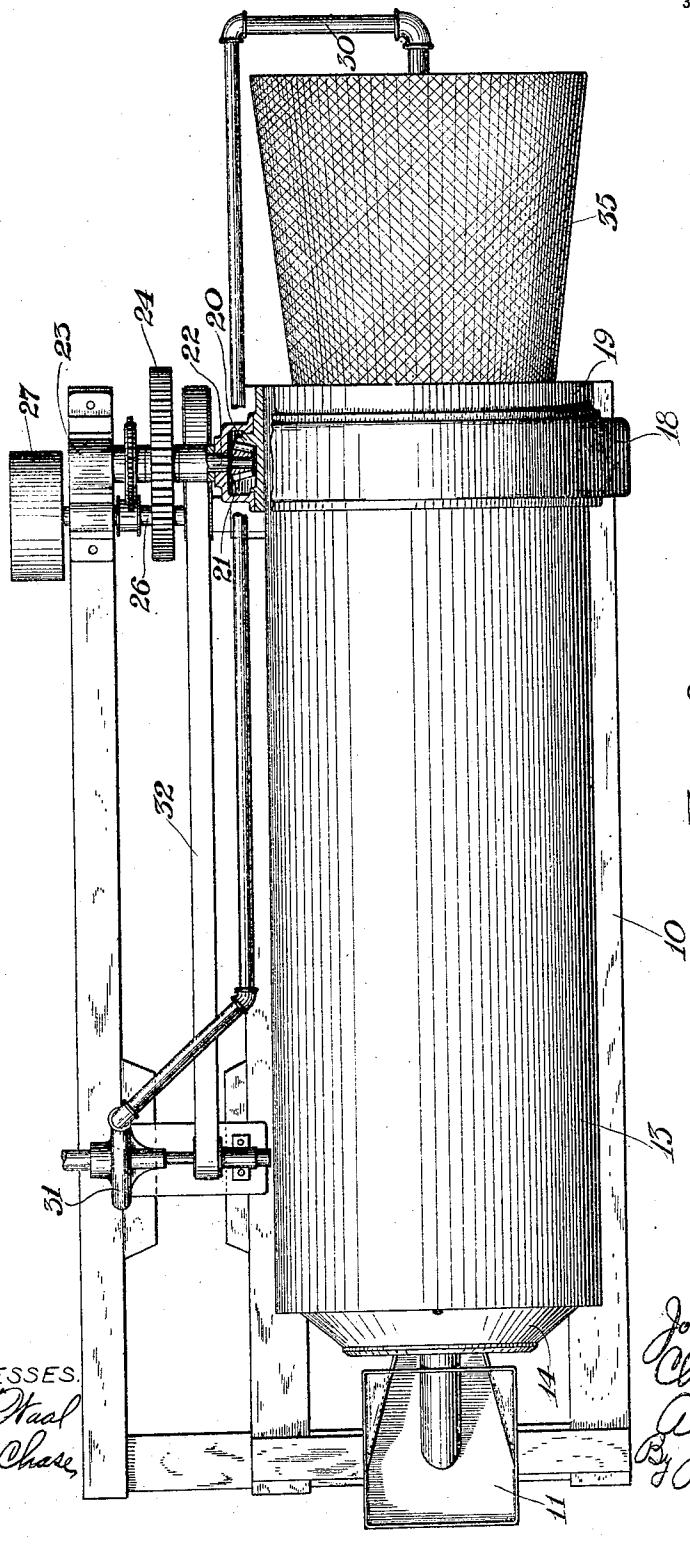


FIG. 2.

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3 SHEETS—SHEET 3.

FIG. 3.

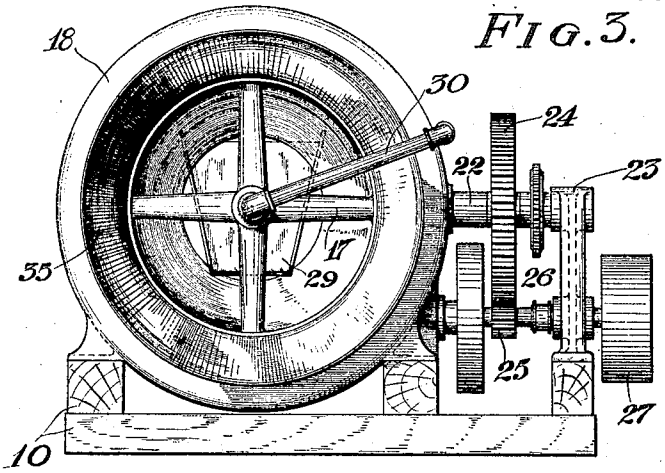
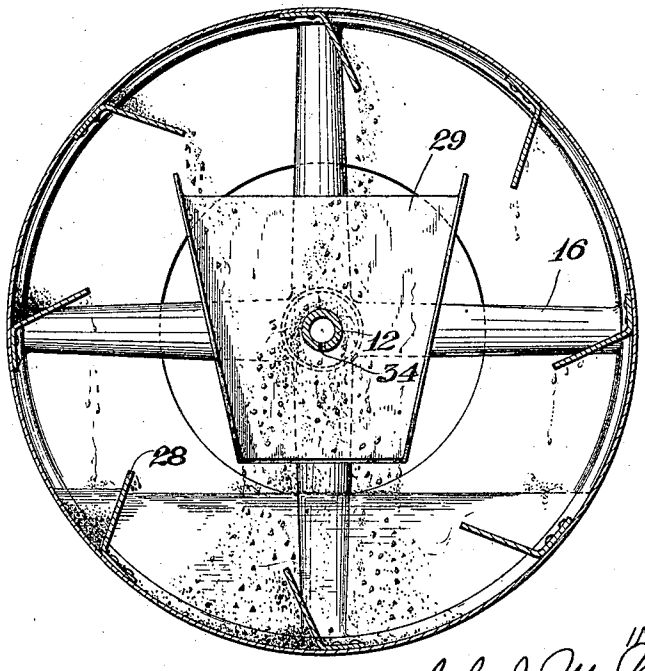


FIG. 4.



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UNITED STATES PATENT OFFICE.

JOHN J. McMANAMEN, OF MITCHELL, SOUTH DAKOTA, AND CHARLES F. SMITH AND ALEXANDER L. MUNRO, OF MILWAUKEE, WISCONSIN, ASSIGNORS TO SMITH ENGINEERING WORKS, OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

SAND AND GRAVEL WASHER.

1,392,779. Specification of Letters Patent. Patented Oct. 4, 1921.

Application filed December 21, 1917. Serial No. 208,313.

To all whom it may concern:

Be it known that we, JOHN J. McMANAMEN, a citizen of the United States, and resident of Mitchell, South Dakota, and CHARLES F. SMITH and ALEXANDER L. MUNRO, respectively, a citizen of the United States and a subject of the King of England, and both residents of Milwaukee, Wisconsin, have invented new and useful Improvements in Sand and Gravel Washers, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention has for its object to provide a portable machine for washing sand and gravel to remove the soluble matter and other foreign matter therefrom to improve its quality for concrete making and other purposes.

An object is to simplify the construction to make the machine light and compact, portable and easily operated.

Another object of the invention is to so mount the washing drum at its discharge end as to permit of the ready removal of the screen so that the screen may be changed when worn or when a different mesh is desired, without dismemberment of the machine or disturbing the central shaft support for the washing drum.

Another object of the invention is to utilize the central supporting shaft of the washing drum as a means for introducing water to the washing drum.

Another object of the invention is to perfect details of construction of a sand and gravel washer of this type.

With the above and other objects in view, the invention consists in the sand and gravel washer, its parts and combinations of parts, as herein claimed and all equivalents.

Referring to the accompanying drawings in which like characters of reference indicate the same parts in different views:

Figure 1 is a central longitudinal sectional view of a sand and gravel washer constructed in accordance with this invention;

Fig. 2 is a plan view thereof;

Fig. 3 is a view of the discharge end thereof; and,

Fig. 4 is a transverse sectional view of the washing drum.

In these drawings 10 indicates a frame or base which is of suitable construction for permitting the device to be carried from place to place. At one end of the frame is mounted a casting forming a feed hopper 11 through which passes a central rigid shaft 12. A cylindrical washing drum 13 has its ends formed by truncated conical rings 14 and 15 respectively, on spiders 16 and 17 which are journaled on the fixed shaft 12. The spider bearing on the shaft 12 at the feed end of the machine constitutes the support for this end of the drum, while the other end of the drum is supported by a bearing ring 18 mounted on the frame and having rotatably mounted within it a flanged ring 19 which is secured to the washing drum. The bearing ring 18 forms an annular hollow shell with its edges fitting against flanges of the ring 19, and one of said flanges has gear teeth 20 formed on it and meshing with a beveled pinion 21 contained within the ring 18 and mounted on a shaft 22. The shaft 22, besides having a bearing in the ring 18, is journaled in a bearing bracket 23, and has a gear 24 meshing with a pinion 25 on a drive shaft 26 which is journaled in the bearing ring 18 and the bracket 23, and is provided with a belt pulley 27 for connection with any suitable engine or motor for driving the machine. The washing drum is thus rotatably supported by the shaft 12 and the bearing ring 18 and is rotated by the beveled gearing connection contained within said ring.

The spout of the feed hopper 11 projects within the opening of the conical ring 14 to feed the material into the drum, and lifting blades 28, mounted on the inner wall of the drum and extending lengthwise of the drum, form troughs with the walls of the drum in which the sand and gravel are lifted by the rotary movement of the drum and carried to the upper part of the drum, where, owing to the change in position of the blades, they are dropped onto inclined troughs or chutes 29, by which they are advanced toward the discharge end of the drum. The inclined troughs or chutes 29 are supported by and fixed on the central shaft 12, each being preferably mounted on a collar which has set screw engagement with the shaft. The cleaning drum 12 contains water up to the level of the overflow through the opening

in conical ring 14 and the supply of water to the drum is maintained through the shaft 12, which is made tubular for this purpose, a water connection 30 from a pump 31 driven by a belt 32 from the driving shaft 26 having a detachable coupling 33 with the end of the tubular shaft 12 at the discharge end of the machine, as shown, though it may be connected to the other end of the tubular shaft if desired. The water is sprayed through openings 34 in the tubular shaft near the discharge end of the machine so that the flow of water through the drum is in a direction opposed to the travel of the sand and gravel material through the drum.

The repeated lifting of the material by the lifting blades 28 and its falling upon the successive inclined chutes 29 causes it to advance toward the discharge end of the drum at the same time that it is being repeatedly dropped into the water to separate the soluble matter and the light matter therefrom, and when it reaches the discharge end of the drum its travel down the last chute 29 carries it through the inwardly projecting conical portion of the ring 15 and it is thus discharged from the drum and into the conical screen 35, which is removably mounted on an outwardly extending flange of the ring 15 and serves to separate the sand from the gravel as it turns with the drum. When it is desired to change the screen, to renew it when worm, or to change the mesh, this may be done by merely disconnecting the water pipe and the screen and without disturbing the other parts of the machine.

The central shaft supports the feed end of the drum, making external supporting means unnecessary, while the bearing ring 18 inclosing the driving gear connection supports the discharge end of the drum, and the shaft at this end of the drum is supported by the drum ring. Thus the shaft at one end supports the drum, while at the other end it is supported by the drum, making a very light construction suitable for portable use, and avoiding the presence of a bearing at the discharge end of the drum that would interfere with the removal of the screen. This arrangement gives ample strength to all parts, especially the central shaft upon the chutes of which the sand and gravel is dropped.

The machine of this invention is found in practice to perform its work thoroughly and efficiently, and can be made so light and compact as to be conveniently moved from place to place, and is, therefore, most suitable for the use intended of preparing sand and gravel for concrete construction work.

What we claim as new and desire to secure by Letters Patent is:

1. In a sand and gravel washer, a rotatable washing drum, a shaft fixed at one end forming a support for the feed end of the drum, and an external bearing forming the support for the discharge end of the drum, said discharge end of the drum forming a support for the free end of the shaft.

2. In a sand and gravel washer, a fixed shaft, a series of inclined chutes mounted thereon, a rotary cleaning drum surrounding the shaft and its chutes and rotatably supported on the shaft at its feed end, and external supporting means for the drum at its discharge end.

3. In a sand and gravel washer, a central shaft rigidly supported at one end, inclined chutes mounted on the shaft, a rotatable cleaning drum surrounding the shaft and its chutes and having a bearing on the shaft at its feed end, an external bearing for the discharge end of the drum, and a support on the discharge end of the drum for the free end of the shaft.

4. In a sand and gravel washer, a shaft rigidly supported at one end, inclined chutes mounted thereon, a cylindrical drum surrounding the shaft and its chutes and having a supporting bearing on the shaft near its supported end, lifting blades within the cleaning drum for lifting material and dropping it on the chutes for advancing it toward the discharge end of the drum, an external bearing at the discharge end of the drum, and a support at the discharge end of the drum rotatably mounted on the free end of the shaft.

5. In a sand and gravel washing machine, a suitably supported feed hopper, a central shaft fixed at one end to the feed hopper, inclined chutes on the shaft, a rotary cleaning drum surrounding the shaft and having a supporting bearing on the shaft next to the feed hopper, an external bearing at the discharge end of the drum, and a supporting bearing at the discharge end of the drum for the free end of the shaft.

6. In a sand and gravel washer, a rotary cleaning drum having its feed end rotatably supported, a flanged ring secured to the other end of the drum, a bearing ring surrounding the flanged ring and forming a support for the end of the drum, said rings together forming an annular casing, gear teeth on one of the flanges of the inner ring, a suitably driven shaft passing through the bearing ring, and a pinion on said shaft meshing with the gear teeth.

7. A sand and gravel washer, comprising a frame, a feed hopper mounted thereon, a tubular shaft with one end fixed in the feed hopper, inclined chutes mounted on the shaft, a rotary cleaning drum surrounding the shaft and its chutes and having a spider with an outwardly projecting truncated cone-shaped flange forming one end thereof, the said spider being rotatably mounted on the shaft and said flange receiving the spout of the feed hopper, and having a spi-

der with an inwardly projecting truncated cone-shaped flange forming the other end thereof with the spider supporting the free end of the shaft and the flange receiving the end of the last chute, a pair of rings surrounding the discharge end of the drum and forming a casing between them and consisting of an inner flanged ring secured to the drum and an outer bearing ring secured to the base, gear teeth formed on a flange of the inner ring, a suitably driven shaft projecting through the bearing ring, a pinion thereon meshing with the gear teeth, a screen removably mounted on the spider at the discharge end of the drum, and means for supplying the tubular central shaft with water.

8. In a sand and gravel washer, a horizontal shaft, a support in which the shaft is fixed at one end, a drum having a bearing at one end journaled on the shaft near the support, an external bearing at the other end of the drum forming the only support therefor whereby this end of the drum is free from stationary obstruction, a spider at the unobstructed end of the drum fitting around the shaft, and a cylindrical screen removably mounted on the spider to form an extension of the drum.

In testimony whereof, we affix our signatures, in presence of two witnesses, as of the 10 day of December, 1917.

JOHN J. McMANAMEN.
CHARLES F. SMITH.
ALEXANDER L. MUNRO.

Witnesses:
E. L. SANBORN,
A. VAN KOOY.