S. E. PFAHLER.

CONCRETE MIXER AND CONVEYER.

APPLICATION FILED MAR. 20, 1916.

1,213,407.

Patented Jan. 23, 1917.

3 SHEETS—SHEET 1.

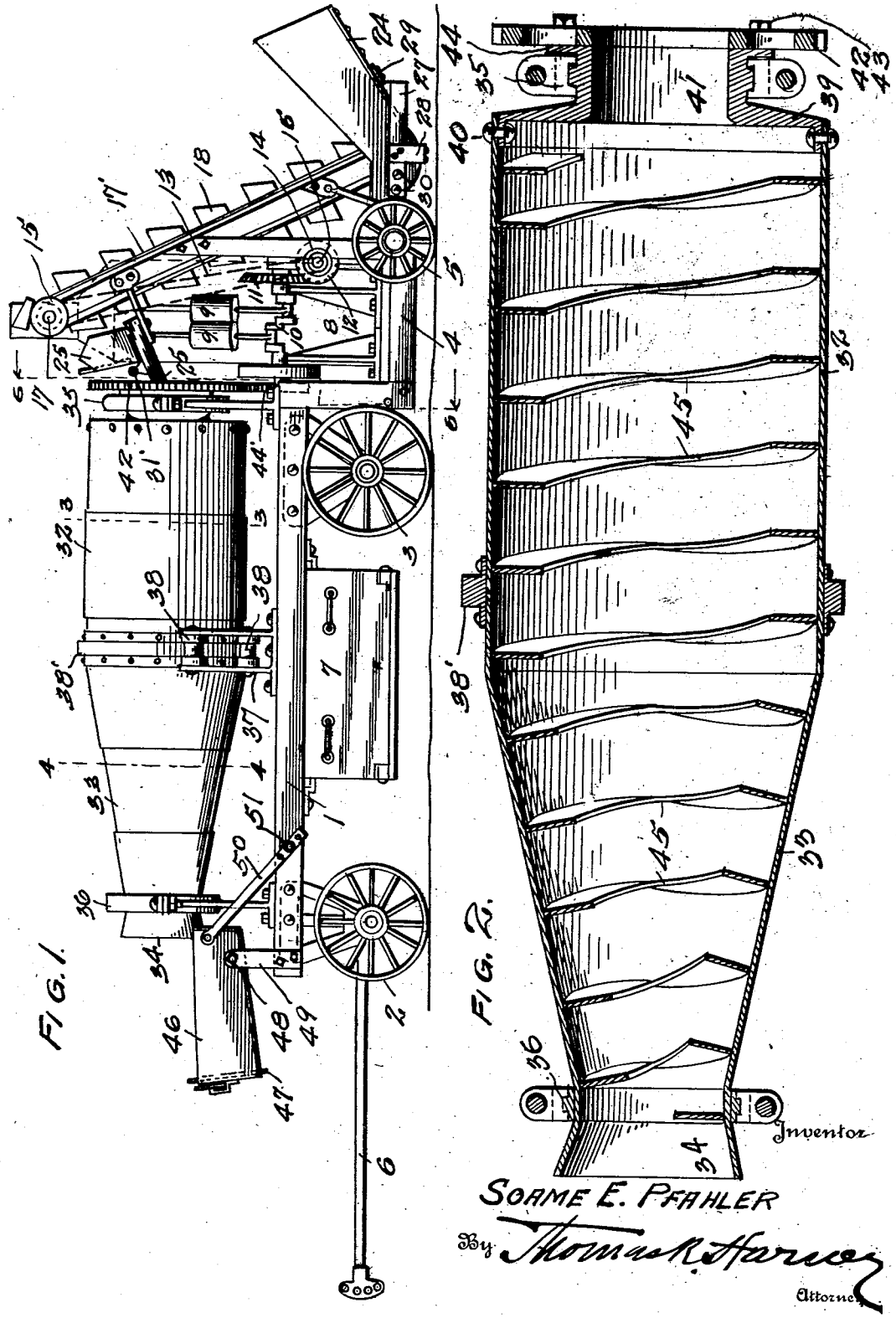


FIG. 1.

FIG. 2.

Inventor

SOAME E. PFAHLER

By Thomas R. Harris

Attorney

S. E. PFAHLER.

CONCRETE MIXER AND CONVEYER.

APPLICATION FILED MAR. 20, 1916.

1,213,407.

Patented Jan. 23, 1917.

3 SHEETS—SHEET 2.

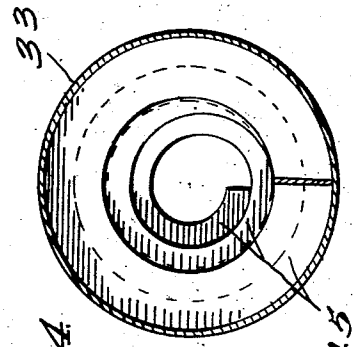


FIG. 4.

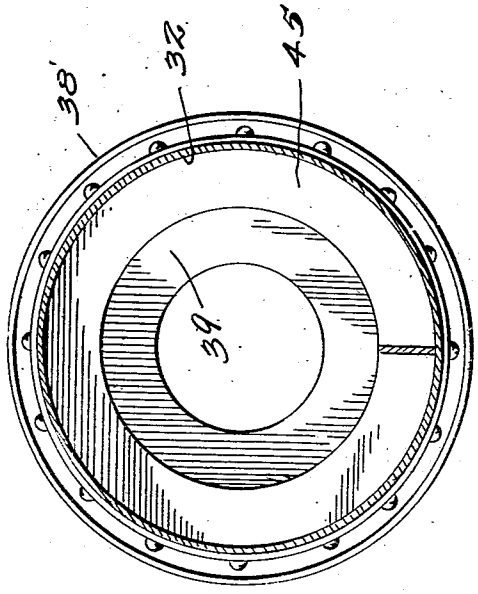


FIG. 3.

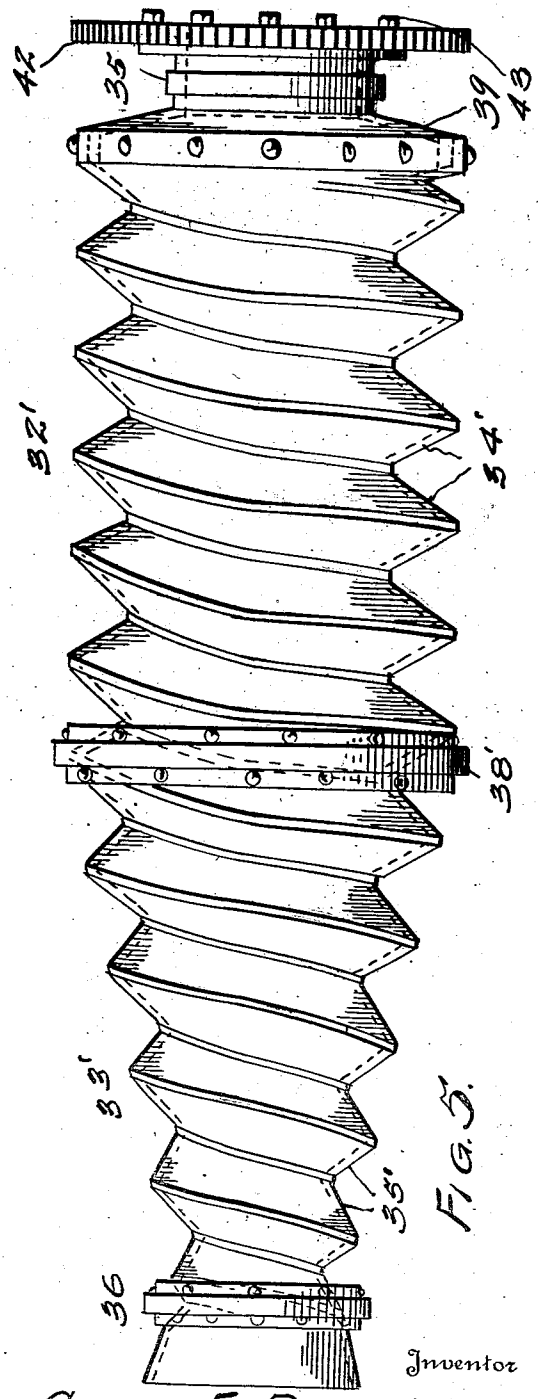


FIG. 5.

Inventor

SOAME E. PFAHLER.

By Thomas A. Harvey

Attorney

S. E. PFAHLER.

CONCRETE MIXER AND CONVEYER.

APPLICATION FILED MAR. 20, 1916.

1,213,407.

Patented Jan. 23, 1917.

3 SHEETS—SHEET 3.

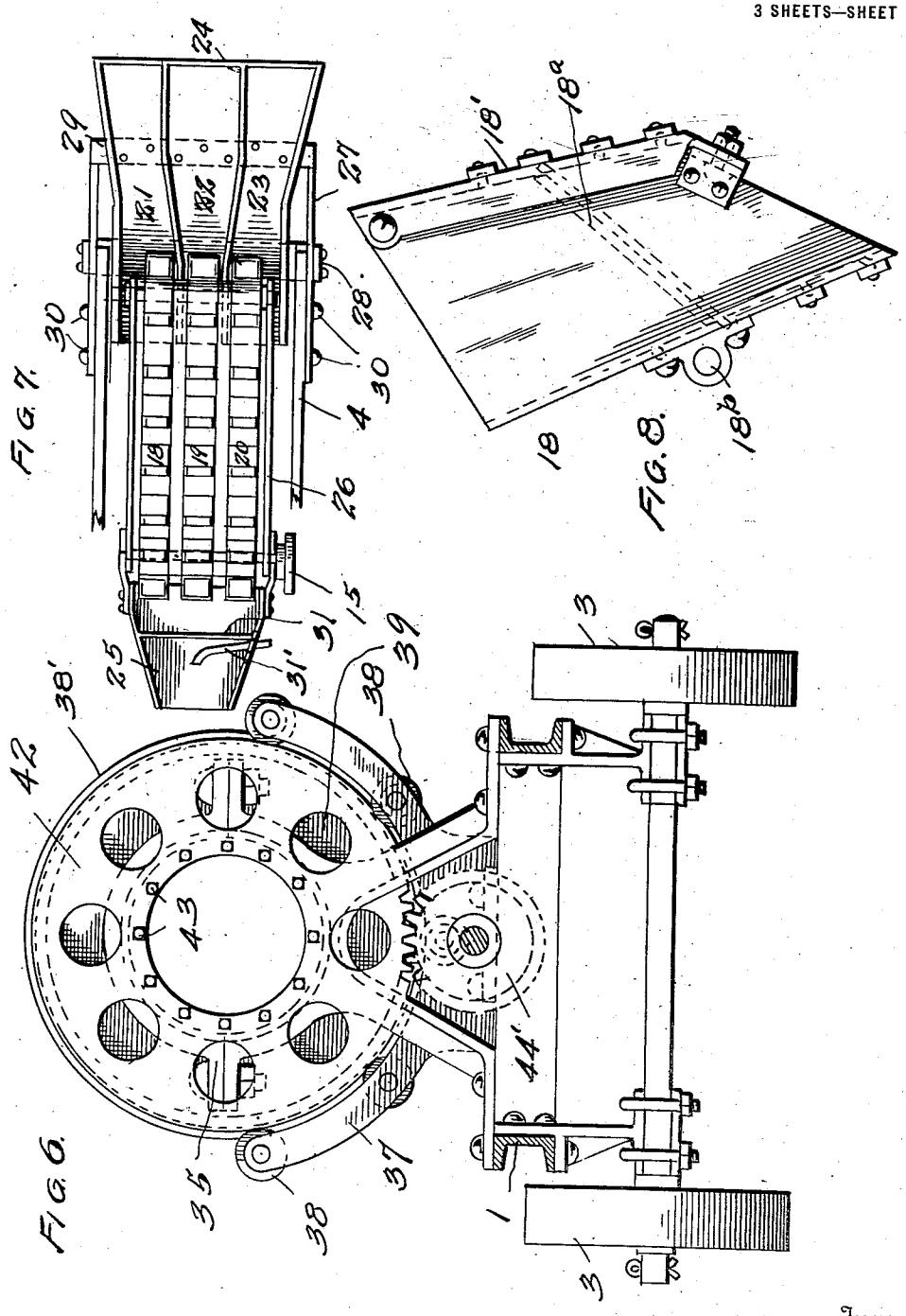


FIG. 7.

FIG. 8.

FIG. 6.

Inventor

SOAME E. PFAHLER.

By Thomas R. Harney

Attorney

UNITED STATES PATENT OFFICE.

SOAME E. PFAHLER, OF HOPEWELL, VIRGINIA.

CONCRETE MIXER AND CONVEYER.

1,213,407. Specification of Letters Patent. Patented Jan. 23, 1917.

Application filed March 20, 1916. Serial No. 85,323.

To all whom it may concern:

Be it known that I, SOAME E. PFAHLER, a citizen of the United States of America, residing at Hopewell, in the county of Prince George and State of Virginia, have invented certain new and useful Improvements in Concrete Mixers and Conveyers, of which the following is a specification.

The present invention relates to an improved concrete mixer and conveyer and is designed primarily for the purpose of mixing and conveying concrete or other materials in a manner wherein a continuous feed of the materials in predetermined quantities and a corresponding discharge of the mixed elements is desired, thus obviating the delay frequently caused in using machines of this character by stopping the mixer in order to feed new material and discharge the mixed materials.

The invention consists essentially in certain, novel combinations and arrangements of the mixing drum which acts as a conveyer, whereby the materials are thoroughly mixed and commingled and conveyed to the discharge point as will be pointed out more fully hereinafter.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principles of my invention.

Figure 1 is a side elevation of the concrete mixer of my invention, complete. Fig. 2 is a horizontal, longitudinal sectional view of the mixing drum, and its connections. Fig. 3 is a vertical transverse sectional view of the drum at line 3—3 Fig. 1. Fig. 4 is a similar view at line 4—4 Fig. 1. Fig. 5 is a modified form of the drum, shown in side elevation. Fig. 6 is a transverse vertical sectional view of the apparatus, at line 6—6 of Fig. 1. Fig. 7 is a top plan view of the endless belt and bucket, feeding device for the mixer. Fig. 8 is a side view of one of the buckets of the endless conveyer.

The apparatus illustrated in the drawings is preferably of the portable type and is supported upon a main frame 1 with wheels 2 and 3, and the lower drop frame 4 supported upon wheels 5. The supporting frame and wheels are of any suitable type, and the apparatus may be transported by suitable power applied to the tongue or draft bar 6, while the tool box 7 suspended beneath the main frame is designed for customary uses.

The power for the machinery of the apparatus is furnished preferably from the boiler 8 and steam engines 9 through the driving crank shaft 10, all of which are supported on the drop frame 4 at the front of the apparatus convenient for both the feeding mechanism and the combined mixer and conveyer.

The feeding mechanism is of the endless belt and bucket type and is driven from the driving shaft 10 through the gear connection 11 12, belt 13 and pulleys 14 and 15, the former on counter shaft 16 and the latter on the upper shaft 17 of the endless conveyer or feeder. The endless feeder comprises the usual buckets and traveling belt or chains, but I utilize these buckets in three series as indicated in Fig. 7 at 18, 19, 20, and these series of buckets are designed to pass through the three separated compartments 21, 22, 23 of the feed hopper 24, and scoop up different materials for the concrete mixture, such as cement, sand, and gravel, and deliver them to the feed hopper 25, supported at the upper end of the frame 26, from whence the ingredients or materials for the concrete mixture are passed to the mixer and conveyer. It will be understood that the sand, cement and gravel are fed into their respective compartments in the feed hopper 24, as from a wheel barrow, or by shovelfuls, and the quantity of the materials to be conveyed by the series of buckets may be varied on account of the construction of the buckets. In Fig. 8 it will be noted that the bucket 18 has an adjustable bottom 18^a so that its capacity may be varied, and the hinged lid 18′ permits of accessibility in adjusting the bottom. By means of the eye 18^b, two of which are attached to each bucket, the bucket may be attached to the belt 17′ as usual. By the utilization of these buckets of varying capacity I am enabled to furnish the required amount of cement, gravel and sand in the proper proportions, regardless of the quantity desired. The feed hopper or feed trough 24 is attached to the drop frame 4 by means of a U-shaped frame 27, which is equipped with two cross arms 28 and 29, and by means of bolts 30 is attached to the drop frame. The feed hopper 25 is provided with a transverse arched partition 31 under which the materials for the mixture

pass as the buckets empty their contents in the hopper, and at this point the required water is introduced to the material through the nozzle 31′ which is supported from the feed hopper and to which a suitable hose is attached. Thus the required water is mixed with the materials, not in bulk, but before they become massed, and as the materials are being fed to the mixer so that all materials are thoroughly and uniformly moistened as required, and to much better advantage than if the water were introduced only in the mixer.

From the feeding device the materials for the concrete are passed through the feed hopper 25 to the mixing drum 32. This drum is of usual metallic construction and of suitable dimensions, cylindrical in cross section and provided with a tapering extension 33 diminishing in diameter toward the discharge end or nozzle 34. The drum is revolubly supported in journal bearings 35 and 36 at its respective ends, the frames of the bearings being supported from the main frame 1, and a central support 37 including the rollers 38 is provided to prevent sagging and provide for a stable movement of the drum as it is revolved, on ring 38′.

The front or inlet end of the drum is provided with a head 39, attached to the drum by rivets 40, and the head is fashioned with a reduced barrel or throat 41 into which the feed hopper 25 projects and through the materials for the concrete are introduced.

An open gear ring or gear wheel 42 is attached, as by bolts 43, to the flange 44 of the barrel 41, and through the medium of this wheel, and the pinion 44′ on the crank shaft 10, the drum is revolved, clockwise, in order to mix, and convey the concrete mixture toward the discharge end or nozzle 34.

Within the drum and its tapered extension is attached a screw or spiral conveyer plate or flange 45, which extends continuously from the inlet end of the drum to the outlet or discharge end thereof, and conforms to the interior shape of the drum and its extension. The spiral flange, it will be noted is approximately the same width throughout its lengths, and the convolutions are equidistant, and arranged to convey, or cause to flow, the contents from the inlet end toward the outlet or discharge end of the drum, and at the same time permit of a free movement of the mass between the convolutions or coils of the spiral conveyer. When the materials are fed into the drum at the right end in Fig. 2 they are agitated and mixed by the rotation of the drum itself and also by the movement of the spiral flange or ribbon, and the action of the spiral flange urges the mass toward the outlet end of the drum. However, the tapering extension of the drum prevents the mass from moving forward too quickly, and masses of the mixture are being continuously turned back into the drum proper for further mixing and commingling, because of the difference in capacity of the drum and its extension. In this manner the spiral flange in the drum is continuously forcing toward the outlet of the drum, a larger mass than can be accommodated by the tapering extension, with the consequence that only the desired quantity is discharged from the outlet, while the mass of materials in the drum is being continuously and thoroughly agitated and mixed.

The width of the flange 45 may be varied so that either end of the drum will move larger quantities than the other, as for instance in the modification of the drum shown in Fig. 5. Here, the cylindrical casing and tapering extension are disposed of and the mixer comprises a hollow screw shaped drum 32′ with a tapered screw shaped extension 33′, and it will be noted that the lands 34′ of the drum 32′ are wider or deeper than the lands 35′ of the extension 33′.

As the concrete mixture flows from the discharge nozzle 34 it may be disposed of as desired, but I have illustrated a discharge hopper 46 fashioned with a front gate 47 and pivoted at 48 in the standards or brackets 49 projecting upwardly from the frame 1. By means of the adjustable pivoted links 50, one at each side of the discharge hopper, the latter may be held in desired position. When not in use, the link 50 may be released by detaching the nuts 51, and then the discharge hopper may be swung on its pivot 48 so that it covers the discharge opening 34 of the drum.

What I claim is:—

The combination in a concrete mixing and conveying device with a revoluble drum having an inlet opening and an imperforate tapered extension having an axial outlet opening, said drum and extension each having a spirally arranged imperforate flange on its inner wall of uniform width uniformly spaced to form a closed wall arranged within the conveyer from end to end thereof and having a free open central space, the conveying capacity of the drum being greater than the capacity of the extension.

In testimony whereof I affix my signature.

SOAME E. PFAHLER.