

W. S. GREGG.
PUMP.

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1,011,340.

Patented Dec. 12, 1911.

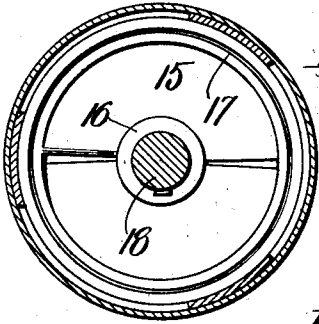


Fig. 2.

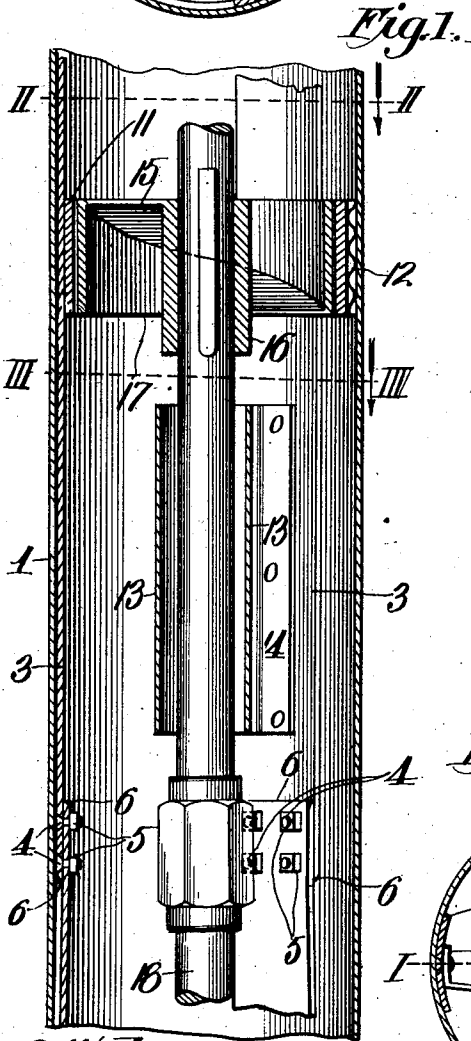


Fig. 1.

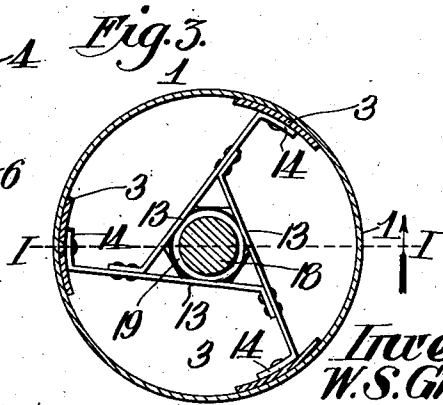


Fig. 3.

Witnesses
Frank R. Horn
H. C. Rogers

Inventor
W. S. Gregg
By George S. Thorpe Atty.

UNITED STATES PATENT OFFICE.

WALTER S. GREGG, OF KANSAS CITY, MISSOURI.

PUMP.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WALTER S. GREGG, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

This invention relates to pumps of that class embodying a plurality of rotary impellers for elevating a column of water by causing it to spirally ascend within a casing, and breaks between the impellers to interrupt the spiral progress of the water and thereby compel each impeller to perform its apporportioned share of the work of elevating the water.

One of the special objects of my invention is to produce an efficient pump which is susceptible of extended continuous service without danger of the water breaks becoming broken or dislodged and thereby impairing the efficiency of the pump and perhaps wrecking it.

With these general objects in view the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1, is a fragmentary central vertical section of a pump embodying my invention. Fig. 2, is a horizontal section on the line II—II of Fig. 1. Fig. 3, is a horizontal section on the line III—III of Fig. 1.

In the said drawings, where like reference characters identify corresponding parts in all the figures, 1 indicates the cylindrical casing of a pump, which casing is adapted to extend down into a tubular well, and is adapted to be suspended in the customary manner from a support, not shown, at the surface level of the well, as common in this type of pumps.

Fitting within the casing is a skeleton caging constructed as follows: 3 indicates a plurality of bars arranged vertically and of arcuate shape in cross section, the curvature of the bars being such that they fit snugly against the inner face of the casing and by being of such cross sectional form possess great rigidity and strength for resisting twisting or lateral strains. The caging, like the casing, is composed of a plurality of sections, the upper ends of the bars of each section being overlapped by the bars

of the section next above, bolts 4 extending through the overlapping bars and being engaged by nuts 5, at their inner ends, it being noted that the heads of the bolts are countersunk in the outer bars. The ends of the bars are beveled as at 6, the beveled surfaces 6 at the lower ends of the bars facilitating the insertion of the caging in the casing. The caging is adapted to be suspended from a suitable support at the surface level as customary in this class of pumps.

11 indicates a plurality of circular bands (one only appearing) secured rigidly to and between the bars 3, and connected to the peripheries of said bands and extending from one bar 3 to the adjacent one, are filling plates 12, these filling plates like the outer surfaces of the bars 3, fitting snugly against the inner face of the casing. Preferably these filling plates are horizontally corrugated as shown in Fig. 1, and form a series of pockets adapted to be filled with sand pumped upward with the water as herein-after explained, which sand tends to establish a water-tight joint between said plates and the casing and thus guard against what is known as "slippage" of the water.

Arranged closely below each band is a water break for interrupting the upward progress of the water in a spiral direction from the underlying impeller hereinafter referred to, and each water break consists of a plurality of plates 13, arranged vertically at suitable angles to form by preference, an equilateral triangle shaped frame, the plates being secured to each other and to the bars 3, the water break thus constituting a strong and rigid interrupter for the water and brace for the bars. Fitting snugly within each band 11 of the caging but not in frictional contact therewith, is a spiral impeller 15, having a central hub 16, and a peripheral flange 17, and the impellers are keyed rigidly upon a vertical shaft 18, which also extends through the water breaks as shown most clearly in Figs. 1 and 3, and said shaft like the caging is of sectional construction, with the section secured together by couplings 19. In practice the parts of sectional construction will preferably be in approximately ten foot lengths for convenience in handling and there will preferably be from two to four impellers and associated bands and water breaks within each ten-foot section.

The operation of shaft 18 effects the ro-

tation of the impellers carried thereby and the water elevated by the undermost impeller travels upward in a spiral direction within the casing until it comes into engagement with the undermost water break which obviously interrupts the spiral or whirling travel of the water and causes it to travel vertically upward a slight distance until engaged by the next impeller which again causes it to ascend spirally, these alternate spiral ascents and interruptions by the water breaks continuing until the water is ejected into the cylinder 20, from which it escapes from the upper end of the casing.

15 A pump of this character is intended primarily for use for deep well pumping and can be operated for long periods of time without shutting down and at very low cost of maintenance.

20 From the above description it will be apparent that I have produced a pump possessing the features of advantage enumerated as desirable in the statement of invention, and I wish it to be understood that I do not desire to be restricted to the exact details of construction shown and described as obvious modifications will suggest themselves to one skilled in the art.

30 Having thus described the invention what I claim as new and desire to secure by Letters Patent is:—

1. In a pump, a caging, and a waterbreak therein consisting of plates arranged to form an equilateral triangle centrally of and secured rigidly together and to the casing.

35 2. A pump, comprising a cylindrical casing, a shaft extending therethrough, a rotary impeller mounted on a shaft for caus-

ing water to flow upwardly through the casing, a skeleton caging, consisting of parallel bars fitting snugly in the casing, inclosing the impeller, a waterbreak below the impeller and inclosing the shaft, consisting of bars secured at their outer ends to the casing and also secured to each other, a band snugly encircling the impeller and secured to and within the caging, and filling plates engaging the periphery of the band between the bars of the caging.

3. A pump, comprising a cylindrical casing, a shaft therein consisting of a plurality of sections secured endwise together, a plurality of rotary impellers mounted on each section of the shaft for causing water to flow upwardly in the casing in a spiral direction, a caging of upright bars fitting snugly within the casing and around the impellers and consisting of a plurality of sections each provided with a band for and snugly encircling one of the impellers, filling plates secured peripherally to the bands between said bars and fitting snugly against the inner face of the casing, and water breaks fitting around the shaft below the impellers and bands and rigidly secured to and forming braces for the said bars; said water breaks each consisting of three plates arranged to constitute an equilateral triangle within the space inclosed by the said bars.

In testimony whereof I affix my signature, in the presence of two witnesses.

WALTER S. GREGG.

Witnesses:

H. C. RODGERS,

G. Y. THORPE.