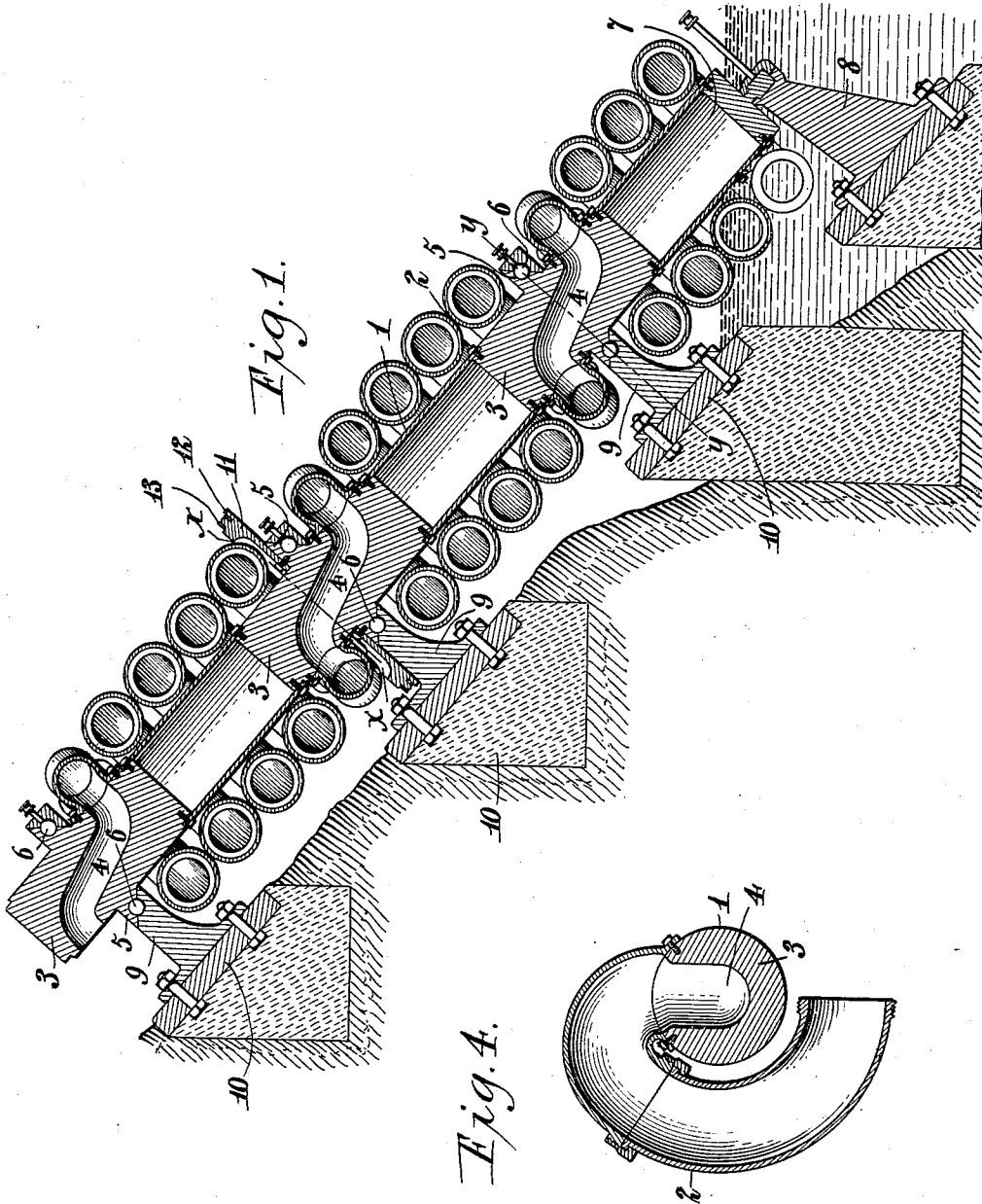


R. SNYDER.
WATER ELEVATOR.
APPLICATION FILED MAR. 22, 1911.

1,005,664.

Patented Oct. 10, 1911.

2 SHEETS—SHEET 1.



Witnesses:
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2 SHEETS-SHEET 2.

Fig. 2.

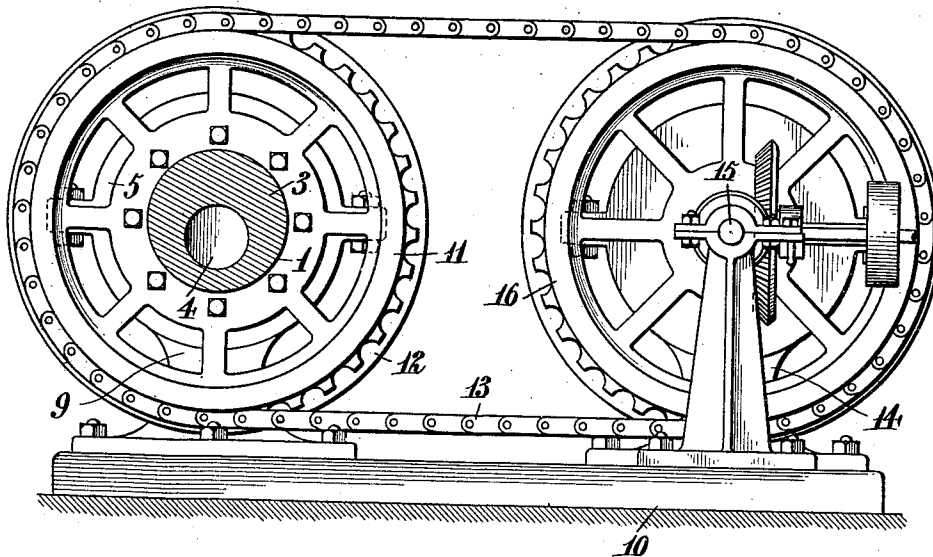
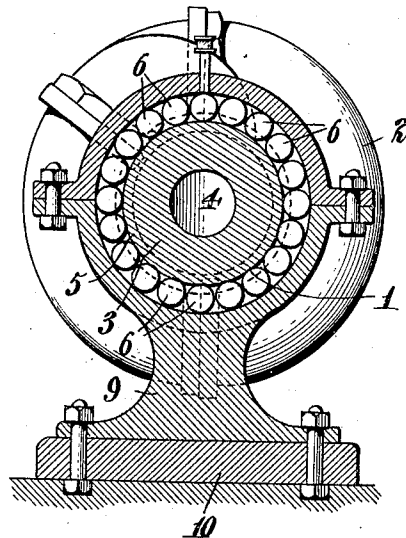


Fig. 3.



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UNITED STATES PATENT OFFICE.

ROBERT SNYDER, OF LOS ANGELES, CALIFORNIA.

WATER-ELEVATOR.

1,005,664.

Specification of Letters Patent.

Patented Oct. 10, 1911.

Application filed March 22, 1911. Serial No. 616,174.

To all whom it may concern:

Be it known that I, ROBERT SNYDER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Water-Elevators, of which the following is a specification.

The present invention relates to water elevating means involving the Archimedean screw principle and is designed to provide a novel structure of spiral elevator and peculiar mountings therefor, said mountings being of such construction as to equalize the load and to reduce the resistance to rotation to the smallest amount possible.

The invention consists of the novel features, details of construction and combination of parts, which hereinafter will be more particularly set forth, illustrated in the accompanying drawings, and pointed out in the appended claims.

Referring to the drawings, forming a part of the specification, Figure 1 is a vertical central longitudinal section of a water elevator embodying the invention. Fig. 2 is an enlarged section on the line $x-x$ of Fig. 1. Fig. 3 is an enlarged section on the line $y-y$ of Fig. 1. Fig. 4 is an enlarged detail view showing more clearly the means for connecting the sections of the spiral elevator to one another and to the shaft.

Corresponding and like parts are referred to in the following description, and indicated in all the views of the drawings, by the same reference characters.

The water elevator comprises a shaft 1 and an elevating spiral 2, each comprising a plurality of sections which are connected in any substantial way. The device is set at an angle of about forty degrees, this having been found to give the best results, but within the scope of the invention the angle of inclination may vary. The shaft is hollow and comprises sections which have their ends mated and secured by bolts or machine screws, thereby admitting of the sections being separated when required. This sectional formation of the shaft and the spiral elevator admits of lengthening or shortening the device to meet existing conditions. The shaft comprises bearing sections 3 which are similar to the remaining sections with the exception that a passage 4 is formed there-through in a diagonal direction so as to connect with the elevating spiral upon oppo-

site sides of the bearing. An annular extension 5 is had upon each bearing section and a face thereof is journaled to receive a ball bearing 6, said bearing embodying a casing and balls. The annular extension 5 is located intermediate the ends of the diagonal passage 4 so as not to interfere with the movement of the water when the device is in operation. The lowermost section 7 has a journal which is mounted in a bearing 8, which sustains the end thrust of the shaft.

A number of bearings 9 are provided and located at proper intervals in the length of the shaft 1 to afford a substantial support therefor. The bearings 9 and also the lower bearing 8 are secured to masonry 10, which forms a substantial foundation. Each of the bearings 9 comprises a standard and a cap piece, both being flanged and the flanges being apertured to receive the securing bolts. The part of the bearing 9 encircling the shaft 1 has a groove or channel formed therein to match the groove or channel in the outer flange 5 of the bearing section 3, the matching grooves or channels in the two parts forming a rest in which the antifriction bearing or the casing thereof is placed. The meeting parts of the bearing are formed on a miter joint, the part 5 being arranged above the bearing 9 so that the latter may carry the weight of the shaft and the parts mounted thereon.

The spiral elevator is hollow and consists of a sectional tube having the sections connected by unions or like couplings so that the parts may be separated when desired or the length of the elevator increased to meet varying conditions. The sections of the spiral elevator adjacent the bearing sections of the shaft are formed with outer flanges which are apertured to receive the machine screws or fastenings employed for connecting said sections to the parts 3. One of the bearing sections has a spur wheel 11 bolted thereto, the same being attached directly to the annular extension 5. A flange 12 is located upon the lower side of the spur wheel and acts as a guide to support the sprocket chains 13 by means of which the shaft and elevator are rotated.

The operating means for the elevator comprise a standard 14, a shaft 15, a spur wheel 16 fastened to the shaft 15, and means for imparting rotary movement to the shaft 15 from a suitable source of power. The parts

14, 15 and 16 constitute elements of a pump jack, the sprocket chain 13 connecting the spur wheel 16 with the spur wheel 11.

The elevator is arranged at an inclination so that the lowermost element of the spiral elevator has its lower portion immersed in the liquid to be elevated and its upper portion projecting above the surface of said liquid, so that at each revolution of the shaft 1 the lowermost element of the spiral elevator receives a quantity of the liquid and a portion of air after the well known principle of the Archimedean screw so that the liquid is elevated from a given source of supply and discharged at a higher point either for irrigating purposes or for lifting the liquid from one level to another.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention what is claimed as new, is:—

1. An elevator of the character described comprising a shaft having parts formed with approximately diagonal passages, bearings for the shaft supporting the latter at the points in which said diagonal passages are formed, and a spiral conduit encircling the shaft and having portions upon opposite sides of the bearing in communication with the diagonal passages formed therein.

2. In an elevator of the character described, the combination of a shaft arranged at an inclination and having parts formed

with approximately diagonal passages and having outer annular extensions, bearings for supporting the shaft and arranged to engage the outer annular extensions thereof, antifriction devices between the two parts of the bearings, and a spiral conduit encircling the shaft and having portions upon opposite sides of the bearings in communication with the ends of the diagonal passages formed in said shaft.

3. In an elevator of the character described, the combination of an inclined shaft having an approximately diagonal passage formed in a part thereof and having an outer annular extension with its bearing surface formed at an angle, a bearing for the shaft having a portion formed at an angle corresponding to the inclination of the outer extension of the shaft, antifriction devices between the matching surfaces of the bearing parts, and a spiral conduit passage having portions upon opposite sides of the bearing in communication with opposite ends of the diagonal passage formed in the shaft.

4. In an elevator of the character described, the combination of a shaft having a part formed with an approximately diagonal passage and having the outer annular extension between the ends of said diagonal passage, a bearing for the shaft cooperating with the outer annular extension thereof, a spiral conduit passage encircling the shaft and having parts upon opposite sides of the bearing in communication with the diagonal passage, a spur wheel secured to the outer annular extension of the shaft, and means for imparting rotary movement to said spur wheel.

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

ROBERT SNYDER.

Witnesses:

H. L. ST. CLAIR,
J. COLE BAIRD.