H. Z. HOYLMAN.

WATER ELEVATOR.

APPLICATION FILED JULY 17, 1907. RENEWED NOV. 4, 1908.

924,071. Patented June 8, 1909.

3 SHEETS—SHEET 1.

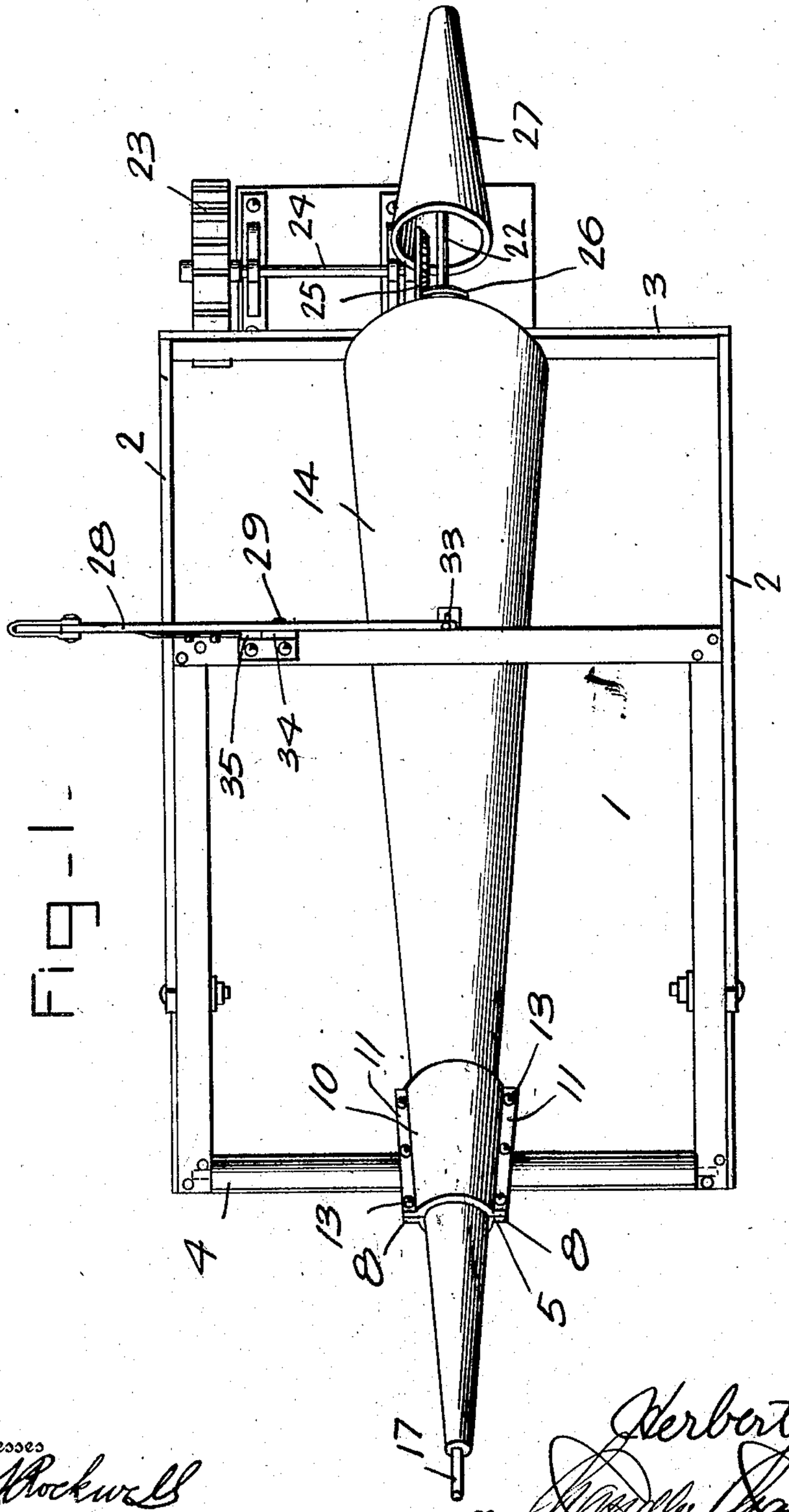

Fig. 1.

Witnesses

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3 SHEETS—SHEET 2.

Fig. 2

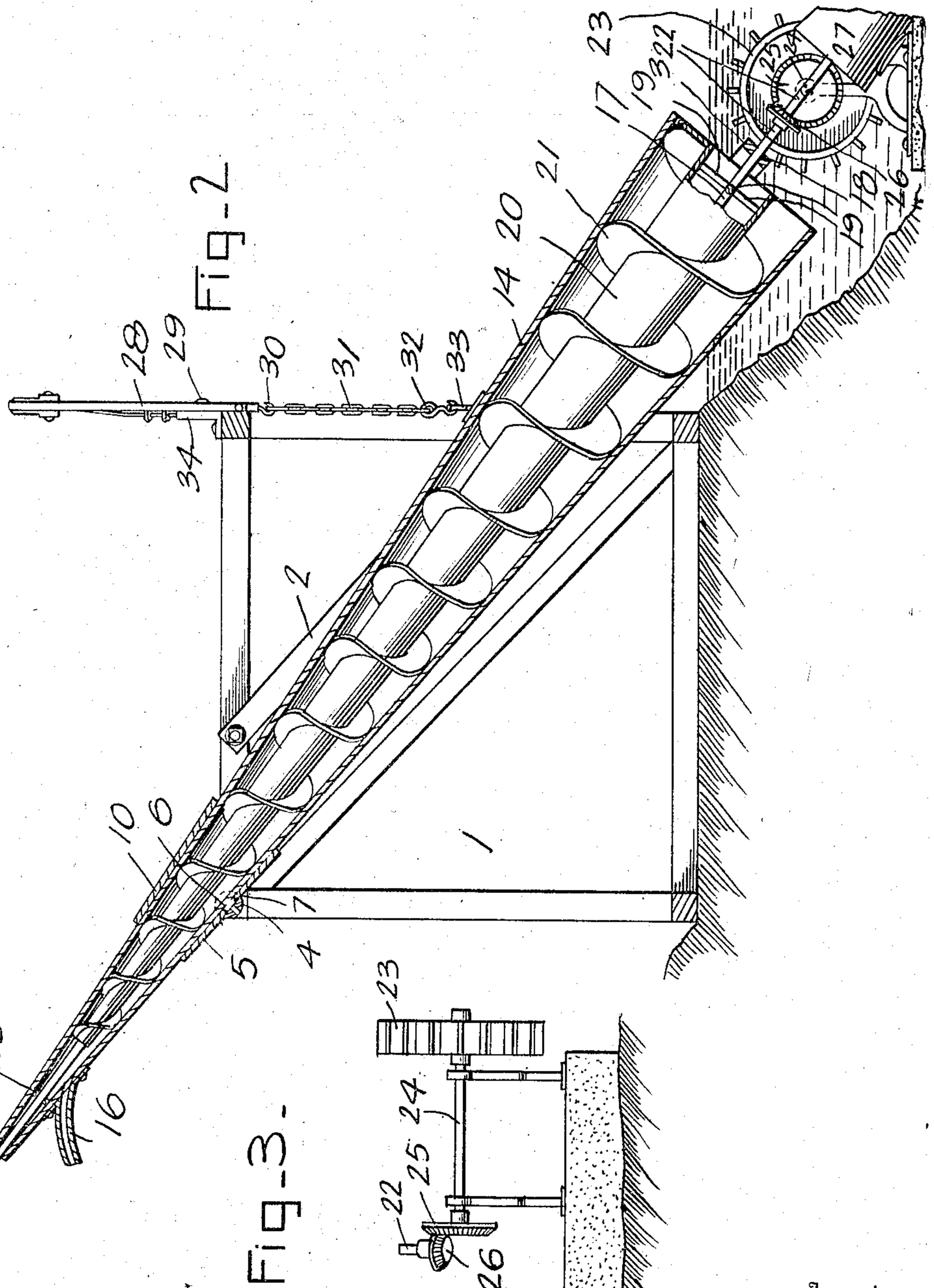

Fig. 3.

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3 SHEETS—SHEET 3.

Fig. 4

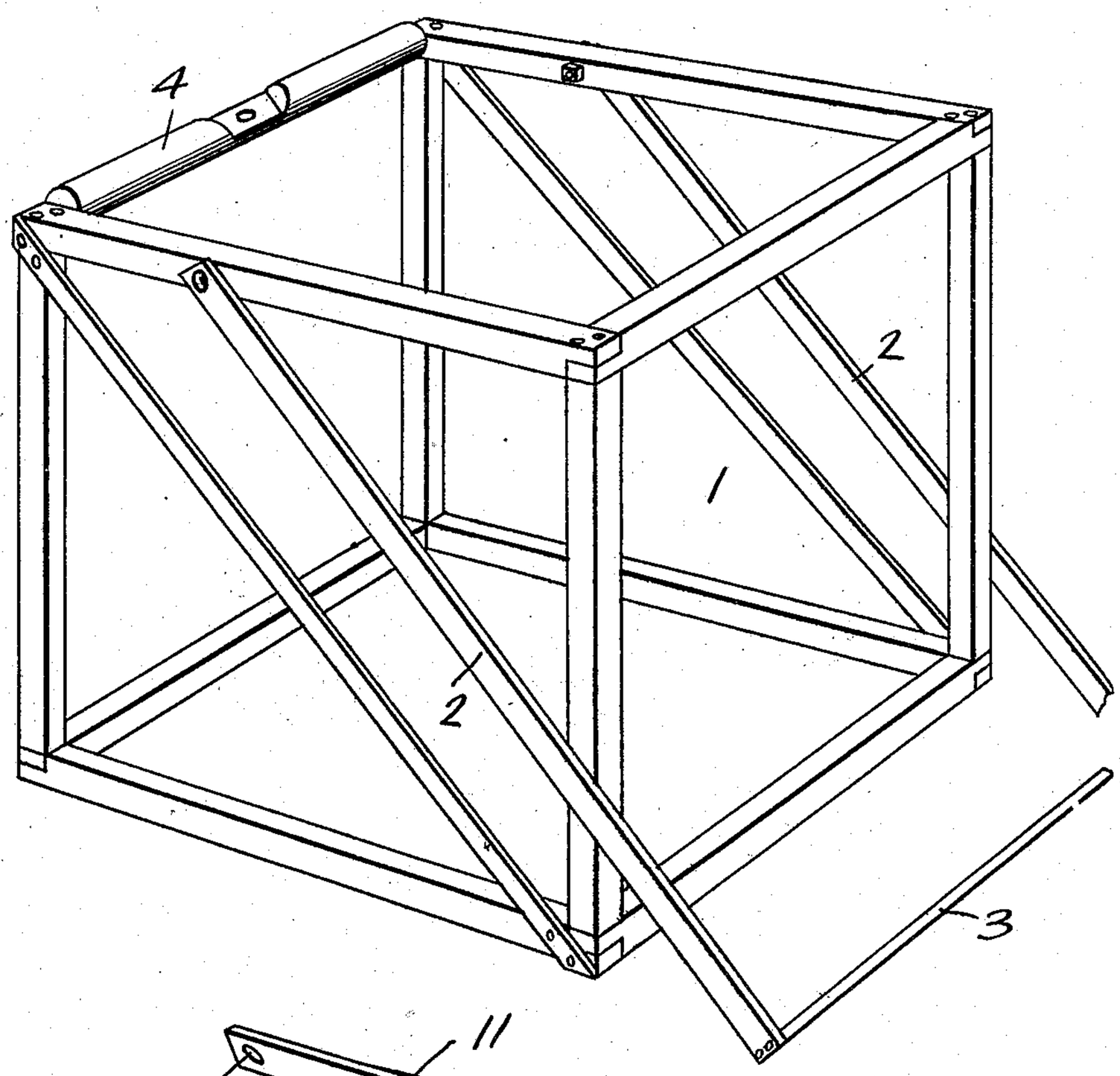

Fig. 6.

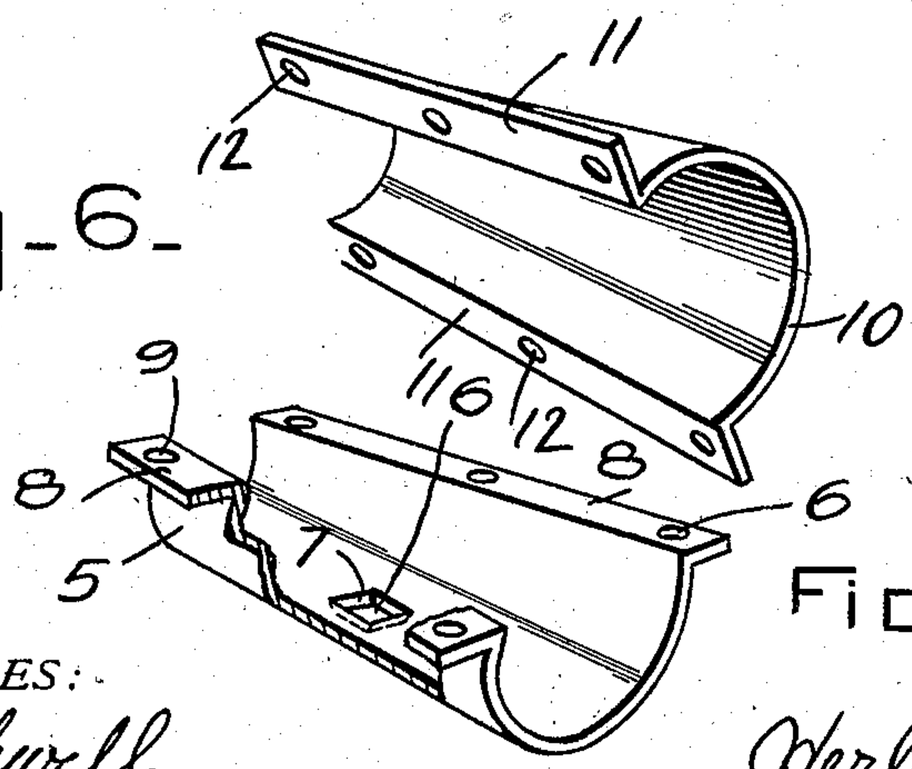

Fig. 5.

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UNITED STATES PATENT OFFICE.

HERBERT Z. HOYLMAN, OF CARLILE, WYOMING.

WATER-ELEVATOR.

No. 924,071. Specification of Letters Patent. Patented June 8, 1909.

Application filed July 17, 1907, Serial No. 384,156. Renewed November 4, 1908. Serial No. 461,092.

To all whom it may concern:

Be it known that I, HERBERT Z. HOYLMAN, a citizen of the United States, residing at Carlile, in the county of Crook, State of Wyoming, have invented certain new and useful Improvements in Water-Elevators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in water elevators and it has particular reference to an apparatus of this class designed for irrigating land or for other purposes, from small creeks or streams, to eliminate the necessity of damming.

Generally speaking the invention comprises an outside casing, an elevator casing in the form of an auger, and means for rotating said elevator casing so that the water is fed upwardly, the principle of operation being similar to that of the Archimedean screw.

In connection with an apparatus of the above type the invention aims as a primary object to provide a novel construction, combination and arrangement of parts, the details of which will appear in the course of the following description, in which reference is had to the accompanying drawings, forming a part of this specification, like characters of reference designating similar parts throughout the several views, wherein:

Figure 1 is a top plan view of a water elevator constructed in accordance with the present invention. Fig. 2 is a central longitudinal section thereof. Fig. 3 is a detailed view illustrating the gearing for operating the auger from a water wheel. Fig. 4 is a detailed view illustrating the construction of the frame from which the elevator is supported. Fig. 5 is a detailed view of the bottom plate upon which the elevator rests in the frame together with the adjuncts of said plate. Fig. 6 is a similar view of the top plate imposed upon the bottom plate illustrated in Fig. 5.

Referring specifically to the accompanying drawings, the numeral 1 designates the frame for supporting the elevator over a creek or other stream, said frame including forwardly and downwardly extending bars 2 united at their lower ends by a cross bar 3. Pivoted for axial rotation in the rear portion of the frame, is a cross bar 4, and the latter is cut away transversely thereof to afford a seat for a concave plate 5 formed with a central opening 6 of square conformation and having bevel sides 7, the plate 5 being illustrated more particularly in Fig. 5. The plate 5 is formed around its edges with a laterally projecting flange 8 constructed with apertures 9. The said plate 5 coacts with a similar plate 10 to hold the water elevator in the frame. The plate 10 is illustrated more particularly in Fig. 6 and is constructed with a laterally projecting flange 11 having openings 12 therein. The flange 11 is formed to overlie the flange 8 and is fastened thereto by means of bolts 13 engaged through the openings 11 and 9.

The water elevator comprises an outer casing 14 constructed of sheet metal and of cone shape. The casing 14 is open ended and converges from its lower to its upper end. At its open upper end said casing is provided with a bearing 15 for a rotatable shaft to be later described, and in advance of said bearing with an angular extension 16 affording a discharge pipe. A hollow shaft 17 is projected through the bearing 15. The shaft 17 extends entirely through the casing 14 and its lower end is journaled in an opening 18 provided in the cross bar 3. The shaft 17 is connected by means of spokes 19 with a hollow cone shaped casing 20 which feeds conformably in the casing 14 in spaced relation. The casing 21 is of materially less length than the casing 14 and its upper end terminates at a distance from the upper end of said casing 14. The casing 20 is constructed throughout its length with outwardly extending spiral convolutions 21, which are of sufficient depth to occupy the space between said casing 20 and the casing 14. The convolutions 21 are preferably of a strip separate from the casing 20 and which is attached thereto in any suitable manner. The shaft 17 projects through and beyond the bar 3 and has connection with a square rod 22 which is employed for adding strength and rigidity to the shaft 17, the bar 22 being employed to take up the strain of the transmission from a source of power supply.

In the preferred embodiment of the invention, the power for rotating the shaft 17 is furnished by means of a water wheel 23 carried upon a power shaft 24. The shaft 24 carries adjacent its inner end a bevel pinion 25 which meshes with a similar pinion 26 provided on the rod 22. At its lower end

the rod 22 carries a hollow guard 27 of inverted cone shape the function of which is to deflect extraneous matter away from the casing. The said guard is made hollow in order that extraneous matter may be carried thereinto by eddy currents.

The cross bar 4 is provided as previously noted in order that the elevator as an entirety, may be raised and lowered in accordance with the depth of the stream and the character and circumstances of use. Toward the end of effecting a pivotal adjustment of the elevator a lever 28 is provided which is pivoted as at 29 to the front cross bar of the frame 1. The lever 28 at its lower end carries a hook 30 with which is engaged a chain 31, the latter in turn carrying a hook 32 which is engaged with an eye 33 provided upon the casing 14. The lever 28 works about a rack quadrant 34 and carries a trigger operated pawl 35 for engagement with the teeth of said quadrant to hold the lever 28 at selected positions in accordance with the adjustment desired.

While the shaft 17 is shown as rotated by the water wheel 23, it is obvious that other forms of power generating mechanisms may be equally as advantageously employed. For instance, the upper end of said shaft may be extended and connected either directly or by suitable gearing to a wind mill. It is not deemed necessary to show this application of the invention, which is merely mentioned in passing for the purpose of example.

In use, as the shaft 17 rotates, the casing 20 will rotate, and the spiral convolutions 21, will feed water from the creek upwardly. The water thus elevated after it passes beyond the zone of the convolutions, is forced through the extension 16 as a discharge pipe, it being understood that the aperture 15 is suitably packed to prevent leakage. The provision of the concentric casings of cone shape, insures of quick action in the elevation and discharge of water, since the amount of water admitted into the lower end of the casings will be fed upwardly a greater speed by reason of the conformation thereof, than is the ease in those structures which are of uniform diameter throughout their extent.

The apparatus embodied in the present invention is simple in construction, inexpensive to manufacture and practical and efficient in use.

From the foregoing description it will be seen that simple and efficient means are provided for accomplishing the objects of the invention, but while the elements herein shown and described are well adapted to serve the functions set forth, it is obvious that various minor changes may be made in the proportions, shape and arrangement of the several parts, without departing from the spirit and scope of the invention as defined in the appended claim.

What is claimed is:

An apparatus of the type set forth, comprising an outer stationary casing, an inner casing arranged in spaced concentric relation thereto, spiral convolutions carried by the inner casing and occupying the space between the same and outer casing, a shaft projected through the inner casing and positively connected therewith, means for rotating said shaft, and a cone shaped deflector carried on the lower end of said shaft.

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

HERBERT Z. HOYLMAN.

Witnesses:

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CHAS. W. LANEY.