(No Model.) 2 Sheets—Sheet 1.

J. W. THORP.

WATER ELEVATOR.

No. 327,205. Patented Sept. 29, 1885.

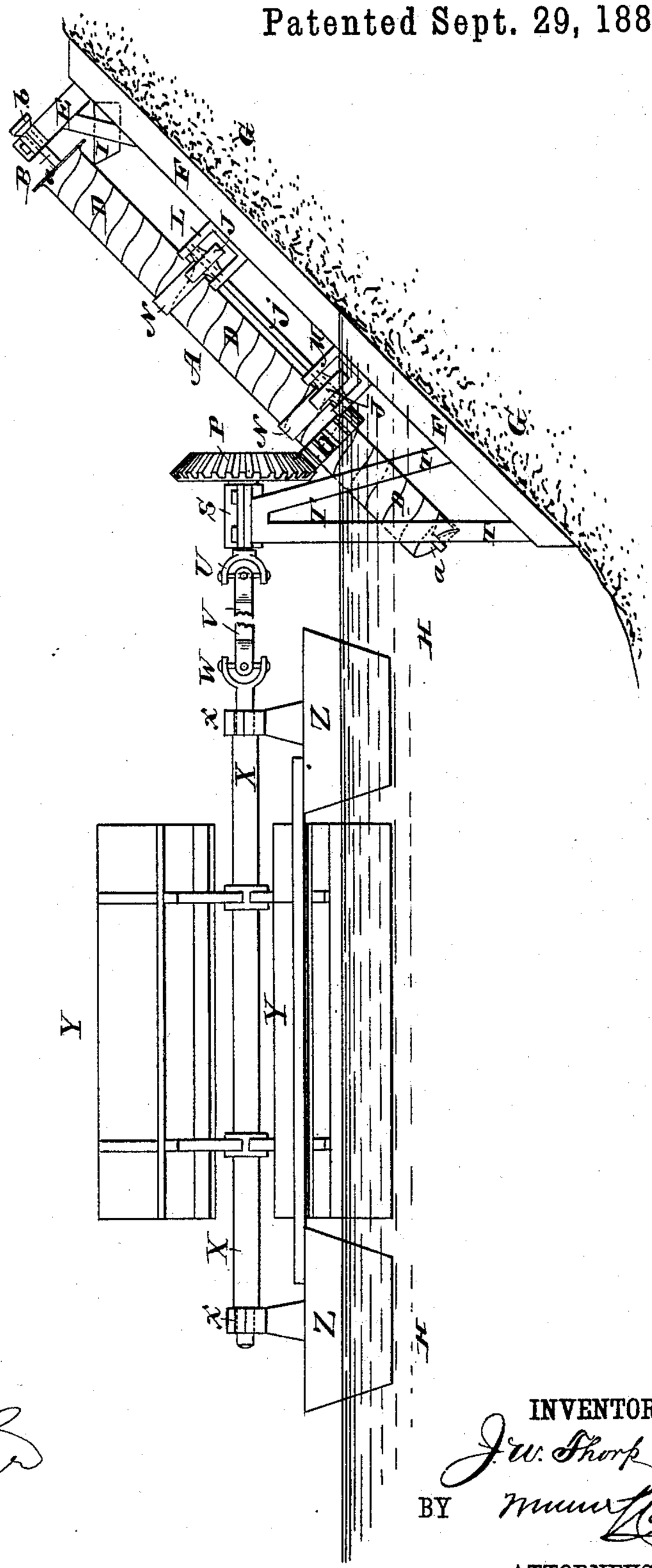

Fig. 1.

WITNESSES:

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C. Sedgwick

INVENTOR:

J. W. Thorp

BY Munn & Co

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

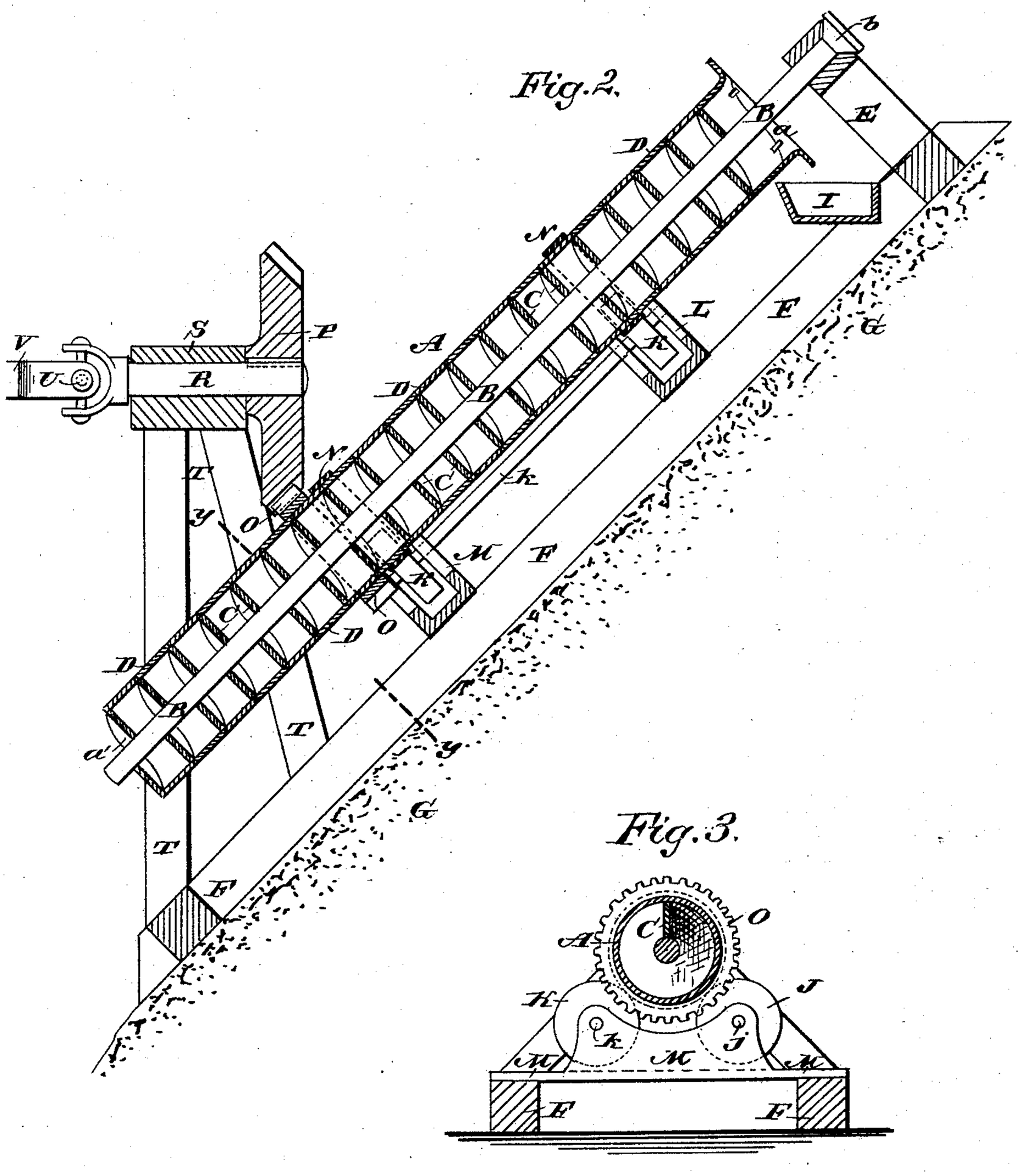

Fig. 3.

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UNITED STATES PATENT OFFICE.

JUSTUS W. THORP, OF DAYTON, WASHINGTON TERRITORY, ASSIGNOR TO HIMSELF AND JAMES E. HENSLEY, OF SAME PLACE.

WATER-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 327,205, dated September 29, 1885.

Application filed May 23, 1885. (No model.)

To all whom it may concern:

Be it known that I, JUSTUS W. THORP, of Dayton, in the county of Columbia and Territory of Washington, have invented a new and Improved Water-Elevator, of which the following is a full, clear, and exact description.

My invention relates more particularly to elevators for raising water from a water-course to a sluiceway for use in hydraulic-mining operations; and it has for its object to promote the efficiency and durability of this class of apparatus.

The invention consists in a water-elevator comprising a lifting-screw hung from its upper end and supported on anti-friction rollers, whereby a lower end bearing for the screw is dispensed with; and also in a novel arrangement of anti-friction rollers to support the screw; and also in universally-jointed shaft-connections from the driving-gearing of the screw to a water-wheel in the stream from which the water is lifted by the screw; and also in other details of construction and combinations of parts of the apparatus, all as hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my improved water-elevator with the driving-shaft partly broken away. Fig. 2 is an enlarged view in longitudinal sectional elevation of the water-lifting screw, its supports, and drive-gearing; and Fig. 3 is a cross-sectional elevation taken on the line *y y*, Fig. 2.

The letter A indicates the water-lifting screw, which I make with a central shaft, B, around which is fitted closely edgewise the spiral web or flange C, to the outer edges of which is soldered or otherwise secured the outer casing, D, of the screw, which casing, as shown, consists of a narrow strip of metal about as wide as the pitch of the screw flange or web C, and which is wound spirally around the flange and soldered to it, the flange preferably being soldered to the shaft B, which may be made of a solid or hollow bar of metal or other suitable material, the flange C and casing D being preferably made of galvanized sheet metal, which construction is strong, light, and durable.

As near as convenient to the open-mouthed upper end, *a*, of the screw A, the shaft B has a conical head, *b*, which has a bearing in a strong frame, E, fixed to the bed or sill-timber frame F, which is secured suitably to the bank G of the river or water-course H, from which the water is to be taken into the lower open end or mouth, *a'*, of the screw A, which is submerged in the water, and by the revolution of the screw the water will be discharged from its upper end, *a*, into a trough or sluiceway, I, to be conveyed thereby to any desired place or places for utilization in hydraulic-mining operations.

To give a substantial support to the body of the screw A, I provide opposite pairs of anti-friction rollers or wheels, J J K K, the pairs of wheels J J being journaled on or fixed to a shaft, *j*, having bearings in upper and lower bracket-frames, L M, fixed to the sill-frame F, and the rollers K K are journaled on or fixed to a shaft, *k*, having its bearings in said frames L M, the pairs of rollers standing at opposite sides of the center of the screw A, and far enough apart to prevent lifting of the screw from them by the operation of the driving-gearing presently described.

Where the screw A rests on the rollers J K, I encircle it with heavy metal bands M N, which sustain all the weight of the screw coming on the rollers and provide a smooth track to run on the rollers and relieve the screw-casing of wear, which otherwise would come upon it.

To apply power to rotate the screw, I fix to the screw-case D, and preferably below the lower rollers, J K, the toothed rim or gear O, which meshes with the bevel gear-wheel P, fixed to a shaft, R, which is journaled in a long box or bearing, S, at the head of a frame, T, which is fixed to and supported by the sill-frame F. (See Figs. 1 and 2.) The shaft R connects by a universal joint, as at U, with a shaft, V, which is shown broken away, but may have any desired or necessary length, and the shaft V connects at its outer end by a universal joint, as at W, with the shaft X of the water or current wheel Y, said

shaft X being journaled in boxes *x x* on standards fixed to floats or pontons Z, which rise and fall with the water and always submerge the paddles of wheel Y to a like depth to receive the best effect of the flowing current for turning it, and consequently the shafts V R and gear-wheel P, for imparting motion to the screw A for lifting the water and discharging it into the sluiceway I, as above described.

It is obvious that the universal-joint connections W U of the shafts X V R will allow the smooth working of the driving-gearing to rotate screw A as the water-wheel Y rises and falls with the water, and, if desired, the entire sill-frame F may be fitted to slide in ways on the bank of the stream, so as to be raised with the screw A and its supports, above described, in time of floods or very high water, and to be lowered in time of very low water.

One of the important advantages of my method of supporting the water-lifting screw A by the upper conical head, *b*, of the shaft and the anti-friction rollers is that a lower journal-bearing for the shaft B is dispensed with; hence any grit or sand which might enter the screw at the lower end can not work into a lower bearing to quickly wear and destroy it, and a long-continued smoothness of working of the apparatus is insured, which promotes its effectiveness and durability.

The screw A may have any requisite length and capacity, and may be used for elevating other materials or substances besides water, as will readily be understood.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A water-elevator, comprising a lifting-screw hung from its upper end and supported on anti-friction rollers, substantially as described, whereby a lower end bearing for the screw is dispensed with, as set forth.

2. A water-elevator, comprising a lifting-screw, A, provided with a head, *b*, on its shaft B, the frame E F, and anti-friction rollers journaled on the sill-frame, substantially as herein set forth.

3. A water-elevator, comprising a lifting-screw, A, provided with a head, *b*, on its shaft B, the frame E F, and anti-friction rollers, as at J J K K, arranged on shafts *j k*, journaled in the frame at opposite sides of the center of the screw, substantially as herein set forth.

4. The combination, in a water-elevator, of a lifting-screw, A, provided with a head, *b*, on its shaft B, the frame E F, anti-friction rollers supporting the screw, a drive-gear, O, on the screw, the drive-gear P, and shafts R V X, connected by universal joints U W, and a current-wheel, Y, on shaft X, and supported by floats Z in the water-course, substantially as herein set forth.

JUSTUS W. THORP.

Witnesses:
J. H. HESLER,
C. F. MILLER.