

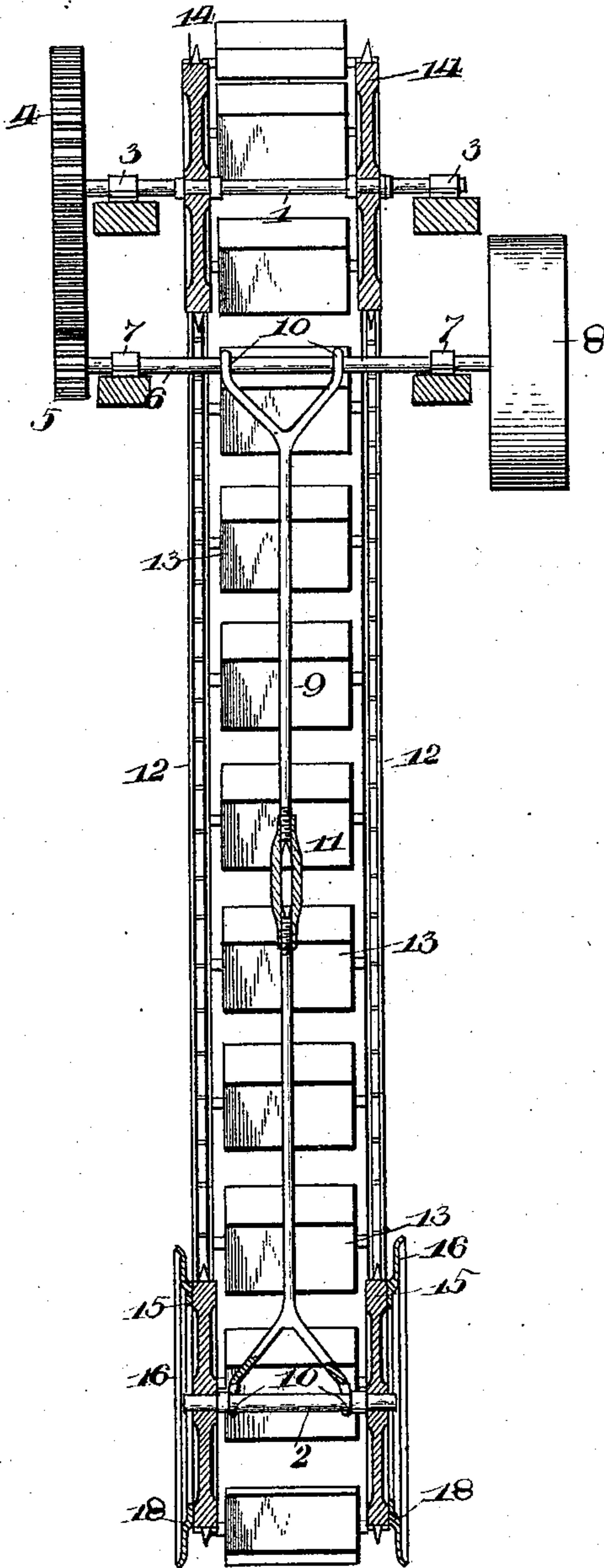
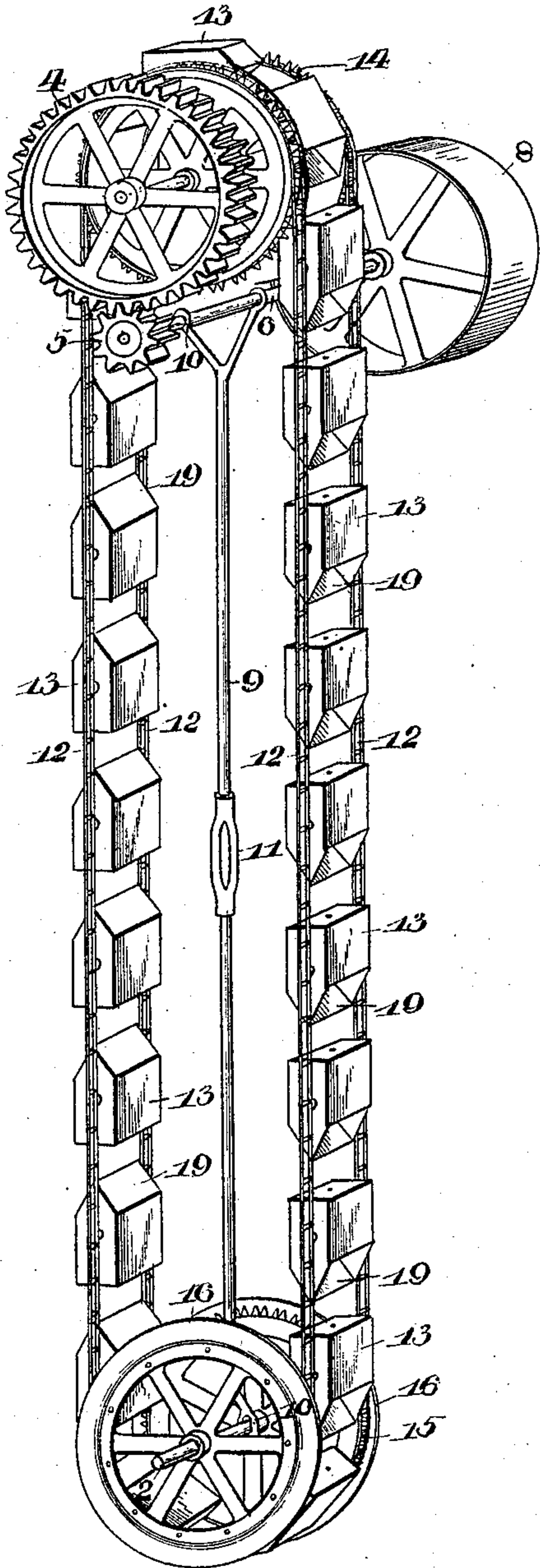
(No Model.)

2 Sheets—Sheet 1.

C. H. SEAMAN.
IRRIGATING PUMP.

No. 576,699.

Patented Feb. 9, 1897.



Inventor,

Witnesses

W. H. Doyle
D. P. Wharton

By *W. S.* Attorneys,

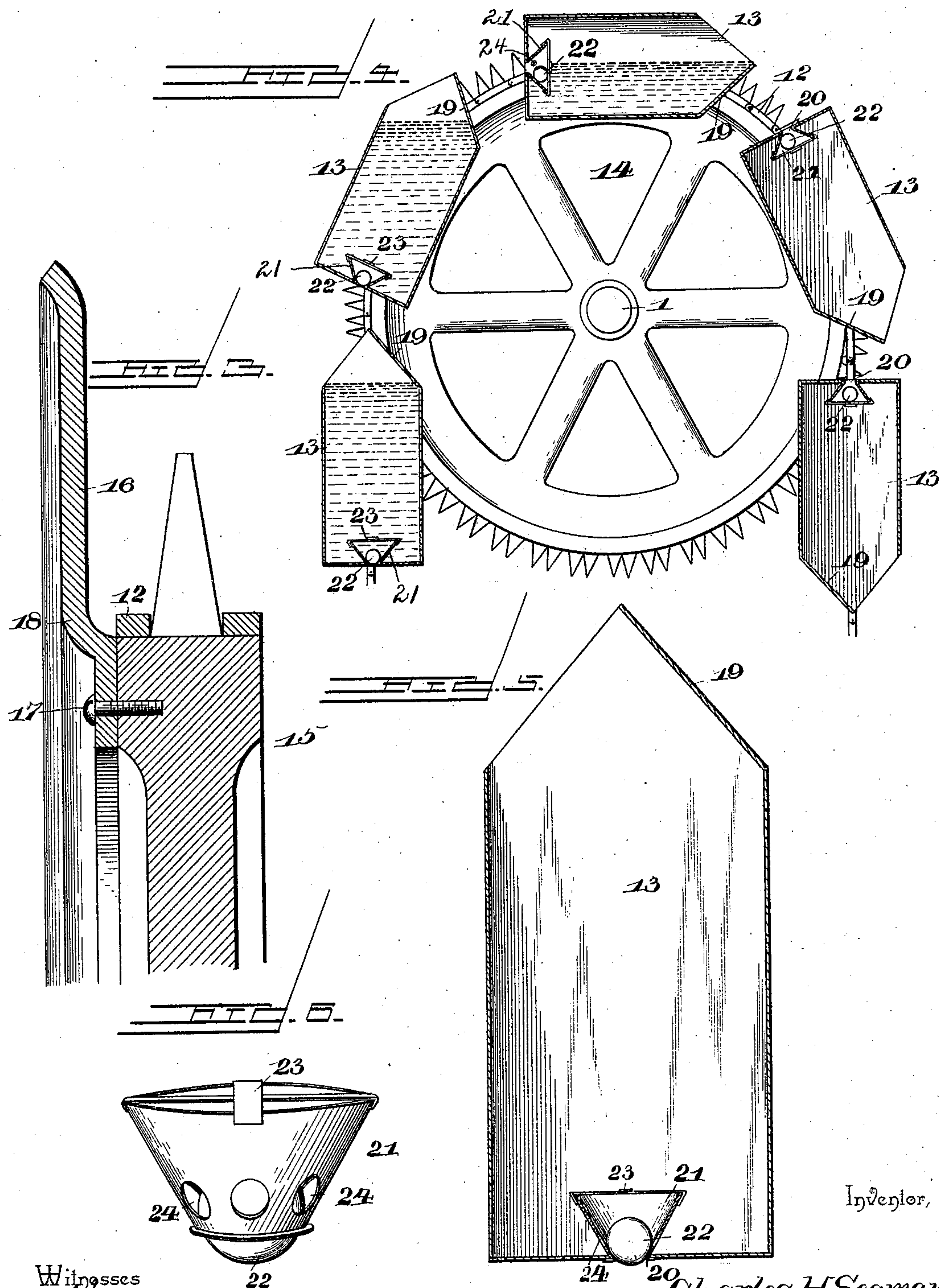
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2 Sheets—Sheet 2.

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Inventor,

Witnesses

By *W* S Attorneys.

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UNITED STATES PATENT OFFICE.

CHARLES H. SEAMAN, OF ST. JOSEPH, MISSOURI.

IRRIGATING-PUMP.

SPECIFICATION forming part of Letters Patent No. 576,699, dated February 9, 1897.

Application filed August 19, 1895. Serial No. 559,816. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. SEAMAN, a citizen of the United States, residing at St. Joseph, in the county of Buchanan and State of Missouri, have invented a new and useful Irrigating-Pump, of which the following is a specification.

This invention relates to irrigating-pumps; and it has for its object to effect certain improvements in pumps of the endless-chain type that are especially adapted for use in raising water from wells, rivers, or canals where a large volume of water is required for irrigating and other purposes.

To this end the invention contemplates a simple and efficient construction of pump, the parts of which are so constructed and arranged as to insure a positive operation, and the invention also contemplates a special improvement in the elevator-cups of the pump whereby the cups shall be entirely relieved of air and dirt when the same are carried down into the well or river from which the water is elevated to the point of use.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a perspective view of a chain irrigating-pump constructed in accordance with this invention. Fig. 2 is a central vertical sectional view of the same. Fig. 3 is an enlarged detail sectional view of a portion of one of the idler sprocket-wheels and the circular chain-guard flange thereof. Fig. 4 is an enlarged detail sectional view of the upper portion of the pump. Fig. 5 is an enlarged central vertical sectional view of one of the elevator-cups. Fig. 6 is a detail in perspective of the combined valve cage and seat removed from the cup.

Referring to the accompanying drawings, 1 2 designate, respectively, upper and lower wheel-shafts that are adapted to be arranged conveniently adjacent to the well, river, or canal from which the water is to be elevated, and the upper wheel-shaft is arranged to turn in the bearing-boxes 3, that are mounted on suitable stationary supports above the source

of supply for the pump, and the said upper wheel-shaft 1 has mounted thereon, near one end, a gear-wheel 4, which meshes with the smaller pinion 5 immediately below the same. The pinion 5 is mounted on one end of the drive-shaft 6, turning in bearings 7, also mounted on suitable stationary supports. The said drive-shaft 6 is arranged horizontally below the upper wheel-shaft 1 and has mounted on the end opposite the pinion 5 the drive-pulley 8, which receives the power-belt for operating the pump.

The upper and lower wheel-shafts 6 and 2 are connected by an intermediate sectional connecting-rod 9, provided at its upper and lower ends with the bearings 10, in which loosely turn the shafts 6 and 2, and the bearings 10 at the lower end of the sectional rod 9 are larger than the diameter of the lower shaft 2, in order to allow said lower shaft a free play, which is necessary to prevent a straining or disarranging of parts, inasmuch as the lower wheel-shaft is suspended freely in the water of the well, river, or canal. The said sectional connecting-rod 9 has the separate sections thereof adjustably connected together by a screw-coupling 11, which serves the double function of adjusting the pump to the depth of water, in connection with the lengthening and shortening of the chain 12, and also of maintaining the chains 12 adjusted to the proper tension to insure the steady operation of the pump.

The chains 12 are ordinary endless sprocket-chains arranged parallel with each other and having fitted therebetween a series of water-elevator cups 13, which travel downwardly into the water to be filled and then upwardly to the point of discharge at the top of the pump. The pair of endless chains 12 pass around the upper and lower pairs of sprocket-wheels 14 and 15, respectively, the lower of which wheels 15 are mounted on opposite ends of the lower wheel-shaft 2 and form idler-wheels for the chain to maintain the same in proper working position as the elevator-cups 13 are carried down into the water. The upper pair of spaced sprocket-wheels 14 are mounted on the upper wheel-shaft 1 and serve to impart motion to the endless chains and the elevator-cups carried thereby. The

lower pair of sprocket-wheels 15, around which pass the lower portions of the chains 12, are provided at their outer peripheral edges with the circular guard-flanges 16, which project beyond the sprockets of the wheels 15 and form guards for the chains 12 to prevent the same from twisting out of engagement with the sprockets of the lower chain-wheel, inasmuch as the chains have this tendency by reason of the fact that the entire series of ascending elevator-cups are weighted or filled, while the entire series of opposite descending cups are empty, thereby producing an uneven strain upon the chains. The circular guard-flanges 16 are preferably detachably secured to the wheel 15 by means of fastening-screws 17, as illustrated in the drawings, and directly at the base of the sprockets of the wheels 15 the said flanges 16 are provided with the chain-offsets 18, which allow the chains to snugly register with the sprockets of the wheels 15, around which they pass.

While the guard-flanges 16 form guards and also guides for the outside edges of the chains as they pass over the wheels 15, it will be noted that the buckets which pass in between the pair of wheels 15 serve to hold the inner edges of the chains properly in position to insure their engagement with the sprockets of the wheels 15. At this point attention is also called to the fact that the lower idler sprocket-wheels 15 are positively prevented from being lost in the event of a disengagement thereof from the chains, by reason of the sectional rod 9, which serves to properly support the idler sprocket-wheels in position within the water.

The elevator-cups 13 are illustrated as being provided at one side of the upper open ends thereof with the angularly-disposed deflecting-plates 19, which serve to direct the water away from the cups to the proper point of discharge, and in the present invention the said cups are provided in the bottoms thereof with the central valve-openings 20. The valve-openings 20 of the elevator-cups are adapted to have suitably fitted therein the small or tapered end of a conical combined valve cage and seat 21.

The conical combined valve cage and seat 21, that is fitted to the bottom of each elevator-cup, is arranged entirely within the cup and is flared upwardly toward the open upper end thereof, and the sides of the said combined cage and seat are continuously sloping or inclined, so as to form at the contracted or small end thereof a smooth and perfect seat for the ball-valve 22, that is arranged to loosely work inside of the said combined cage and seat. The ball-valve 22 is held to its work within the combined cage and seat by means of the diametrically-crossed stop-bars 23, secured across the upper flared end of the cage and seat, which thereby forms not only a cage for the valve to permit of the free working thereof, but also provides a

water-tight-fitting seat therefor, so that the water cannot escape through the valve-opening 20 when the elevator-cup is in its upright position and is filled with water.

At a point adjacent to the contracted or small extremity of the combined cage and seat the latter is provided with a circular series of vent openings or holes 24, which communicate with the interior of the elevator-cup directly adjacent to the bottom thereof and provide for the quick and complete expulsion of air from the bottom of the elevator-cup when the same is carried into the water, and also provide for the cleaning out of accumulations of dirt in the bottom of the cup and the combined valve cage and seat.

It will be understood that as the elevator-cups are carried downwardly within the well the valves 22 fall down against the transverse stop-bars 23 to uncover the bottom valve-openings 20 of the cups and allow the free escape of air directly through the combined cage and seat and also through the vent-openings 24, which lie close to the bottom of the cups, and by reason of thus providing for the free and rapid escape of air from the interior of the cups there will be no appreciable resistance to the complete and rapid filling thereof. After the cups have been filled with water and assume an upright position the valves close and hold the water within the cups until discharged. When the cups are inverted and are on their downward travel, with the valve-openings uncovered, it will be obvious that by reason of the speed of the downwardly-traveling cups the air, as it is forcibly expelled through the valve-openings in the bottom of the cups by the water, will force out through the vent openings or holes 24 any accumulations of dirt that may have settled in the bottom of the cups or in the combined valve cage and seat.

By reason of arranging the valve device just described entirely within the elevator-cups the valve is absolutely prevented from being opened except by an inversion of the cup as it is carried down into the water in the well, and the specific shape of the combined cage and seat 21 provides such a perfect seat for the valve as to prevent the dislocation thereof by any vibration of the pump during its operation.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

In an irrigating-pump, the combination with a water-elevator cup provided in its bottom with a valve-opening; of a conical combined valve cage and seat arranged wholly within the cup and fitted at its small end in said valve-opening, said combined cage and seat having continuously-sloping sides, and

a circular series of vent openings or holes disposed within the cup in a plane at one side of the bottom of the same and the seat proper of the said combined cage and seat, and a
5 ball-valve arranged entirely inside of the cage and seat and adapted to seat itself below the plane of said vent openings or holes, said vent openings or holes communicating with the space exterior to the valve-opening only when

said ball-valve is unseated, substantially as is set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES H. SEAMAN.

Witnesses:

FRANK J. M. SCHUSKE,
CHARLES SEAMAN.