No. 854,336. PATENTED MAY 21, 1907.

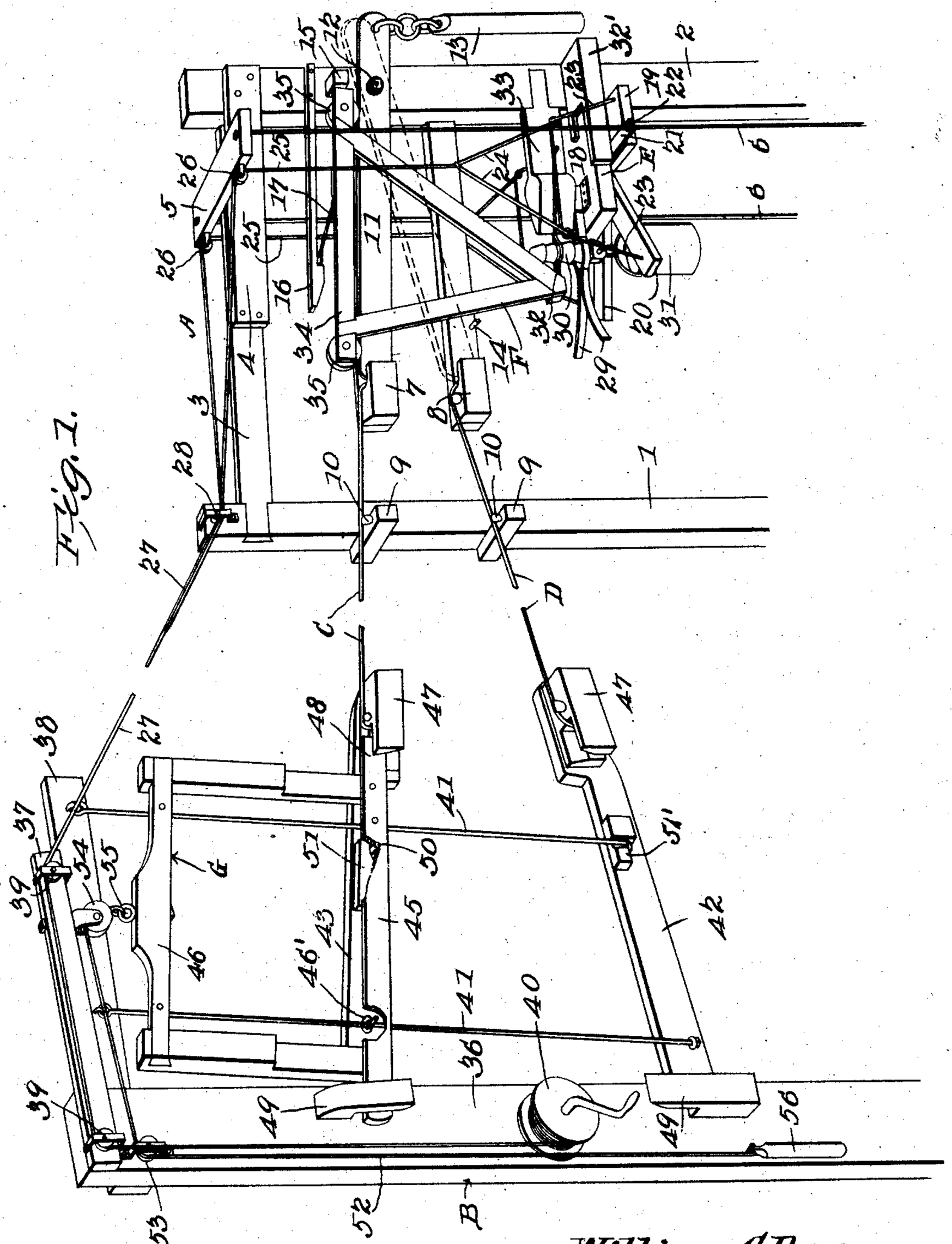
W. C. DAY.

WATER ELEVATOR AND CARRIER.

APPLICATION FILED JULY 30, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



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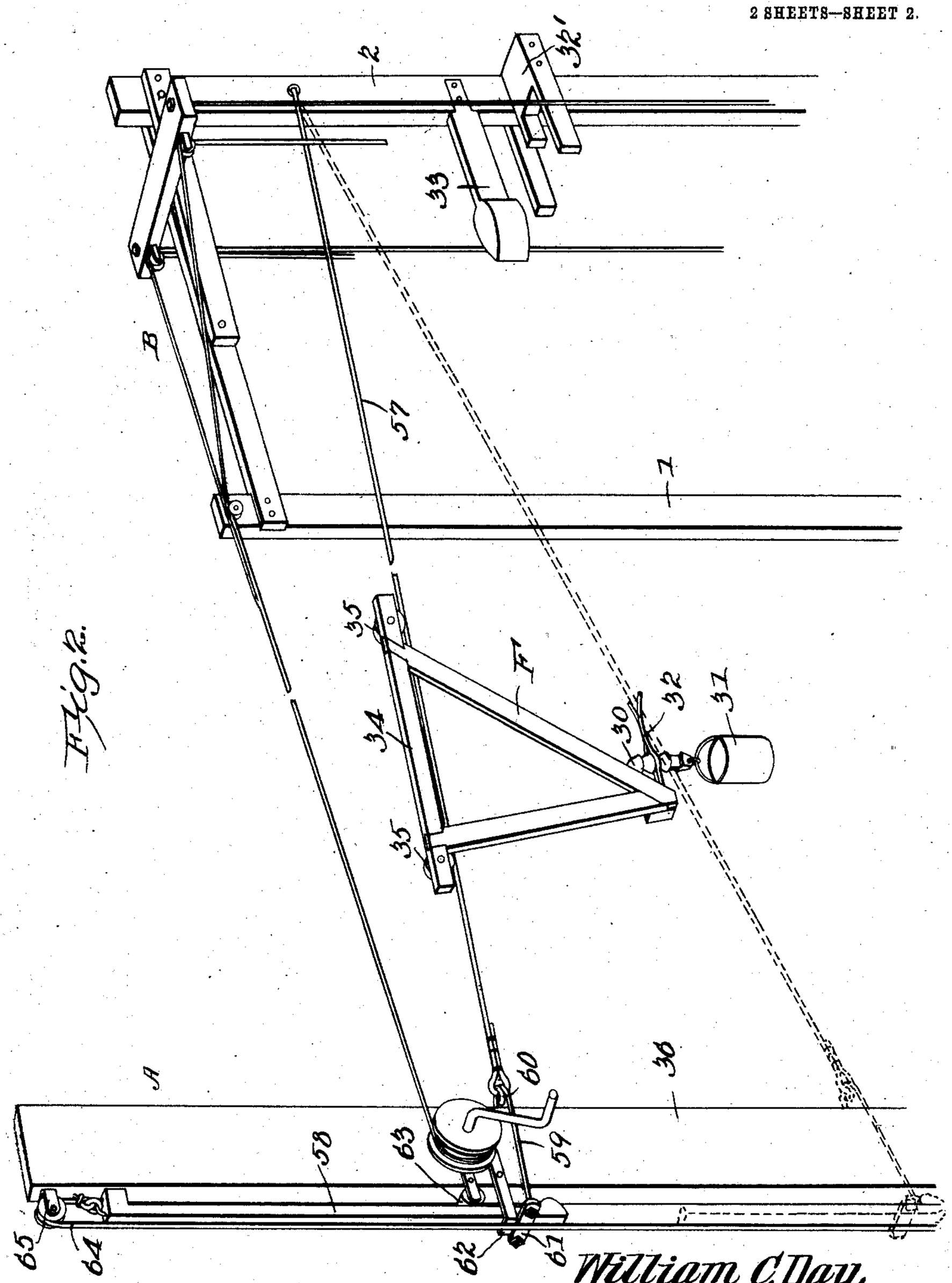

Fig. 2.

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WATER ELEVATOR AND CARRIER.

No. 854,336. Specification of Letters Patent. Patented May 21, 1907.

Application filed July 30, 1906. Serial No. 328,443.

To all whom it may concern:

Be it known that I, WILLIAM CALVIN DAY, a citizen of the United States, residing at Winchester, in the county of Clark and State of Kentucky, have invented a new and useful Water Elevator and Carrier, of which the following is a specification.

The present invention relates to apparatus designed primarily for raising water from a well or other source and transferring it to a more or less remote point for distribution and use, and while the invention is of particular advantage in this connection, it is not necessarily limited to such use.

One of the objects of the invention is to simplify the construction of this class of devices, improve the operation, and render them thoroughly reliable.

With this object in view, and others, as will appear, as the nature of the invention is better understood, the invention comprises the novel features of construction and arrangement of parts, described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate certain of the embodiments of the invention, Figure 1 is a perspective view of the apparatus arranged with the mechanisms at the ends of the system for water carrying their relative positions but closely grouped together for convenience of illustration. Fig. 2 is a similar perspective view showing a modified construction of the water carrying system.

Corresponding parts in the several figures are indicated throughout by similar characters of reference.

The present invention is adapted to be used more commonly between a well or other source of water and a house or other place of consumption, the two being located at a more or less distance apart, so that the inconvenience of manually carrying water can be dispensed with. The apparatus, according to one of its embodiments, comprises a frame A located at the well or other source, a frame B located at the house or station of distribution, with cables C and D stretched between them, the former being arranged on such an incline as to permit the bucket carriage to return to the well by gravity, while the cable D is arranged at an opposite incline so that the bucket carriage will travel from the well to the station also by gravity.

The well frame comprises two uprights 1 and 2 that may be planted in the ground or otherwise suitably supported, and the cross beam 3. At the cross beam, a diagonal brace is arranged that is connected at its ends to the upright 2 and the cross beam itself. Suitably secured on the top of the cross beam and brace, the latter being indicated at 4, is a transverse bar or member 5 from the ends of which extend parallel guides 6 in the nature of wires, cables, or the like, which are anchored at their bottoms in the well in any suitable manner. These wires 6 serve to guide the movement of the lift E whereby the bucket is lowered into the well to be filled and raised therefrom.

Extending from the upright 2, substantially in a horizontal direction toward the upright 1, are two arms 7 and 8 to the outer ends of which are attached, or anchored, respectively, the conveyer cables C and D. On the upright 1 are arranged brackets 9 having supports 10 for the cables. Intermediate the two arms is a switch 11 pivoted on the upright 2 at 12 near one of its ends and counterbalanced by the weight 13. The weight 13 is of sufficient mass to maintain the blade-like switch 11 in the position shown in full lines, so as to be on a level with the return cable C in order to permit the bucket carriage to ride freely from the cable C onto the switch 11. After the bucket carriage, which is indicated at F, moves onto the switch, the latter will tilt under the weight thereof to the position shown in dotted lines, so that the top edge of the switch will be in line with the cable D, in order to permit the carriage to move back to the station after the bucket or pail has been replenished. A suitable stop on the lower arm 8, as indicated at 14, is provided, for preventing the switch from moving too far.

In order to prevent the carriage F from rebounding, when it strikes upon the abutment 15 arranged on the upright 2, a notched member 16 is supported on the upright just above the path of the carriage F, so that the leaf spring 17 will engage the notch approximately simultaneously with the carriage striking the abutment 15.

The bucket lift E comprises a base plate 18 having a bottom cross piece 19 and two obliquely extending members or fingers 20, all suitably connected together. The lift is guided by two diametrically arranged arms

21 (only one being shown in Fig. 1) having apertures 22 through which the guides 6 pass. On opposite sides of the carriage are inverted U-shaped irons 23 to the corners of which are attached the branch ends 24 of the elevating cables 25. These cables pass around pulleys 26 arranged on the front edge and at the ends of the bar 5. Thence they pass toward the upright 1 and unite in a single cable 27 that extends from the well frame to the station frame, the same passing around a sheave 28 located at the upper end of the upright 1. On the base plate 18 of the lift or elevator E are two forwardly extending and diverging spring jaws 29 that are adapted to receive between them and tightly grip the notched suspending link 30 that carries the pail or bucket 31. The height to which the lift can be carried is determined by the stop 32′ on the upright 2. When in this position, the fingers 29 are at the proper level to grip one of the notches of the link 30 when the bucket carriage F moves upon the switch 11 from the cable C.

The bucket carriage comprises a triangular frame having its apex inverted, at which point are arranged two diverging spring fingers or jaws 32 extending in a direction opposite from the jaws 29 of the lift E and at a slightly higher level. These jaws are adapted to engage one of the upper notches of the bucket supporting link 30 so as to hold the bucket during its transit between the well and station. As the carriage F moves upon the switch 11, the jaws 32 are spread apart by a wedge member 33 on the upright 2, thereby causing the jaws to release the link 30. Simultaneously with this releasing of the link, the jaws 29 of the lift D grip the same, so that the bucket is prevented from dropping. At the ends of the upper bar 34 of the carriage F are rollers 35 suitably grooved to hold the carriage on the cables as it moves along the same.

The station frame comprises the upright 36 suitably supported and arms 37 and 38 secured to the upper ends of the upright. The arm 37 is fitted with sheaves 39 over which the elevating cable 27 passes to a windlass 40 arranged at a convenient height to be manually operated on the upright 36. The arm 38 supports the upper ends of parallel guide rods or irons 41, which guide the movement of the shifting lift G of the conveying system. The lower ends of the guide rods 41 are anchored on the upwardly inclined arm 42 to which the lower cable D is attached. A suitable distance above the arm 42 is a downwardly inclined arm 43 that anchors the station end of the upper cable C.

The guide rods 41 deviate slightly from a perpendicular line and are disposed approximately at right angles to the length of the cable C so that as the shifting lift G is raised from its lower to its uppermost position, the rail 45 thereof will be slightly inclined so as to be in line with the upper cable C. The rear sides of the rail and upper cross piece 46 of the lift are provided with eyes, one of which is shown at 46′, that engage the guide rods 41. It will be understood that sufficient play is provided between the eyes 46′ and the rods 41 to permit the lift G to shift its position as it is raised or lowered, so that the rail 45 will aline with the cables. The outer ends of the arms 42 and 43 are provided with slotted blocks 47 to which the cables C and D are suitably secured, and the pockets serve to receive the end 48 of the rail 45 so that the rollers of the carriage F can pass freely to and from the cables and rail 45. The movement of the shifting lift G is limited by the stops 49 on the upright 36 of the station frame. In order to prevent the outer end of the rail 45 from rising above the level of the cable C, a pin or projection 50 is arranged on the rear side of the rail that engages a stop 51 on the arm 43. On the lower arm 42 is an abutment 51′ with which the pin 50 engages as the lift G reaches the end of its downward movement. The pin 50 is at one side of the center line of gravity and it is arranged to engage with the abutment 51′ before the end of the rail 45 engages the lower stop 49. Therefore, after the pin strikes the abutment 51′, the weight of the lift will cause the latter to tilt on the pin as a center, so that the end of the rail 45 will come to rest on the lower stop 49. The lift thus rests on the said stop and abutment 51′, so that the rail 45 will be in line with the cable B. In raising the lift B, the latter has a slight initial tilting movement about the pin 50 and then moves bodily and, by means of the pin 50 coming into engagement with the stop or abutment 51 and the rail 45 abutting the stop 49, the lift will assume a position in which the rail is in line with the cable C. The lift is raised and lowered by means of a rope or cable 52 that passes around the sheaves 53 and 54 and connects with the lift by the eye bolt 55. The lower end of the rope 52 is preferably provided with a counterweight, 56, the rope extending to a point conveniently accessible to the operator.

The operation may be briefly stated as follows:—Assuming the bucket carriage F has just returned to the well, and has passed upon the switch 11, the bucket link 30 is gripped by the jaws 29 and released by the jaws 32. The operator next unwinds the windlass 40 so that the bucket lift E may be lowered into the well and the pail is filled. At the beginning of the lowering of the lift, the carriage F also lowers switch 11 to the tilted position shown in dotted lines. By this movement of the carriage, the spring members or jaws 32 disengage from the wedge 33 to a position below the same, so as to be ready to grip the link 30 as soon as the bucket is sufficiently

elevated. After the bucket is filled, the operator winds up the windlass until the lift is brought to rest by the stop 32′ on the upright 2 of the well frame. By the time this point is reached, however, the jaws 32 will have gripped the link 30, so that as the carriage moves off the switch 11 the bucket will be carried therewith, the jaws 29 permitting the link to be freely released under the movement of the carriage. The carriage then moves along the cable D to the station, the shifting lift G in the meantime having been lowered by the operator so that the rail 45 will be on a level with the cable D. When the carriage reaches the station, the bucket is emptied, and then the shifting lift G raised to its upper position to permit the carriage to be returned to the well. The operation is then repeated when an additional supply of water is desired.

In the modification shown in Fig. 2, the double cable on which the carriage is adapted to travel from the station to the well and return is dispensed with and only a single cable employed. This cable, designated 57, is pivotally, or otherwise attached, to the upright 2 of the well frame and is of a suitable height above the ground. The opposite end of the cable is attached to a vertically movable frame or bar 58 guided on the upright 36 of the station frame. The cable is secured to the frame 58 by means of a yoke 59 having an eye 60 into which the cable is looped and a cross plate 61 mounted on the lower end of the frame 58. The frame is guided in its vertical movement in an eye or loop 62 bolted or otherwise secured to the upright 36 and it bears on an anti-friction roller 63 located between the vertically movable frame and the upright 36. The upper end of the frame is connected with a rope 64 passing over the sheave 65 on the upper end of the upright, and from the sheave the rope extends downwardly to a point conveniently accessible to the operator. The well frame and the bucket lift are substantially of the same construction as that already described, except that the cable supporting arms 7 and 8, switch 11 and the device 16 are eliminated.

In Fig. 2, the parts are shown in the position they occupy when the bucket carriage is in the act of returning to the well, the vertically movable cable shifting frame 58 being in its raised position, so that the cable is inclined downwardly toward the well frame. The bucket lift of the well frame has been dispensed with for clearness of illustration. When the carriage is to be returned to the station with a pail full of water, the operator lowers the cable shifting frame 58 to the position shown by dotted lines by raising the rope 64. This shifts the cable 57 so that it is inclined outwardly from the well to the station frame so as to permit the carriage to travel toward the latter. After the bucket is emptied, the bucket carriage is returned to the well by raising the shifting frame 58 again to the position shown by full lines.

I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, but I desire to have it understood that the apparatus shown is merely illustrative, and that the invention can be carried on by other means.

What is claimed is:—

1. In an apparatus of the class described, the combination of a conveying means, a carriage arranged to travel thereon, a receptacle, supporting frames at the opposite ends of said means, a lift at one of the frames, means at the other frame for raising and lowering the lift, mechanism for transferring the receptacle from the carriage to the lift and vice versa, and a shifting device at the frame having the lift raising and lowering means for causing the carriage to be returned.

2. In an apparatus of the class described, the combination of a well frame, a station frame, conveying means between them, a bucket lift on the well frame, a carriage arranged to travel on the conveying means, mechanism for transferring the bucket from the carriage to the lift and vice versa, a shifting mechanism at the station frame for causing the carriage to return to the well, and means extending from the well frame to the station for raising and lowering the bucket lift.

3. In an apparatus of the class described, the combination of a well frame, a station frame, a conveying cable between them, a carriage arranged to travel on the cable, a bucket lift at the well frame, mechanism for transferring the bucket from the carriage to the lift and vice versa, guiding devices for guiding the movement of the lift, a draft line extending between the frames and connected with the lift, and means at the station frame for winding and unwinding the line to operate the lift.

4. In an apparatus of the class described, the combination of a well frame, a station frame, a conveying cable between them, a carriage arranged to travel on the cable, a bucket lift, mechanism for transferring the bucket from the carriage to the lift and vice versa, vertical guide members located at the well frame, devices on the lift engaging the guides for guiding the movement of the lift, and a mechanism at the station frame for raising and lowering the lift.

5. In an apparatus of the class described, the combination of a well frame, a station frame, a conveying cable extending between them, a bucket carriage arranged to travel on the cable, a bucket lift guided on the well frame, shifting mechanism at the station frame for causing the carriage to return to the well, a guiding means on the station frame

for the said mechanism, means for actuating the mechanism, and a rope and windlass device at the station frame for actuating the bucket lift.

6. In an apparatus of the class described, the combination of a well frame, a station frame, separate cables strung between them, a switch at the well frame, a bucket carriage arranged to travel on the cables, a bucket lift guided by the well frame, means for transferring the bucket between the carriage and lift, a device at the station frame for shifting the carriage from one cable to the other, and separate means at the station frame for actuating the device and bucket lift.

7. In an apparatus of the class described, the combination of a well frame, a station frame, separate cables strung between them, a bucket carriage arranged to travel on the cables, a switch at the well frame for shifting the carriage from one cable to the other, a bucket lift arranged under the switch, means for transferring the bucket between the carriage and lift, and mechanism on the station frame for actuating the bucket lift.

8. In an apparatus of the class described, the combination of a well frame, a station frame, separate cables strung between them, a bucket carriage arranged to travel on the cables, a switch at the well frame for shifting the carriage from one cable to the other, a bucket lift arranged under the switch, means for transferring the bucket between the carriage and lift, and mechanism on the station frame for actuating the bucket lift, said mechanism comprising an operating cable extending from the lift to the station frame, and suitably arranged sheaves for the cable on both of the frames.

9. In an apparatus of the class described, the combination of a well frame including two arms located one above the other, a station frame including two arms located one above the other and on different levels from the arms of the well frame, separate cables strung respectively between the upper arms and lower arms of the frames, a switch at the well frame, a shifting device arranged on the station frame to move between the arms thereof, and a carriage arranged to travel on the cables.

10. In an apparatus of the class described, the combination of a well frame including two arms located one above the other, a station frame including two arms located one above the other and on different levels from the arms of the well frame, separate cables strung respectively between the upper arms and lower arms of the frames, a carriage arranged to travel on the cables, a switch on the well frame which is movable between the arms thereof to transfer the carriage from the upper to the lower cable, a shifting device on the station frame for transferring the carriage from the lower to the upper cable, and means for guiding the movement of the shifting device.

11. In an apparatus of the class described, the combination of a well frame including two arms located one above the other, a station frame including two arms located one above the other and on different levels from the arms of the well frame, separate cables strung respectively between the upper arms and lower arms of the frames, a carriage arranged to travel on the cables, a switch on the well frame which is movable between the arms thereof to transfer the carriage from the upper to the lower cable, a shifting device on the station frame which includes a rail, means for guiding the movement of the device for changing the rail from the inclination of one cable to that of the other, and an actuating mechanism for the shifting device.

12. In an apparatus of the class described, the combination of a station frame having two arms extending in the same general direction and at an inclination to each other, a cable extending from each arm, a shifting device arranged to move from one arm to the other, and guides on the frame for changing the inclination of the shifting device as the same is moved from one arm to the other.

13. In an apparatus of the class described, the combination of a station frame having two arms extending in the same general direction and at an inclination to each other, a cable extending from each arm, a shifting device arranged to move from one arm to the other which includes a rail, guiding members arranged at a slight angle to a perpendicular line for changing the alinement of the rail from one cable to the other, and means for actuating the shifting device.

14. In an apparatus of the class described, the combination of a station frame having two arms extending in the same general direction and at an inclination to each other, a cable extending from each arm, a shifting device arranged to move from one arm to the other which includes a rail, guiding members arranged at a slight angle to a perpendicular line for changing the alinement of the rail from one cable to the other, stops on the frame for limiting the movement of the shifting device, and means for actuating the device.

15. In an apparatus of the class described, the combination of a bucket carriage, a bucket lift, and means for transferring a bucket from one to the other which comprises separate pairs of gripping members, and a link to which the bucket is attached.

16. In an apparatus of the class described, the combination of a bucket carriage, a bucket lift, and means for transferring a bucket from one to the other which comprises separate resilient jaws on the lift and carriage opening in opposite directions, a

link adapted to be gripped by the jaws and supported thereby, and means arranged to cause the jaws of the carriage to release the link for transferring the bucket to the lift.

17. In an apparatus of the class described, the combination of a bucket carriage, a bucket lift, and means for transferring a bucket from one to the other which comprises separate resilient jaws on the lift and carriage opening in opposite directions and arranged one above the other, a notched member for carrying a bucket arranged to be gripped by the jaws, and a device for causing the jaws of the carriage to release the member when the bucket is to be transferred to the lift.

18. In an apparatus of the class described, the combination of a supporting frame, a bucket carriage, a bucket lift, mechanism for arresting the movement of the carriage, and means for transferring a bucket between the carriage and lift which comprises resilient jaws on the carriage and lift which extend in the general direction of travel of the carriage and open in opposite directions, a notched member for carrying a bucket arranged to be gripped by the jaws, and a wedge-shaped device arranged on the supporting frame to engage the jaws of the carriage to release the said member at about the time the carriage is brought to rest.

19. In an apparatus of the class described, the combination of a supporting frame, a bucket carriage, a bucket lift, mechanism for arresting the movement of the carriage, and means for transferring a bucket between the carriage and lift which comprises resilient jaws on the carriage and lift which extend in the general direction of travel of the carriage and open in opposite directions, a notched member for carrying a bucket arranged to be gripped by the jaws, a wedge-shaped device arranged on the supporting frame to engage the jaws of the carriage to release the said member at about the time the carriage is brought to rest, and means on the frame for holding the lift with its jaws in the path of movement of the notched member.

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

WILLIAM CALVIN DAY.

Witnesses:
J. A. BOONE,
S. W. POWELL.