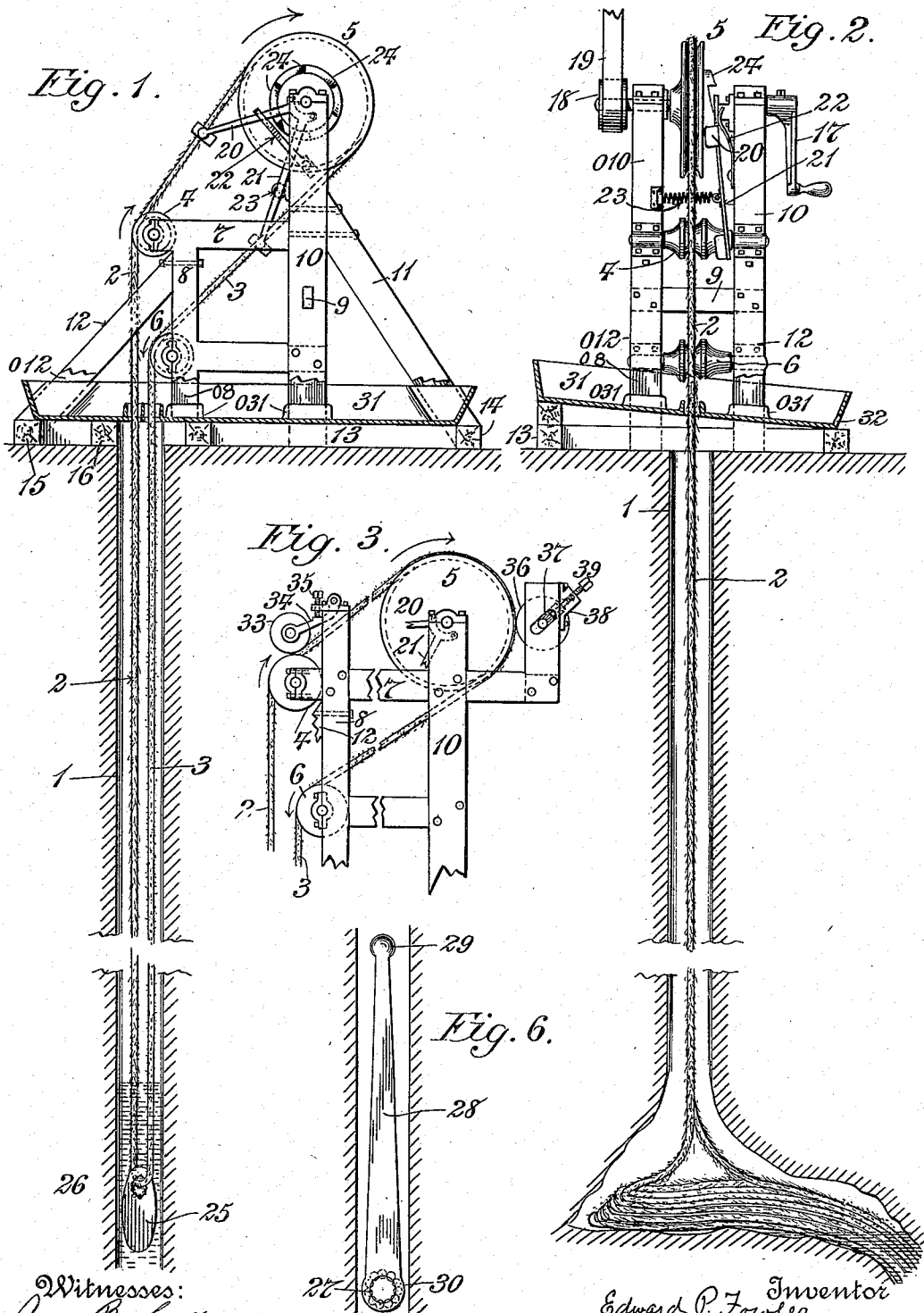


E. P. FOWLER.
LIQUID CONVEYER.
APPLICATION FILED NOV. 3, 1908.

930,465.

Patented Aug. 10, 1909.

2 SHEETS—SHEET 1.



Witnesses:
Anna Fowler
Edward Fowler.

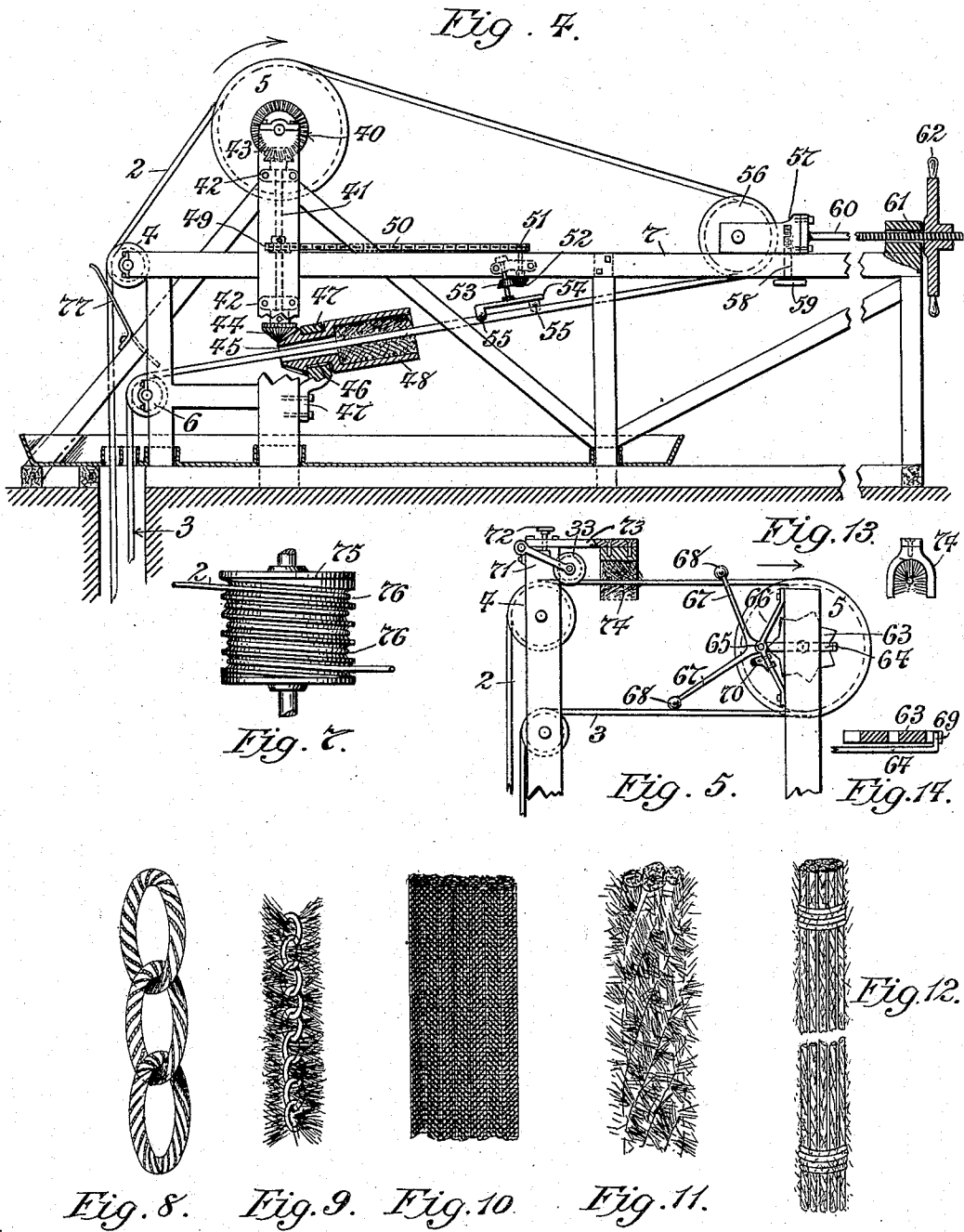
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE

EDWARD P. FOWLER, OF NEW YORK, N. Y.

LIQUID-CONVEYER.

No. 930,465.

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To all whom it may concern:

Be it known that I, EDWARD P. FOWLER, of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Liquid-Conveyers, of which the following is a full, clear, and exact description, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings and to the characters of reference marked thereon.

This invention relates to devices adapted to absorb and transmit liquids from wells, pits or other places from which it is desired to remove the same, and it is especially useful in places where for any reason ordinary pumping devices cannot be applied, or where such cannot be conveniently obtained.

Among the objects of my invention are the provision of simple and effective means for disposing or submerging the carrier in the fluid or liquid to be taken up thereby; for conveniently bringing the carrier with its contents to a point where the same may be discharged; for separating the contents from the carrier; for separating and freeing the fibrous parts of the carrier from each other, in order to make their action effective, as well as securing other advantages as will hereinafter appear.

To accomplish these objects my improvements involve certain novel and useful arrangements or combinations of parts, peculiarities of construction, and principles of operation, all of which will be herein first fully described, and then pointed out in the claims.

In carrying out my invention carriers are provided which may consist of a suitable woven, braided, gathered or twisted construction or application of fabric adapted to absorb or retain liquids, and suitable devices in connection therewith by which such carriers may be applied and operated. In the drawings I illustrate my invention by several examples of such carriers and devices.

Figure 1 is a side view of one form of carrier and devices for operating the same; showing the lower part of the carrier suspended in liquid at the bottom of a well. Fig. 2 is an end view of the device shown in the upper part of Fig. 1. Fig. 3 is a side view of the device showing method of applying pressure rolls. Fig. 4 is a side view of an arrangement of the invention showing a device for taking up the carrier, together with a form of jolter, and a form of brushing de-

vice for the carrier. Fig. 5 is a side view of an arrangement of the invention showing one form of jolter and of a brushing device. Figs. 6, 7, 8, 9, 10, 11, 12, 13 and 14, are 60 views of details.

Similar characters of reference indicate like parts in all the drawings.

In applying my invention, to take up liquids from deep wells, a suitable endless carrier is provided, several examples of which 65 are shown, which may consist of strong twisted, braided or woven fibrous materials. If the carrier is constructed of fibrous parts which are left loose or free from each other 70 and are adapted to absorb sufficient liquid for the purposes for which it is intended to be used, then it will not generally be necessary to provide absorbing attachments to such carrier, but if the strands of the carrier 75 are tightly twisted or braided; or if the carrier is composed of wire, chain or similar non-liquid absorbent material, then fibrous additions may be made thereto by attaching to or inserting into the body of the carrier at 80 suitable intervals in any convenient manner, bulbs, bunches or other parts of suitable fibrous material, such as will take up and retain the liquids to be transmitted.

In Fig. 1, I illustrate one application of 85 my invention. In this, 1, is the well, 2 is the upward moving part of the carrier, 3 is the downward moving part of the same; 4 is a pulley wheel over which the part 2, of the carrier passes, as it emerges from the 90 well; 5 is a wheel to which the power may be applied and over which the carrier passes; and 6 is a pulley wheel over which the downward moving part, 3, of the carrier passes; 7, 8, 08, 9, 10, 010, 11, 12, 012, 13, 14, 15, 16 95 are parts constituting a suitable frame to support the carrying devices. The pulleys 4 and 6 are deeply grooved and supported in suitable bearings on the frame parts 7 and 8 respectively. The power wheel 5 is sup- 100 ported in suitable bearings in the uprights, 10, 010, having its periphery grooved and corrugated or otherwise suitably roughened to engage and hold and move the carrier passing over it. For operating this wheel by 105 hand, handles at each end of the journal may be provided similar to the handle 17; or a belt pulley, 18, with suitable belt, 19, if desired, may be provided, as shown in Fig. 2, when the device is to be operated by power. 110

On a convenient part of the structure, in the examples shown in Figs. 1 and 2, on the

upright 10, hammers or jolters, 20, 21, are suitably secured, and are adjusted to have their striking heads impinging against the carrier, by the action of springs, as 22, 23, and on the wheel, 5, suitable projections, 24, in ratchet like or similar form may be arranged to press the hammers, 20, 21, away from the carrier and suddenly release the same as the wheel 5 is turned, causing them to strike the carrier and jolt the same, and thereby aiding in the release of the liquid in the carrier, and also of the pebbles, sand, &c. which may have been brought up with such liquid. The jolting of the carrier furthermore serves to loosen the fibers from each other, and makes their operation in taking up the liquid more effective, especially where the liquid is thick or viscous, and liable to cause the fibers to become matted. The grooves on the wheels, 4, 5, 6, should be made deep enough to secure the carrier in position therein when being jolted. The operation of this example of my invention is as follows: The carrier, 2, 3, formed of proper length, is fed into the well, and when it has reached the liquid reservoir, the wheel 5 is operated. This raises the part, 2, of the carrier which has absorbed the liquid and allows the part 3 thereof to descend. As the wheel 5 is turned, the weight of the up coming part, 2, pressing upon the pulley, 6, and the wheel, 5, is thereby squeezed and the liquid to some extent expressed therefrom; and the impact of the hammers, 20, 21, further assists in this result. The liquid &c. thus brought up is allowed to drop into a suitable pan, 31.

In the cases of some liquids which are not viscous, and with some structures of carrier the method of freeing the liquid, sand, etc., from the carrier, as shown in the example of my invention illustrated in Fig. 1, will be found sufficient. In other cases, however, it may be necessary to provide additional means for freeing the liquid, etc., from the carrier; in such cases other suitable squeezing devices may be employed. An example of such devices is shown in Fig. 3. In this example of my invention, suitable pressure rollers are shown, which may be applied for the purpose. A pressure roller, 33, is disposed in a suitable position to bear upon the wheel 4, and may be supported in swinging bearings, 34, mounted upon one of the parts of a suitable frame. To the part of the device supporting the bearing 34, a set screw, 35, is arranged so that by means thereof the pressure of the roller, 33, upon the up coming part, 2, of the carrier may be regulated. Upon another suitable part of the frame, pressure roller, 36, may be disposed, having its journal arranged in an oblique slot, 37, in such manner that a portion of the slot, 37, is open below the journal of the roller, 36, when that roller impinges against the carrier. Bearings 38 are disposed to impinge upon the

journal of the pressure roller, 36, and these are adjustable by means of the set screw 39. When the weight of the rollers, 33, 36, is sufficient for the required pressure, of course the set screws 35 or 39 need not be employed.

In Fig. 4, another example of my invention is shown. In this a bevel gear, 40, is attached to the side of the power wheel 5, and a vertical journal, 41, is disposed in suitable bearings 42, 42, in one of the uprights of the frame of the structure. To the upper end of the journal 41, a bevel gear, 43, is disposed, adjusted to be operated by the gear, 40, on the wheel, 5, when the same is rotated. To the lower end of the journal, 41, a bevel gear, 44, is attached, which engages with a bevel gear, 45, part of a tubular part, 46, which is journaled in a bearing, 47, also secured to the upright of the structure. To the free end of the part, 46, a tubular brush, 48, is attached. When the wheel, 5, of this form of my invention is operated the brush, 48, through which the descending part, 2, of the carrier passes, is revolved, and jars and loosens the fibers of the carrier. The brush, 48, may be semi-circular like 74. To a part of the vertical journal, 41, furthermore, a sprocket wheel, 49, and chain, 50, are operatively attached, which are adjusted to revolve a gear, 52, which meshes into a gear, 53, on the journal of a plate 54, which plate is disposed to have its underface just above the path of the carrier, and inclined to such path. To the lower side of this plate, 54, bulbous projections 55, 55, are attached. When the wheel, 5, is operated, the plate, 54, is also rotated, and as the parts, 55, 55, strike the carrier, they jar and drive it down and then allow it to come up and strike the under surface of the plate, 54, loosening the liquid, sand, &c. from the carrier. The parts, 55, 55, may be secured to the plate 54, in eccentric position relatively to each other, so that they will not both strike the carrier at the same time.

In the example of my invention shown in Fig. 4, a take up wheel, 56, is provided, which is mounted in a frame or carriage, 57, movably disposed upon the horizontal bars of the frame, which may be extensions of the horizontal parts, 7, 7, as shown in Fig. 1. A cross piece, 58, secures the sides of the carriage 57, and a part, 59, extending under the horizontal bars 7, 7, keeps the carriage in place. To the end of the carriage, 57, a screw threaded rod, 60, is rigidly secured, which passes through a sleeve, 61, on the end of the frame. A wheel, 62, screw threaded at its center to engage with the thread on the rod, 60, is screwed on to that rod, and braces against the sleeve, 61. When it is desired to take up any slack of the carrier, the wheel, 62, is turned to draw the take up wheel, 56, around which the carrier passes, toward the end of the frame of the structure, and when it is desired to allow the carrier to

go deeper down into the well, the wheel, 62, is turned so as to move the take up wheel, 56, toward the carrier wheel, 5. By this arrangement it is practicable to use the endless carrier at different stages of deepening the well, when desired, without making changes in the length of the carrier itself.

In Fig. 5, another example of the invention is shown. In that example of the invention there is provided on the side of the power wheel, 5, a trip hammer device to operate upon the carrier. Attached to the wheel, 5, is a toothed wheel, 63, and a lever, 64, is pivoted at 65, in bearings, 66, which are attached to the upright of the frame. To the pivoted end of the lever, 64, arms, 67, 67, which may be pliable, are secured, ending in suitably weighted hammers, 68, 68. At the other end of the lever, 64, a tooth, 69, clearly shown in Fig. 14, is provided, which is disposed in the path of the toothed wheel, 63. The adjustment of the parts is such, that as the wheel, 5, is revolved, the teeth on the wheel, 63, engage with the tooth, 69, on the lever, 64, and carry that end of the lever down, and the hammers, 68, 68, up. As the tooth, 69, is released by the rotation of the wheel, 63, the hammers strike upon the carrier and jolt it, releasing, or aiding in releasing, the liquid, and any sand, pebbles, &c. from the same. In order to regulate the downward movement of the weighted hammers, 68, 68, a detent, 70, is provided for the hammer end of the lever, 64. In this illustration of my invention a pressure roller, 33, is shown applied to the wheel, 4, and arranged in swinging supports, 71, with an adjusting screw, 72, by which the pressure upon the carrier of the roller, 33, may be regulated as desired. Projecting from the upright of the frame of the structure, is an arm, 73, to which a semi-circular brush, 74, is attached, an end view of which is shown in Fig. 13. After the upcoming part, 2, of the carrier passes the pressure roller, 33, it is carried through this brush, 74, and the fibers of the carrier, which have been compressed by the roller, 33, are thereby loosened, which loosening, etc., is further aided by the hammers, 68, 68, as already described. The "brushes" of the brushes, 48, and 74, may consist of wire, whalebone, and similar materials, stiff enough to stir up the fibrous portions of the carrier, but not sufficiently sharp or rigid to injure the carrier. For some purposes, a drum, instead of a grooved wheel, 5, may be employed—in Fig. 7, a suitable drum, 75, is shown, which may be provided with grooves, 76, 76, into which the upcoming part, 2, of the carrier may be wound.

For receiving the liquids, sand, etc., brought up by the carrier, a suitable pan, 31, is to be provided. This pan may be supplied with lips 031, 031, wherever there is an opening in it to permit the passage of the carrier

or the vertical supports for the frame of the structure, and it may have lipped indentations in its edges at the points where the braces of the frame are arranged to pass the same. A gutter, 77, as shown in Fig. 4, may also be attached to the frame, having an opening through which the upcoming part, 2, of the carrier passes, and which catches any drip from the carrier which might fall back into the well, and discharges into the pan, 31. If the pan, 31, is arranged on an incline, a hose or faucet may be provided through an opening, 32, at its lower part, as shown in Fig. 2. However, if desired, the uprights of the frame of the structure may be placed at such distances from each other as will permit of the insertion of a smaller pan, but for most uses, a large pan with a more compact frame of structure will be found advantageous.

In some cases it will be found advantageous to weight the carrier, especially where the well is of small bore. When that is the case a weight, 25, as shown in Fig. 1, may be employed. The opening through which the carrier passes may consist of a round smooth hole, in such weight, or the opening may be surrounded by ball bearings, 26, as indicated in Fig. 1. The weight shown in Fig. 1, is such as may be conveniently used where there is abundant depth of liquid, as shown in Fig. 1, but when the liquid remains at a low level, and it is desired to have the carrier very near the bottom of the well, a weight, such as 28, shown in Fig. 6, may be employed. In this the opening, 30, for the carrier is shown at the lower end, and it may also be surrounded by ball bearings 27. The upper end, 29, of this weight, 28, should be rounded, in order not to abrade the carrier passing around it.

In applying my invention to wells or pits, etc., in which there is not a sufficient local gathering of the liquids in the direct path of the carrier, the carrier may be fed down and allowed to spread out or tumble about to cover a portion of the bottom of the pit or well, &c., as shown in Fig. 2, and allowed to take up the fluid or liquid by capillary action, and as the carrier becomes saturated or soaked, it may be drawn up and the liquid &c. removed, as described. The carrier to be employed for such purposes may be constructed of light fibrous materials, in the form of links, if desired, as shown in Fig. 8; as such construction is favorable to the tumbling about of the carrier on the bottom of the pit or well.

When the liquid to be gathered by means of my invention is of great fluidity, or for any reason is loosened from the carrier in its passage upward from the well by the jar of the hammers, etc., it will be of advantage to employ pressure rollers, as 33, 36, to break the shock or vibration of the part of the car-

rier which is in the well, and these rollers may be provided with soft rubber facings.

In Figs. 8 to 12 different forms of carriers are shown, much larger in proportion than the other figures, in order to indicate the parts more clearly. In Fig. 8, a carrier is shown which may be formed in the shape of rings or links (in use of course they will be stretched out) consisting of cords or bands or strips of fabric with a coarse nap, which may be wound around itself until a suitable number of windings have been made, and the ends may then be tied, or the parts otherwise secured to each other. In Fig. 9, a chain is shown through the links of which bunches of suitable fibrous material, strips of fabric, etc., etc., may be inserted and firmly secured. In Fig. 10, a braided band is shown, which may be of any suitable material, with or without fibrous parts inserted between the braids. In Fig. 11, a rope is shown, with fibrous materials inserted between the strands. In Fig. 12, a bunch of fibrous cords is shown, tied together at different points. The carrier furthermore may be wound around with strips or bands of fabric having a coarse nap, such as will readily take up the liquids to be gathered.

I do not limit myself to any particular form of endless carrier, to any particular arrangement of frame, or operating parts to move the carrier, or to any particular form of device for jolting or for brushing, or stirring up the carrier, or to any form or disposition of the vessel for receiving the discharges from the carrier, or to any form of device for taking up the slack of the carrier, as these will all be varied without departing from my invention, but

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

1. Mechanism for raising liquids from wells, comprising an endless liquid absorbent carrier adapted to depend into a well, suitable wheels disposed in a frame and adapted to operate such carrier, an elongated weight adapted to extend above the bottom of the well between the dependent parts of the carrier, such weight provided with a suitable opening adapted to receive and keep the dependent part of the carrier near the bottom of the well, in combination with a rotatable brush surrounding such carrier above the mouth of the well and adapted to impinge upon and to be rotated about such carrier by one of the wheels operating the carrier, substantially as described and shown.

2. Mechanism for raising liquids from wells, comprising an endless liquid absorbent carrier adapted to depend into a well, suitable wheels supported in a frame and adapted to operate such carrier, suitable weight adapted to draw the dependent parts of the carrier toward the bottom of the well, a

brush taking in such carrier and adapted to loosen the fibers thereof, in combination with a jolting device disposed in the path of such carrier and adapted to be acted upon by devices operating the carrier to jolt part of the same not depending in the well, substantially as described and shown.

3. A liquid absorbent elongated carrier comprising parts adapted to absorb the liquid, and parts adapted to move the carrier continuously over a suitable receiving vessel, in combination with a jolting device adapted to be operated by the parts moving the carrier, substantially as described and shown.

4. In a device such as described, a wheel suitably fitted to take up an endless carrying device, and a jolting part disposed near such wheel, in combination with a tripping device disposed to be operated by such wheel to move the jolting part away from the carrier and then free the same, substantially as described and shown.

5. In a liquid conveyer such as described, an endless absorbent carrier adapted to depend into a well, a series of wheels adapted to operate the same, a platform disposed at a distance from the mouth of the well, a shifting device disposed on such platform, in combination with a wheel disposed upon such shifting device and adapted to be interposed in the path of the carrier to take up any slack thereof, substantially as described and shown.

6. In a liquid conveyer such as described, an endless absorbent carrier, a series of wheels adapted to operate the same, a brushing device adapted to surround such carrier, in combination with a suitable device to jolt the carrier, substantially as described and shown.

7. In a liquid conveyer such as described, an endless absorbent carrier, a series of wheels adapted to operate the same, a squeezing roller and a jolting device adapted to liberate the liquid from the carrier, in combination with a brushing device adapted to loosen the fibers of the carrier, substantially as described and shown.

8. The liquid transmitter described, consisting of a suitable carrier adapted to absorb liquids, and a series of wheels adapted to operate such carrier, in combination with a suitable device adapted to jolt such carrier to discharge the liquid and loosen the fibers, substantially as described and shown.

9. The liquid transmitter described, consisting of a suitable carrier adapted to absorb liquids, and a series of wheels adapted to operate such carrier, a jolting device adapted to loosen the fibers of such carrier, in combination with a suitable vessel disposed at an incline to receive the liquid, substantially as described and shown.

10. In a liquid conveyer such as described, an endless absorbent carrier, a series of

wheels adapted to operate the same, a brushing device arranged about such carrier and adapted to impinge against and to be rotated around the carrier to loosen the fibers thereof, substantially as described and shown.

11. In a liquid conveyer such as described, an endless absorbent carrier, a series of wheels adapted to operate the same, in combination with a brushing device disposed around such carrier and operatively connected to be rotated by one of such wheels when the carrier is operated, substantially as described and shown.

12. In a liquid conveyer such as described, an endless absorbent carrier, a series of wheels adapted to operate the same, in combination with a suitable device operatively

connected with one of such wheels and adapted to jar the carrier as it is operated, substantially as described and shown. 20

13. In a liquid conveyer such as described, an endless absorbent carrier, a series of wheels adapted to operate the same, in combination with a lever carrying parts adapted to strike upon the carrier, and a tripping device on one of the wheels of the carrier adapted to raise and release such striking parts as the carrier is being operated, substantially as described and shown. 25

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