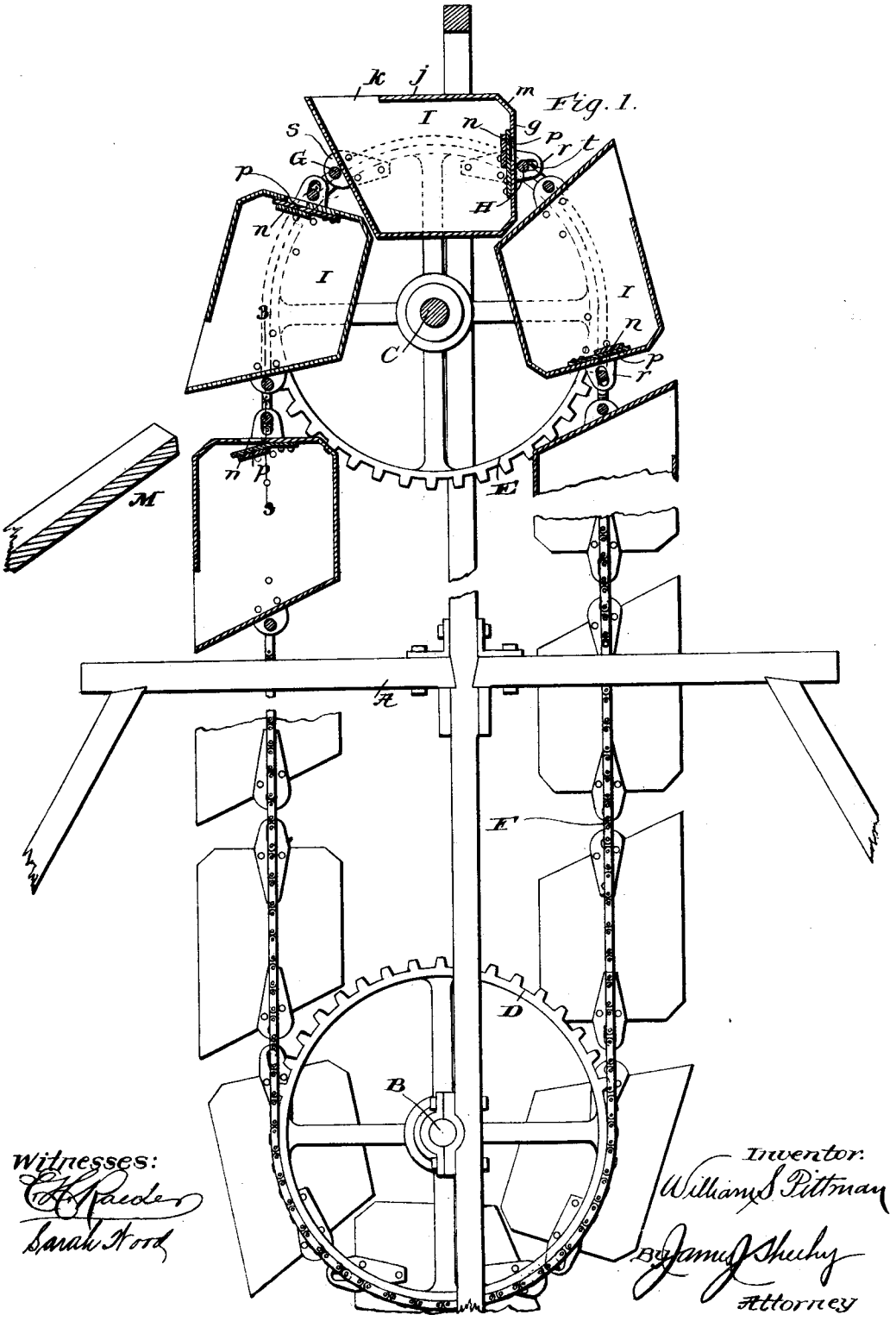
No. 675,905. Patented June 11, 1901.

W. S. PITTMAN.

CHAIN PUMP.

(Application filed May 15, 1900.)

(No Model.) 2 Sheets—Sheet 1.



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(Application filed May 15, 1900.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

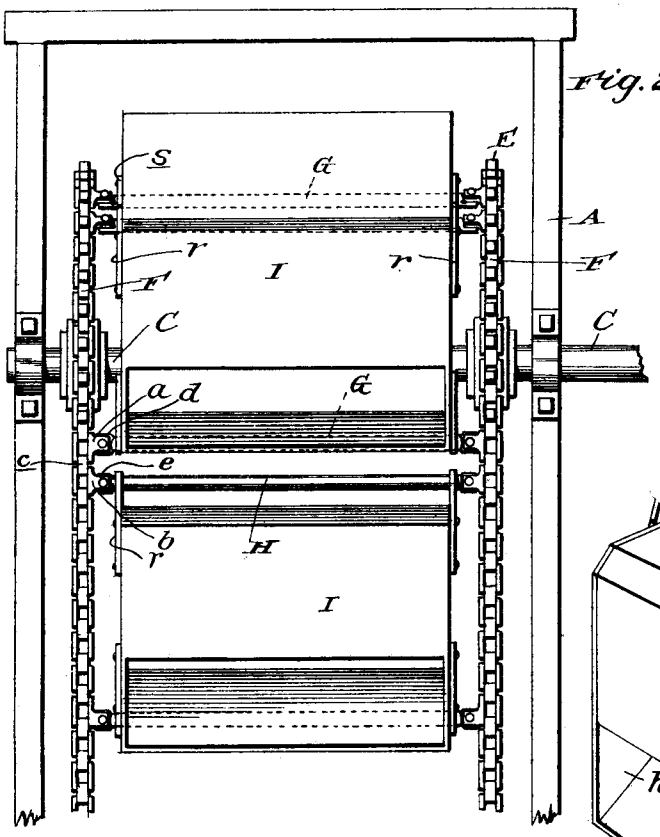


Fig. 5.

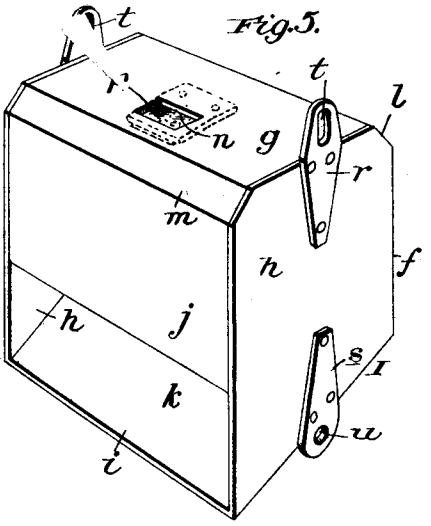


Fig. 3.

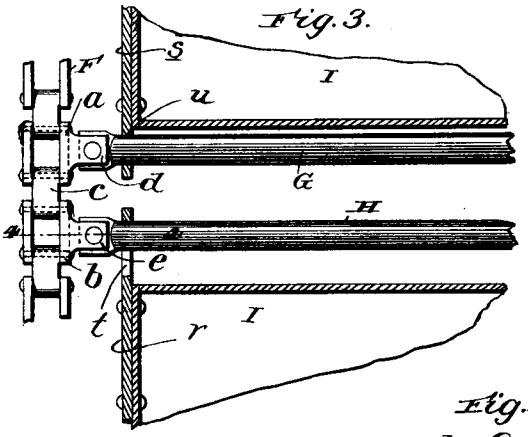
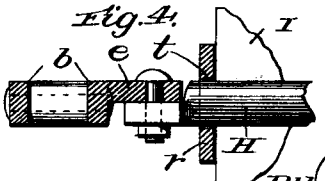


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM S. PITTMAN, OF PIERCEVILLE, KANSAS.

CHAIN-PUMP.

SPECIFICATION forming part of Letters Patent No. 675,905, dated June 11, 1901.

Application filed May 15, 1900. Serial No. 16,798. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. PITTMAN, a citizen of the United States, residing at Pierceville, in the county of Finney and State of Kansas, have invented new and useful Improvements in Chain-Pumps, of which the following is a specification.

My invention relates to chain-pumps—*i. e.*, pumps or water-elevators which comprise endless chains taking around lower and upper wheels and buckets connected with and carried by said chains.

It consists in the peculiar and advantageous construction of buckets and manner of connecting the same to the endless chains, as will be hereinafter described, and particularly pointed out in the claim appended.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of my improved chain-pump or water-elevator. Fig. 2 is a front elevation of the upper portion thereof. Fig. 3 is an enlarged detail section taken in the plane indicated by the broken line 3 3 of Fig. 1. Fig. 4 is a detail section taken in the plane of broken line 4 4 of Fig. 3. Fig. 5 is a perspective view of one of the buckets removed from the chains.

Referring by letter to the said drawings, A designates a suitable main frame; B C, lower and upper shafts journaled in bearings thereon; D, sprocket-wheels fixed on the shaft B at a suitable distance apart; E, sprocket-wheels fixed on shaft C at a corresponding distance apart; F, endless sprocket-chains passed around the sprocket-wheels D E; G H, transverse rods interposed between the chains and connected to links thereof, and I buckets interposed between the chains and connected to the rods G H. When the lift is very high, it is obvious that lower and upper frames may be employed in lieu of the single frame A to support the shafts B and C.

The sprocket-chains F are provided at intervals of their length with pairs of links *a b*, which are separated by a single link *c* and are peculiar in that they have flat lateral lugs *d e* for the connection of the correspondingly-flat ends of the rods G H, respectively, as best shown in Fig. 3.

The buckets I are formed of sheet metal or other suitable material and are of the length slightly less than the distance between the chains F. They are similar in construction, and therefore a specific description of the one shown in Fig. 5 will suffice to impart an understanding of all. Said bucket comprises an inner wall *f*, a rear wall *g*, disposed at right angles to the inner wall, side walls *h*, disposed at right angles to the inner and rear walls, a front wall *i*, pitched or inclined forwardly from the forward edge of the inner wall, a top wall *j*, which is arranged flush with or in the same plane as the outer edge of the forward wall and is of about the proportional length illustrated, so as to afford a mouth *k* between it and said forward wall, a beveled corner *l*, interposed between the rear end of the inner wall *f* and the inner end of the rear wall *g*, and a beveled corner *m*, interposed between the outer end of said rear wall and the rear end of the outer wall *j*. It is provided in its rear wall with an opening *n*, controlled by an inwardly-opening valve *p*, and is also provided on its side walls *h* with rearwardly-projecting cast or heavy sheet metal lugs *r* and forwardly-projecting cast or sheet metal lugs *s*. The valve *p* is preferably of the clack or flap pattern and is flexibly connected to the inner side of the rear wall *g* at a point between the opening *n* and the beveled corner *l*, so as to enable it to gravitate and assume and remain in an open position incident to the descending movement of the bucket. The lugs *r* have oblong openings *t* disposed in alinement with the longitudinal center of the bucket and receiving one of the transverse rods H, and the lugs *s* have circular openings *u*, also disposed in alinement with the longitudinal center of the bucket and receiving the next forward transverse rod G.

It will be readily observed by reference to the drawings that the rods G H steady the chains F and strongly connect the buckets thereto, and it will also be observed that said rods G H are arranged quite close together, as are also the several buckets. The shape of the buckets enables them to hold a large quantity of water, and their close arrangement on the chains materially increases the capacity of the pump or water-elevator in proportion to the travel of the chains. Such close arrangement of the buckets on the chain is rendered possible by the provision of the

inclined wall *i* at the forward end and the beveled corner *l* at the rear end of each bucket, for it will be seen that in passing the upper and lower sprocket-wheels the beveled corner *l* of each bucket will conform to the wall *i* of the bucket following. The inclined forward wall of each bucket is also advantageous because, being longer than the rear wall, it increases the capacity of the bucket, and it is further advantageous because it facilitates the entry of the bucket into the water, and in going around the top sprocket-wheels projects a greater distance from the chains than it does when moving between the upper and lower sprocket-wheels, and hence prevents the escape of water from the bucket to a trough M until the rear wall of the bucket is uppermost. When, however, the discharge-point is reached, the wall *i* permits the water to quickly escape from the bucket, and therefore renders feasible the placing of the trough M adjacent to the top of the elevator, which saves power and renders the elevator quicker in action.

The valves *p* remain in a pendent and open position incident to the descent of the buckets into the water, so as to permit the escape of air and facilitate the entry of water into the buckets, and as the buckets pass below the lower sprocket-wheels they gravitate and are forced by the action of the water into a closed position and remain in such closed position until the buckets reach a position immediately above the trough M, when they gravitate into an open position to admit air to the interior of the buckets and expedite the discharge of water therefrom.

As will be readily observed by reference to Fig. 1 of the drawings, the distance in a straight line between each of the rods II and the next forward rod G is less when said rods are passing around the sprocket-wheels than when they are traveling in a straight line from one pair of sprocket-wheels to the other. From this it follows that the connection of the buckets to the rods II G through the medium of the lugs *r s* forms an important part of my invention, for it will be seen that when a bucket is passing around either pair of sprocket-wheels the slots *t* in its lugs *r* permits its complementary rod II to approach its complementary rod G. This causes the chains to seat properly on the sprocket-wheels and insures the easy working of the pump or water-elevator, which would not be the case were no adjustment provided between one of the buckets and one of the rods G H, for the links of the chain would fail to properly engage the teeth of the wheels and would ride over the same, and, besides making a loud noise, would render the pump very hard to operate.

It will be appreciated from the foregoing that my improved chain-pump or water-elevator is very simple and practical and that it is calculated to lift a maximum amount of water with the expenditure of a minimum amount of power. It will also be appreciated that by virtue of the form of the buckets each is wider than it is deep and is much longer than it is wide, and hence is calculated to hold a large quantity of water, and being shallow is able to empty very quick and discharge all of its contents on the trough M.

The chief function of the valved openings *n* is to permit the escape of air from the buckets incident to the entry thereof into the water, and thus obviate the necessity of the operator pulling the bucket full of air down into the water, which requires considerable effort.

I am well aware that a straw-carrier comprising sprocket-chains some of the links of which are provided with lateral apertured lugs and cross-bars connected by bolts to said lugs is old. I therefore make no claim to such construction.

What I claim, and desire to secure by Letters Patent, is--

The herein-described chain-pump, consisting of the lower and upper pairs of sprocket-wheels, the chain belts passing around said wheels and provided at intervals of their length with pairs of links *a*, *b*, separated by links *c*, and having inwardly-directed flat lugs, the transverse rods arranged in pairs between the chain belts, and provided at their ends with flattened portions connected to the flat lugs of the links *a*, *b*, and buckets I; the said buckets being each interposed between a rod II and the next forward rod G, and having an inner wall, side walls, a rear wall, an outer wall, a beveled corner *l* interposed between the rear ends of the inner and rear walls, a forward inclined wall having its outer edge arranged in the same plane as and in advance of the forward edge of the outer wall, forward lugs having apertures receiving a rod G, and rear lugs having slots receiving the rod II in rear of said rod G, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM S. PITTMAN.

Witnesses:
S. G. NORRIS,
W. M. KINNISON.