

T. TULLY.  
Apparatus for Elevating and Forcing Water through  
Pipes.

No. 224,561.

Patented Feb. 17, 1880.

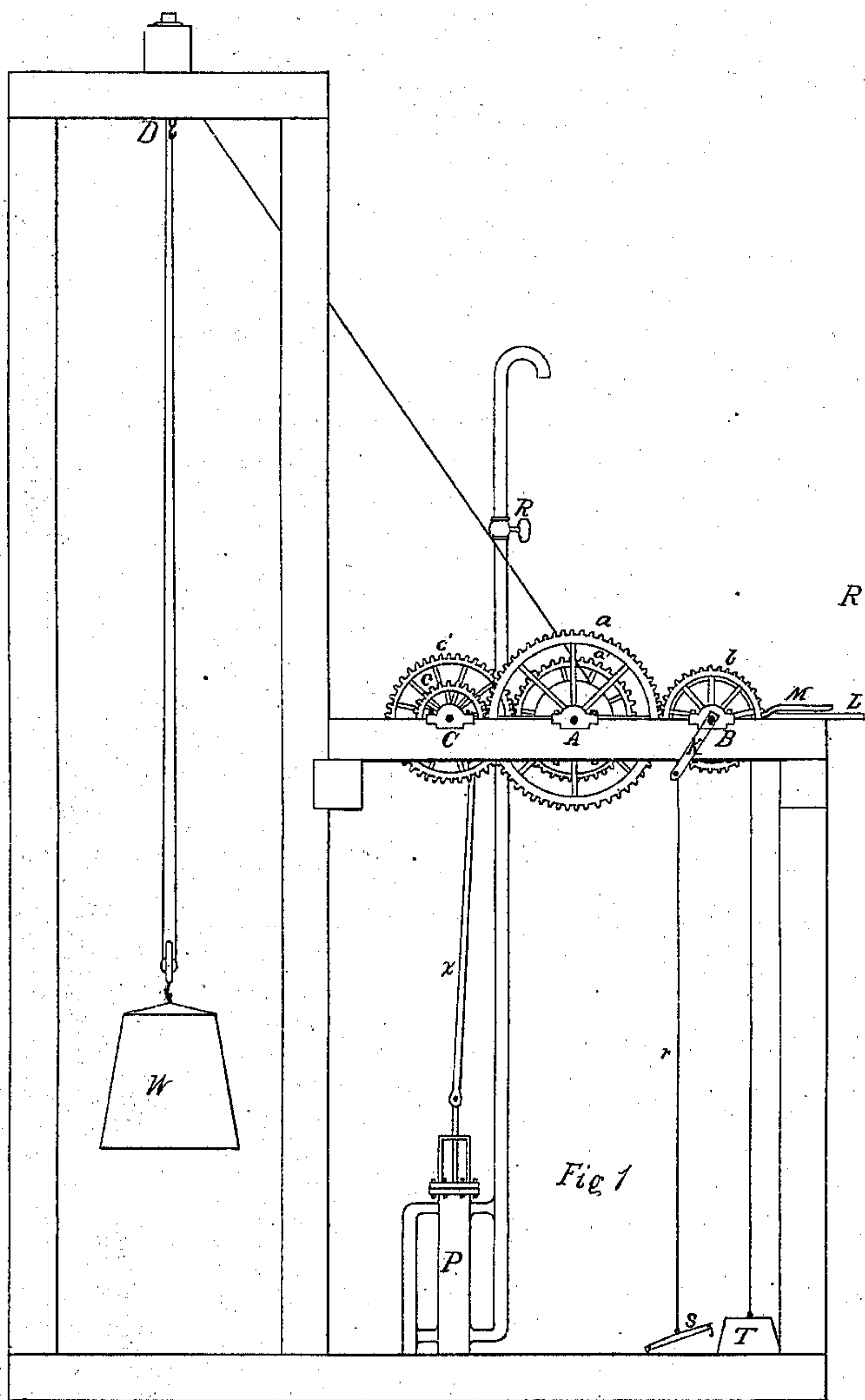


Fig 1

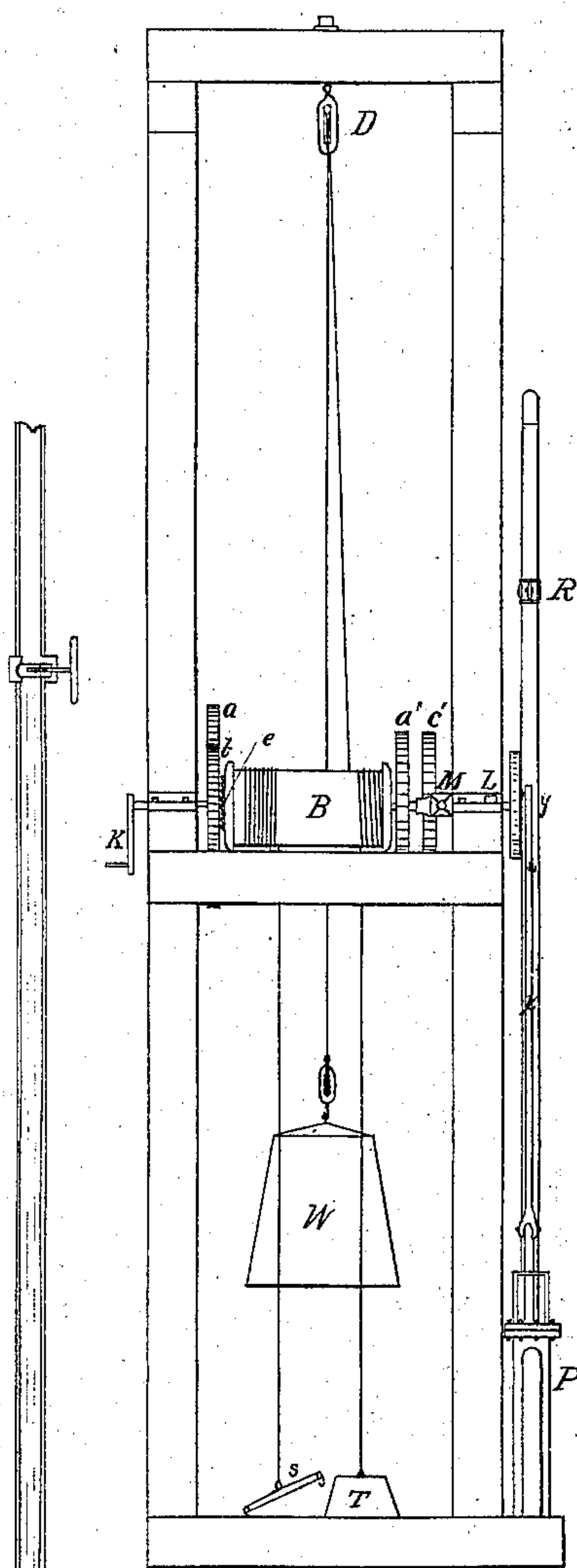


Fig 2

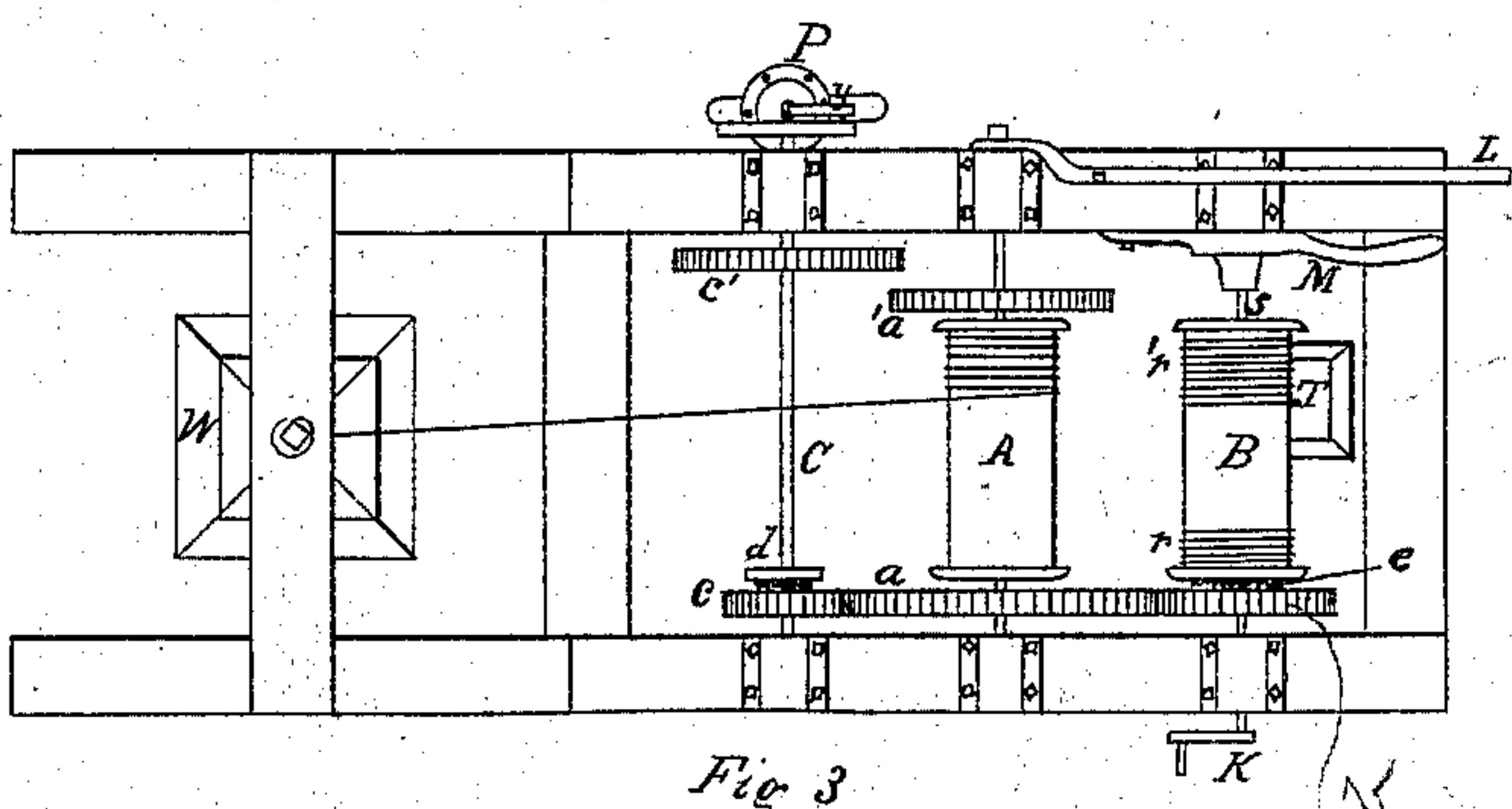


Fig 3

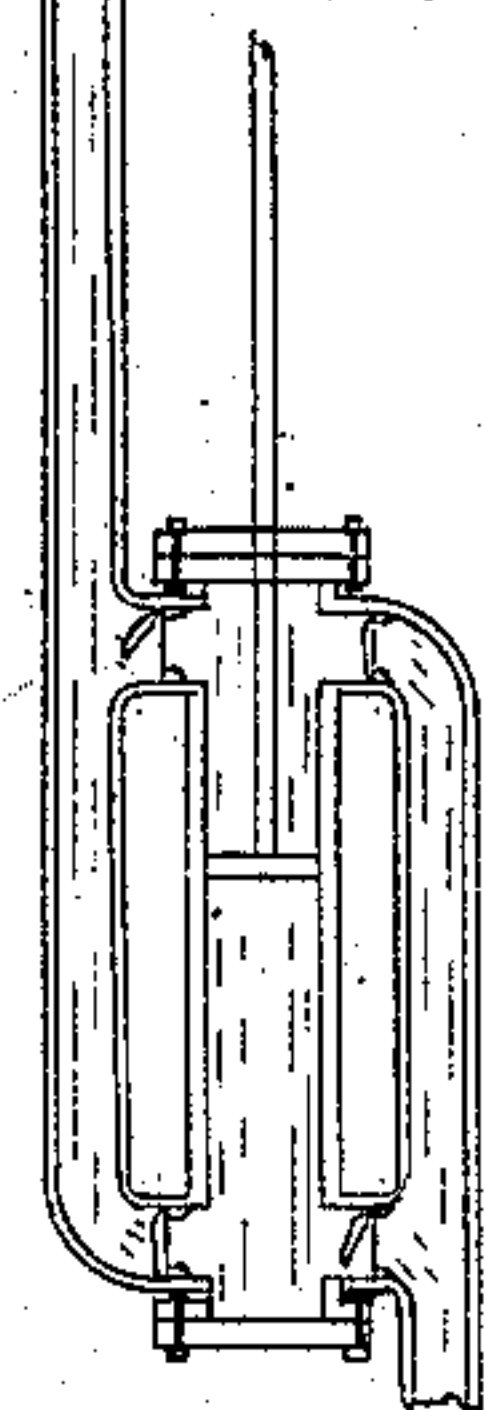


Fig 4

Witnesses:  
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# UNITED STATES PATENT OFFICE.

THOMAS TULLY, OF SPRINGFIELD, ILLINOIS.

APPARATUS FOR ELEVATING AND FORCING WATER THROUGH PIPES.

SPECIFICATION forming part of Letters Patent No. 224,561, dated February 17, 1880.

Application filed August 15, 1879.

*To all whom it may concern:*

Be it known that I, THOMAS TULLY, of Springfield; county of Sangamon, State of Illinois, have invented certain Apparatus for Elevating Water and Forcing the Same Through Pipes at a given Pressure, of which the following is a specification.

The first part of my invention consists of an arrangement of a weight by means of pulleys, drums, and gearing in such a manner as to exert its force upon the piston of a reciprocating pump so as to be automatic in its action, the object of this part of my invention being to draw water from a well or cistern direct and force the same through pipes at a uniform pressure, the amount of pressure being regulated by the relative size of the weight and gearing, and so arranging the several parts that the pump will act while water is being drawn from service-pipes, and then only sufficient to replace the water drawn out.

The second part of my invention relates to an arrangement of a lever and gear-wheels in such a manner as to change the pressure in the service-pipes at will, the object being to increase the pressure in the service-pipes instantly, so as to be available in extinguishing fires and for other purposes where great pressure is desired.

The third part of my invention relates to the winding attachments, so arranged that the weight may be wound up either by hand or horse power without any change or adjustment of the parts.

Figure 1 is a side elevation of my apparatus. Fig. 2 is an end elevation of the same. Fig. 3 is a plan, showing the relative positions of the several parts. Fig. 4 is a sectional view of the pump.

A is the principal drum, from which is suspended the weight W by means of a rope and suitable pulleys D. To this drum and its shaft are fastened the gear-wheels *a* and *a'* at each end in the manner shown. The gear-wheel *a* is larger than the gear-wheel *a'*. To the shaft of the drum A is attached the lever L.

B is a drum placed upon the shaft *s* so as to run loosely thereon. Rigidly fixed to this drum B is the ratchet-wheel *e*. On this drum B are wound in opposite directions the ropes *r* and *r'*. To the end of the rope *r'* is attached

the small weight T, and to the end of the rope *r* is attached a whiffletree, S.

Rigidly fixed to the shaft *s* is the pinion *b*, to which is affixed a spring-catch, which engages in the ratchet-wheel *e*. On one end of the shaft *s* is placed the crank K. The shaft *s* is of sufficient length to allow a lateral motion of the same, so that the pinion *b* may be engaged or disengaged with the gear-wheel *a*, as required, the said shaft and pinion being held in place by the catch M.

C is the shaft, to which is attached the pitman or crank which actuates the piston of the pump P. On this shaft C are placed the gear-wheels *c* and *c'*, and also the ratchet *d*. This ratchet *d* is fixed permanently to the shaft C, while the gear-wheel *c* is placed loosely thereon. Attached to this gear-wheel *c* is a spring-catch, which engages in the ratchet *d*. The gear-wheel *c'* is fixed rigidly to the shaft C in such a position that when the gear-wheel *c* is engaged with the gear-wheel *a* said gear-wheel *c'* will be free; but when the drum A is actuated by lever L so as to free the gear-wheels *a* and *c* said gear-wheel *c'* will engage with the gear-wheel *a'*. The said gear-wheel *c'* is made larger than the gear-wheel *c*, and the gear-wheel *a'* also correspondingly smaller than the gear-wheel *a*, so that there is more force imparted to the shaft C by the weight W when thus engaged than when the gear-wheels *a* and *c* are in contact.

The pump used is a double-acting force-pump of any convenient form or make, but so constructed that the piston will fit the barrel perfectly. The valves also must be perfectly tight.

The weight W can be made cheaply by constructing a strong box and filling the same with stone or any heavy and cheap material. This weight W is suspended on a suitable and substantial frame, either over the well, by the side of the house, or in any convenient place.

The operation is as follows: The drum A, being impelled by the force of the weight W, imparts power to the shaft C by means of the gear-wheels *a* and *c*, which power is transmitted to the piston of the pump P by means of the pitman or crank *y* and piston-rod *x*. The amount of power or force thus employed will depend upon the weight used and the size of the gear-wheels *a* and *c*, and can be arranged to ex-



ert force sufficient on the piston to force water through the service-pipes to any desired height. Water being practically inelastic, so long as the outlet-valves in the service-pipes remain closed the pressure of the water acts upon the piston of the pump P and counterbalances the force imparted to the said piston by the weight W. Thus the machine will stand still and the weight will not descend; but the instant a valve in the service-pipe is opened the pressure on the piston is relieved and the superior force of the weight W causes the piston of the pump P to move, and will continue to do so so long as there is an opening in the service-pipe. By moving the lever L and disengaging the gear-wheels *a* and *c* and engaging the gear-wheels *a'* and *c'*, more force is exerted on this piston of the pump P, which may be augmented to any desired extent by the relative size of the gear-wheels *a'* and *c'*.

In winding up the weight W the pinion *b* is engaged with the gear-wheel *a* and held in position by the catch M. A horse being attached to the whiffletree S, in moving in a straight line imparts motion to the drum B by means of the rope *r*, which motion is transmitted to the drum A by means of the ratchet *e*, pinion *b*, and gear-wheel *a*. The gear-wheel *c* is allowed to turn loosely on the shaft C in this direction, because of the spring-catch and ratchet *d*, so that the pump is not actuated by the winding

process. The outward motion of the horse unwinds the rope *r* from the drum B. At the same time the rope *r'*, being wound on the drum B in the opposite direction, lifts the small weight T. The force at the whiffletree being released, the small weight T, in descending, winds up the rope *r*, the drum B being allowed to turn loosely on the shaft in this direction by reason of the ratchet and spring-catch *e*. Thus by a forward and backward motion a horse can quickly and easily elevate a great weight.

When it is desired to wind up the weight W by hand, motion is imparted to the pinion *b* by the crank K. The drum B, being loose upon the shaft *s*, is not operated while the crank K is being turned. Thus no change or adjustment is necessary in the apparatus, whether it be desired to use horse or hand power in winding up the weight W.

I claim—

The piston of the reciprocating pump actuated by and in combination with weight W, drum A, gear-wheels *a*, *a'*, and *c*, ratchet *d*, shaft C, and crank *y*, as described, and for the purpose set forth.

THOMAS TULLY.

Witnesses:

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