

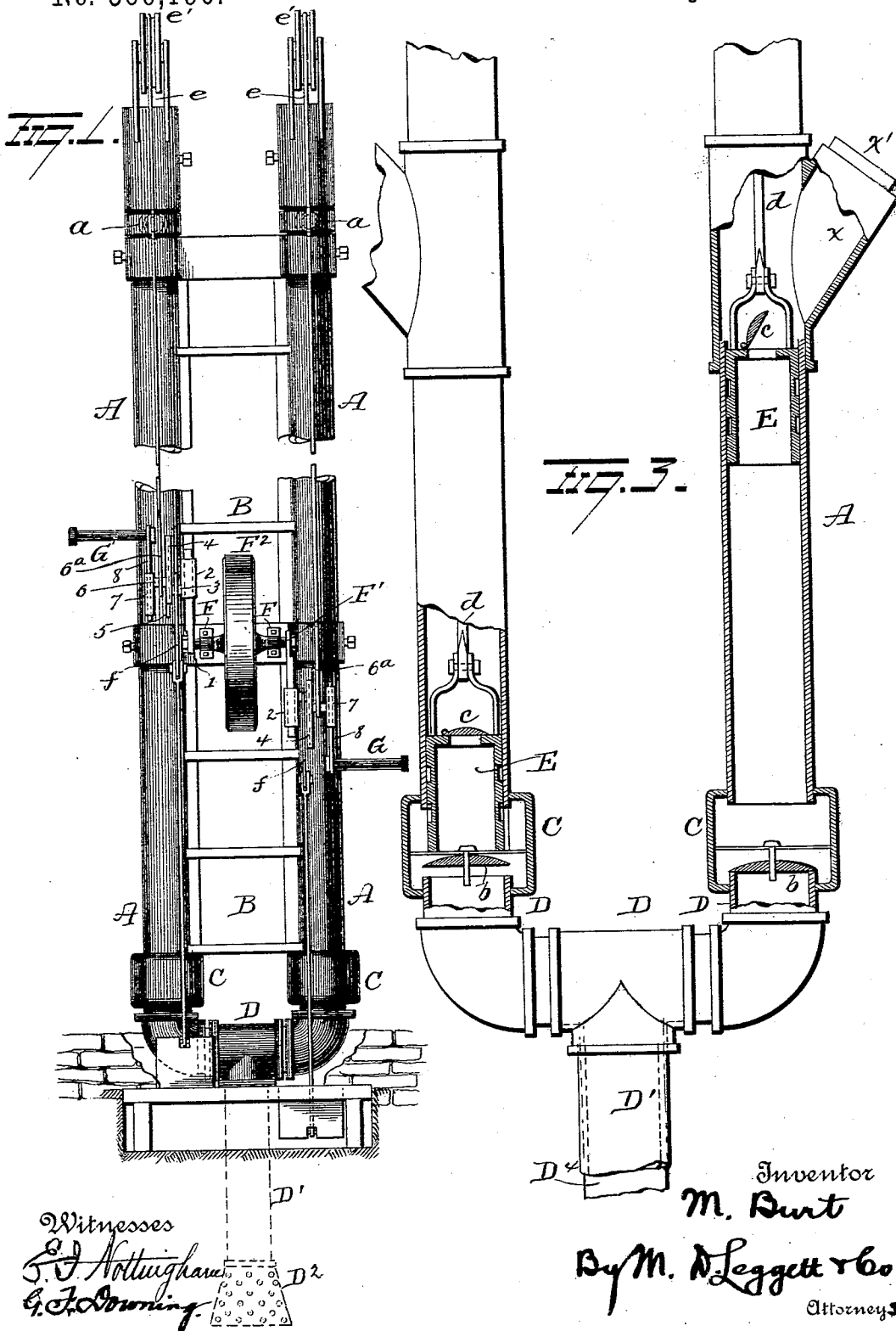
(No Model.)

4 Sheets—Sheet 1.

M. BURT.
PUMPING APPARATUS.

No. 560,190.

Patented May 19, 1896.



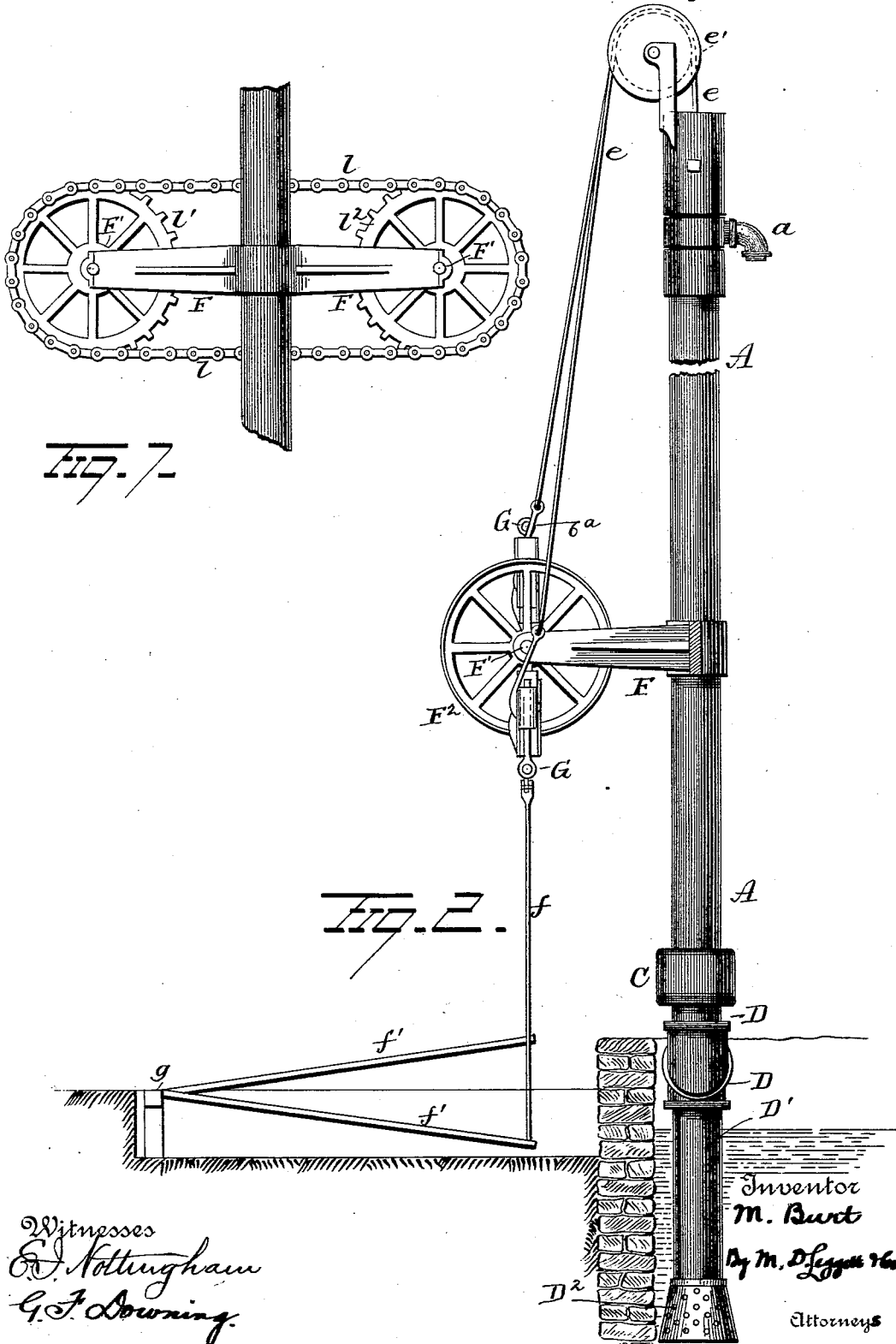
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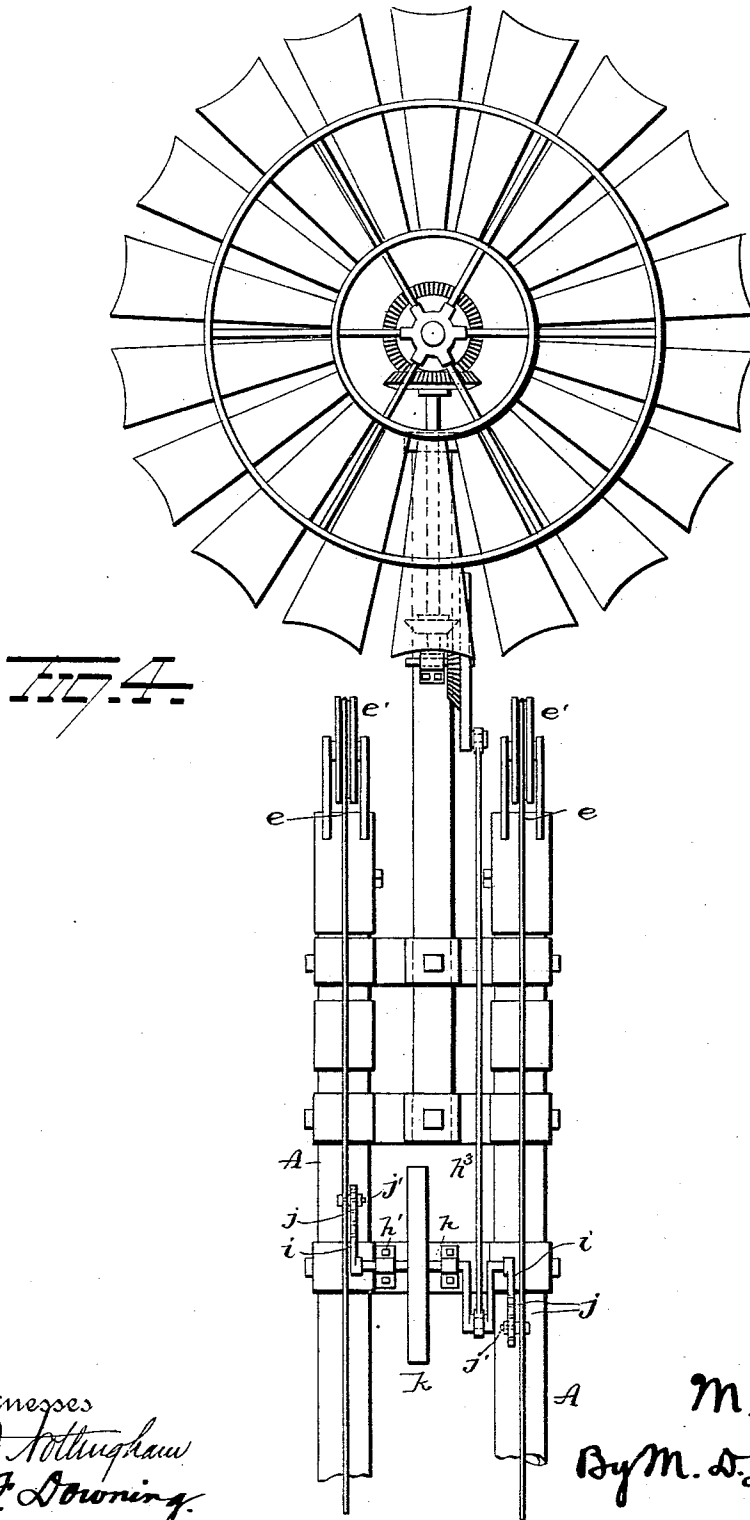
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Patented May 19, 1896.



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(No Model.)

4 Sheets—Sheet 4.

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FIG. 5.

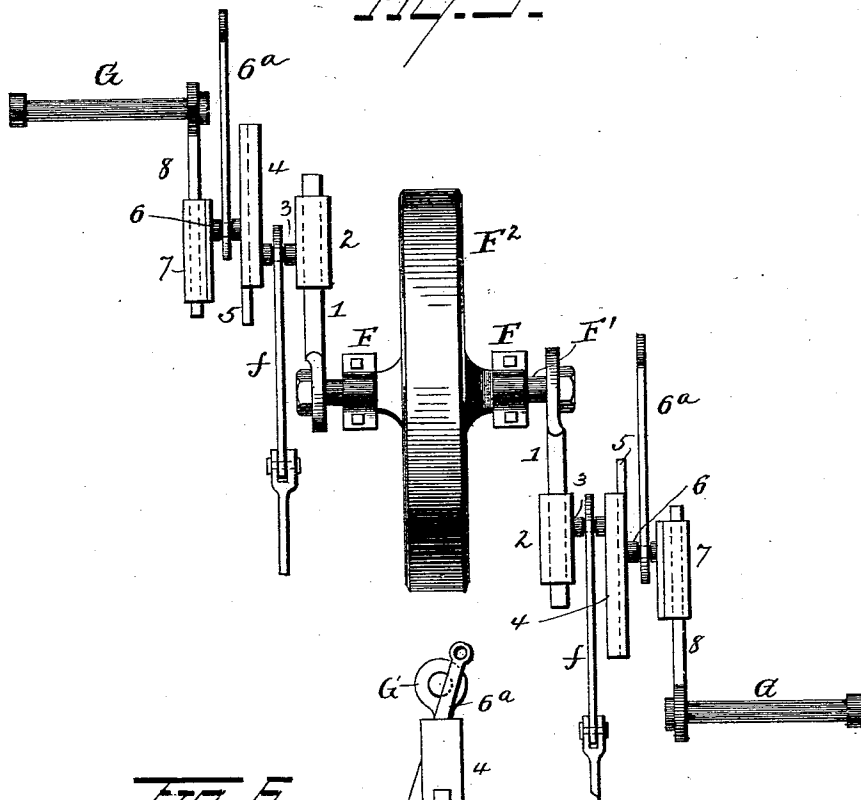
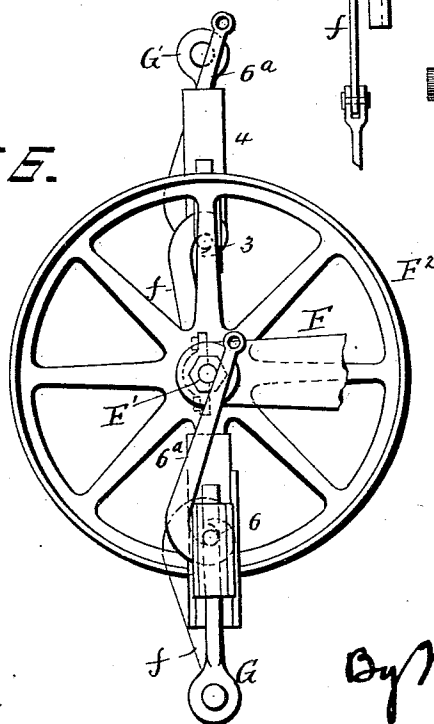


FIG. 6.



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UNITED STATES PATENT OFFICE.

MERRITT BURT, OF JACKSONVILLE, FLORIDA.

PUMPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 560,190, dated May 19, 1896.

Application filed February 14, 1895. Serial No. 538,417. (No model.)

To all whom it may concern:

Be it known that I, MERRITT BURT, a resident of Jacksonville, in the county of Duval and State of Florida, have invented certain new and useful Improvements in Pumping Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in pumping apparatus, the object of the invention being to so construct such apparatus that a large amount of water can be raised in a given time with the expenditure of a small amount of power.

With this object in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation, partly in section. Fig. 2 is a side elevation. Fig. 3 is an enlarged detail view. Fig. 4 is a view illustrating the application of a windmill to my improved pumping apparatus. Figs. 5 and 6 are detail views. Fig. 7 is a view of a modification.

A represent two pipes or pump-cylinders made either of wood or metal and arranged parallel with each other at such distance apart as to permit the insertion between them of a ladder B for the accommodation of an attendant when it is necessary to oil or adjust the more elevated parts of the apparatus. The ladder will be held in place between the pipes or cylinders A by means of a series of iron loops or straps passing about said pipes or cylinders.

Each pump-cylinder A is provided near its upper end with an outlet-spout *a*, and at its lower end communicates with a short cylinder or valve-chamber C, in each of which a quick-acting valve *b* is located and adapted to normally close the upper ends of a yoke or pipe D, which communicates at its respective ends with said short cylinders or valve-chambers C. Between the ends of the yoke or pipe D a suction-pipe D' communicates therewith and extends into the well D².

Within each pump-cylinder A a heavy piston or plunger E is located and provided with

a quick-acting valve *c*, said pistons or plungers being adapted to fit neatly within the cylinders. Neither the pistons nor the valves will be provided with packing, and thus a considerable amount of friction will be obviated. The pistons or plungers E E are adapted to operate alternately, so that the descent of one piston or plunger will assist in the raising of the other. Each piston or plunger is provided with a piston-rod *d*, to which a wire rope or chain *e* is attached, and these wire ropes or chains are passed over pulleys *e'*, supported in suitable brackets at the tops of the cylinders, and then down to the operating mechanism, which latter will now be described in detail.

To the pipes or cylinders A A brackets F are adjustably secured, and in these brackets a shaft F' is mounted, said shaft carrying a fly-wheel F² between its ends. To the respective ends of the shaft F crank-arms 1 1 are secured and project therefrom in opposite directions. To each crank-arm 1 a sleeve 2 is adjustably secured and provided with a laterally-projecting pin 3, which latter is secured to a grooved plate 4. To each grooved plate 4 a bar 5 is adjustably secured and provided with a laterally-projecting pin 6, the latter being secured at its other end to a sleeve 7. To each sleeve 7 a bar 8 is adjustably secured, and to each bar 8 a crank arm or handle G is fixed. To the pins 6 the lower ends of the cords or chains *e* from the piston-rods *d* are connected by means of arms 6^a. To the pins 3 the upper ends of jointed rods *f* are connected, the lower ends of said rods being pivotally connected to foot-levers *f'*, and the latter are pivotally connected at their rear ends to a suitable bracket *g*. From this construction and arrangement of operating mechanism it will be seen that the handles G can be easily adjusted relatively to the shaft F', so as to increase or decrease the amount of leverage and to accommodate the mechanism to persons of different sizes and strengths. It will also be seen that the connection of the ropes or chains *e* and the treadles or foot-levers *f'* can be easily adjusted relatively to the shaft F', whereby to regulate the stroke of the treadles and that of the pistons when it is desired to increase or decrease the amount of water to be raised

in a given time with the expenditure of a given amount of power.

By the use of my improved apparatus the weight of the operator will be utilized in operating the pumping mechanism, and by the construction and arrangement of the operating mechanism a comparatively small amount of exertion on the part of the operator will result in the raising of a large amount of water in a given length of time, and when the apparatus is in operation the weight of one piston in descending will assist in the raising of the other piston.

If desired, the pump-cylinders may be made to enter the well, in which case the yoke or pipe D and the suction-pipe D' may be omitted.

When it is desired to operate the apparatus by means of a wind-wheel, a crank-shaft *h* will be mounted in suitable brackets *h'*, secured to the cylinders A A near the upper ends thereof, and the wind-wheel gearing (which may be of any preferred form of construction) will be connected with said crank-shaft by means of a suitable pitman *h''*. On the respective ends of the shaft *h* crank-arms *i* are secured. Each crank-arm *i* is made with a series of perforations *j* for the reception of crank-pins *j'*, to which the cords or chains are connected.

By providing the crank-arms *i* with a series of perforations the crank-pins may be adjusted relatively to the crank-shaft and the stroke of the pistons regulated commensurate with the amount of water it is desired to draw. The crank-shaft *h* may be provided with a pulley *k*, over which a belt from a steam-engine may be passed when it is desired to use such motive power. It is evident that the apparatus might also be operated by horsepower.

If desired, the apparatus may be equipped to be operated manually and by the power derived from a windmill so that both operating apparatus may be operated simultaneously or successively.

In some cases it may be desired to raise more water in a given length of time than can be done by a single operator—for instance, in case of fire. For this reason I prefer to provide another set of hand and foot operated devices, similar to those above described, at the opposite side of the pump-cylinders (with

the exception of the connections with the pistons) and to connect the two sets of devices by means of a sprocket-chain *l*, which passes over sprocket-wheels *l'* *l''* on the shafts of the respective mechanisms. By these means a number of operators can manipulate the mechanism at the same time. In order that access may be had to the pistons for priming or for other purpose, I provide each cylinder or pipe A with an elbow *x*, normally closed by means of a plug *x'*.

Various slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope, and hence I do not wish to limit myself to the precise details of construction herein set forth; but,

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

1. In a pumping apparatus, the combination with pump cylinders and pistons therein, of a shaft, arms secured to said shaft and projecting therefrom in opposite directions, sleeves adjustably secured to said arms, plates connected with said sleeves, a bar adjustably secured to each plate, a sleeve connected with each bar, a bar adjustably secured to each of said last-mentioned sleeves and a crank-arm or handle secured to each of said last-mentioned bars, and a connection between the operating mechanism thus produced and the pump-pistons, substantially as set forth.

2. In a pumping apparatus, the combination with pump cylinders and pistons therein, of a shaft, arms secured to said shaft, sleeves adjustably secured to said arms, foot-levers connected with said sleeves, plates also connected with said sleeves, bars adjustably secured to said plates, connections between bars and the pistons, sleeves also connected with said bars, bars adjustably connected to said sleeves and crank-arms or handles secured to said last-mentioned bars, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

MERRITT BURT.

Witnesses:

B. A. LEITE,
WILLIAM L. GIBSON.