No. 650,075. Patented May 22, 1900.

A. ELLIS.

STEAM PUMP.

(Application filed Mar. 19, 1900.)

(No Model.)

Fig. 1.

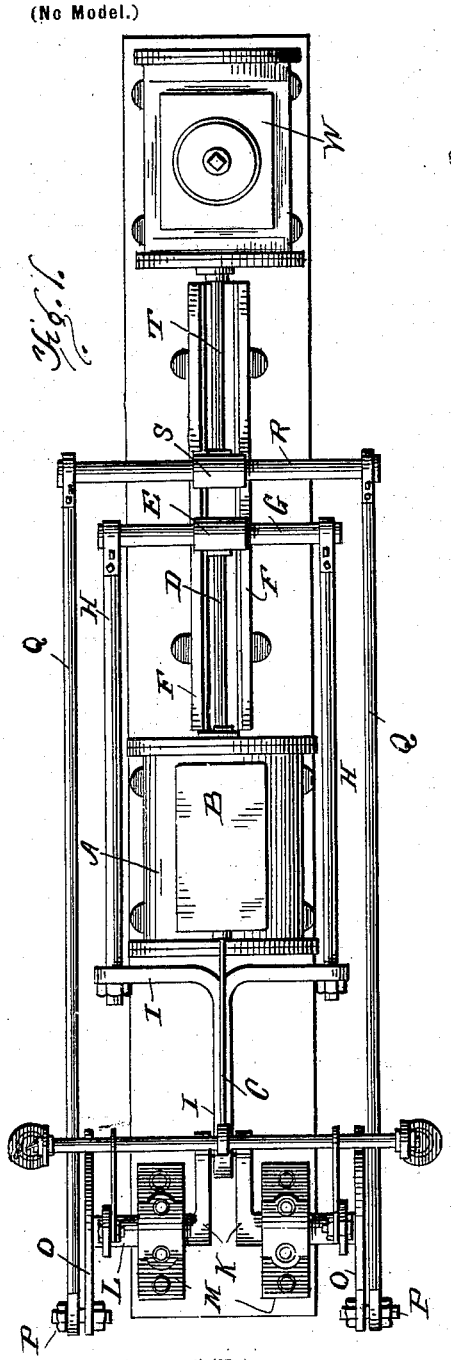
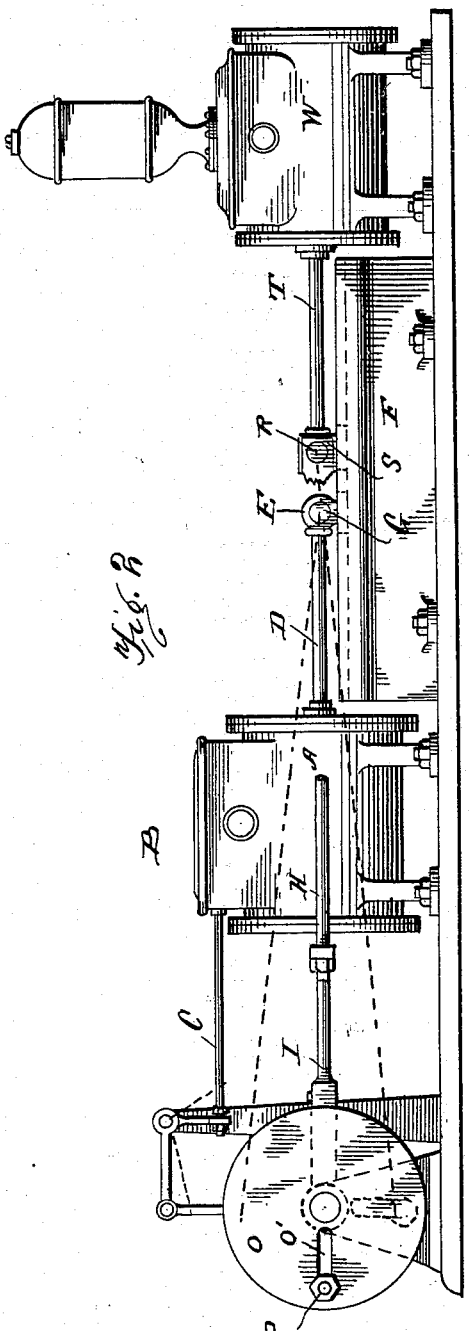


Fig. 2.



WITNESSES

Charles K. Davies.

M. E. Brown

INVENTOR

A. Ellis

By H. A. Bartlett

Attorney

UNITED STATES PATENT OFFICE.

ABRAM ELLIS, OF AUGUSTA, GEORGIA.

STEAM-PUMP.

SPECIFICATION forming part of Letters Patent No. 650,075, dated May 22, 1900.

Application filed March 19, 1900. Serial No. 9,311. (No model.)

To all whom it may concern:

Be it known that I, ABRAM ELLIS, a citizen of the United States, residing at Augusta, in the State of Georgia, have invented certain new and useful Improvements in Steam-Pumps, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to steam-pumps.

The object of the invention is to afford a convenient means for changing the throw of a pump-piston without changing the travel of the steam-piston by which the pump is driven.

In most reciprocating steam-engines the piston movement must be to the same distance with every stroke; but there are many pumps in which a shorter or a longer stroke may be made, with the only difference in result that less water is lifted by a short stroke than by a long one. It thus becomes desirable to have a changeable stroke, so that the full power of the engine may be applied to the movement of the pump-piston a short distance should the resistance be great, or a full stroke of the pump-piston may be made when the resistance is such as to permit the maximum quantity of water to be lifted by the pump.

Figure 1 of the drawings is a plan, and Fig. 2 a side elevation, of a steam-pump according to the principles of the present invention.

A indicates the steam-cylinder, to which steam is supplied in any suitable manner through steam-chest B, the valve therein being controlled by usual connections from the crank-shaft, as indicated at C. The piston-rod D of the steam-cylinder is connected to a cross-head E, which slides on guideways F F. A rock-shaft or spreader G extends through the cross-head E, and to the ends of this spreader G two pitman-bars H are connected. The pitman-bars H are connected near the other end of the steam-cylinder by a coupling-bar I, which in turn is connected to the crank K of crank-shaft L, said crank-shaft being supported in usual bearings, as M. At each end of crank K a disk O is attached to said crank, and these disks are of course rotated as the pitman-bars reciprocate. It is not very material whether spreader G rocks in the cross-head E or whether the spreader be fixed and the pitman-bars rock thereon.

The disks or fly-wheels O will be driven by the reciprocation of the piston-rod D through the mechanism described. The disks O are slotted, and in the slots O′ wrist-pins P P may be adjusted at any distance from the center by means of nuts or usual fastening devices. To these crank-pins P pitman-rods Q Q are connected, both leading to a spreader R, which passes through a cross-head S, this cross-head being guided on the slideways F F. The cross-head S is connected to a pump-rod T, so that the rotation of disks O reciprocates spreader R and cross-head S, and the length of this reciprocating movement is determined by the position of the wrist-pins P in the slots O′.

The pump-cylinder W is of usual construction, the valves operating to cut off and supply the liquid thereto in usual manner.

The valve-controlling mechanism C may be located in any convenient position, so that eccentrics on the shaft will control the movement of the slide-valve.

From the above description it is thought the general principles of my invention will be well understood. The reciprocation of the steam-piston is uniform as to distance, and the connections from such piston serve to rotate the disks or fly-wheels O. These fly-wheels, being at opposite ends of the crank-shaft, give convenient means for attachment of the long pitman-bars Q Q and are in position to balance the crank, or very nearly so. The adjustment of wrist-pins P may be according to the desired stroke of the pump, and by setting the cross-head S to a desired position and loosening the fastenings of the wrist-pins these pins will find their proper positions in slots O′ and may be there secured in such manner as to cause any desired throw of the pump-piston within the limits of the capacity for adjustment determined by the length of slots O′.

I do not limit my claims to the precise construction of parts, as it is understood that the substitution of equivalents does not change the nature of the invention.

What I claim is—

1. In a steam-pump, the combination of a steam-cylinder, piston-rod, and cross-head, a pitman from said cross-head to a crank-shaft, and a slotted disk on said crank-shaft and a wrist-pin therein, and a pitman connected to

said wrist-pin and to a cross-head moving on a slideway and connected to a pump-piston, all the specified elements and their necessary coöperating adjuncts combined substantially as described.

2. In a steam-pump, the combination of a steam-cylinder, piston-rod and cross-head moving on ways, a second cross-head moving on the same ways and connected to a pump-piston, and means connecting the cross-heads by which the uniform throw of the steam-piston may be changed to give a different throw to the pump-piston, substantially as described.

3. In a steam-pump, the combination of a steam-cylinder and its piston-rod, pitman connection from said piston-rod past the cylinder to a crank-shaft, an adjustable connection from said crank-shaft to a second pitman, and a pump-rod operated by said second pitman, substantially as described.

4. In a steam-pump, the steam-cylinder and piston-rod, a cross-head connected to said piston-rod and a spreader projecting therefrom, pitman-bars connected to said spreader, and extending past the steam-cylinder, a coupling-bar to said pitman-bars and a crank-shaft engaged by said coupling-bar, and an adjustable wrist-pin on the crank-shaft connected by second pitman to a pump-rod, substantially as described.

5. In a steam-pump, the steam-cylinder, piston-rod, and connections substantially as described to a crank-shaft, a face-plate at each end of said crank-shaft, and a radially-adjustable wrist-pin thereon, and pitman-bars connected to each of said wrist-pins and to a spreader attached to a pump-rod, all combined substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ABRAM ELLIS.

Witnesses:

STEWART THINIZY,

A. S. MORRIS.