

No. 732,713.

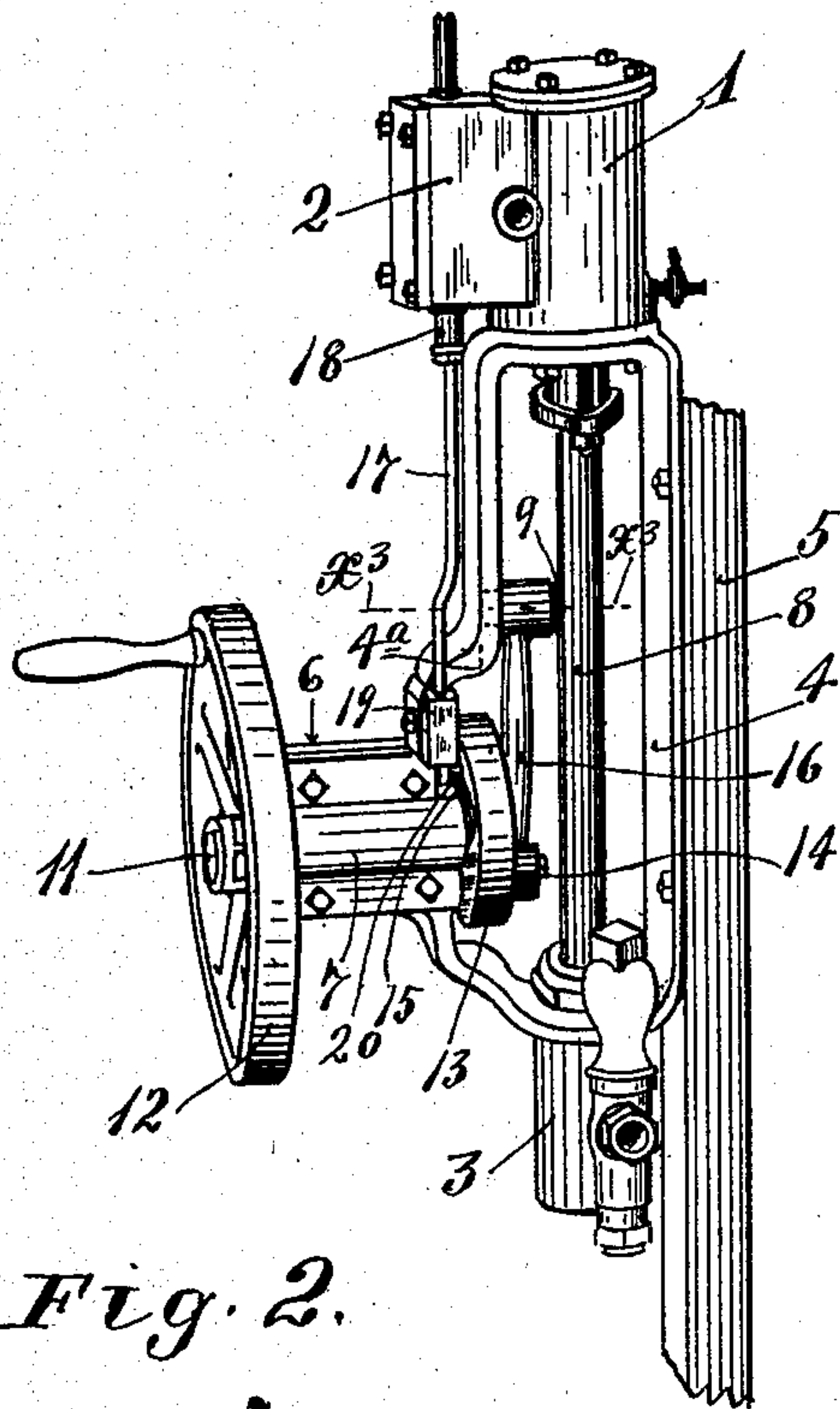
PATENTED JULY 7, 1903.

F. D. CLINGER.  
STEAM PUMP.

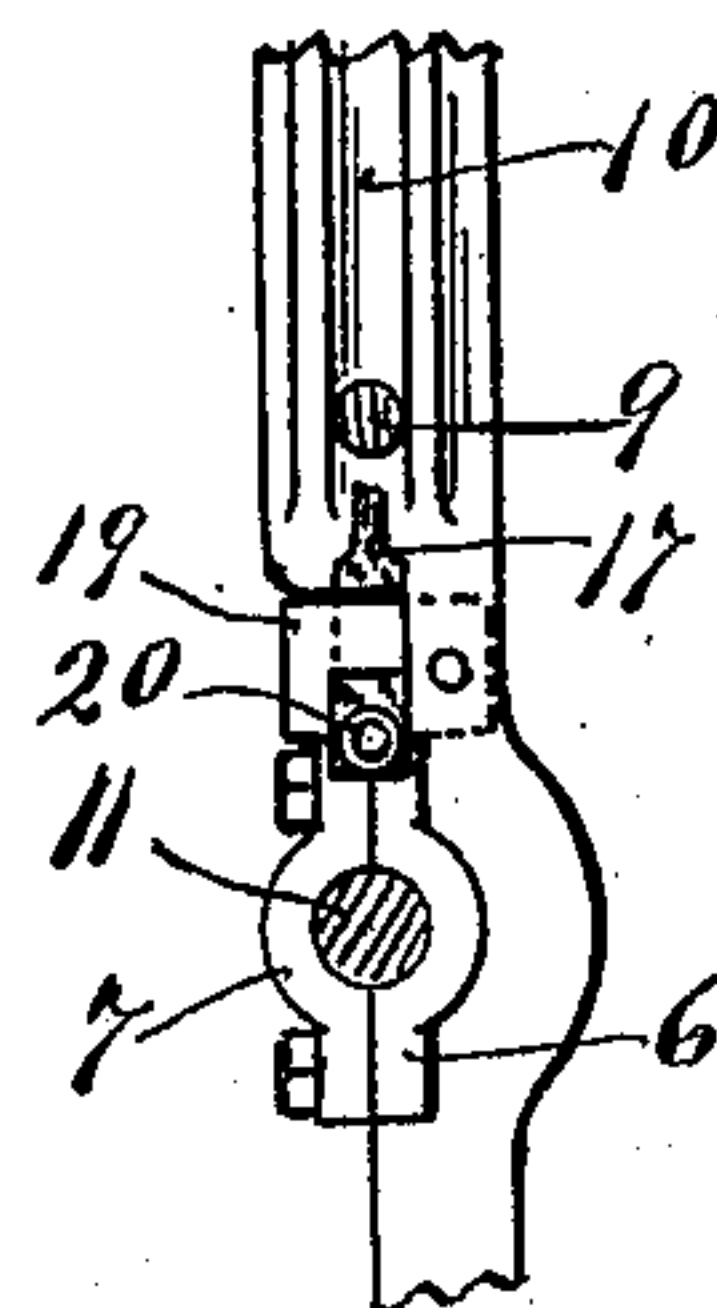
APPLICATION FILED SEPT. 15, 1902.

NO MODEL.

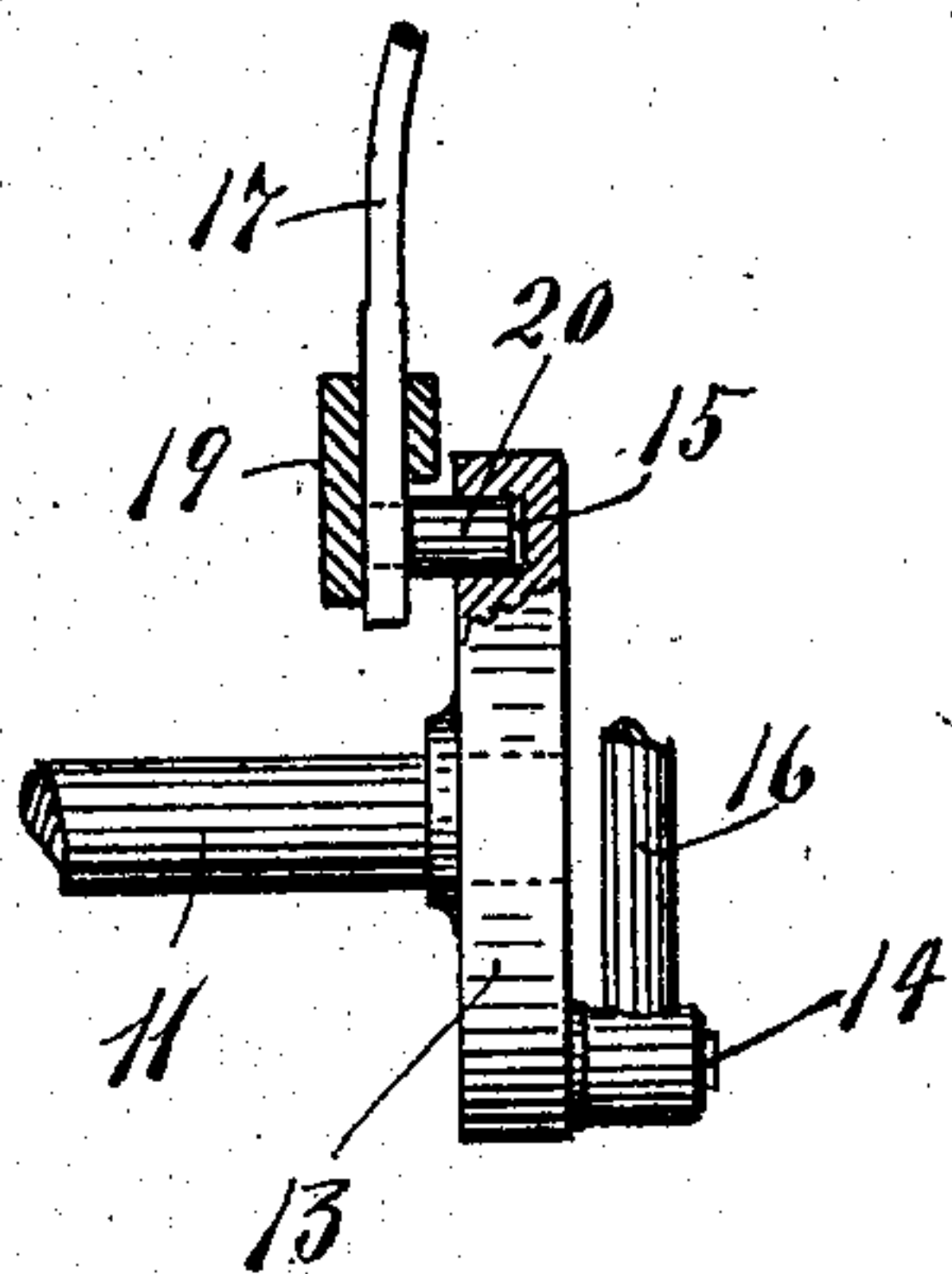
*Fig. 1.*



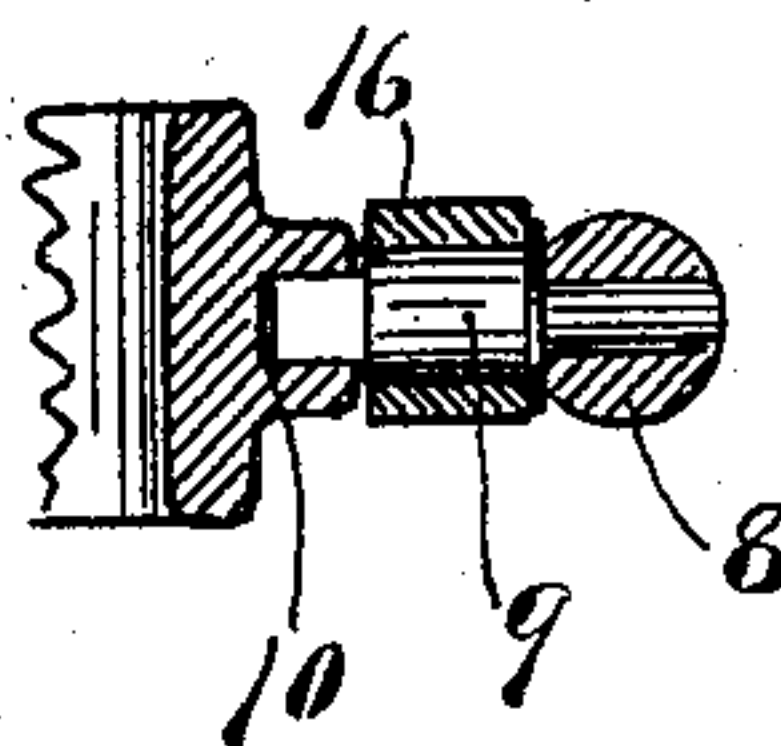
*Fig. 4.*



*Fig. 2.*



*Fig. 3.*



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## STEAM-PUMP.

SPECIFICATION forming part of Letters Patent No. 732,713, dated July 7, 1903.

Application filed September 15, 1902. Serial No. 123,451. (No model.)

*To all whom it may concern:*

Be it known that I, FRED D. CLINGER, a citizen of the United States, residing at Owatonna, in the county of Steele and State of Minnesota, have invented certain new and useful Improvements in Steam-Pumps; 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 has for its object to provide an improvement in steam-pumps; and to this end it consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a perspective view showing a steam-pump embodying the several features of my invention. Fig. 2 is a detail, principally in side elevation, but with some parts sectioned and others broken away, showing the combined crank-disk and valve-actuating cam. Fig. 3 is a horizontal section on the line  $x^3 x^3$  of Fig. 1, some parts being broken away; and Fig. 4 is a detail in elevation looking at one side of the supporting yoke or frame of the pump in a direction from the inside toward the outside thereof.

The numeral 1 indicates the cylinder, and the numeral 2 the steam-chest, of a steam-engine.

The numeral 3 indicates the cylinder of a pump.

The cylinders 1 and 3 are rigidly connected in axial line, the one vertically over the other, and are rigidly connected by an oblong frame or yoke 4, which, as shown, is bolted or otherwise secured at one side of a supporting-post 5, although it may be otherwise supported. At one side the yoke 4 is cast integral with a half-bearing 6, to which is bolted or otherwise detachably secured a half bearing or box 7. The axis of the journal afforded by the box-sections 6 and 7 intersects the common axes of the cylinders 1 and 3 at a right angle.

The numeral 8 indicates a long heavy piston-rod, which is provided at its ends with ordinary pistons which work in the cylinders 1

and 3 in the ordinary way. The piston-rod 8 is provided with a wrist-pin 9, the end of which is preferably reduced, as shown in Fig. 3, and works in a vertical channel or groove 10, formed on one side of the yoke 4, as shown, by a pair of projecting parallel flanges. The guide-channel 10 terminates at its lower end at a point where the frame or yoke bulges abruptly outward at 4<sup>a</sup>. The purpose of this construction will later appear.

Loosely mounted in the journal afforded by the box-sections 6 and 7 is a short counter-shaft 11, which at its outer end is provided with a hand-wheel 12 and at its inner end is provided with the disk 13. The disk 13 is provided with a crank-pin 14, which projects from its inner face, and in its outer face it is provided with a profile cam-groove 15. A pitman 16 connects the crank-pin 14 of the said disk 13 to the wrist-pin 9 of the piston-rod 8.

The distribution-valve of the steam-engine, which is of the ordinary or any suitable construction and works in the steam-chest 2, is not shown; but its stem 17 works downward through a stuffing-box 18 in the lower end of the steam-chest, and its lower end works through a guide-block 19, bolted or otherwise secured to the bulged side 4<sup>a</sup> of the yoke-frame 4 just above the box-sections 6 and 7. The piston-rod 17 is thus mounted for true vertical movements, and at its extreme lower end it is provided with a roller 20, which works in the cam-groove 15 of the disk 13. The crank-disk 13 is thus made to serve the double function of cam and crank. The cam-groove 15 must of course have the proper form to impart the desired movements to the admission-valve, this being well understood. The valve-stem 17 receives a straight-line reciprocating movement directly from the said cam. This construction is not only simple and of small cost, but is extremely efficient.

The upper bearing of the pitman 16, which works on the wrist-pin 9, closely fits between the piston-rod 8 and the grooved side of the yoke 4, and is thus held against lateral or side movements of the said wrist-pin. In other words, the said pitman is thus held in working position both on the wrist-pin 9 and on the crank-pin 14 and can be removed therefrom only when the piston-rod 8 is dropped



downward far enough to carry the wrist-pin 9 below the bulged section 4<sup>a</sup> of the yoke 4. The piston-rod and wrist-pin can be thus lowered only when the half-box 7 is removed 5 and the disk 13, shaft 11, and hand-wheel 12 are lowered or dropped down out of working position. The pin 9 also prevents turning of the piston.

The yoke 4 forms a very good support for 10 the working parts of the pump and rigidly ties together the two cylinders 1 and 3. Furthermore, it is disposed in the best way to receive the end thrusts on the pitman 16. By means of the hand-wheel 12 the pump can 15 be easily started into action by the movement of the pitman 16 from the dead-center. Furthermore, by means of the said hand-crank the pump may be run by hand. The said wheel 12 also serves as a fly-wheel for 20 the crank-disk 13.

It will of course be understood that the pump described is capable of modification within the scope of my invention, as herein set forth and claimed.

25 What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a pump, the combination with a frame and a piston-rod, of a crank-disk having on one face a wrist-pin, and on its other face a 30 valve-actuating cam, a pitman connected to the wrist-pin of said crank-disk and to said piston-rod, and a valve-stem having a projection subject to the cam of said crank-disk, substantially as described.

35 2. In a pump, the combination with a pair

of cylinders, of a frame connecting the same, and a piston-rod cooperating with the said cylinders, of a crank-disk mounted on said frame, a wrist-pin on said piston-rod, the projecting end thereof working in a longitudinal groove, 40 formed in one side of said frame, and a pitman connecting said crank-disk to the wrist-pin of said piston-rod, and held in working position by the grooved side of said frame, substantially as described. 45

3. In a pump, the combination with the cylinders 1 and 3, of the frame or yoke 4 rigidly connecting said cylinders, provided at one side with the groove 10, lateral bulge 4<sup>a</sup> and half-boxes 6 and 7, with the piston-rod 8 50 cooperating with both cylinders and provided with a wrist-pin 9 the outer end of which works in said groove 10, the crank-disk 13 having a shaft mounted in the bearing 6 7, provided at its inner face with a crank-pin 55 14 and on its outer face with a cam-groove 15, the pitman 8 connecting said crank-pin 14 and wrist-pin 9 and held in place by the side of said frame 4, and the valve-stem 17 working through a fixed bearing 19 on the 60 frame 4 and provided with a roller or projection working in said cam-groove 15, substantially as described.

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

FRED D. CLINGER.

Witnesses:

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