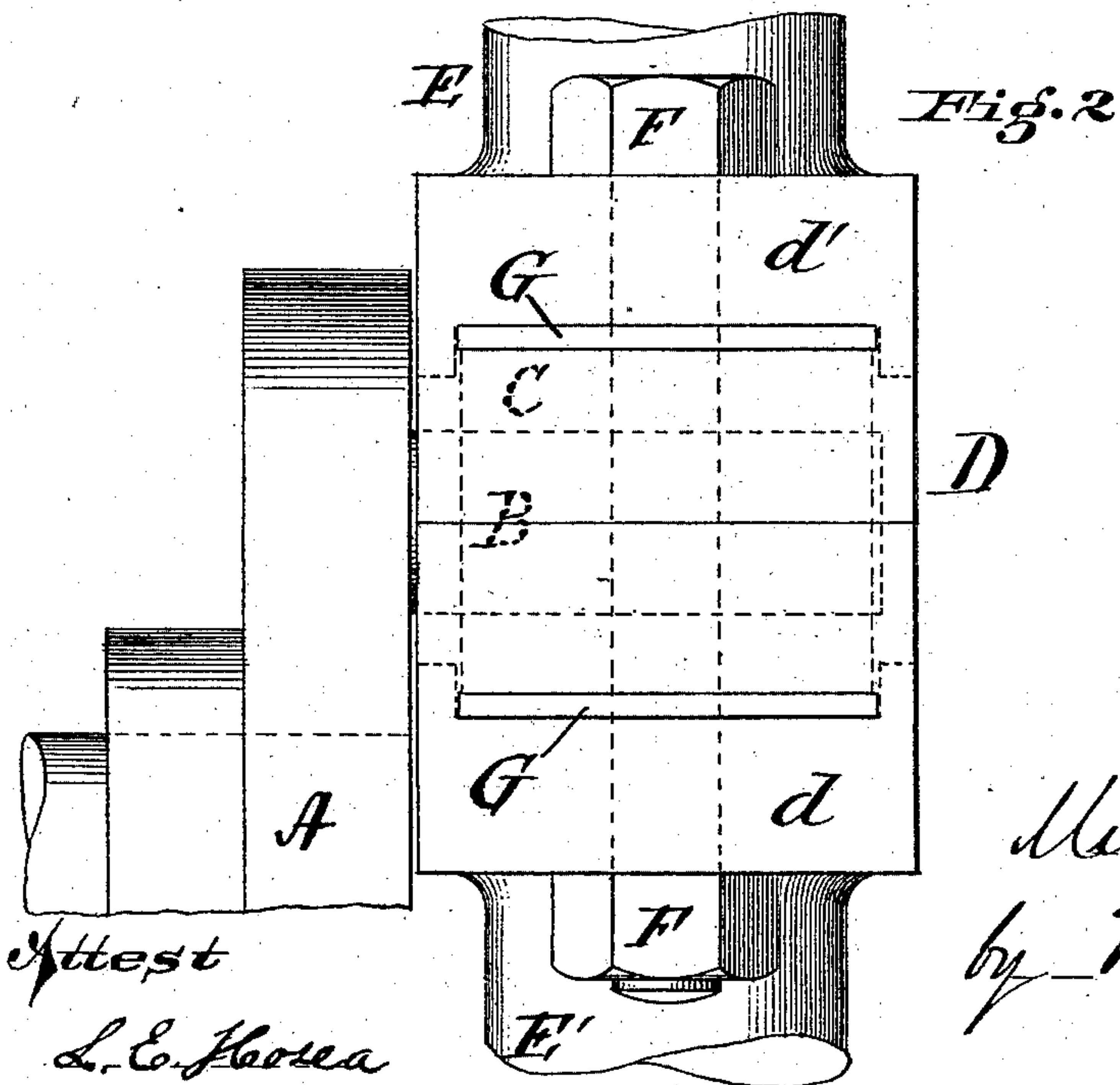
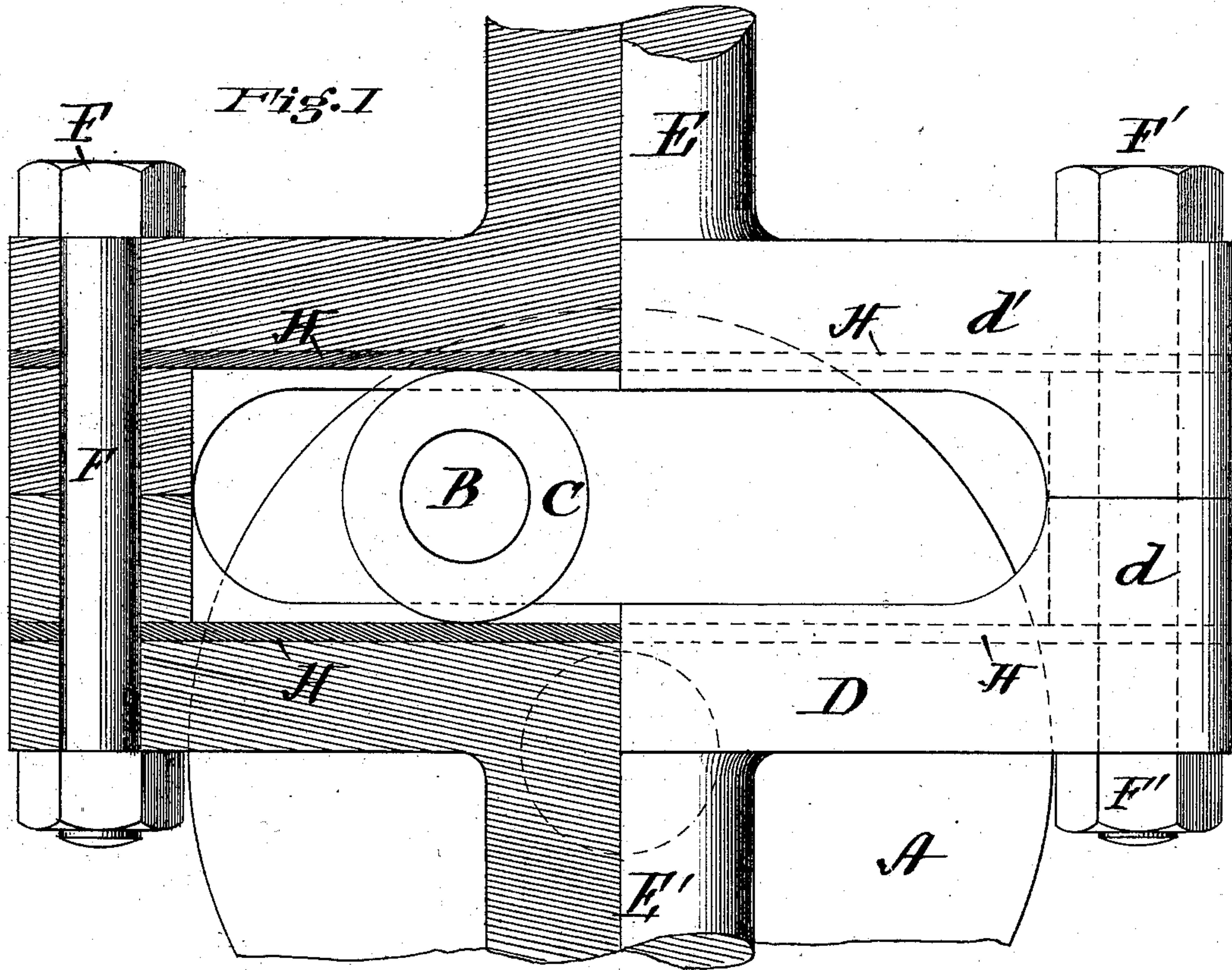


(No Model.)

M. SCHULTZ.
Steam Pump.

No. 235,905.

Patented Dec. 28, 1880.



Attest

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UNITED STATES PATENT OFFICE.

MICHAEL SCHULTZ, OF CINCINNATI, OHIO.

STEAM-PUMP.

SPECIFICATION forming part of Letters Patent No. 235,905, dated December 28, 1880.

Application filed August 20, 1880. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL SCHULTZ, a citizen of the United States, residing at Cincinnati, Hamilton county, Ohio, have invented
5 new and useful Improvements in Steam-Pumps, of which the following is a specification.

My invention relates to direct-acting steam-pumps employing a fly-wheel for regulating
10 their movements and a yoke device for imparting motion to said fly-wheel, and is in the nature of an improvement upon the invention for which Letters Patent Reissue No. 8,798 were granted to me July 8, 1879. Said patent
15 describes a direct-acting pump in which the steam and pumping cylinders are arranged in the same axial line, with the yoke device between them engaging a roller upon the crank-pin of the fly-wheel shaft, instead of the old
20 sliding box commonly used in the Scotch yoke. In the construction of the pump therein described I have heretofore used a steel roller, and harden the faces of the yoke-slot between which it plays by a chill in the casting, in order
25 to prevent wear of the parts and lost motion; but it is found by experience that this method of construction is not altogether satisfactory, as the chill cannot be produced deep enough to allow the necessary grinding and
30 truing of the faces. The rolling action of the roller tends to condense the metal of the yoke-slot at the surfaces exposed to pressure and produce an enlargement of the slot almost equal to that produced by the wearing friction
35 of a sliding box.

The object of my present invention is to remedy this difficulty and at the same time avoid the cost and trouble of chilling and hardening the inner surfaces of the yoke.

40 To this end my invention consists in facing the wearing-surfaces of the yoke with plates of steel or other hard metal, and in the mode of applying and retaining them in position in the yoke, thereby improving and rendering more
45 durable and efficient the pump or other machine employing a yoke device of this nature.

My invention is embodied in mechanism illustrated in the accompanying drawings, in which—

50 Figure 1 represents a front view of the yoke,

one-half in section, and Fig. 2 an end or side view of the yoke.

Similar letters indicate similar parts in the several figures of the drawings.

A in the drawings indicates the crank-plate; 55 B, the crank-pin; C, the roller; D, the yoke, and E E' the piston-rods of the pump and steam-cylinders respectively.

The yoke D is divided in two parts, *d d'*, horizontally on a plane passing centrally 60 through the rectangular opening or slot in which plays the roller C or the sliding box, as the case may be.

In my construction of the parts as described and claimed in my said former patent each 65 half of the yoke D and its contiguous pistons E E' are formed in one piece, being secured together as one whole by bolts F passing through the adjacent ends of the parts *d d'* constituting the yoke D. 70

In my present improvement I dispense entirely with the process of chilling the inner faces of the yoke and of grinding and facing those surfaces after casting, and in lieu thereof I cast the parts of the yoke with a rectangular aperture, G, flush with the slot-surfaces 75 and extending longitudinally through the ends of the yoke, crossing the bolt-holes at right angles, and insert in these apertures steel plates H. (Shown in edge view, partly in section and partly by dotted lines, in Fig. 1.) 80 These plates, being fitted to the yoke and provided with holes at their ends suitably spaced, are firmly secured in position and held by the bolts F, which pass through the plates and 85 hold the parts *d d'* of the yoke together. As these plates are easily prepared by cutting off proper lengths of bar-steel and punching the holes, the substitution of them in the yoke not only improves the structure by rendering it 90 far more durable, but economizes the first cost and facilitates repairs in case removal and replacement should be necessary. They may also be reversed in position end for end or by turning over, so as to present an uneven surface to frictional contact, thus securing great 95 durability.

It will be readily understood that the plates may be inserted in a yoke of any construction, whether employing a sliding box or roller, 100

and also that the benefits of my invention are not confined to steam-pumps, but may be applied in machinery of any kind where a yoke device is employed for converting reciproca-
5 tory into rotary motion, or vice versa.

Having described my invention, I claim and desire to secure by Letters Patent—

1. In a steam-pump or other machine employing a yoke device for converting recipro-
10 catory into rotary motion, or vice versa, a yoke provided with removable and reversible steel or other hard-metal plates for the interior wearing-surfaces of the slot, substantially as and for the purpose specified.

15 2. In combination with the yoke D, the plates

H, of steel or other hard metal, secured in position by the bolts F, substantially as set forth.

3. The parts *d d'*, forming the yoke D, cast with apertures G, in combination with the plates H, as and for the purpose specified. 20

4. The yoke D, provided with removable and reversible steel plates H, in combination with the roller C, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing 25 witnesses.

M. SCHULTZ.

Witnesses:

L. M. HOSEA,

L. E. HOSEA.