(No Model.) 2 Sheets—Sheet 1.

A. SNYDER.

Steam Pumps.

No. 235,037. Patented Nov. 30, 1880.

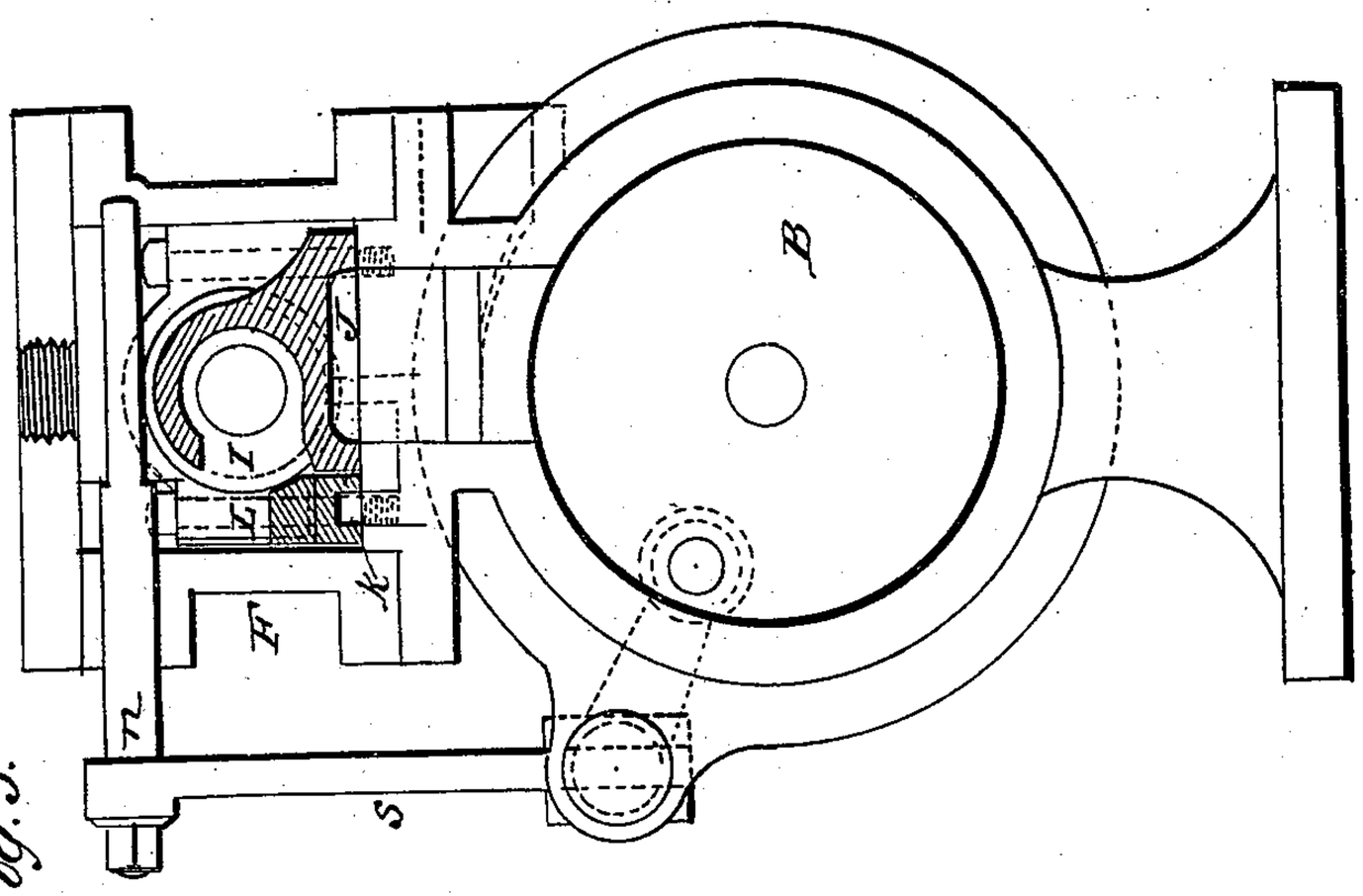

Fig. 3.

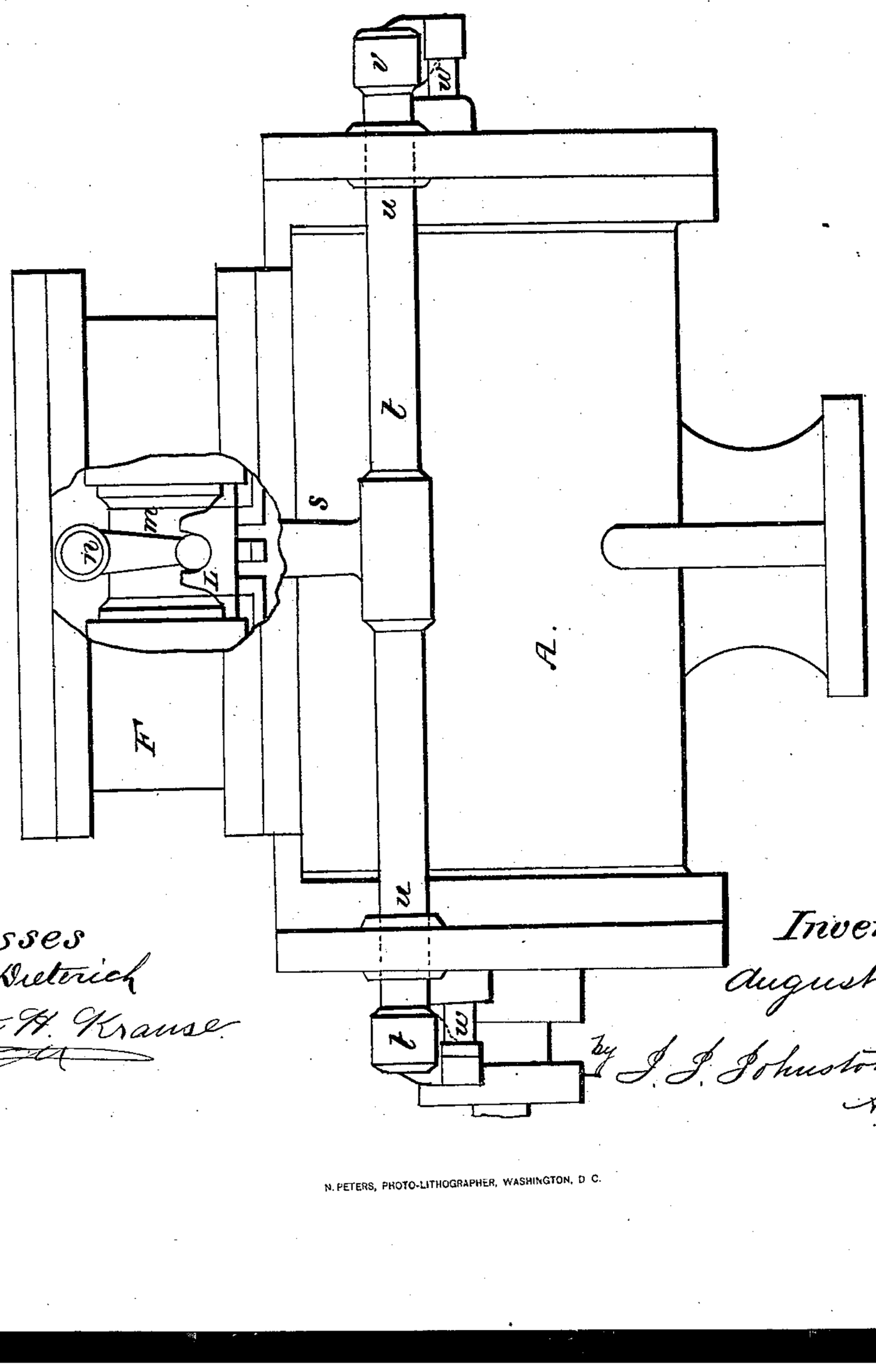

Fig. 4.

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(No Model.) 2 Sheets—Sheet 2.

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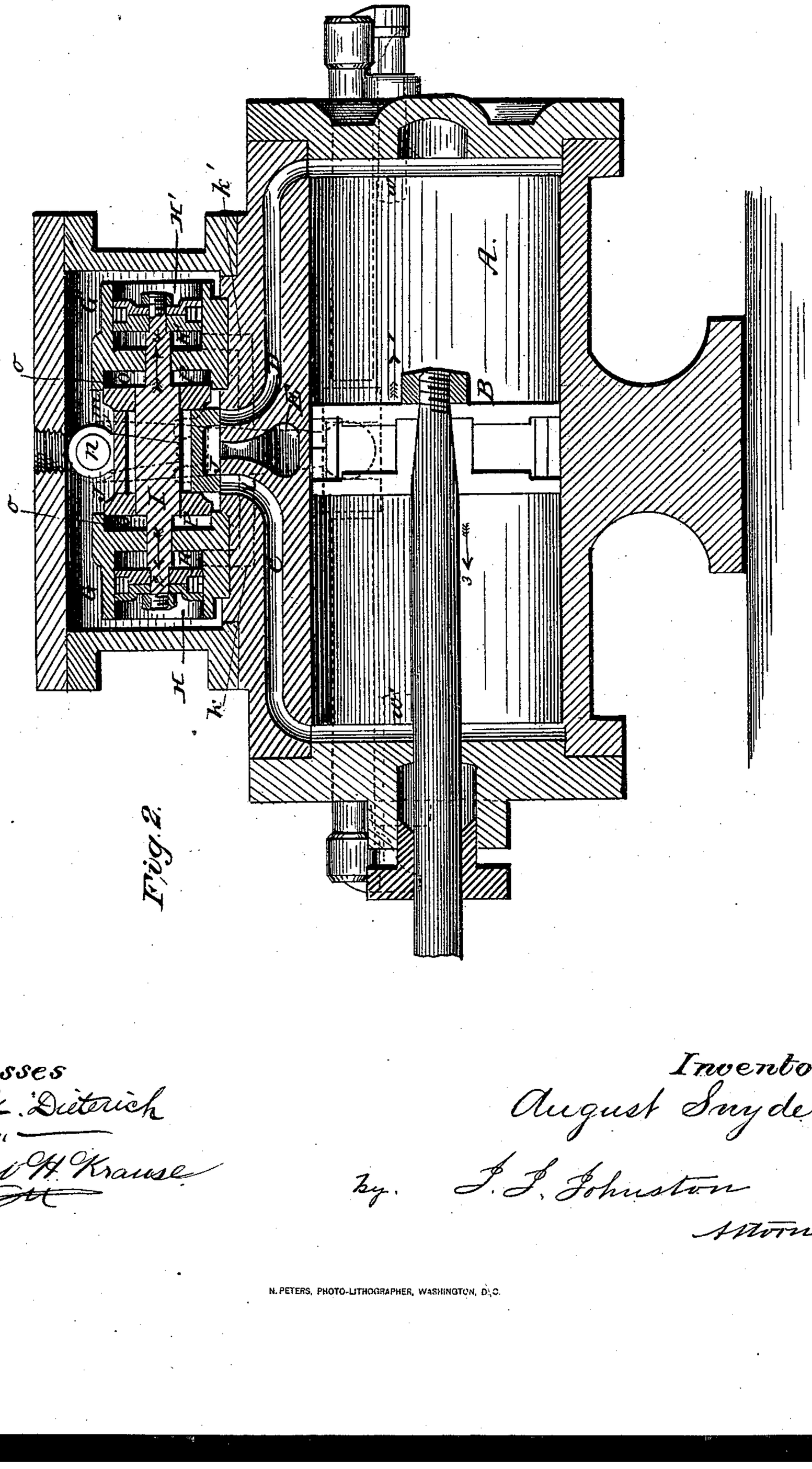

Fig. 2.

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UNITED STATES PATENT OFFICE.

AUGUST SNYDER, OF ALLEGHENY, PENNSYLVANIA.

STEAM-PUMP.

SPECIFICATION forming part of Letters Patent No. 235,037, dated November 30, 1880.

Application filed July 21, 1880. (No model.)

To all whom it may concern:

Be it known that I, AUGUST SNYDER, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Steam-Pumps; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to an improvement in that class of steam-pumps known as "direct-acting steam-pumps;" and it consists in the method and means hereinafter described for operating, balancing, and cushioning the slide-valve of the steam-cylinder, and in harmonizing the action of the force applied to the piston of the steam-cylinder with the pumping force and action of the piston of the pumping-cylinder, whereby the thumping, knocking, jerking, and jarring action common to this class of pumps is obviated, and instead thereof a steady, smooth, and uniform action of the several parts of the pump is obtained.

To enable others skilled in the art with which my invention is most nearly connected to make and use it, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification, Figure 1 is a side elevation of the steam-cylinder of the steam-pump, representing a portion of one side of the steam-chest broken away for the purpose of showing the relative position of the auxiliary slide-valve with the principal slide-valve, and also the seat and operating-gear of the former valve and the steam-ports connected therewith. Fig. 2 is a vertical and longitudinal section of the same. Fig. 3 is a vertical and transverse section of the same.

In the accompanying drawings, A represents the steam-cylinder, B its piston, C D E its steam-ports, and F its steam-chest, all of which are of ordinary construction. In the steam-chest F are arranged two steam-cylinders, G G′, having pistons H H′ and cushioned carrier I for the principal slide-valve J.

The cylinders G G′ are supplied with steam through the medium of steam-ports *k* and *k′*. The admission of steam through them is controlled by an auxiliary slide-valve, L, which is operated by means of a pendant, *m*, attached to a shaft, *n*, pivoted in the walls of the steam-chest F.

To the outer end of the shaft *n* is attached an arm, *s*, the lower end of which is attached to a rod, *t*, which moves in bearings *u*. To each end of the rod *t* is attached an arm, *v*, to the lower or inner end of which are attached pins *w* and *w′*, which project through the head of the steam-cylinder A.

The skilled mechanic will, by reference to the accompanying drawings and from the foregoing description, be enabled to construct my improvement. I will therefore proceed to describe its operation.

The steam-chest F being supplied with steam and the port C opened, the piston B will travel in the direction indicated by the arrow marked 1, which, coming against the end of the pin *w*, will thereby move the rod *t*, arm *s*, shaft *n*, pendant *m*, and auxiliary valve L and open the steam-port *k* and admit steam into the chamber R of the cylinder G, which will move the piston H and the carrier I with the principal slide-valve J in the direction indicated by the arrow marked 2, and thereby open the steam-port D, causing the piston B to move in the direction indicated by the arrow marked 3, and, coming against the pin *w′*, will move the rod *t*, arm *s*, shaft *n*, pendant *m*, and auxiliary valve L, and thereby open the port *k′*, and steam will pass into the chamber R′ of the cylinder G′ and move the piston H′, carrier I, and valve J in the direction indicated by the arrow marked 4, and thereby open the steam-port C. The steam having performed its office in the cylinders A, G, and G′, it is exhausted through the exhaust-port E.

The ends *o o* of the carrier I are fitted to the bore of the chambers P of the cylinders G and G′, and steam entering said chambers, when said ends *o o* are moved out of said chambers the steam forms a cushion in the chambers P for the carrier I, thereby causing the principal slide-valve J to move slowly, smoothly, and steadily during the opening and closing of the steam-ports C and D, and thus prevents that undue thumping, knocking, jerking, and jar-

ring action common to pumps of this class—viz., direct-acting steam-pumps—that is to say, steam-pumps which have no balance-wheel.

It will be readily observed that the valve J will be perfectly balanced through the medium of the carrier I and cylinders G and G′ by the steam surrounding said carrier.

Having thus described my improvement, what I claim as of my invention is—

1. In a steam-pump, the separated stationary cylinders G G′, having inner chambers, P P, and outer chambers, R R′, and the intermediate movable carrier, I, having pistons H H′ and ends *o o*, adapted to fit and move in the chambers P P of the cylinders G G′, in combination with the balanced slide-valve J, connected to said carrier, and steam inlet and exhaust ports, all arranged substantially as and for the purpose herein shown and described.

2. In a steam-pump, the combination, with the main cylinder and piston A B and auxiliary valve L, of the intermediate operating mechanism composed of the pendant *m*, shaft *n*, arm *s*, rod *t*, and arms *v v*, having pins *w w′* projecting through the heads of the cylinder A, the several parts arranged to operate substantially in the manner as and for the purpose herein shown and described.

AUGUST SNYDER.

Witnesses:
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JAMES J. JOHNSTON.