

G. E. NYE.  
STEAM AND VACUUM PUMP.

No. 440,719.

Patented Nov. 18, 1890.

Fig. 1.

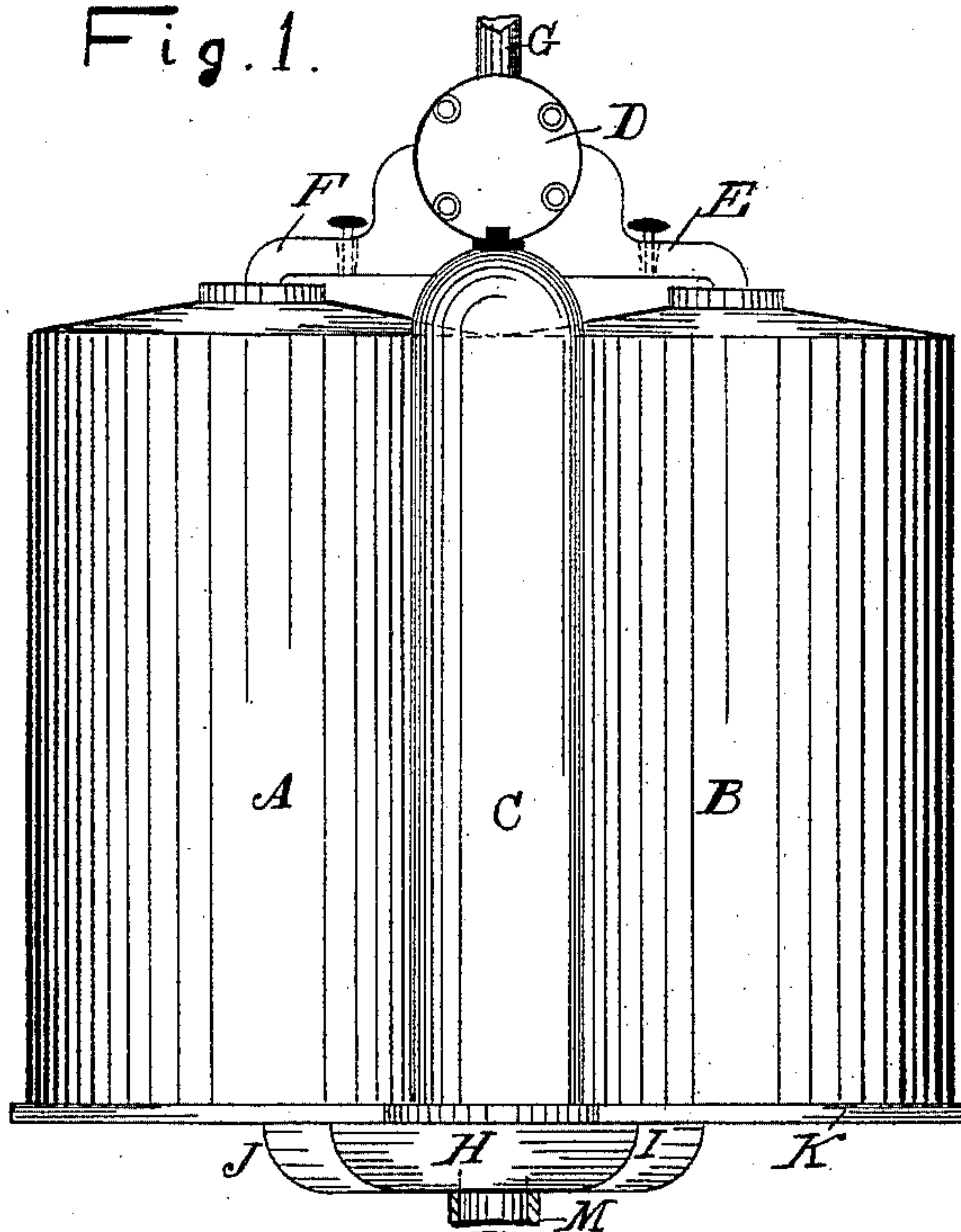
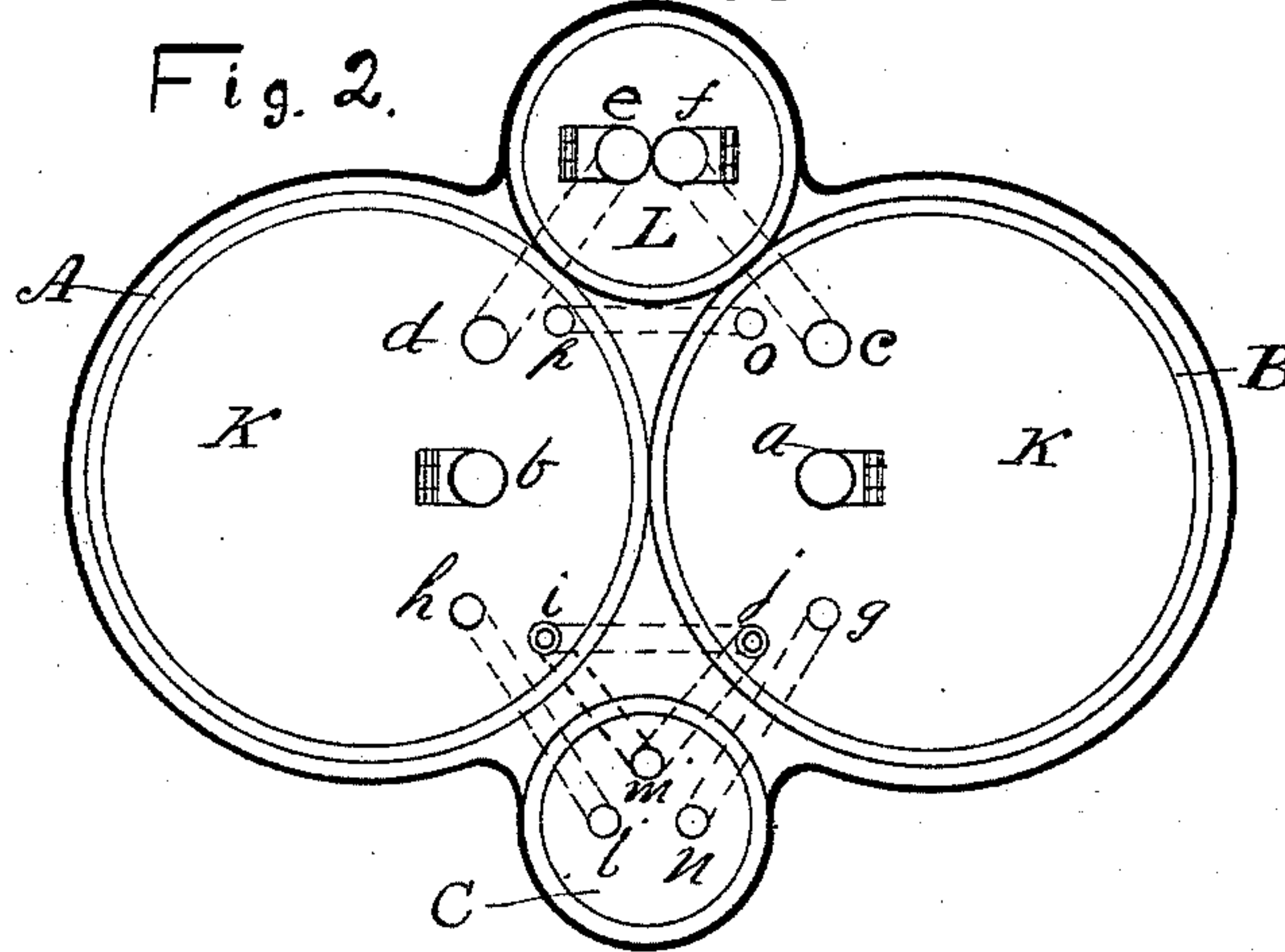


Fig. 2.



Witnesses:  
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Inventor.  
George E. Nye.  
By G. L. Chapin. Atty.

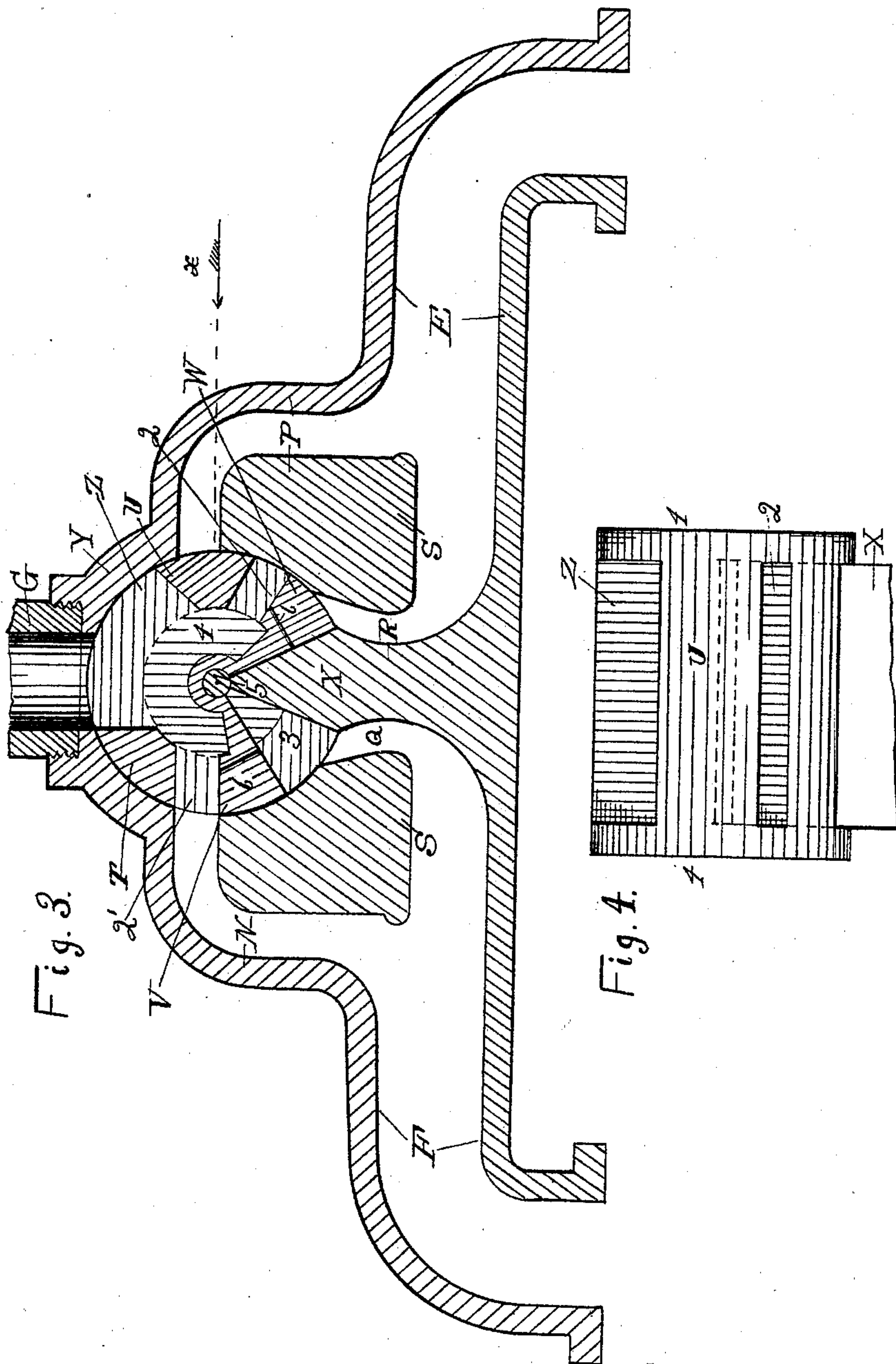
(No Model.)

2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

GEORGE E. NYE, OF AUSTIN, ILLINOIS.

## STEAM AND VACUUM PUMP.

SPECIFICATION forming part of Letters Patent No. 440,719, dated November 18, 1890.

Application filed March 24, 1890. Serial No. 345,021. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE E. NYE, a citizen of the United States, residing in Austin, in the county of Cook and State of Illinois, have invented new and useful Improvements in Steam and Vacuum Pumps, of which the following is a specification, reference being had to the accompanying drawings, illustrating the invention, in which—

Figure 1, Sheet 1, is a side elevation of a steam vacuum-pump in which my invention is embodied; Fig. 2, a plan of the base of the pump with the cylinders removed; Fig. 3, Sheet 2, an enlarged longitudinal vertical central sectional elevation of the oscillating valve, its case and pipe-connections removed from the cylinders. Fig. 4 is an elevation of the valve and its pivotal stop-seat with the case removed, looking in direction of dart *x*.

This invention relates to improvements in valves for double-cylinder steam vacuum-pumps which raise water by alternate vacuums in the cylinders, produced by a jet or jets of cold water ejected, respectively, into the cylinders after the water has been forced out by pressure of steam.

The purpose of this invention is to provide an oscillating valve which will be subjected to only a minimum of friction, and which shall under a continuous pressure of steam operate automatically to put steam alternately into the cylinders. The ordinary well-known hollow base to the pump is shown at Fig. 2, and it is not materially different from the base in the G. H. Nye pump patented on November 5, 1872, No. 132,731. The portions J H I, Fig. 1, are the lower walls of the three chambers below the level top plate K K. The induction-pipe to chamber H is shown at M, and admits water by air-pressure therein. From thence water may enter either cylinder A B by means of valve *a* or *b*. From the inside of either cylinder water may pass into a chamber L by means of a pipe *c* or *d* and a valve *f* or *e*.

C is a condensing-chamber, into which air and water may pass, respectively, from the cylinders by means of ports and pipes *n g l h*, and *m j m i*. Water may also pass from one

cylinder to the other by pipes *o p* and *j i*. Ball-valves are to be placed over ports *n l*, so that water for condensing will return to either cylinder by means of reduced ports *i j* in the ordinary manner as the bases of these kind of pumps are constructed.

The valve is shown at Figs. 3 and 4. 4 4 are its heads, and U T and W V are those parts of the periphery which remain after the ports 2 2' Z are formed. The portions W V extend in past the centers of the heads 4 4, and longitudinally through the extension is formed a circular bearing which turns on a seat 5 on the top of a V-shaped portion X, projecting up from the central portion of the lower part of the pipe E F. The steam from the pipe G enters port Z in the valve and may pass out through either port 2 or 2' and into either pipe E or F to either cylinder A or B. The V-shaped notch between the solid periphery portions V W of the valve is so much larger than the V-shaped portion X as will compensate for the throw of the valve in the oscillating movement. This construction is such that when the steam is passing out of port 2' and into cylinder A there is a vacuum in cylinder B, and consequently the portion W has a seat against the V-shaped portion X, and the steam by means of the pipe Q has an equal bearing on both sides of the portion V. Hence the pipe P will be closed by the portion U. When there is a vacuum in cylinder A, the reverse is true. The portion T will close the port 2', and the port 2 will let steam into pipes P E and cylinder B. To form cushions against the portion X, small pipes 6 may be formed through the portions V W. The case to the valve is shown at parts Y S S, which, so far as they extend, have curves coinciding with the periphery of the valve. One head to the case is shown at D, Fig. 1, there being one at each end of the valve closely fitting the same. The valve will operate if held only in position by the case, but the friction will be much less when it oscillates on the support 5.

I claim and desire to secure by Letters Patent—

In a steam and vacuum pump having two

water-cylinders, a condenser, water inlet and outlet pipes, the combination of an oscillating valve consisting of two heads, one induction steam-port, and two exhaust-ports, with  
5 a longitudinal central bearing on the top of the valve-stop of the case and the said stop projecting up between the heads of the valve, and a valve-case with pipes leading to the cylinders, as and for the purpose specified.

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Witnesses:

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