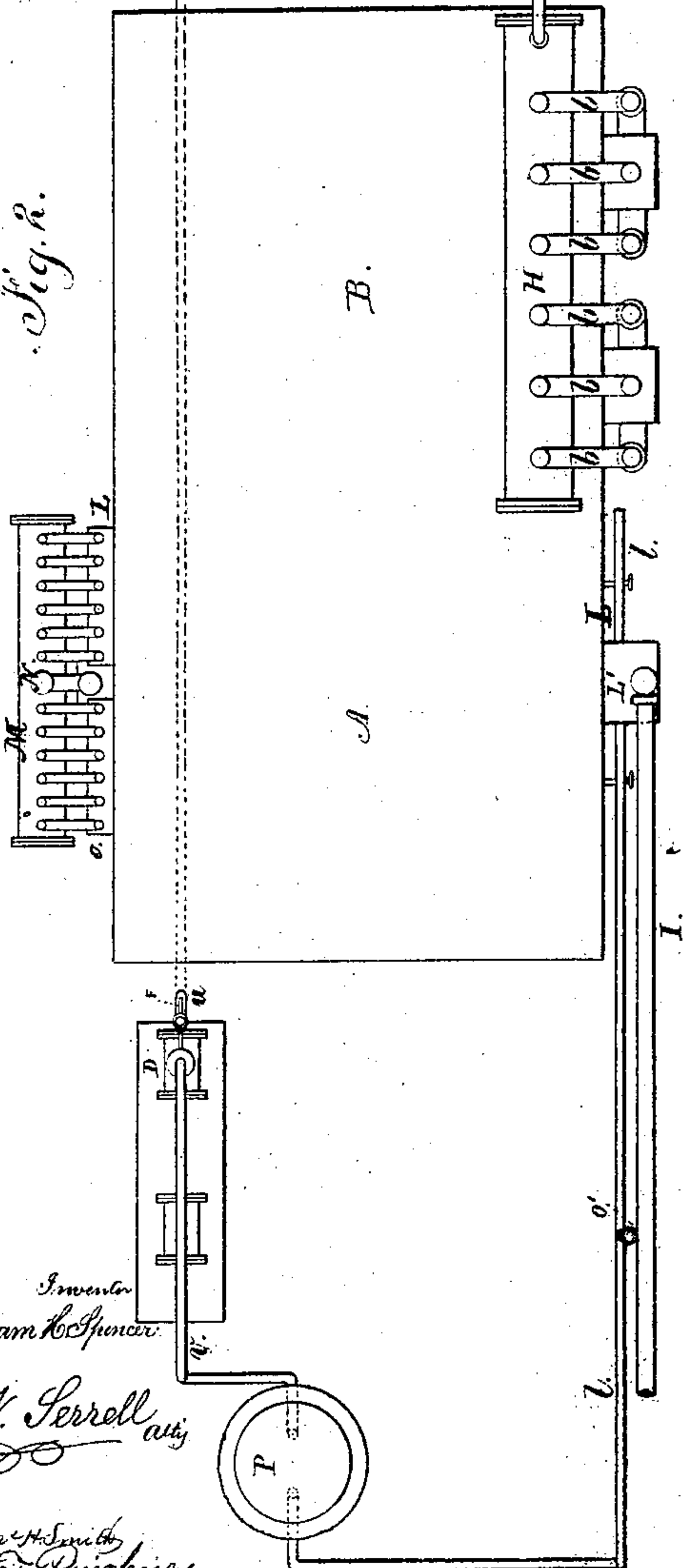
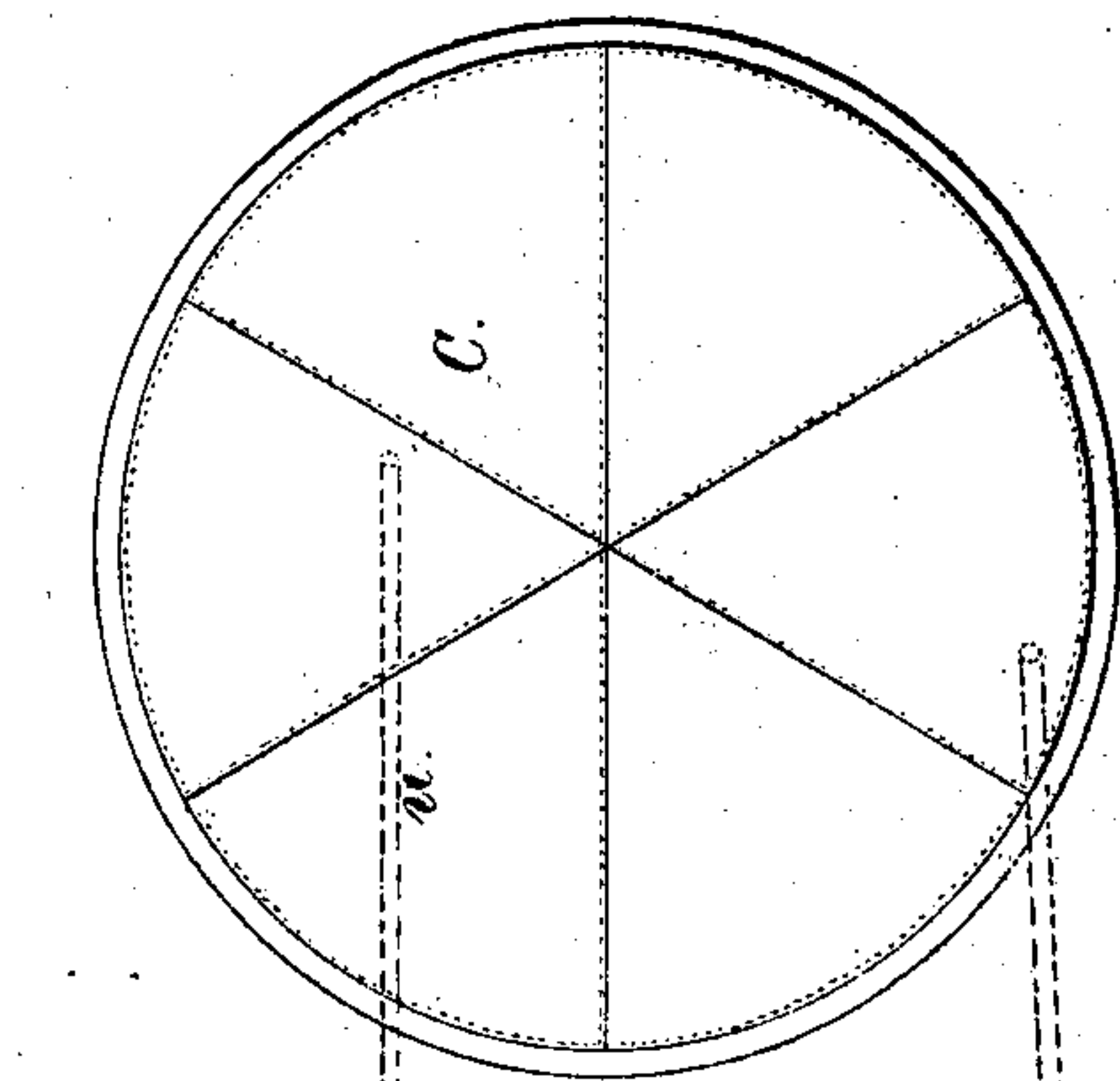
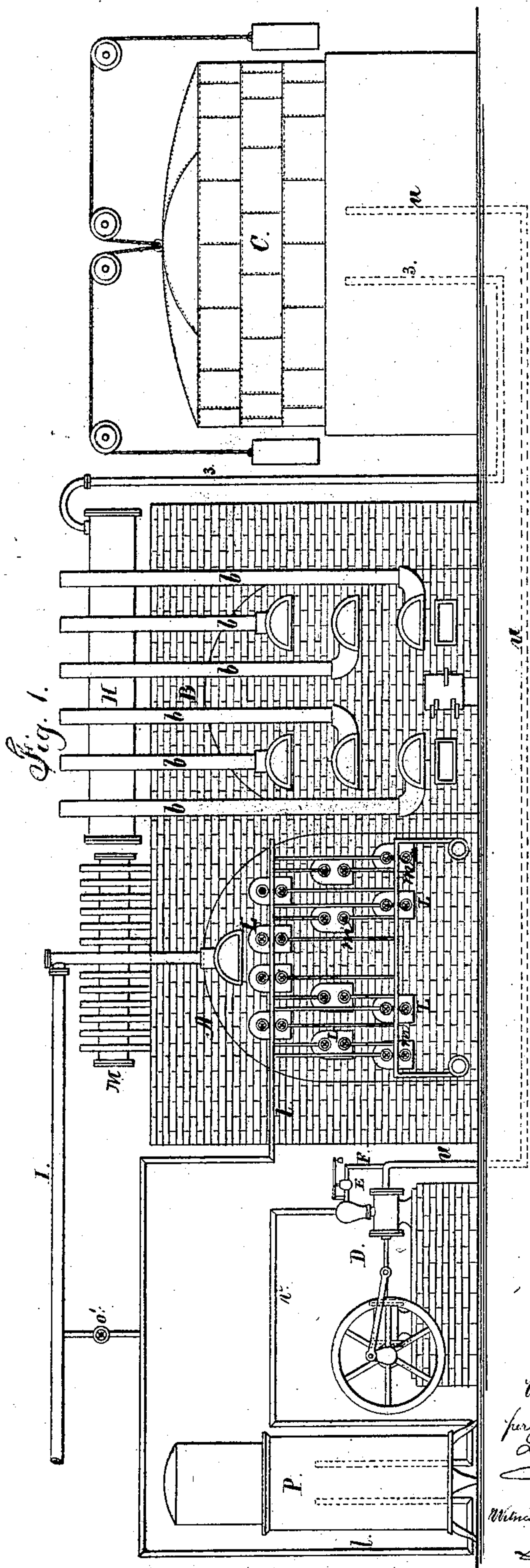


W. H. SPENCER.

Apparatus for the Manufacture of Gas.

No. 141,090.

Patented July 22, 1873.



Inventor
William H. Spencer.
per L. W. Serrell atty
Witnesses
Chas. H. Smith
Geo. D. Pinckney

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Fig. 3.

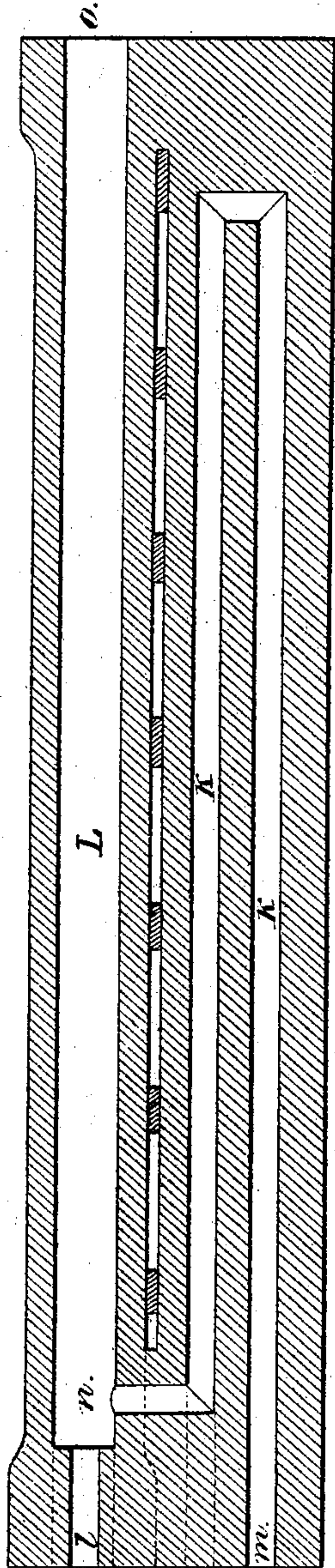


Fig. 4.

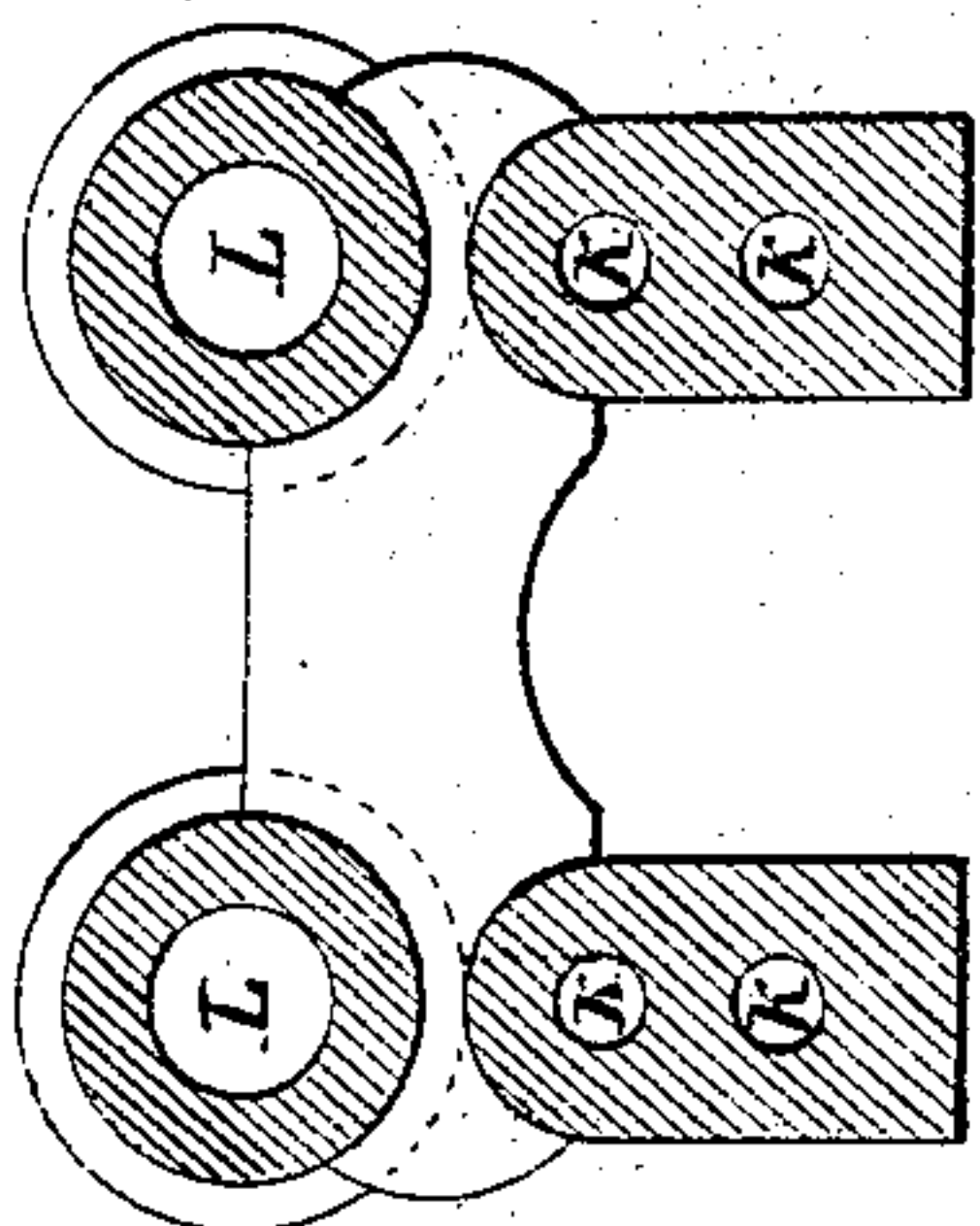
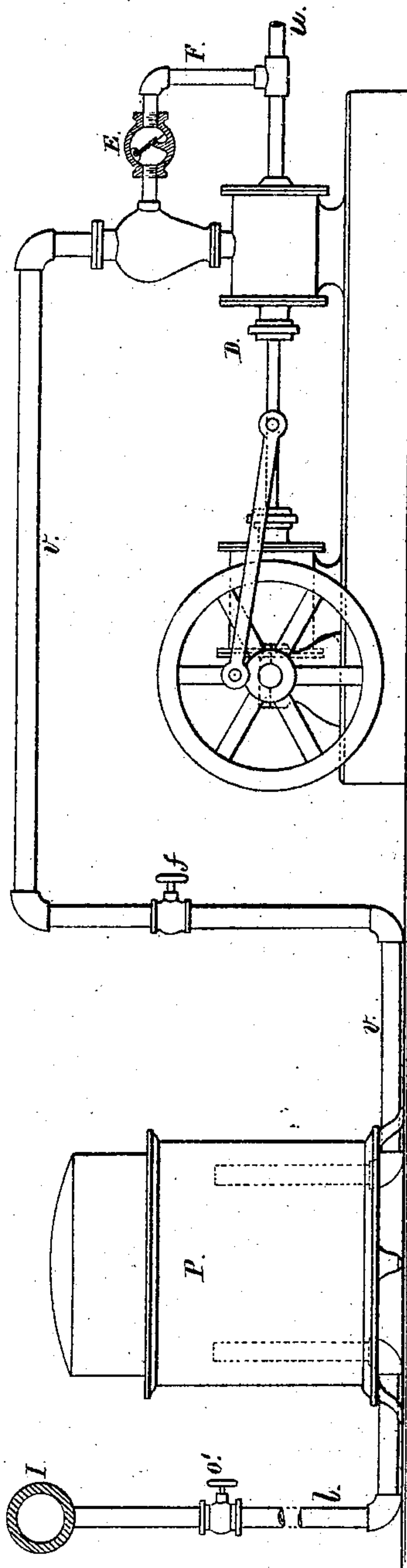


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM H. SPENCER, OF NEW YORK, N. Y.

IMPROVEMENT IN APPARATUS FOR THE MANUFACTURE OF GAS.

Specification forming part of Letters Patent No. **141,090**, dated July 22, 1873; application filed May 20, 1873.

To all whom it may concern:

Be it known that I, WM. H. SPENCER, of the city and State of New York, have invented an Improvement in Apparatus for Manufacturing Gas from Petroleum, of which the following is a specification:

This improvement relates to an apparatus used in the manufacture of gas by the processes invented by me and set forth in Letters Patent No. 131,035.

In the drawing, Figure 1 is an elevation of the apparatus. Fig. 2 is a plan of the same. Fig. 3 is a longitudinal section of the superheating-retort, and Fig. 4 is a transverse section of the same. Fig. 5 is an elevation of the pump, governor, and connecting-pipes. The parts shown in the last three figures are in larger size than in Figs. 1 and 2.

A and B, Figs. 1 and 2, represent two arches, constructed, preferably, though not necessarily, corresponding with ordinary coal-gas arches. The arch B is designed for the retorts producing a rich gas, the manner of making the same forming no part of my present invention, and the material used being either bitumen, petroleum, or any hydrocarbon which yields a product rich in carbon but deficient in hydrogen. In practice, where a liquid or vaporous hydrocarbon is used, I find it convenient to employ a retort having both ends open and extending through the back wall of the furnace, the inlet of said retort being on the opposite side from the stand-pipe, as shown. C, Figs. 1 and 2, is a gas-holder, conveniently made to contain about five per cent. of a day's production. This holder is kept counter-weighted to the pressure of the atmosphere, or more, thus forming a vacuum greater or less in character. The gas from the bench B rises through the stand-pipes *b b b b b b* and enters the hydraulic main H through a seal, which is preferably made as small as possible, and from the main H the gas passes, by the pipe 3, to the gas-holder *c*. By reason of the system of counter-weighting mentioned above the retorts are relieved of pressure, and their leakage diminished, while the deposition of free carbon and the formation of tar are likewise decreased. D, Figs. 1, 2, and 5, represents a pump, which is to be of any desired character capable of taking the gas from the counter-weighted holder *c* and forcing it into

the governor P, Figs. 1, 2, and 5. The pump D has its suction and discharge pipes *u v*, respectively, connected by the pipe F, Figs. 1 and 5, in which a valve, E, is placed, opening toward the suction, which valve may be adjusted or weighted in any suitable manner, to the end that, by means of the valve *f*, Fig. 5, which is used as a throttle, the supply of rich gas entering the governor P may be adjusted without altering the speed of the pump, any surplus being forced back through the valve E into the suction-pipe. The governor P, Figs. 1, 2, and 5, may be made of any convenient capacity, and sufficiently weighted to deliver the proper amount of gas to each of the retorts located in the bench A, Figs. 1 and 2, its object being to afford a uniform and steady feeding pressure, and to prevent the oscillation of the pump being felt in any apparatus placed beyond the governor. The discharge-pipe *l* of the governor, Figs. 1 and 2, delivers gas to the retorts L in bench A, Figs. 1 and 2. These retorts may be of any desired number or size, and either arranged as a continuous tube, into one extremity of which steam is admitted, which, after acquiring the heat of the furnace, is mixed with the rich gas at any convenient point, or they may preferably be made as shown in Figs. 3 and 4, which represent longitudinal and cross sections of such a retort, and in which the steam enters at *m*, Fig. 3, traverses twice the length of the furnace through passage K, and meets the gas at the point *n* in the part L of the retort, a double decomposition taking place during the passage of the gas and aqueous vapor from the point *n* to the point of discharge *o*.

These superheaters and retorts I prefer to arrange in pairs, as shown in the cross-section, and when thus arranged six such pairs may be set in an ordinary coal-gas arch, as shown.

From the retorts L the gas passes to the main M, and thence by the stand-pipe N and retort L' to the conveying-main I.

At any convenient point in the conveying-main I, I introduce a pipe or jet, *o'*, Figs. 1 and 5, communicating directly with the governor P, by which jet, in case the product of the bench A is below the standard candle-power, I can mix the same with rich gas in any desired proportion.

I claim as my invention—

1. A counter-weighted gas-holder receiving the rich gas from the retorts, in combination with a forcing apparatus that passes a regulated quantity of such gas through retorts and in contact with steam at a high temperature, substantially as and for the purposes set forth.

2. The combination of a regulator with a forcing apparatus, a gas-holder, and a retort for superheated steam, substantially as specified, when said regulator is placed between the pump or forcing apparatus and said retorts, for the purposes set forth.

3. In a gas apparatus in which the rich gas is passed through a retort with superheated steam, a connecting-cock between the pipe from the holder containing such rich gas and the conveying-main, to regulate the illuminating power of the gas, substantially as set forth.

Signed by me this 13th day of May, A. D. 1873.

WM. H. SPENCER.

Witnesses:

GEO. T. PINCKNEY,
CHAS. H. SMITH.