

No. 737,520.

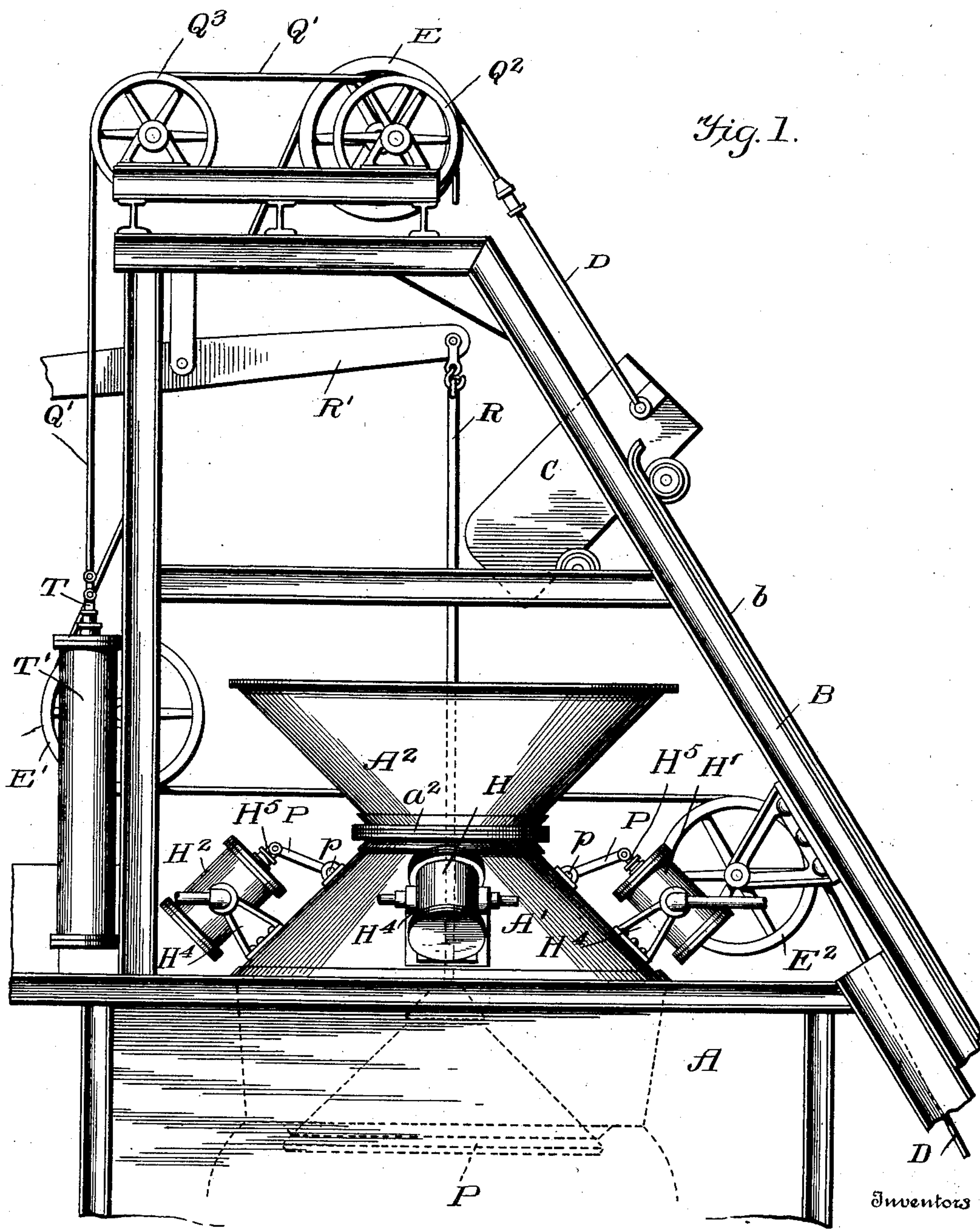
PATENTED AUG. 25, 1903.

S. STEWART & H. HUGHES.  
GAS SEAL FOR METALLURGICAL FURNACES.

APPLICATION FILED MAR. 10, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

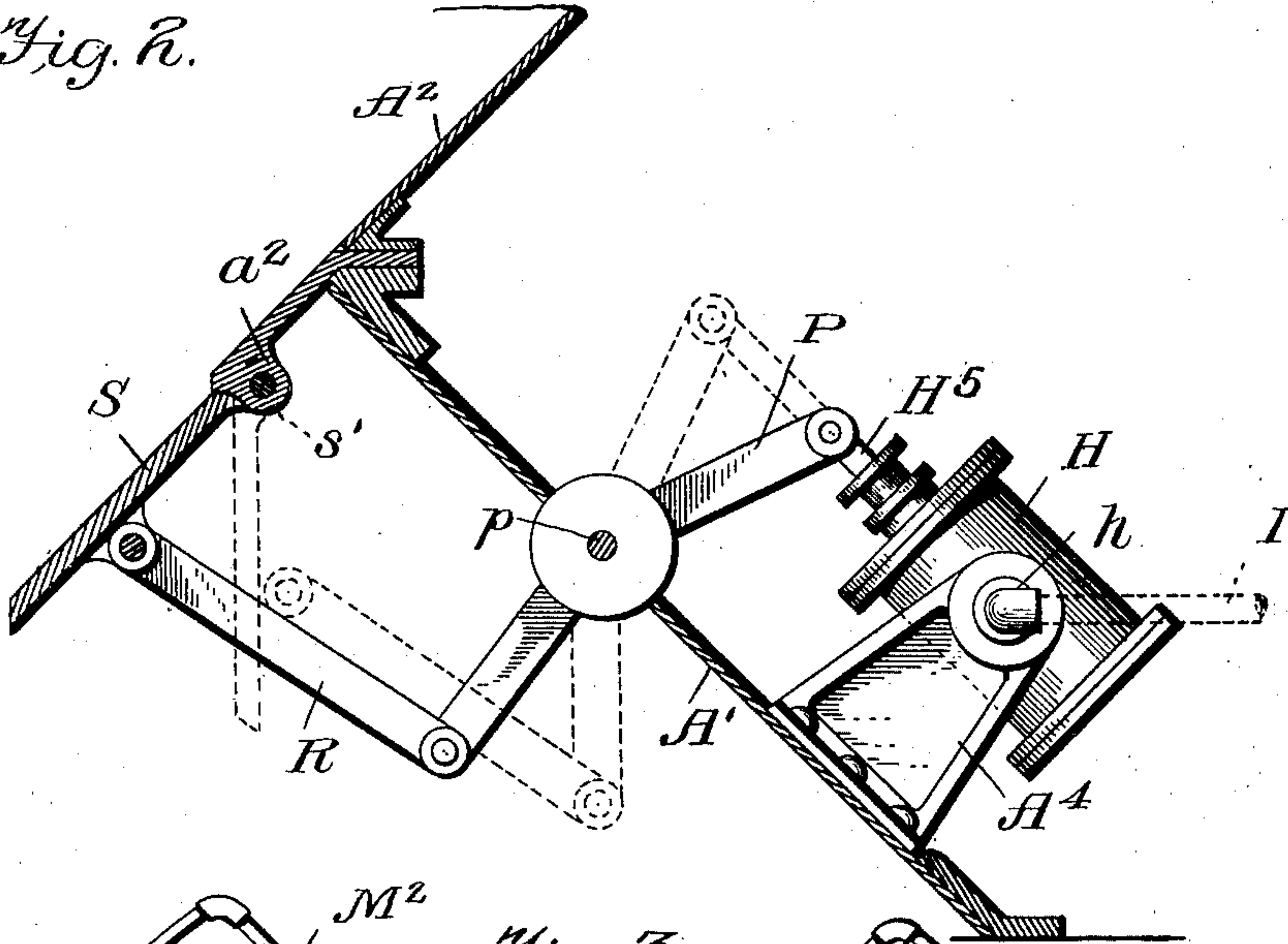
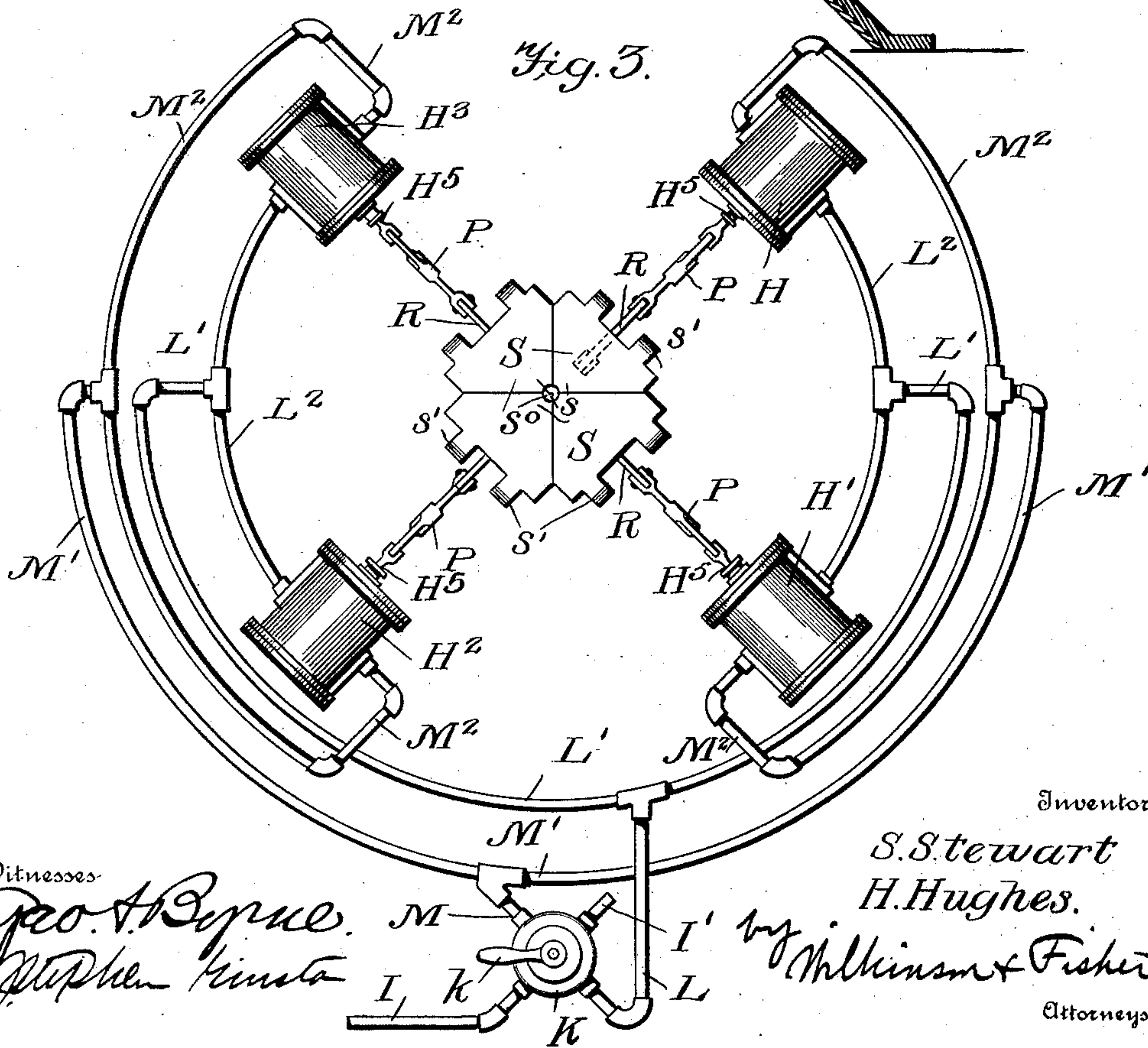


Fig. 3.



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# UNITED STATES PATENT OFFICE.

SAMUEL STEWART, OF BRIGHTON, AND HARRY HUGHES, OF  
WOODWARD, ALABAMA.

## GAS-SEAL FOR METALLURGICAL FURNACES.

SPECIFICATION forming part of Letters Patent No. 737,520, dated August 25, 1903.

Application filed March 10, 1903. Serial No. 147,126. (No model.)

*To all whom it may concern:*

Be it known that we, SAMUEL STEWART, residing at Brighton, and HARRY HUGHES, residing at Woodward, in the county of Jefferson and State of Alabama, both citizens of the United States, have invented certain new and useful Improvements in Gas-Seals for Metallurgical Furnaces; and we 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.

Our invention relates to improvements in gas-seals for metallurgical furnaces; and it consists in providing a gas-tight seal which may be readily applied or removed and which does not clog up.

Our invention will be understood by reference to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 is a side elevation of the top of a metallurgical furnace. Fig. 2 is a sectional elevation of one of the cylinders and of the mechanism for swinging the gate operated thereby. Fig. 3 is a diagram showing the simultaneous operation of the several gates.

A represents the top of the furnace-carrying framework B, on which the track *b* is provided.

C is a car which is hoisted by the rope D, passing over the idlers E, E', and E<sup>2</sup>, and dumps its contents into the hopper A<sup>2</sup>. This hopper is mounted above the cone A', to which are secured brackets H<sup>4</sup>, in which brackets are trunnioned the operating-cylinders H, H', H<sup>2</sup>, and H<sup>3</sup>, respectively. The piston-rods H<sup>5</sup> of these several cylinders are connected to one end of the levers P, which are pivoted, as at *p*, in the cone A'. The other end of the levers P is connected to the link R, which is pivoted to the under side of the gate S, which gate is hinged, as at *s'*, to a ring *a*<sup>2</sup> at the base of the hopper A<sup>2</sup>. These several gates are tapered, as indicated at *s*, so as to fit snugly when brought to a closed position, and the points of these gates are cut away, as at *s*<sup>o</sup>, to permit the passage therethrough of the rod R, which supports the bell P. This rod is attached to the lever R', which is operated in the usual way.

The bell lip ring, cone, or hood A' and hopper are lifted off the furnace when desired by means of the rope Q', passing over the pulleys Q<sup>2</sup> and Q<sup>3</sup> and connected to the piston T in the cylinder T'. There are preferably two of these cylinders and two ropes, as described in our application of even date herewith, serially numbered 147,124.

I (see Fig. 3) represents an inlet-pipe for steam or other fluid pressure, and I' represents the exhaust-pipe from the valve K, which valve is operated by the handle *k*. This is a four-way valve and is of similar construction to that shown in the patent to Samuel Stewart, No. 652,198, granted June 19, 1900, and not being a part of our present invention will not be further described herein. The pipes L, L', and L<sup>2</sup> connect this valve to one end of the cylinders, while the pipes M, M', and M<sup>2</sup> connect this valve to the opposite end of the respective cylinders, so that fluid-pressure may be simultaneously admitted to the same end of all of the cylinders at the same time the exhaust is open to the opposite end of the respective cylinders, or vice versa. Thus it will be seen that by turning the handle *k* in one direction or the other all of the gates may be simultaneously opened or closed. It will be noticed that the gates swing down out of the way of the stock, which passes through the opening in the throat of the hopper. Thus it will be seen that we provide a substantially gas-tight seal consisting of a plurality of swinging gates, which gates may be simultaneously operated by the mere turning of a handle on a four-way valve.

It will be obvious that various modifications might be made in the herein-described apparatus which could be used without departing from the spirit of our invention.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. In a metallurgical furnace, the combination with a hopper, and a cone beneath the same, of a plurality of swinging gates hinged to the bottom of said hopper, a cylinder for each gate trunnioned on said cone and provided with a piston and piston-rod, a lever pivoted to and passing through the shell of said cone and connected to said piston-rod,



and a connecting-rod between the opposite end of said lever and said hinged gate, substantially as and for the purposes described.

2. In a metallurgical furnace, the combination with a hopper, and a cone beneath the same, of a plurality of swinging gates hinged to the bottom of said hopper, a cylinder for each gate trunnioned on said cone and provided with a piston and piston-rod, a lever pivoted to and passing through the shell of said cone and connected to said piston-rod, a connecting-rod between the opposite end of said lever and said hinged gate with a valve and pipe connections for simultaneously admitting fluid-pressure to all of said cylinders, substantially as described.

3. The combination with a furnace, provided with a hopper, cone, of a bell, a rod attached to said bell, means for raising and lowering said rod, a plurality of swinging gates

adapted to close the bottom of said hopper, said gates being cut away at their ends so as to fit snugly together and also to leave a passage-way for said rod when in the closed position, a cylinder and piston for each gate, said cylinder being trunnioned to said cone, a lever operated by said piston, a connecting-rod between said lever and gate for the purpose of swinging the gate, and a valve and pipe connections for simultaneously supplying fluid-pressure to all of said cylinders, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

SAMUEL STEWART.  
HARRY HUGHES.

Witnesses:

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S. HINE.