

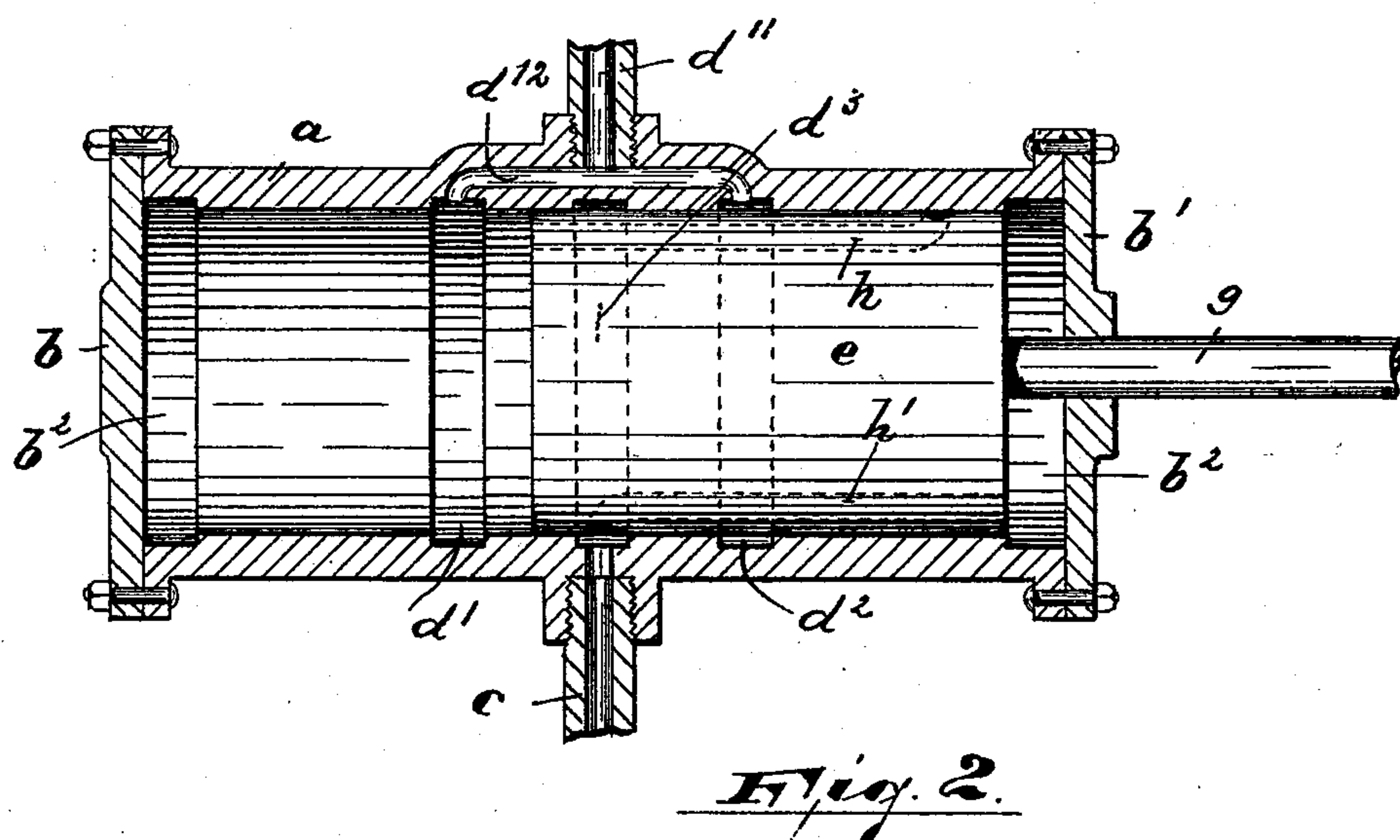
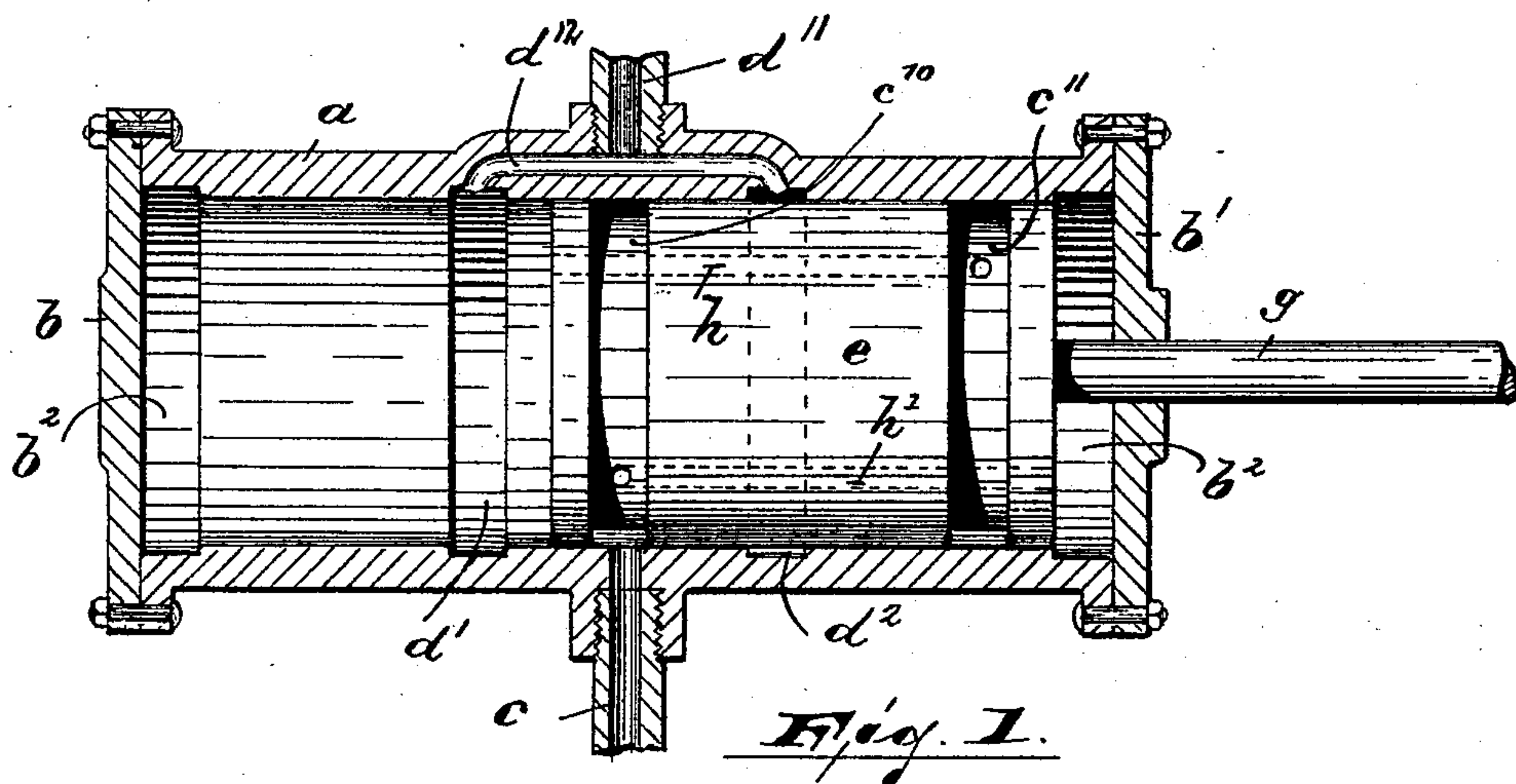
(No Model.)

2 Sheets—Sheet 1.

A. SCHEID.  
VALVELESS ENGINE.

No. 540,461.

Patented June 4, 1895.



WITNESSES:

*Jacob O. Poole*  
*Runcan M. Robertson.*

INVENTOR

*Adam Scheid*

BY

*Partner & Co*

ATTORNEYS

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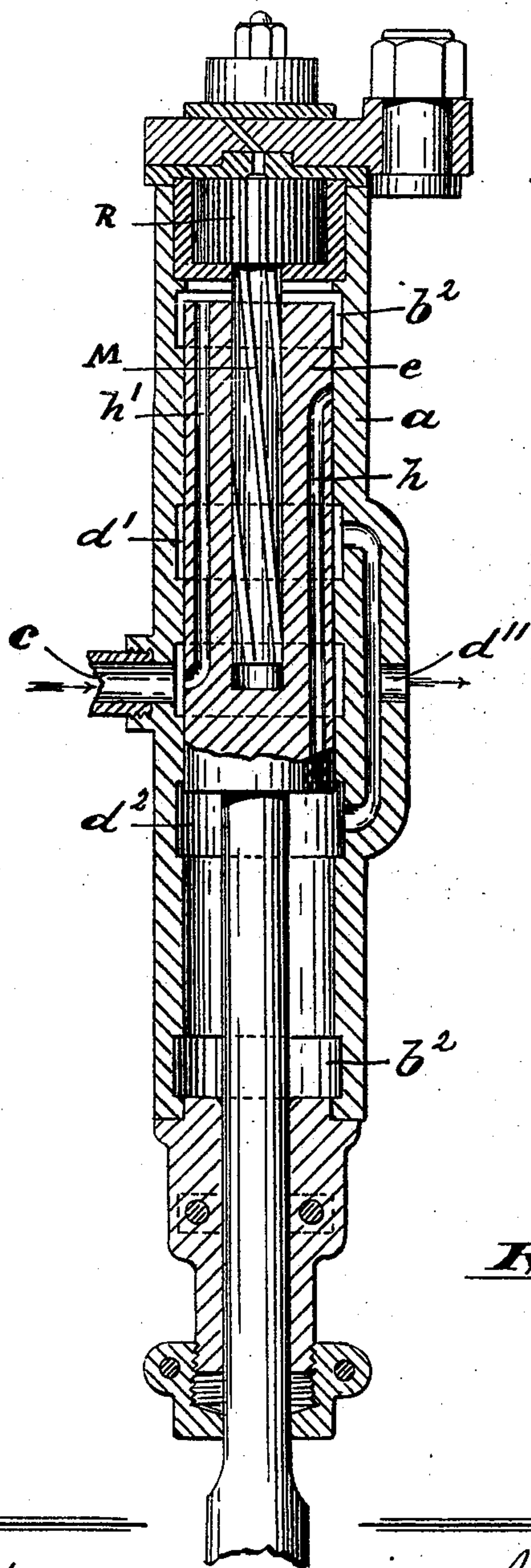


Fig. 3.

WITNESSES: \_\_\_\_\_

*Runcan M. Robertson*

*Arthur H. Thomas*

INVENTOR: \_\_\_\_\_

*Adam Scheid*

BY

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# UNITED STATES PATENT OFFICE.

ADAM SCHEID, OF HARRISON, NEW JERSEY.

## VALVELESS ENGINE.

SPECIFICATION forming part of Letters Patent No. 540,461, dated June 4, 1895.

Application filed November 15, 1894. Serial No. 528,853. (No model.)

*To all whom it may concern:*

Be it known that I, ADAM SCHEID, a citizen of the United States, residing in Harrison, Hudson county, and State of New Jersey, have  
5 invented certain new and useful Improvements in Valveless Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as  
10 it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to provide  
15 an engine for steam, gas, air or any other motive fluid, of simple, strong and durable construction, and which on account of its novel arrangement of parts does not require a valve for controlling the motive fluid inlet  
20 and exhaust respectively.

The invention consists in the improved valveless engine, in its cylinder, piston and piston rod respectively, in the ports and channels arranged in the said cylinder and piston,  
25 and in the combination and arrangement of parts, substantially as will be hereinafter more fully described and finally embodied in the claim.

Referring to the accompanying drawings,  
30 in which like letters of reference indicate corresponding parts in each of the several views, Figure 1 represents in a central sectional view the cylinder, piston, and piston-rod of my improved valveless engine. Fig. 2  
35 is a similar view illustrating a modified form of the same, and Fig. 3 a central sectional view of a rock-drill provided with my improved valveless cylinder and piston.

In said drawings *a* represents the cylinder,  
40 *b* and *b'* the cylinder heads and *c* and *d''* the motive fluid inlet and exhaust respectively, arranged about midway on the cylinder and at opposite sides thereof. On each end of the cylinder *a* is arranged an enlargement or  
45 chamber *b*<sup>2</sup>, whereby a large amount of steam can accumulate in the said ends.

In the construction illustrated in Fig. 1, the piston *e* is provided at or near each end with a circular groove *c*<sup>10</sup> (*c*<sup>11</sup>) adapted to be  
50 alternately brought in communication with the motive fluid inlet *c*. Said grooves *c*<sup>10</sup> and

*c*<sup>11</sup> are in communication with the opposite ends of the cylinder by ports *h* and *h'* penetrating the piston as shown in dotted lines. The exhaust channels *d'* and *d*<sup>2</sup> are arranged  
55 on each side of the fuel inlet *c* and are connected with the exhaust *d*<sup>11</sup> by means of the channel or port *d*<sup>12</sup>.

In the construction illustrated in Fig. 2, the motive fluid inlet communicates with the  
60 circular groove *d*<sup>3</sup> arranged in the cylinder and about midway between the exhaust channels *d'* and *d*<sup>2</sup>. The circular grooves *c*<sup>10</sup> and *c*<sup>11</sup> of the piston are done away with and the channels *h* and *h'* extend to and through the  
65 surface of the piston, as clearly shown in said Fig. 2.

Providing my improved engine—is a steam engine—the operation is then as follows: The steam enters through inlet *c* and port *h'* of  
70 the piston into the forward end of the cylinder. The piston is thus forced backward until it has cleared the circular channel *d*<sup>2</sup>, when the steam is exhausted. Simultaneously the  
75 port *h* is brought into communication with the steam inlet and the steam enters through said port into the rear end of the cylinder, thus forcing the piston forward until it has cleared the annular channel *d'* of the cylinder  
80 *a*, when the steam is again exhausted and the former described operation is repeated. As can be clearly seen from the drawings, the ports *h* and *h'* also act as exhaust ports, in  
85 the backward and forward motion of the piston respectively, as they connect during the travel of the piston the rear and front end of the cylinder with the circular exhaust channels *d*<sup>2</sup> and *d'* respectively, thus allowing the remainder of the steam (should there be any),  
90 to exhaust, before fresh steam is let into the cylinder.

In Fig. 3 a rock drill is illustrated, which is provided with my improved device. The piston operates on the drill rotating bar *M*, controlled by the rotating device *R* in the  
95 usual manner. The mode of operating the piston is the same as the one above described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In an engine, the combination with the cylinder, an inlet and exhaust midway the ends

of the said cylinder, three annular grooves on  
the inside of the cylinder, the central one of  
said grooves being connected with the inlet,  
the side ones through passages arranged in  
5 the wall of the cylinder with the central ex-  
haust, of a solid piston in said cylinder pro-  
vided at or near each end with a circular  
groove and with two channels or ports con-  
necting said circular grooves with the cham-  
10 bers of the cylinder at opposite ends of the

piston, all of said parts being arranged sub-  
stantially as and for the purposes described.

In testimony that I claim the foregoing I  
have hereunto set my hand this 3d day of  
November, 1894.

ADAM SCHEID.

Witnesses:

ALFRED GARTNER,

DUNCAN M. ROBERTSON.