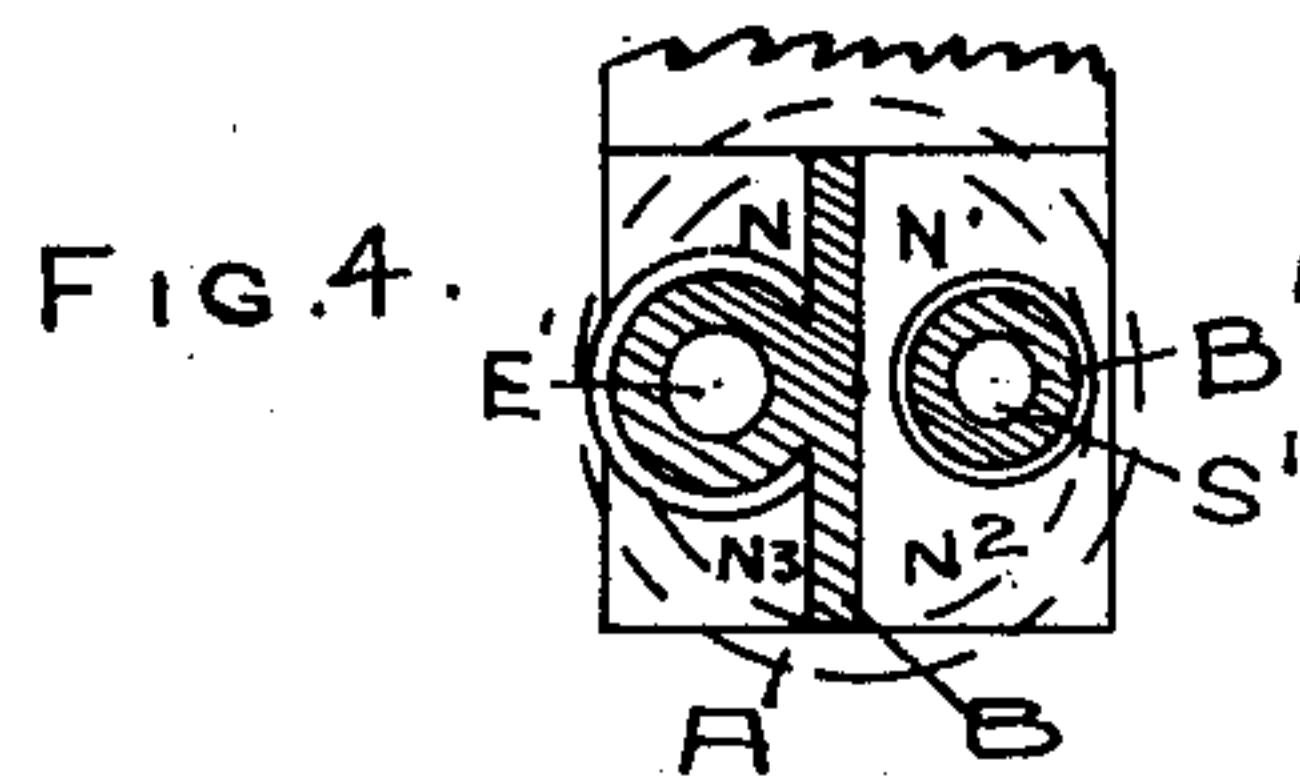
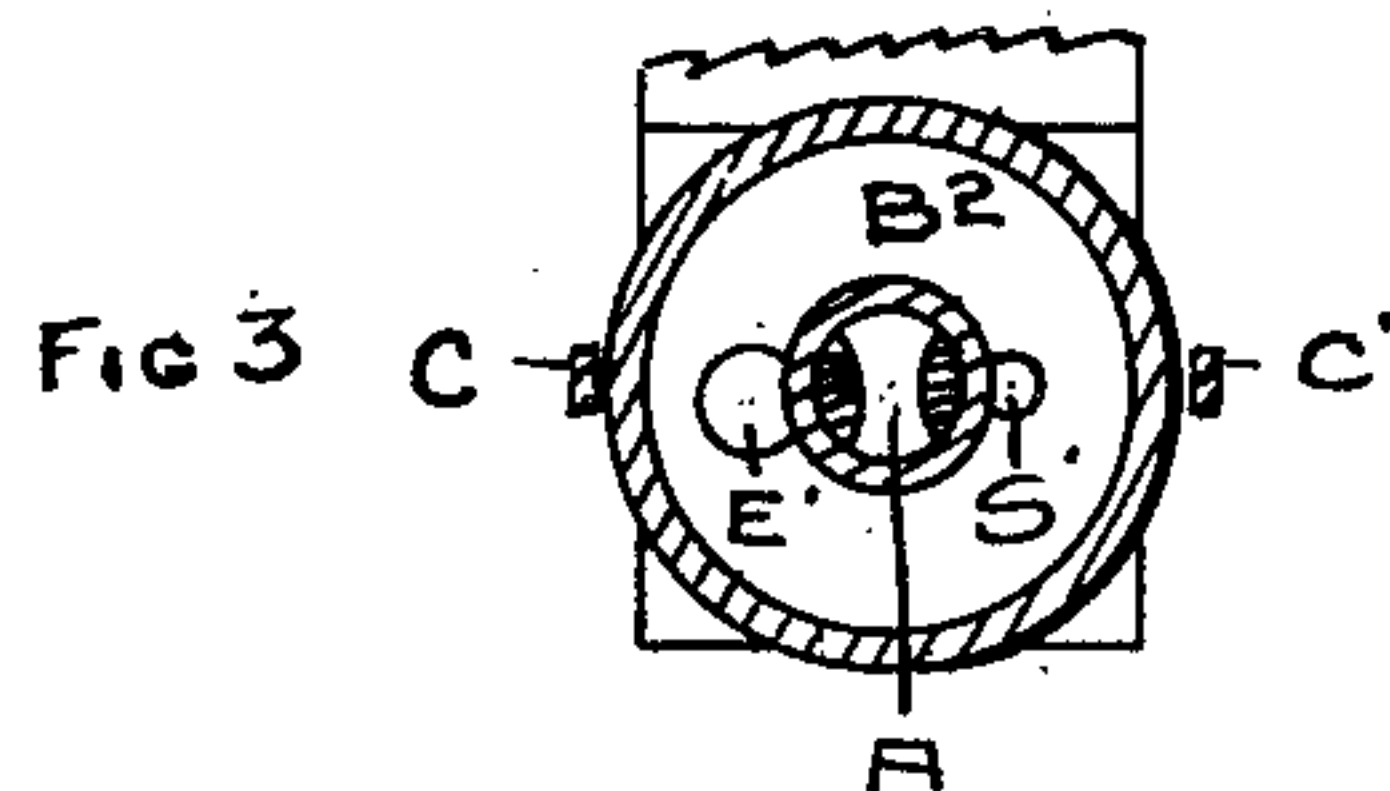
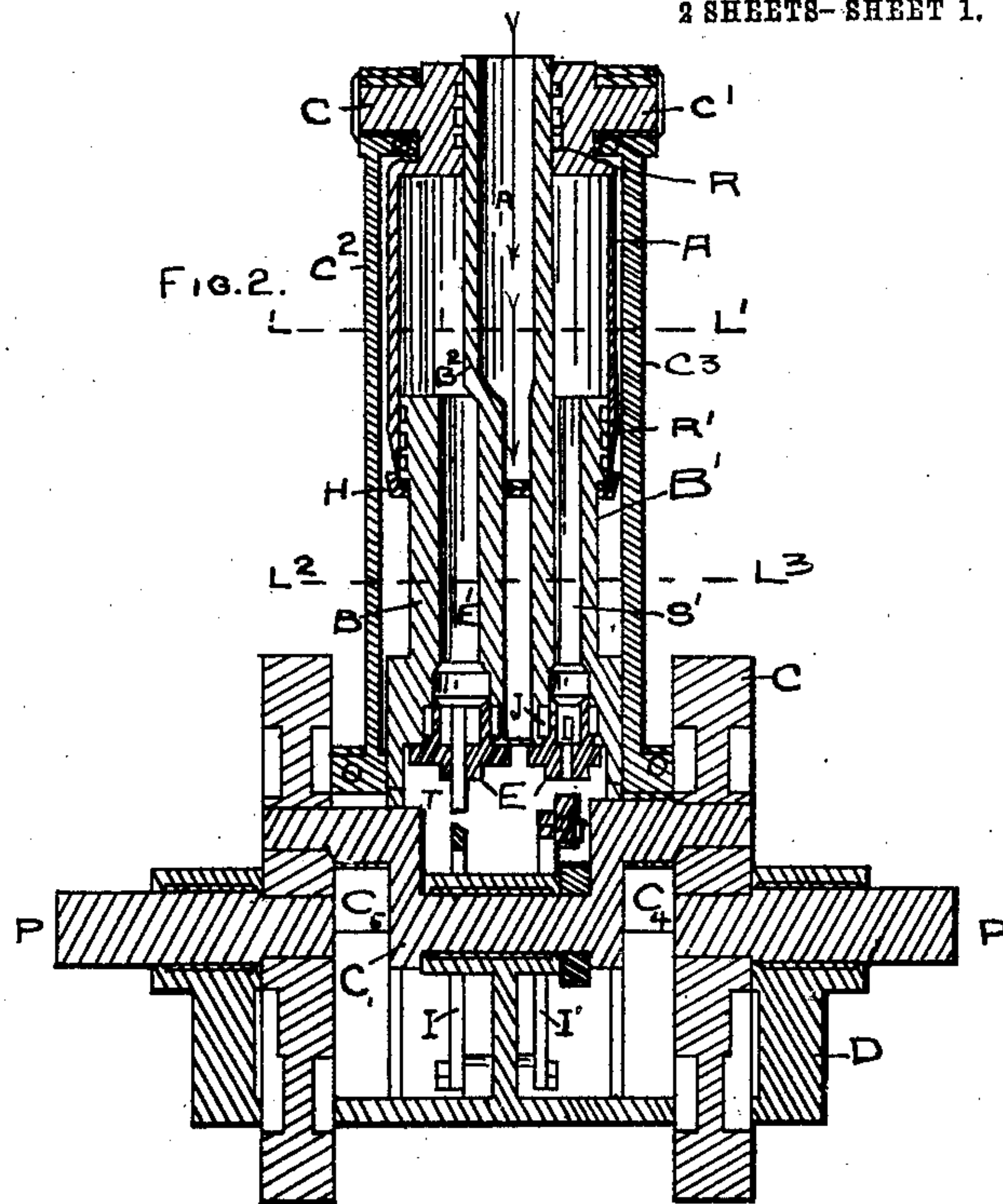
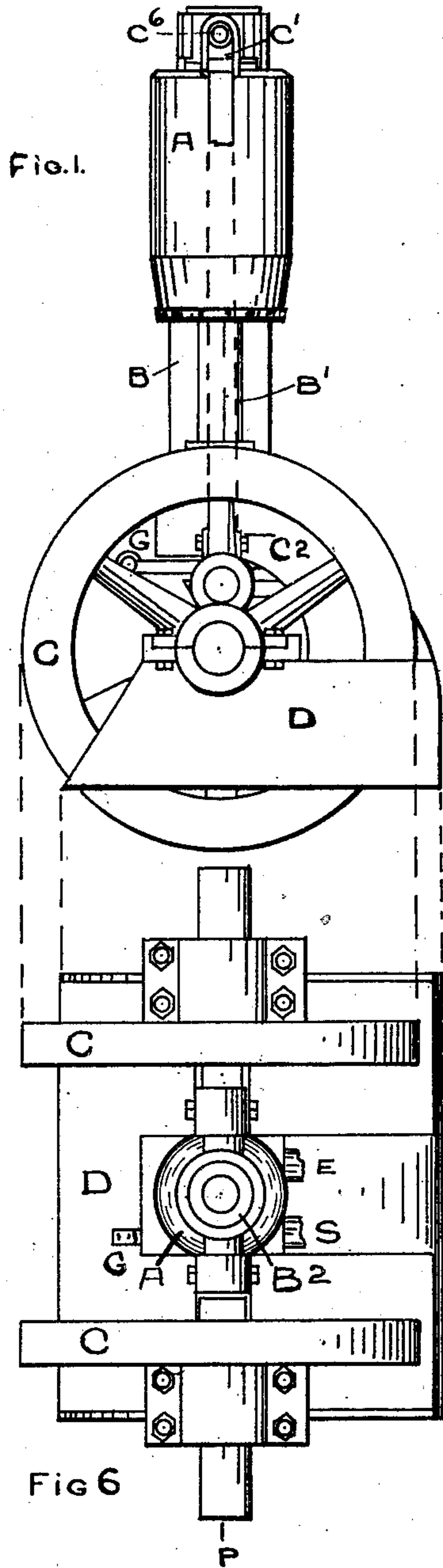


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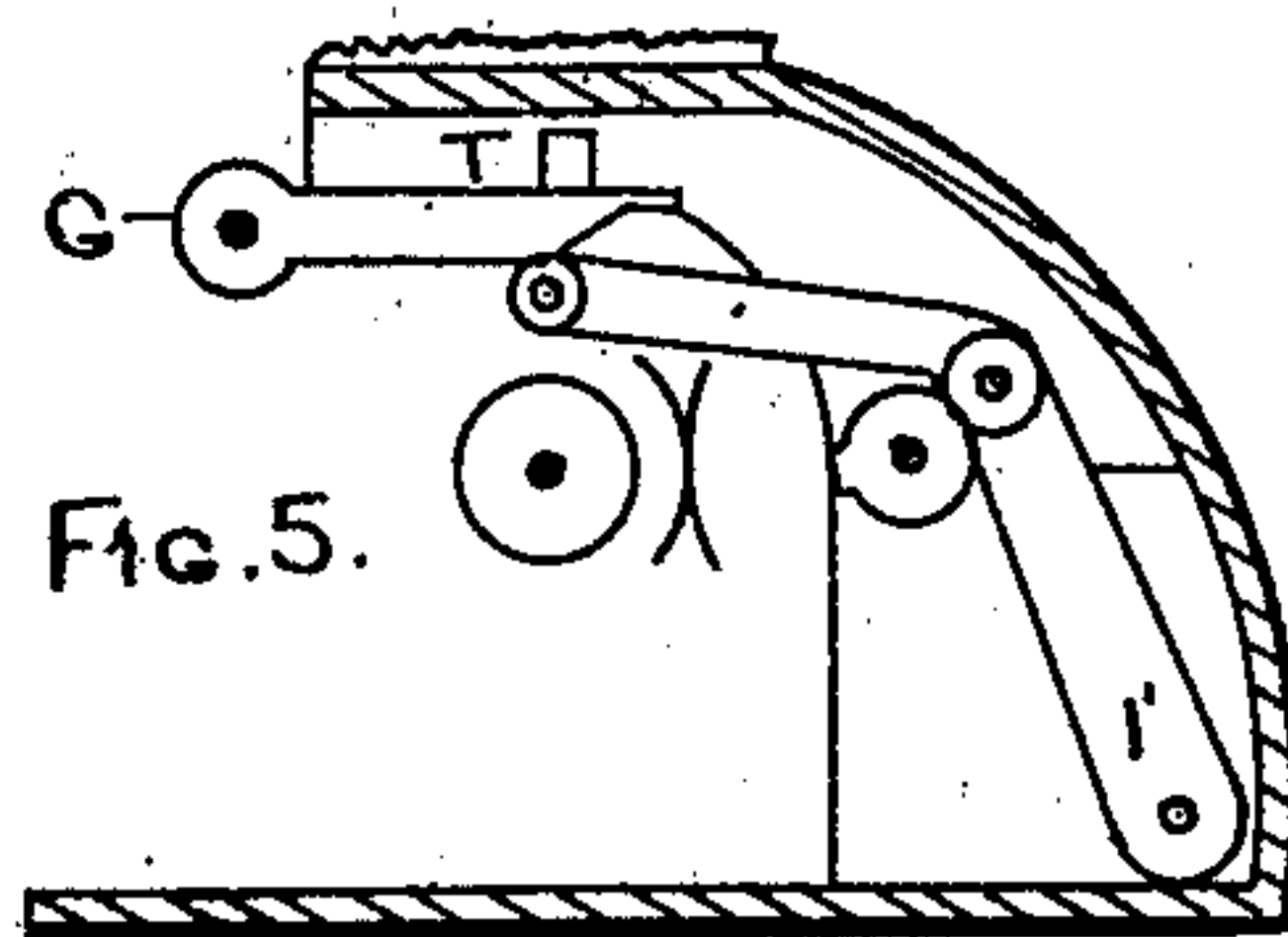
924,634.

Patented June 15, 1909.

2 SHEETS-SHEET 1.



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Fig 7

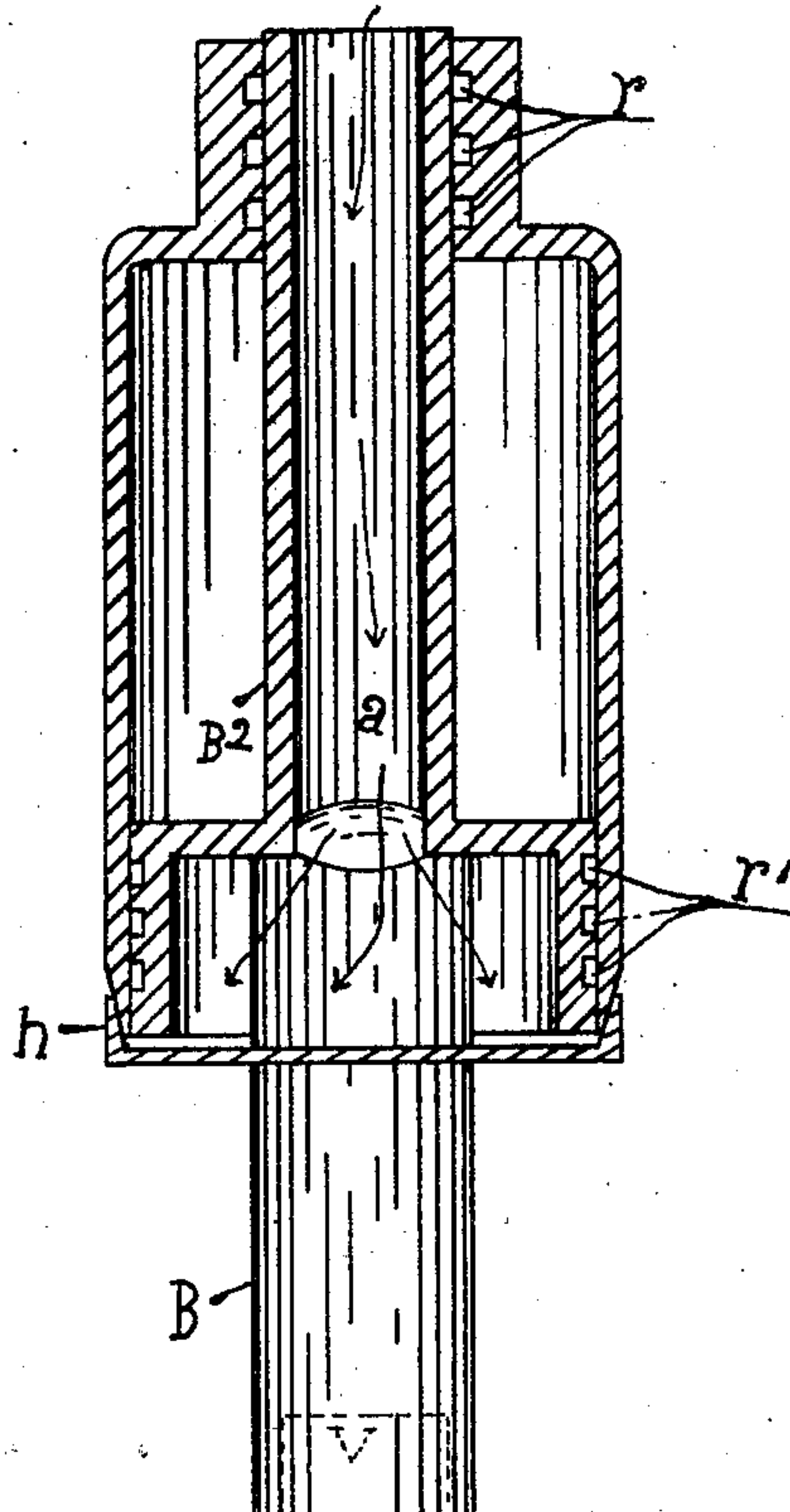
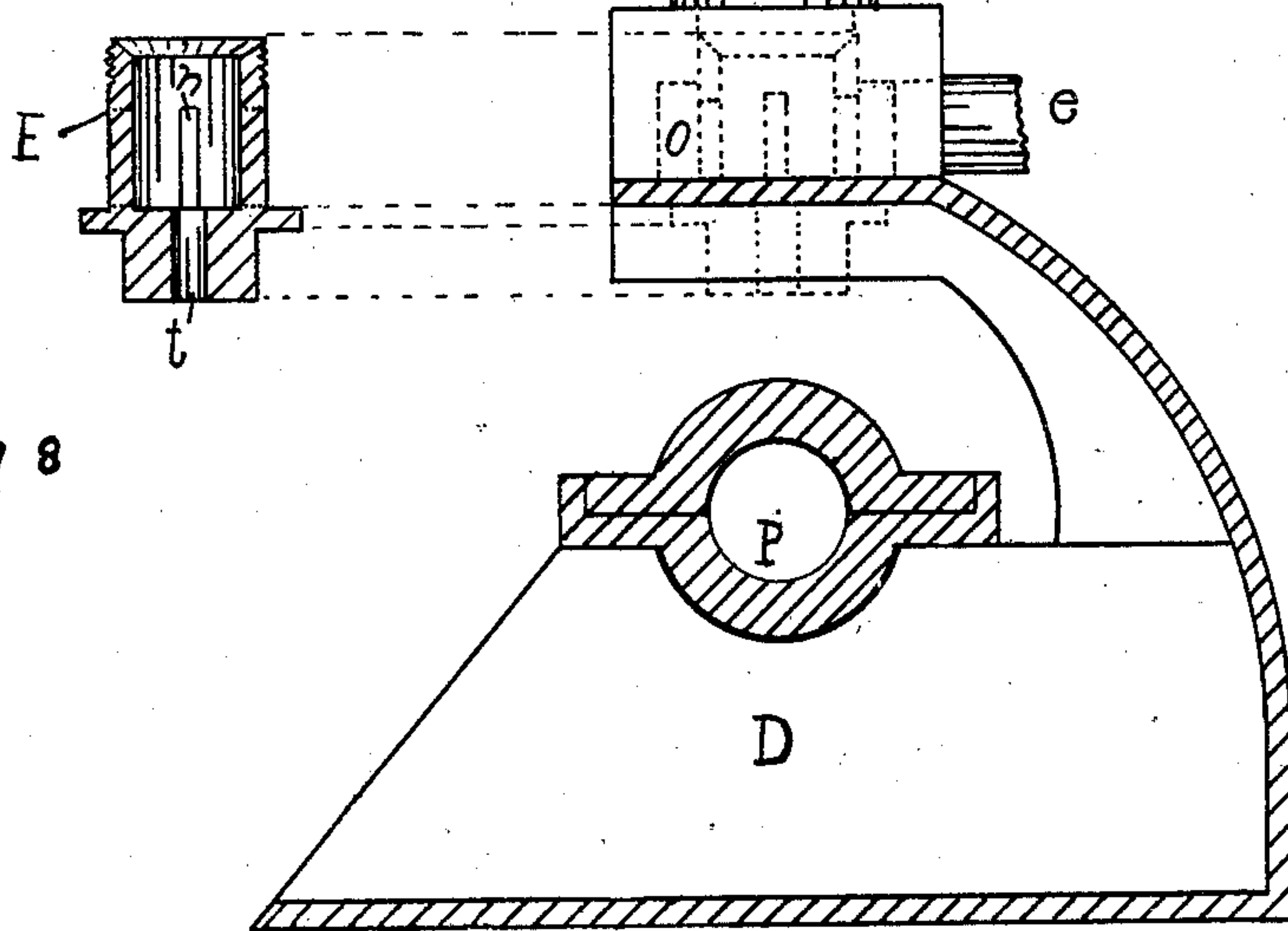


Fig 8



Witnesses

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UNITED STATES PATENT OFFICE.

RICHARD D. CODY, OF WINONA, MINNESOTA.

EXPLOSION-ENGINE.

No. 924,634.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed February 23, 1904. Serial No. 194,877.

To all whom it may concern:

Be it known that I, RICHARD D. CODY, a citizen of the United States, residing at Winona, in the county of Winona and the State of Minnesota, have invented a new and useful Explosion-Engine, of which the following is a specification.

My invention relates to improvements in the explosion-engine, the object being to provide means for carrying off the excess heat caused by the explosion of the gases in the cylinder. I obtain this object with a cylinder having two bores which reciprocate over a stationary center column and piston with a passageway through them, and from the other end of piston two columns one for the supply passageway, and the other for the exhaust passageway. I make said center column smaller than the piston, and make one end of cylinder to fit said center column, the remainder to fit piston and the space between center column and cylinder wall forms the cylinder space.

In the accompanying drawing I have endeavored to show one of many ways in which my invention may be carried out.

Figure 1, is a vertical view of the engine: Fig. 2, is a section through center of engine: Fig. 3, is a section of the engine on the line L and L'; Fig. 4, is a section on the line of L² and L³: Fig. 5, shows a portion of the frame in section showing arch beam and location of valve mechanism: Fig. 6, is a top view of the engine: Fig. 7, Sheet 2 is a section view of engine right-angle to Fig. 2: shows center column B², passageway "A", exhaust column "B", valve casing for exhaust valve, inside of casing in dotted lines, and base of frame "D" with one box for crank shaft. Fig. 8, is a section view of one of the valve seats "E" which screws in to valve casing at "V." (See Fig. 7.)

In the construction of my explosion-engine, the frame "D" with ribs and boxes for crank shaft, arch-beam extending up and supporting valve casing, the two short columns B and B' extending up and supporting piston and center column "B²", are all made in one casting, but they can be made in two or more castings if preferred. The crank shaft "C" carries two fly-wheels C C with two pieces of shafting *p* and *p'*. The cylinder "A" is made with two bores, one to fit over piston the other, reduced with rings "R" to fit over center column B². Outside of said cylinder are two wrist pins *c* and *c'*, and on

the lower end of said cylinder is a head H which fits around B and B'. Connecting rods *c*² and *c*³ are connected to cylinders at *c* and *c'* and to crank shaft at *c*⁴ and *c*⁵. The arch beam extending up from frame has two ribs one on each side, which extend in on base and up over crank shaft supporting valve casing with B and B' resting on said casing. Casing is so formed that when valve seat "E" is in place there will be a space between seat and wall of casing. This space forms a passage-way to E'; valves work in chambers at lower end of E' and S' with stem extending down through valve seat and out at "T". One of the valves is not shown for the purpose of showing port in valve seat, E where gases pass to the outside of valve casing. B and B' extend from valve casing and support piston with rings "R" said piston supports center column B², over which reduced bore of cylinder reciprocates.

In describing the working of my explosion engine I will follow the gas in and out of engine's cylinder. The gas enters valve casing at "S" (see Fig. 6) and passes through port in valve seat to valve, then up in passageway S' to cylinder (see Fig. 2) filling space between center column "B²" and cylinder "A" down through exhaust passageway to valve which rest on seat "E", when in place. Now cylinder and passageway S' and E' to valve on their seats are filled with gas and held there during compression and explosion. When the cylinder reaches the end of its upper stroke exhaust valve opens and lets the burned gas out through port in seat "E" to chamber around seat which communicates with outlet "E". The excess heat caused by the combustion of gas is radiated on the outside of cylinder inside of center column B² lower side of piston, and outside of B and B' and valve casing. On lower end of cylinder is a head "H" which fits around B and B' inclosing the space between said head "H" and under side of piston. (On "B" (see Figs. 1 and 4) I have a rib. This rib can be left off as shown in Fig. 7; as I do not deem it necessary in all cases). Now, as said head "H" moves away from piston it will cause a partial vacuum in the space between head "H" and lower side of piston causing air to flow through passageway A' in center column and piston around B and B', and will be forced out again through passageway "A" when cylinder is on its return stroke carrying the radiated heat with

it, and the continual fanning of valve casing with said head "H" every time it reaches lower part of stroke, will remove the radiated heat from same.

5 Working of valves and the igniter I do not show in detail as I do not claim anything new in them. They are worked from a cam-shaft the usual way, and any one skilled in the mechanism of explosion engines will readily see how to work them.

10 Various modifications may obviously be made in the details of construction without departing from the spirit and scope of my invention, and I, therefore, desire it to be understood that my invention is not limited to the specific details shown and described.

15 Having thus described my invention I claim as new and desire to secure by Letters Patent.

20 1. In an explosive engine, a frame, a fixed piston having an upper center column and two lower supporting columns provided re-

spectively with inlet and exhaust passages, valve casings and valves, and a cylinder movable over said piston and center column and 25 connected to a crank shaft in the frame.

2. In an explosive engine, a frame, a fixed piston having an upper center column and two, lower supporting columns provided respectively with inlet and exhaust passages, 30 valve casings and valves and a cylinder movable over said piston and center column connected to a crank shaft in frame and having an opening in one end provided with rings to fit over center column, said center column 35 and piston having a passageway as described and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RICHARD D. CODY.

Witnesses:

P. FITZPATRICK,
LAURA HERDEG.