

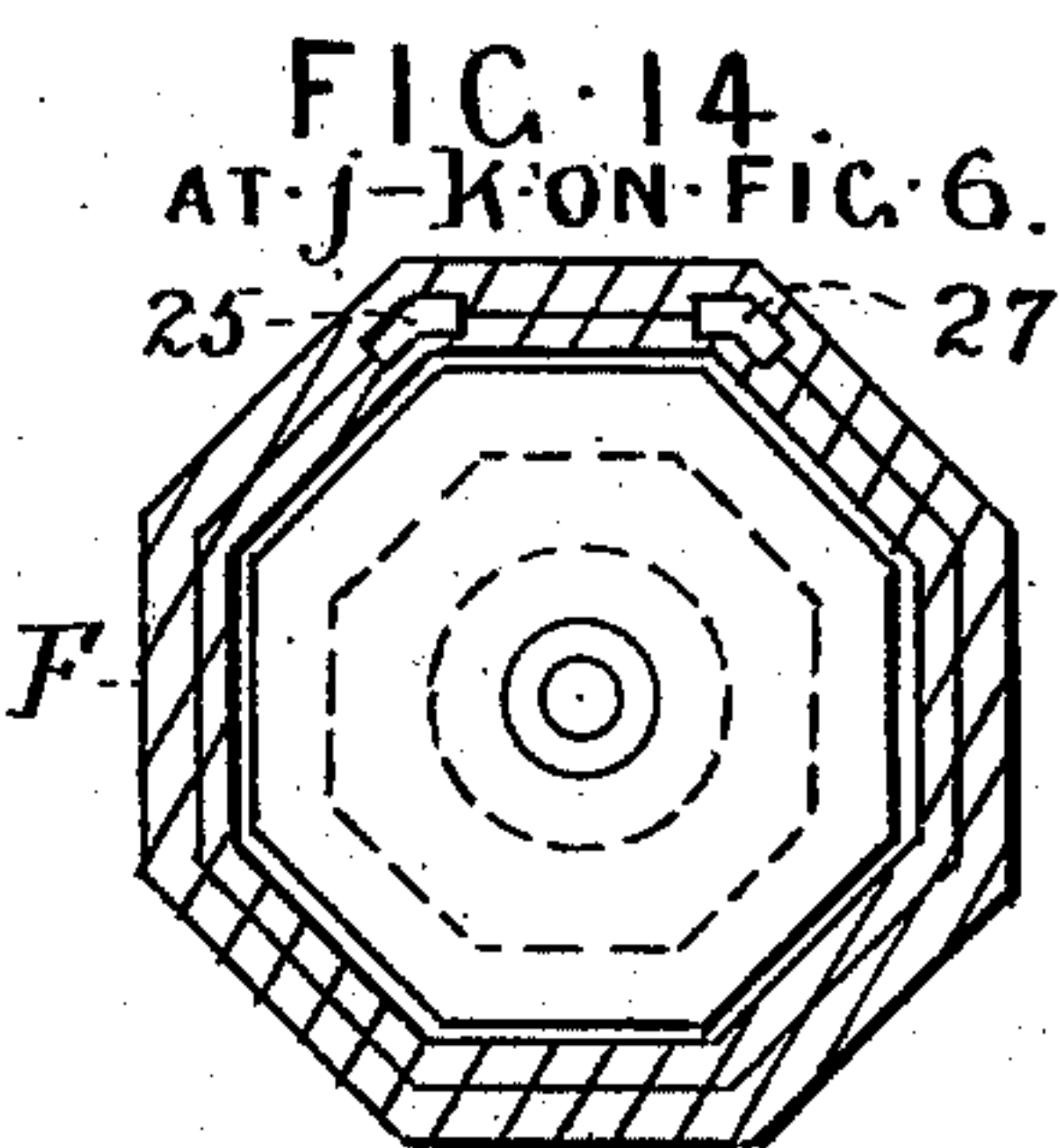
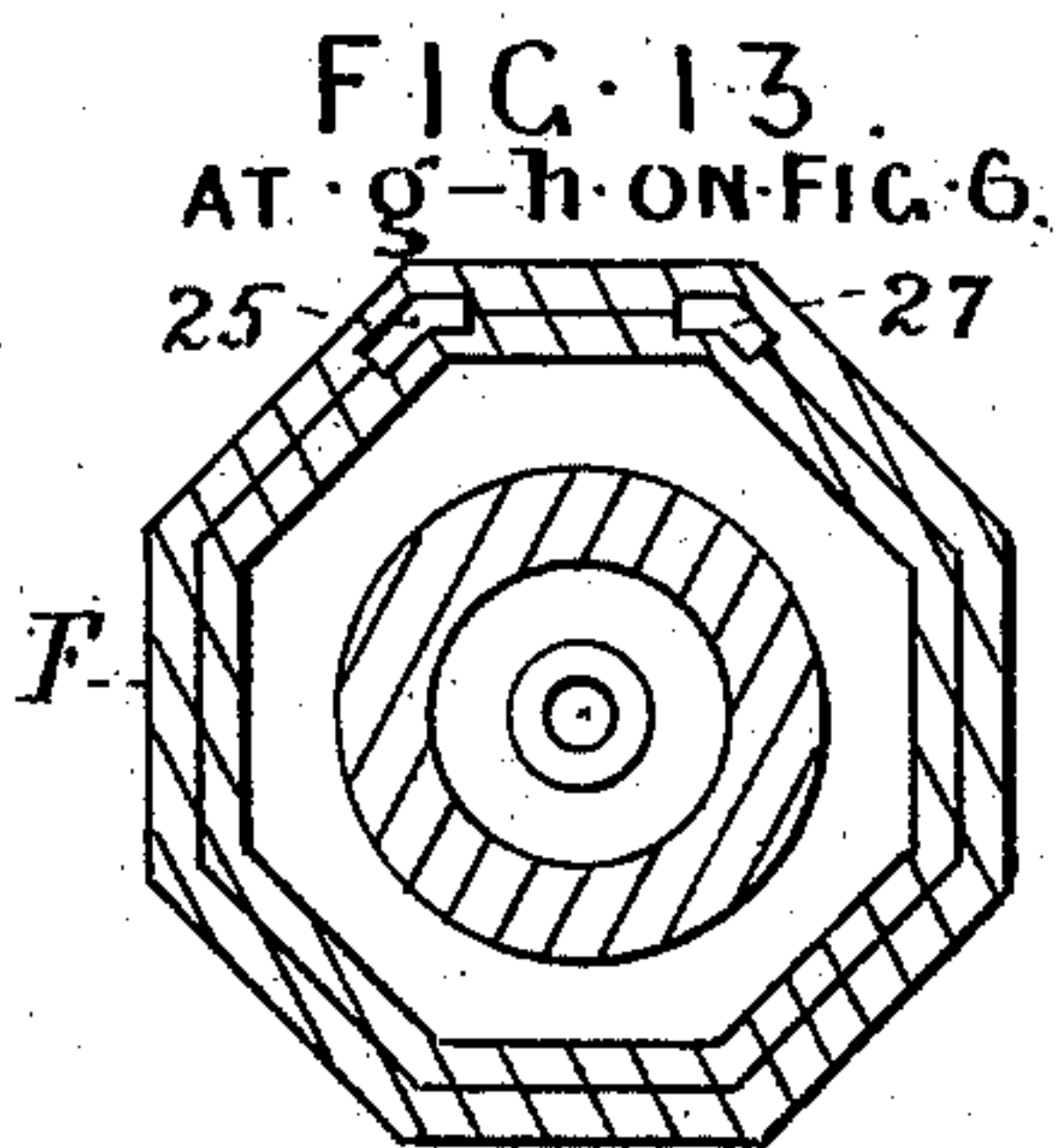
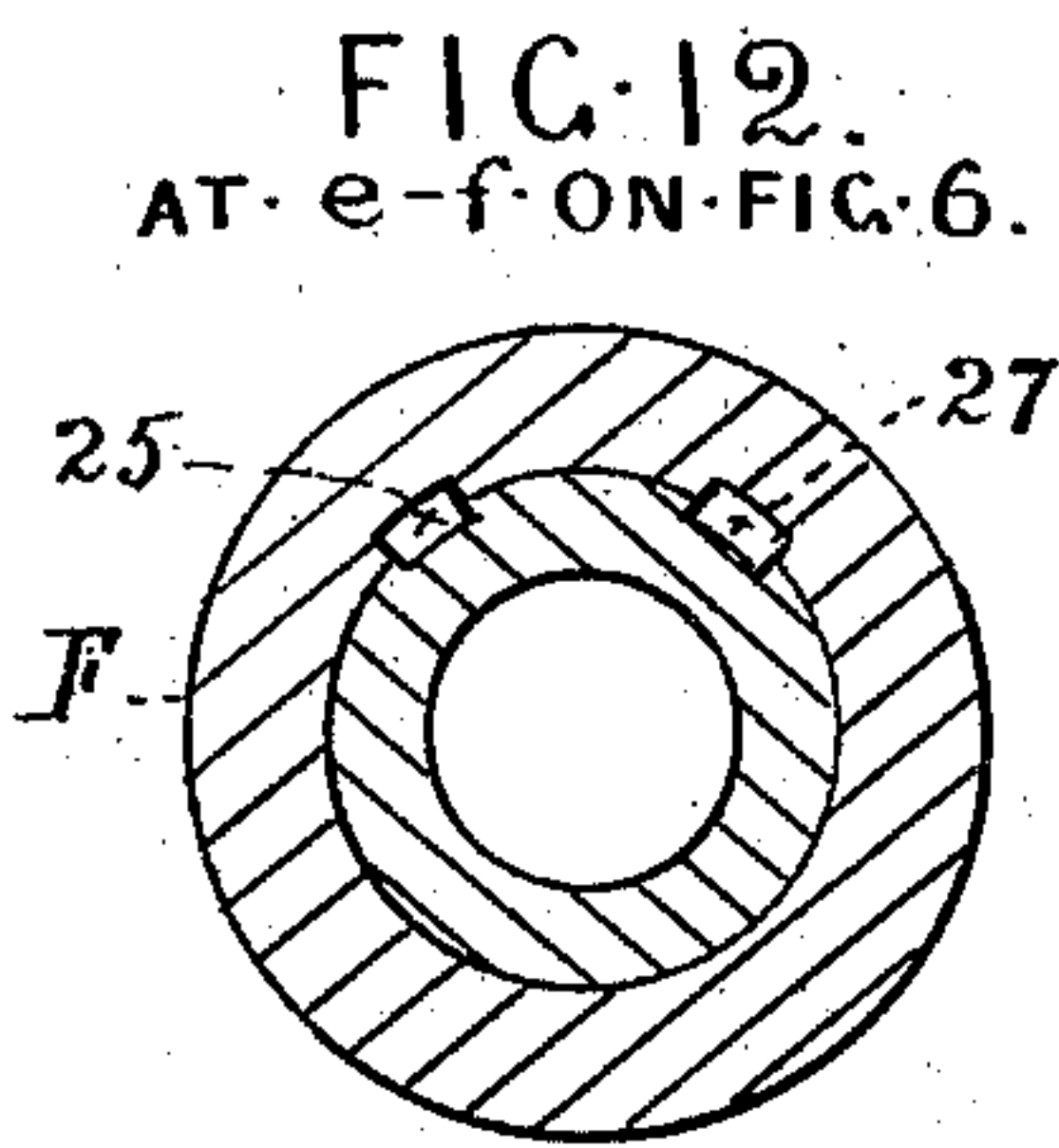
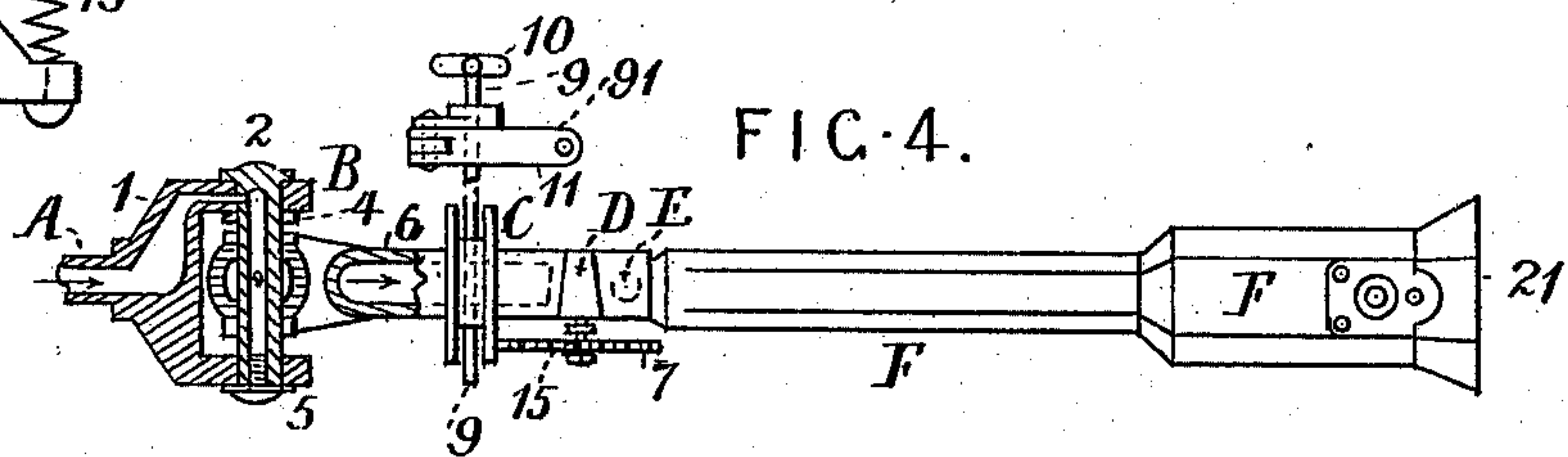
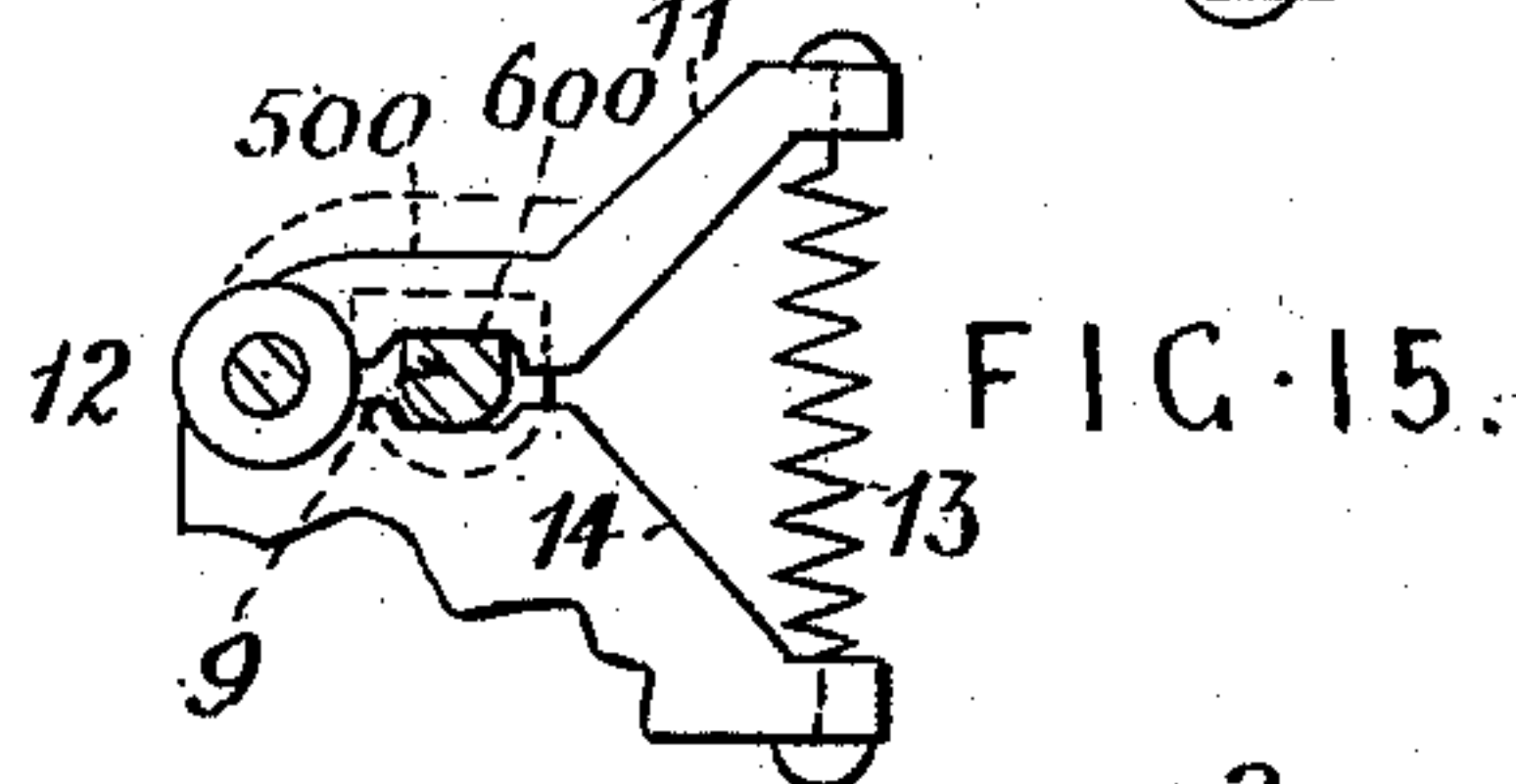
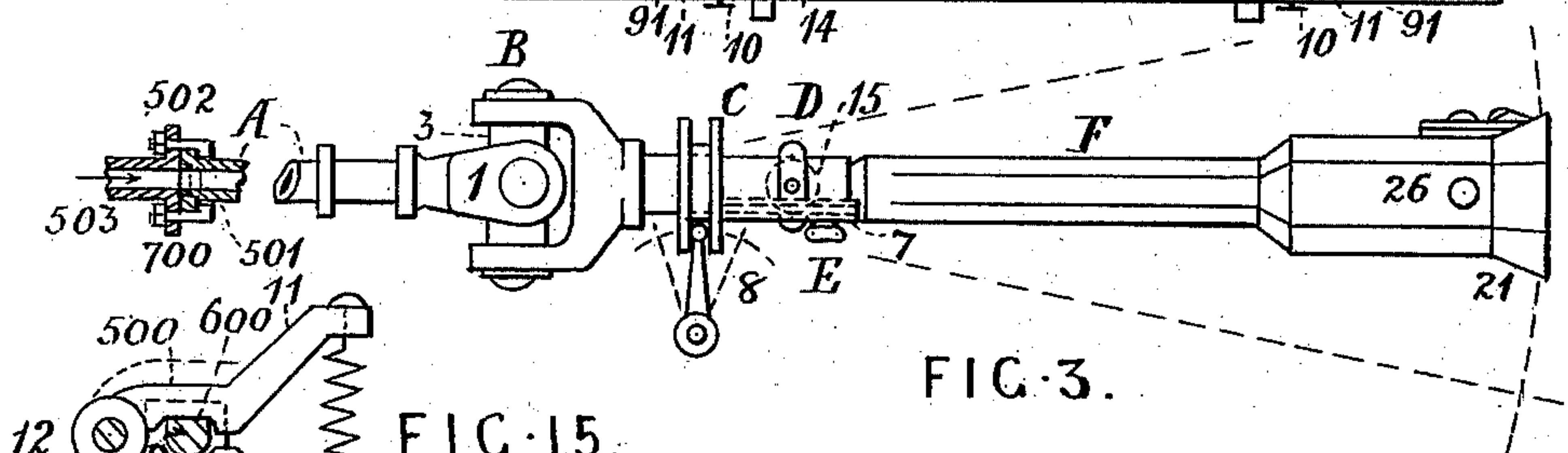
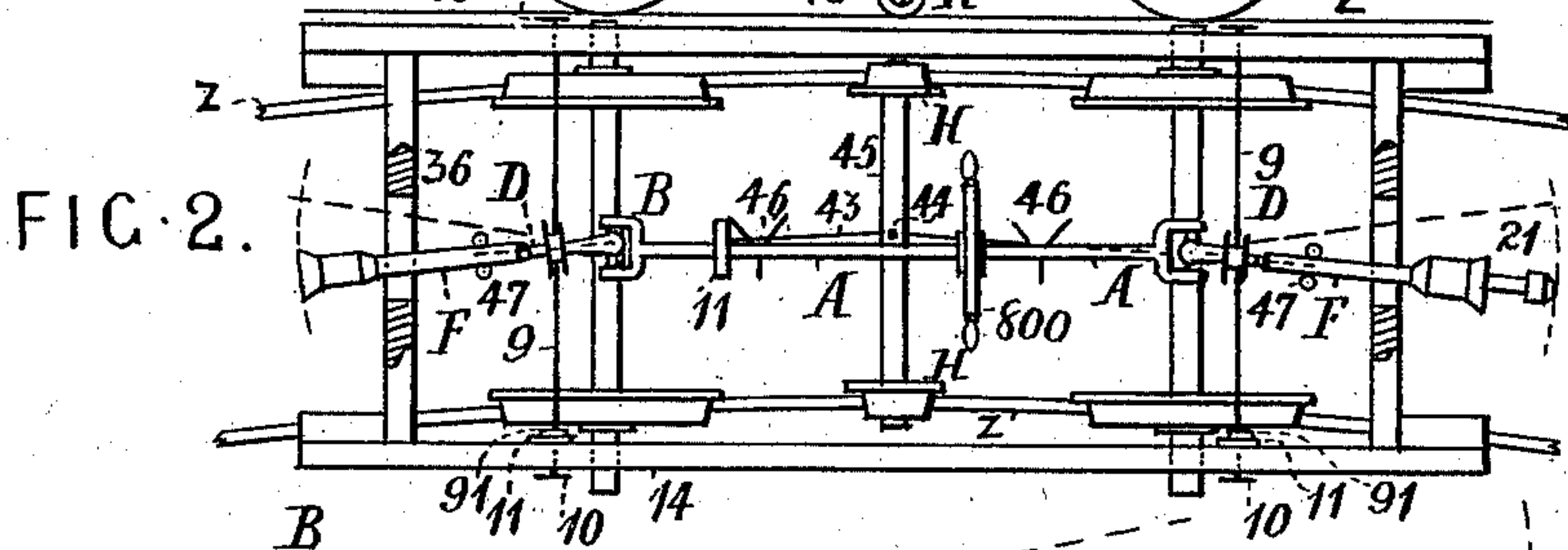
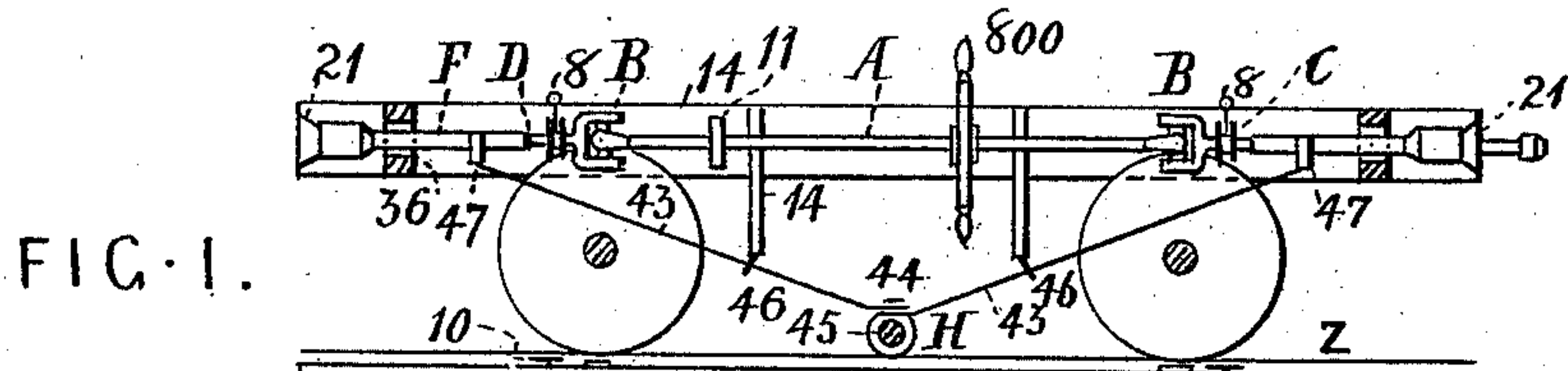
(No Model.)

3 Sheets—Sheet 1.

R. C. SAYER.
CAR COUPLING.

No. 603,996.

Patented May 10, 1898.



Witnesses.

Samuel Percival
Frederick Burnham

Inventor.

Robert Cooke Sayer
By his Attorneys.
Wheatley & Mackenzie.

(No Model.)

3 Sheets—Sheet 2.

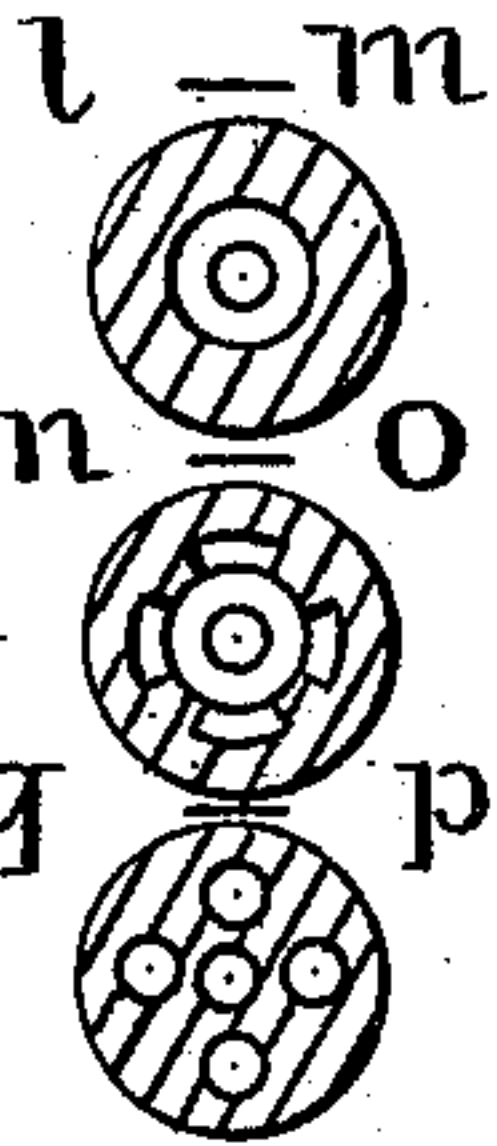
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FIG. 6.

ON FIG. 6 AT



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(No Model.)

3 Sheets—Sheet 3.

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FIG. 8.
AT C-D ON FIG. 6.

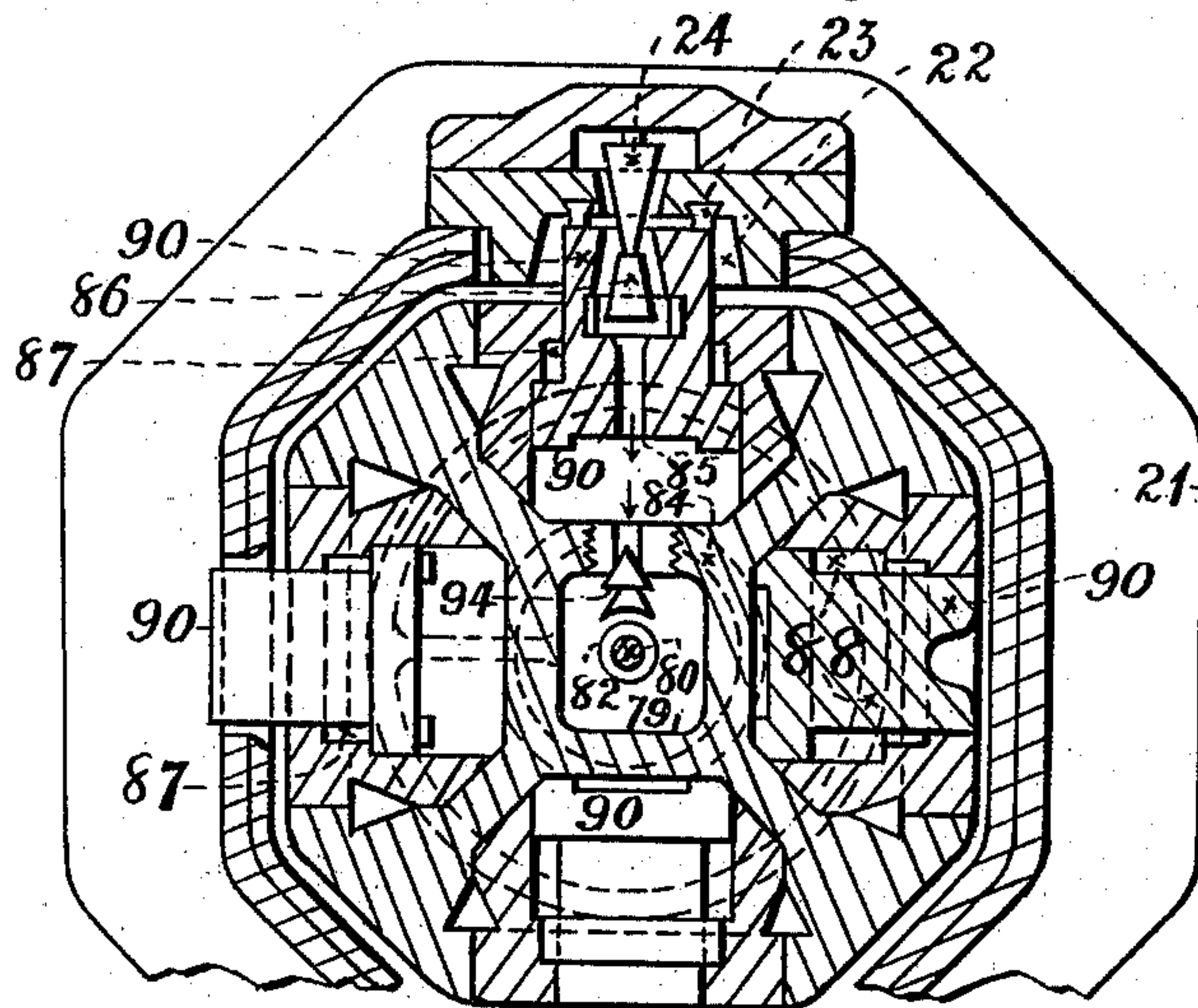


FIG. 5.

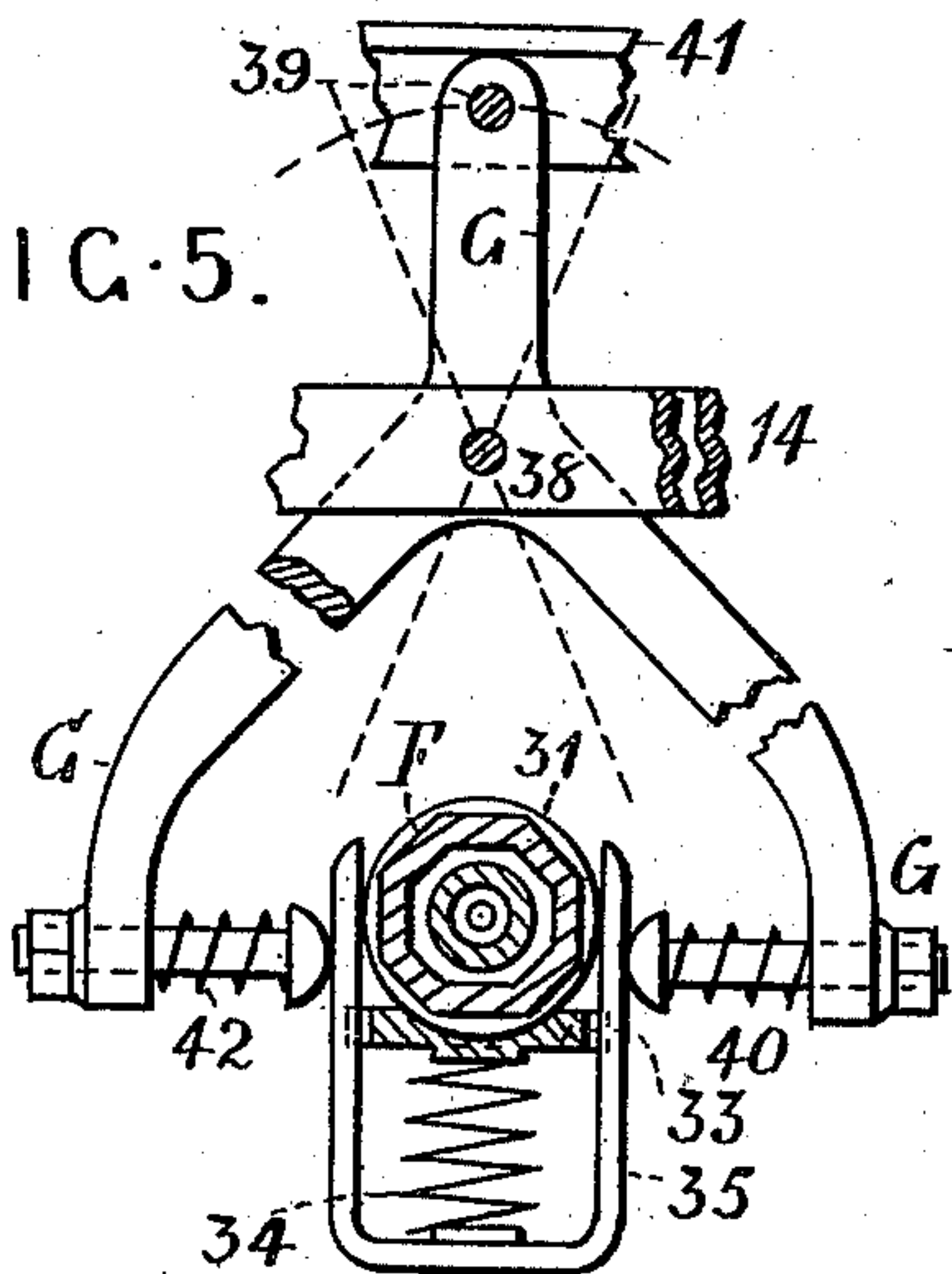


FIG. 7.

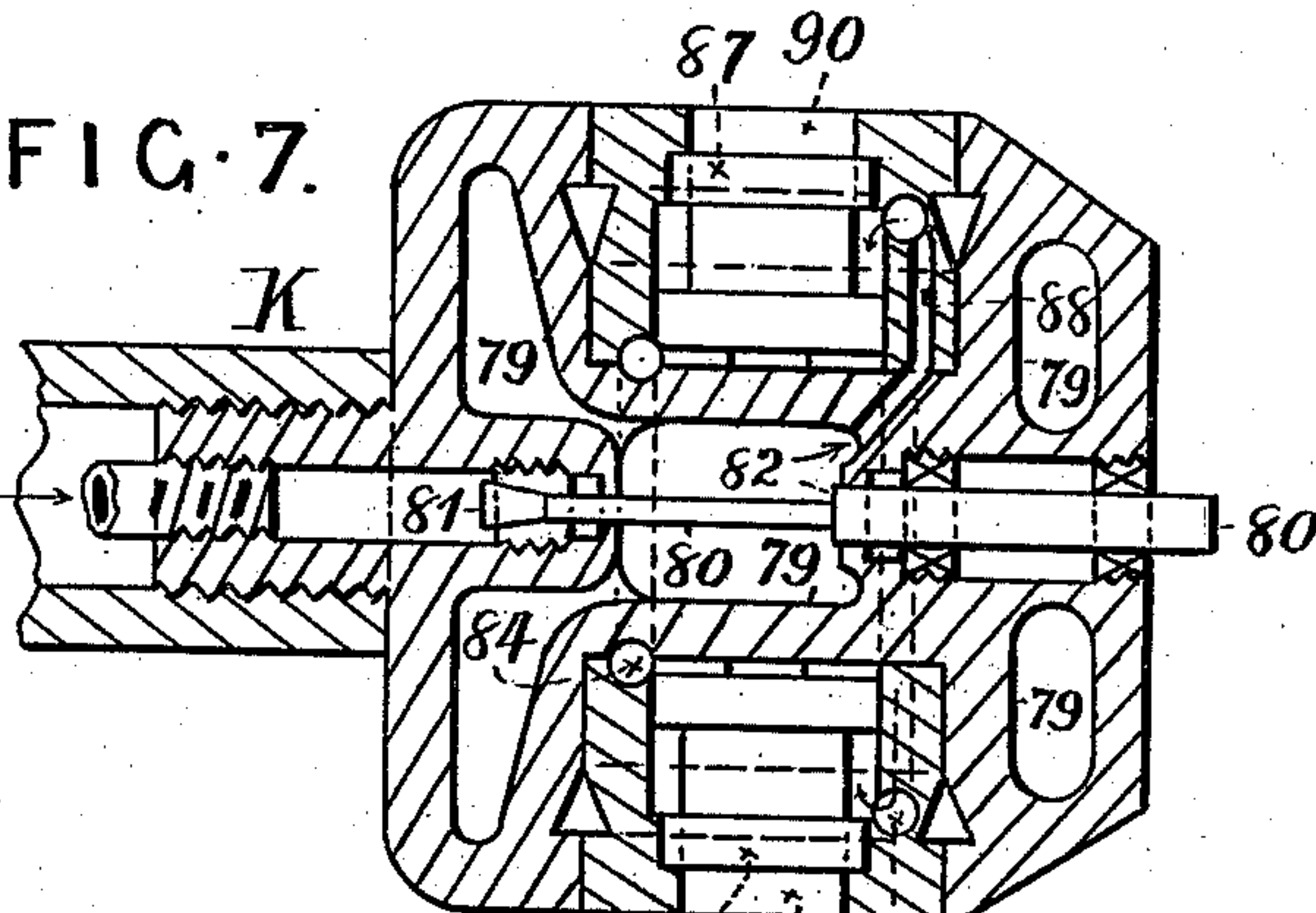
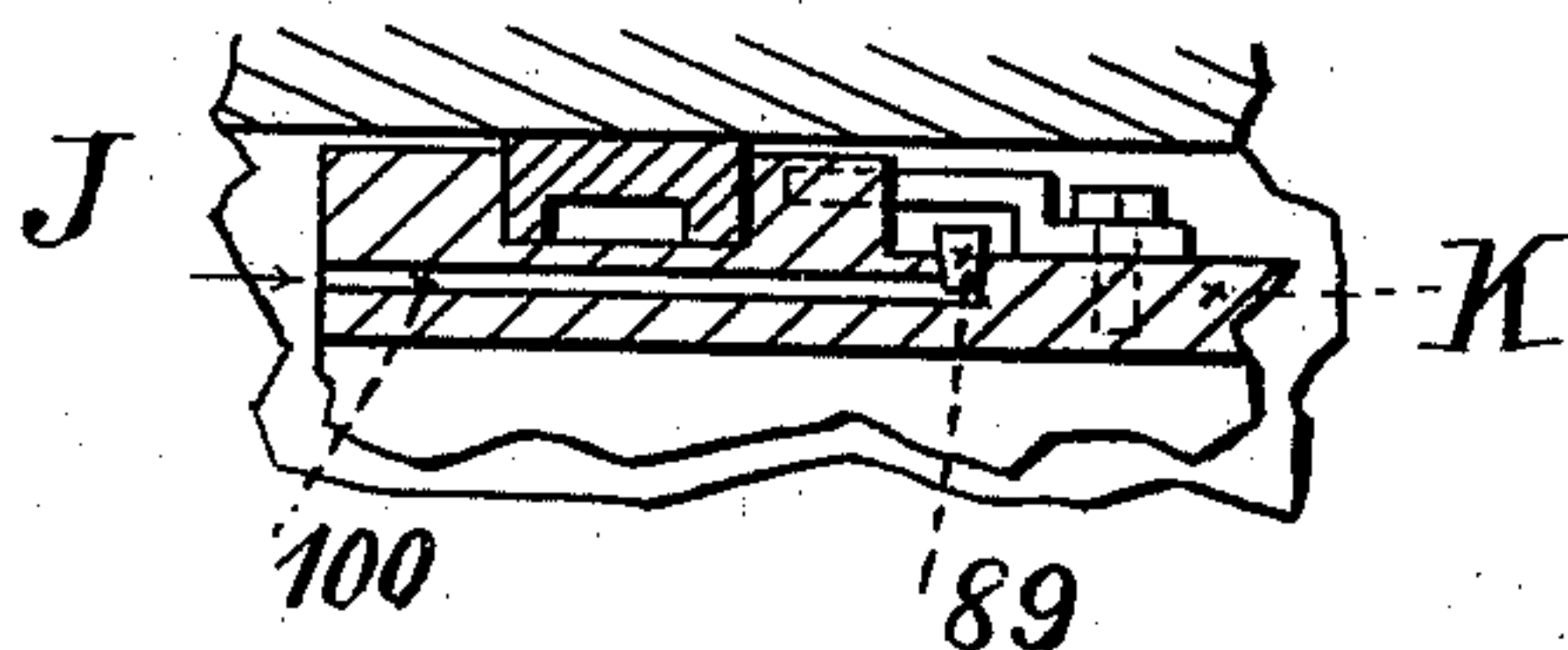


FIG. 9.



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UNITED STATES PATENT OFFICE.

ROBERT COOKE SAYER, OF BRISTOL, ENGLAND.

CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 603,996, dated May 10, 1898.

Application filed June 14, 1897. Serial No. 640,792. (No model.)

To all whom it may concern:

Be it known that I, ROBERT COOKE SAYER, a subject of the Queen of Great Britain and Ireland, residing at Clyde road, Redland, Bristol, in the county of Gloucester, England, have invented certain new and useful Improvements in Car-Couplings; and I 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.

This invention for improvements in car-couplings has for its object to provide an automatic coupling apparatus for railway-vehicles that shall also serve for transmitting power or motion from vehicle to vehicle.

In the accompanying sheets of illustrative drawings, Figure 1 is a diagrammatic elevation of a car fitted with couplings constructed according to this invention, and Fig. 2 is a plan of the same. Fig. 3 is an elevation of the coupling. Fig. 4 is a plan, partly in section. Fig. 5 is a detail elevation. Fig. 6 is a central vertical section of the coupling to an enlarged scale. Fig. 7 is a central section of the head. Fig. 8 is a section at *c d* on Fig. 6. Fig. 9 is a section of the piston-passage. Figs. 10 and 11 show the working positions of the tap controlling the coupling operation. Fig. 12 is a section at *e f* on Fig. 6. Fig. 13 is a section at *g h* on Fig. 6. Fig. 14 is a section at *j k* on Fig. 6, and Fig. 15 is an elevation of the rod and coupling fixing levers.

The couplings proper form when coupled a hollow shaft or tube A, extending the length of the train. The tube for each vehicle consists of a straight part, hereinafter called the "fixed-tube" part, mounted to rotate in bearings on the vehicle. The fixed-tube part is hinged or jointed at B to the other part, hereinafter called the "coupling" part, so that its end can be adjusted to meet the similar end of the adjacent coupling. The joints B (shown in section in Fig. 4) consist of the forks 1, fitted to a cross 2, having the passages shown. Packing 4 prevents any leakage. The coupling part can thus radiate on the joint B and comprises the arm 6, provided with a cock D, and the polygonal cylinder F, having its front end enlarged and provided with a bell-mouth 21. The arm 6 carries an annular sleeve C, that can be slid along the

arm 6 by the lever-arm 8, mounted on a shaft 9, extending to the sides of the car and provided with handles 10. The shaft 9 is kept in position, as shown in Fig. 15, by means of a flat 600, on which the lever 11, hinged at 12 to the frame 14 of the vehicle, is forced to bear by the spring 13. The sleeve C is provided with a rack 7, that gears into a pinion 15 on the plug of a cock D in the arm 6. The cock D is formed, as clearly shown in Figs. 6, 10, and 11, with two recesses and a through-passage, and the valve-casing has four ports and corresponding passages 27, 28, 30, and 92. The passage 27 communicates with the front end of the smaller part of the cylinder F, in which works a piston J. The passage 28 communicates with the atmosphere. The passage 92 communicates through the arm 6 with the tube A. The passage 30 communicates with the rear end of the cylinder F, containing the piston J. In the passage 30 is an automatic valve E, that comprises the valve 17 and the piston 18, working in a short cylinder grooved at its center to allow of the passage of pressure. The passage 25 leads from the tube A, between the cock D and the joint B, to a valve 24 in the front of the cylinder F.

The sides of the enlarged cylinder F are provided with recesses 22 and openings 26. A collar 31 on the cylinder F rests on a bearing-piece 33, supported in the stirrup 35 by a spring 34. The stirrup 35 is retained in position laterally in the case of bogie-cars, as shown in Fig. 5, by the spring-bolts 40 42, mounted in the forked end of a lever G, pivoted to the bogie-frame 14 at 38 and connected to the car-body 41 at 39, so that it is adjusted to the correct position as the car-body moves on the bogie-frame in passing around curves. For ordinary carriages the cylinder F is moved laterally in a similar manner at 47 by levers 43, fulcrumed at 46 and connected at 44 to axle 45, provided with small wheels or sliders H.

The polygonal piston J is provided with a small passage 100, Fig. 9, extending from front to back and provided, when the vehicles are to be coupled up tight, with a non-return valve 89. The rod K of the piston is tubular and is packed at 53 and carries a head 70, formed with a chamber 79. The passage

through the piston-rod K is provided with a valve 81, operated by a rod 80, extending through the chamber 79 to the front of the coupling, and provided in the chamber 79 with a shoulder 82, so that any pressure in the chamber tends to force it outward. The valve 81 communicates by the passage 84 to the back of the lugs 90, having pistons at their inner ends, and through the passage 85 to the base of a conical valve 86 within the lug 90, and also through the valve 94 with the chamber 79. The lugs 90 are packed at 87. The chamber 79 communicates by the passage 88, Fig. 7, to the outer or annular part of the piston of the lugs 90.

The couplings are kept the proper way up by an arrangement exactly similar to that shown in Fig. 15, where the dotted line 500 shows the flat on the shaft A.

The tube A of the locomotive is divided and is connected by two rotating joints 700 to a pressure-reservoir.

The coupling operation is as follows, the pistons J being left from the previous uncoupling operation in their inner positions: The handle 10 of one vehicle is operated to bring the cock D to the position Fig. 11. In this position the pressure in the front of the piston J is exhausted and pressure is admitted through the passage 30 to the back of the piston to force it outward. The cock D is returned by the spring 91, acting on the rod 9, to its normal position, Fig. 6. The cars are then brought together, and as they meet the forced-out head enters the bell-mouthed opening of the other or adjacent vehicle, as shown at 170, and both rods 80 are thrust in, opening the valves 81 and admitting the pressure to the base of the lugs 90, which are forced outward to engage within the recesses 22 of the coupling of the adjacent vehicle, a tight joint being insured by the cushions 23. As the lugs are thrust out the valve 86 meets the valve 24 of the adjacent vehicle and, being of greater area, thrusts 24 against its stop, opening the valve 24, and finally the valve 86 is opened and the pressure in the tubes A of the two vehicles equalize.

To uncouple a vehicle, the cock D of that vehicle whose piston J is out is sent to the position shown in Fig. 10 to exhaust the back of the piston J. The valve 24 first closes and the pressure is then reduced at the base of the lugs 90, and the pressure in the chamber 79, acting on the front of the piston of the lugs 90, forces them in clear of the recesses 22. The surplus pressure in front of the piston J then thrusts it inward and the vehicles are uncoupled. As the valve D is returned to its normal position (shown in Fig. 6) it passes the dotted position and a further charge is admitted to the front of the piston to insure its being sent home. As the piston-heads 70 and 170 leave one another the rods 80 are thrust out by the pressure in the chambers 79 and close the valves 81.

Rotary motion can be given to the shaft A

by the handle 800 or other suitable means and is transmitted throughout the train, the polygonal section of the cylinders allowing these several parts to be worked or rest together and the joints B allowing for any curvature of the train.

What I claim, and desire to secure by Letters Patent, is—

1. An automatic adjustable coupling for a railway-carriage consisting of a fixed tube rotatably mounted in bearings, two polygonally-bored heads connected to the ends of the tube by universal tubular joints so as to allow of the heads being adjusted to meet similar heads when coupling and at the same time to form a continuous communication for fluid-pressure and for mechanical rotation, polygonal pistons within the heads, provided with means for attaching to similar heads when coupling, and valves in the heads adapted to be operated by hand and controlling the fluid-pressure to the pistons.

2. An automatic adjustable coupling for a railway-carriage consisting of a fixed tube rotatably mounted in bearings, two polygonally-bored heads connected to the ends of the tube by universal tubular joints so as to allow of the heads being adjusted to meet similar heads when coupling and at the same time to form a continuous communication for fluid-pressure and for mechanical rotation, polygonal pistons within the heads, provided with means for attaching to similar heads when coupling, valves in the heads adapted to be operated by hand and controlling the fluid-pressure to the pistons, laterally-movable bearings for the heads and a means for moving the bearings laterally as the carriage-body varies relatively to the rails so as to automatically adjust the heads to the desired position of the track.

3. An automatic adjustable coupling for a railway-carriage consisting of a fixed tube rotatably mounted in bearings, two polygonally-bored heads connected to the ends of the tube by universal tubular joints so as to allow of the heads being adjusted to meet similar heads when coupling and at the same time to form a continuous communication for fluid-pressure and for mechanical rotation, polygonal pistons within the heads, provided with means for attaching to similar heads when coupling, coupling-recesses in the heads, valves in the heads controlling the pressure to the pistons so that the pistons can be forced outward, radial piston-lugs in the pistons, automatic valves that are opened when the couplings meet similar couplings and act to force out the radial piston-lugs into the recesses, automatic valves in the piston-lugs that connect the tubular communication between the two vehicles, and a chamber with non-return-valve communication with the back of the pistons to withdraw the pistons when the pressure is removed from their front ends.

4. An automatic adjustable coupling for a

5 railway-carriage consisting of a fixed tube rotatably mounted in bearings, two polygonally-bored heads connected to the ends of the tube by universal tubular joints so as to allow of the heads being adjusted to meet similar heads when coupling and at the same time to form a continuous communication for fluid-pressure and for mechanical rotation, polygonal pistons within the heads, provided with means for attaching to similar heads when coupling valves in the heads, a cross-shaft with handles, a lever-arm on the cross-shaft,

a sleeve adapted to slide on the tube when operated by the lever-arm, a rack on the sleeve, a pinion on the valve gearing with the rack, a flat on the cross-shaft and a spring-lever forced against the flat on the shaft. 15

In testimony whereof I have affixed my signature in presence of two witnesses.

ROBERT COOKE SAYER.

Witnesses:

CHAS. W. TURNER,
A. W. WILKINSON.