

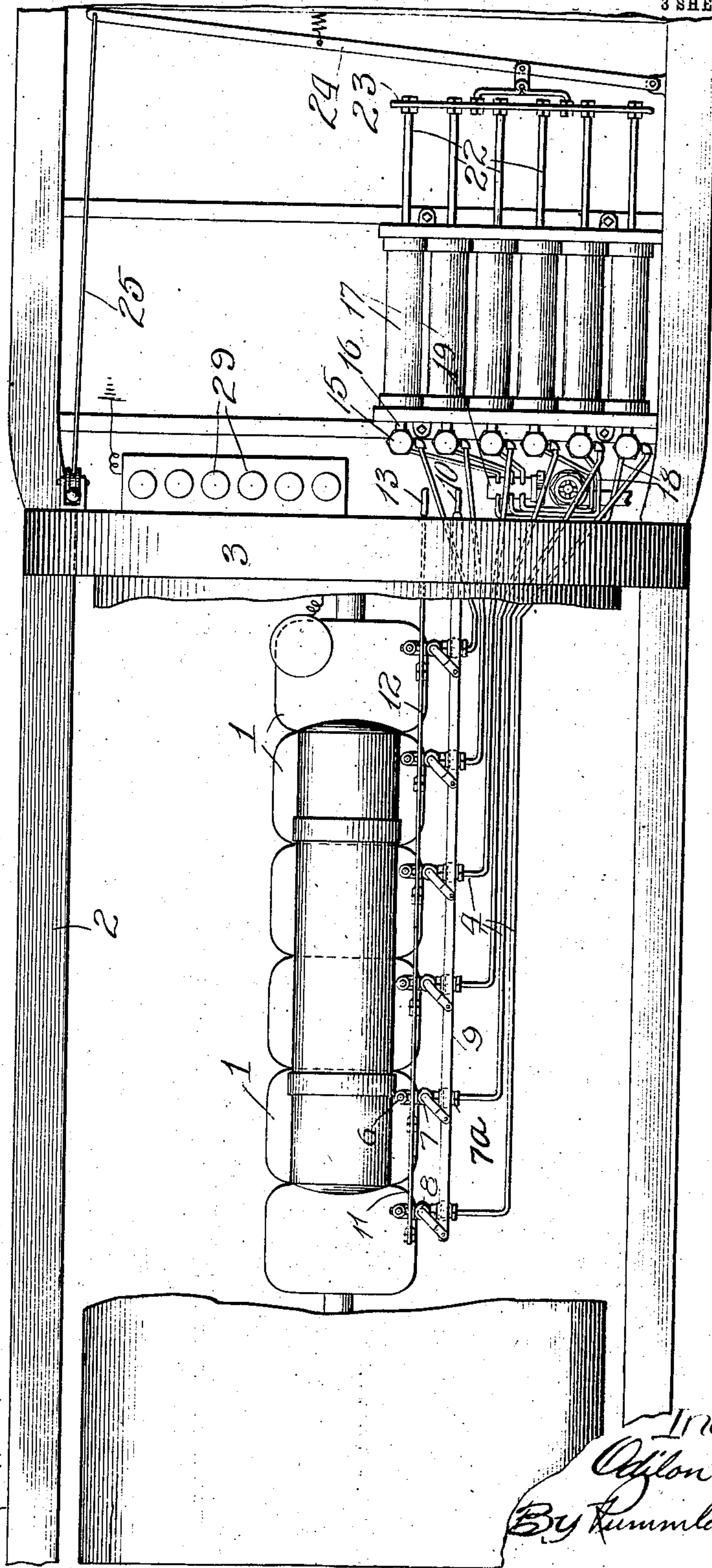
O. BRISBOIS.  
STARTER FOR HYDROCARBON ENGINES.  
APPLICATION FILED APR. 17, 1908.

959,990.

Patented May 31, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 2

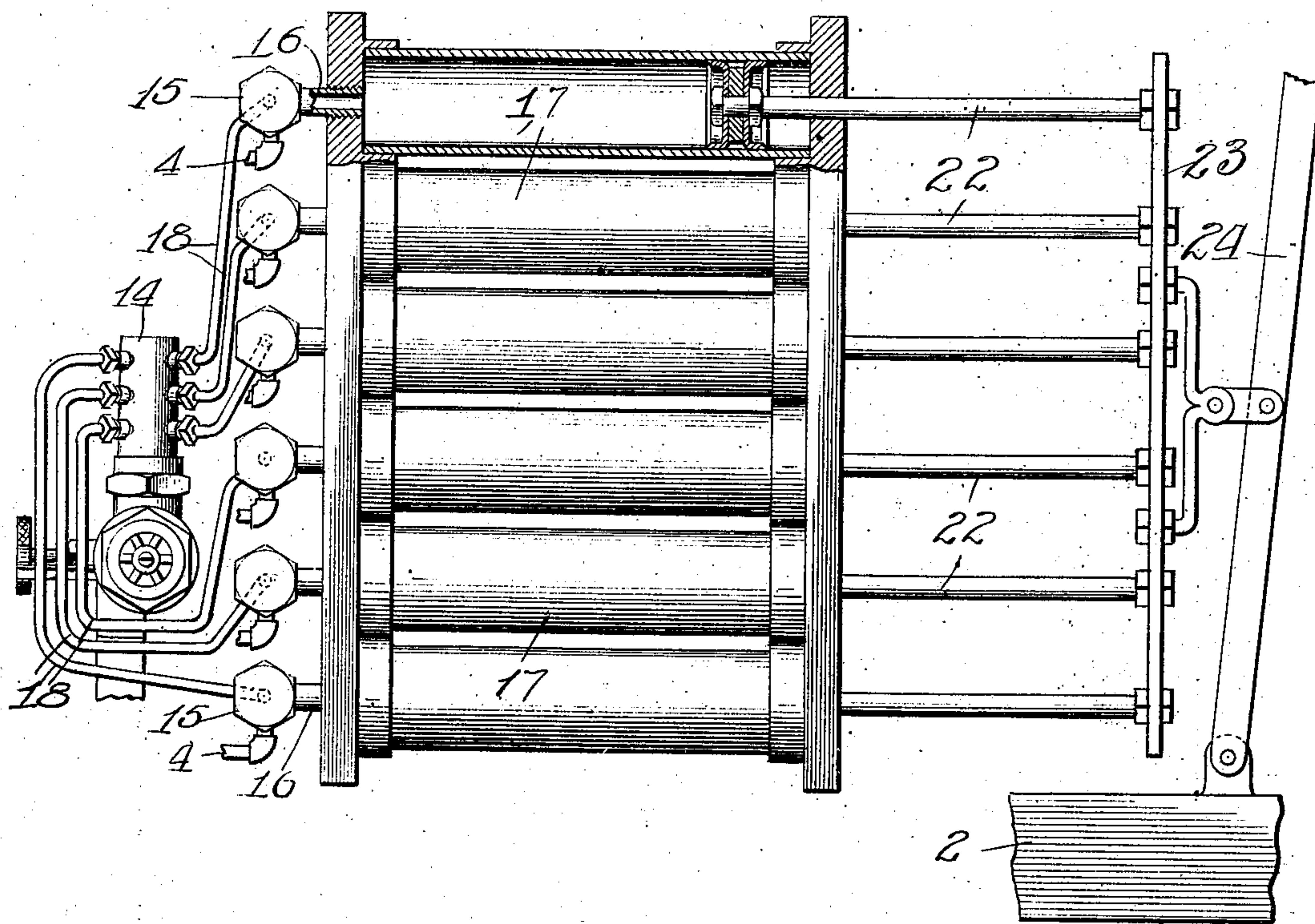
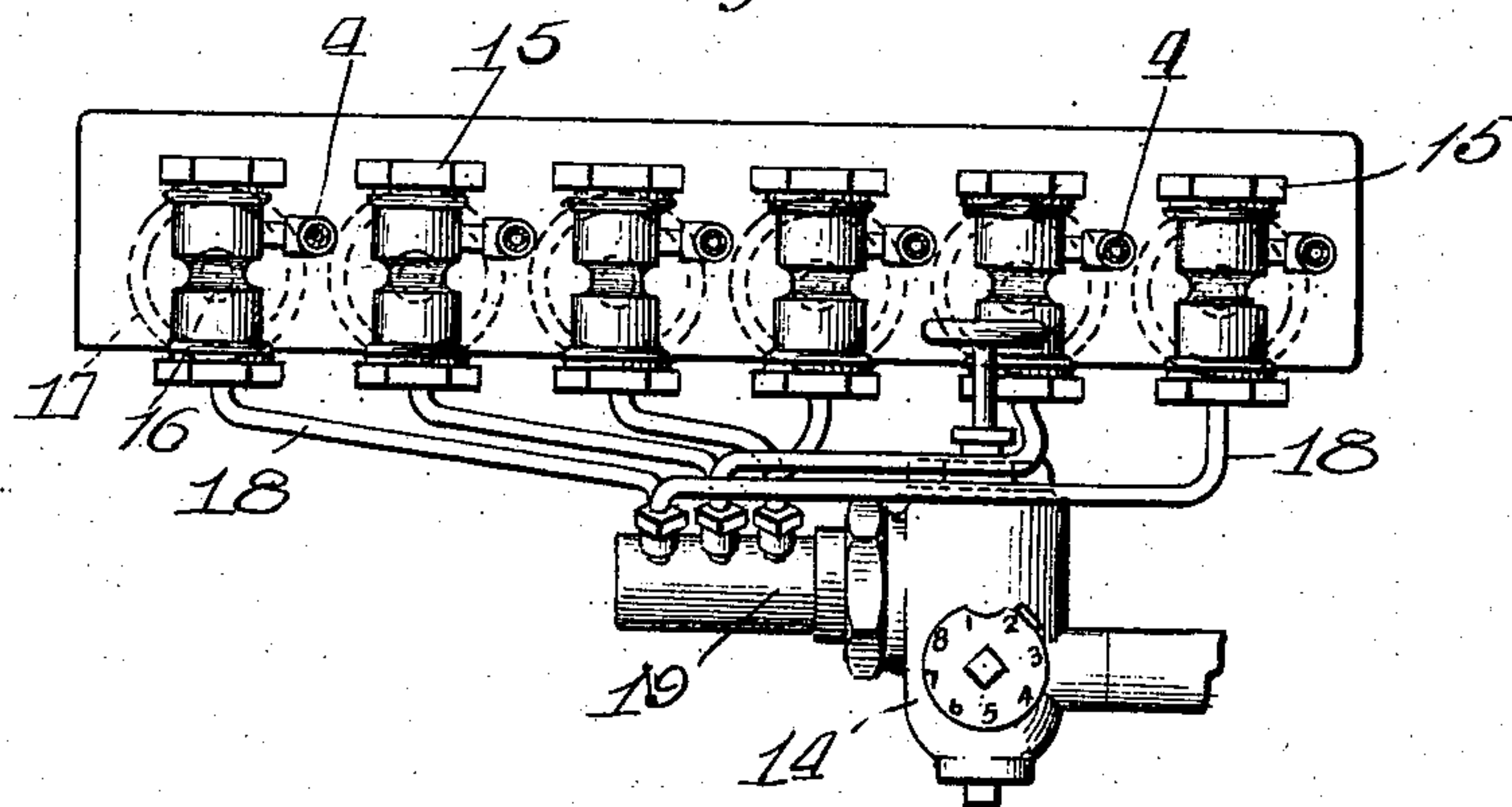


Fig. 3



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3 SHEETS—SHEET 3.

Fig. 4

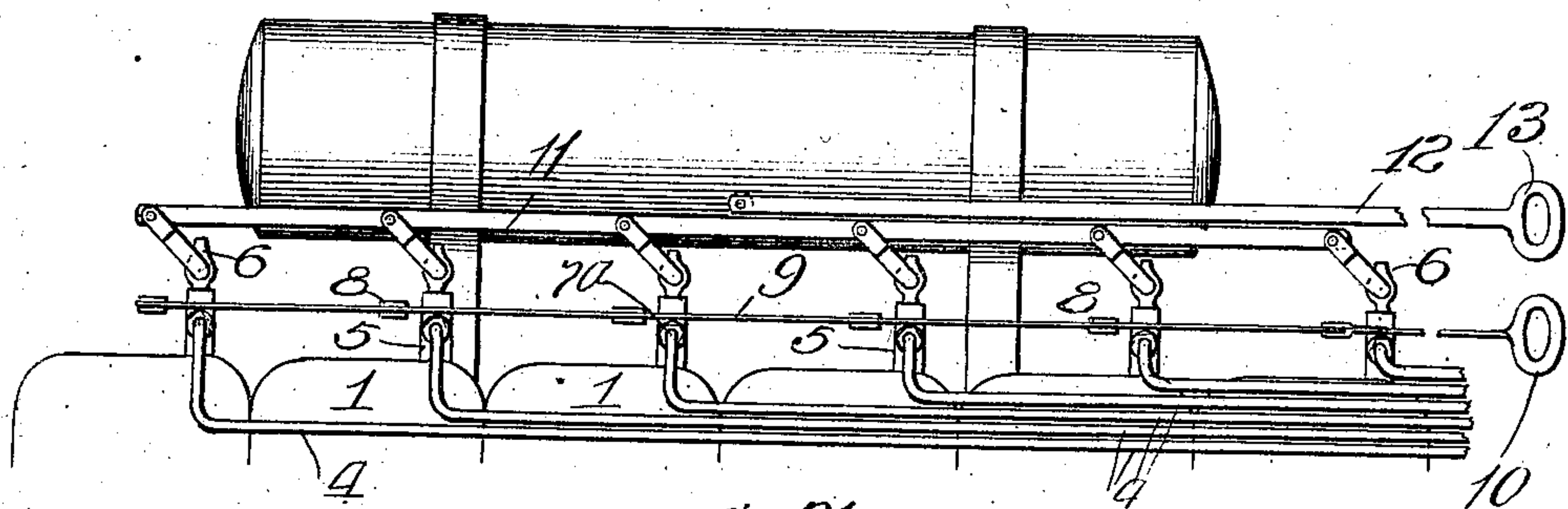


Fig. 7

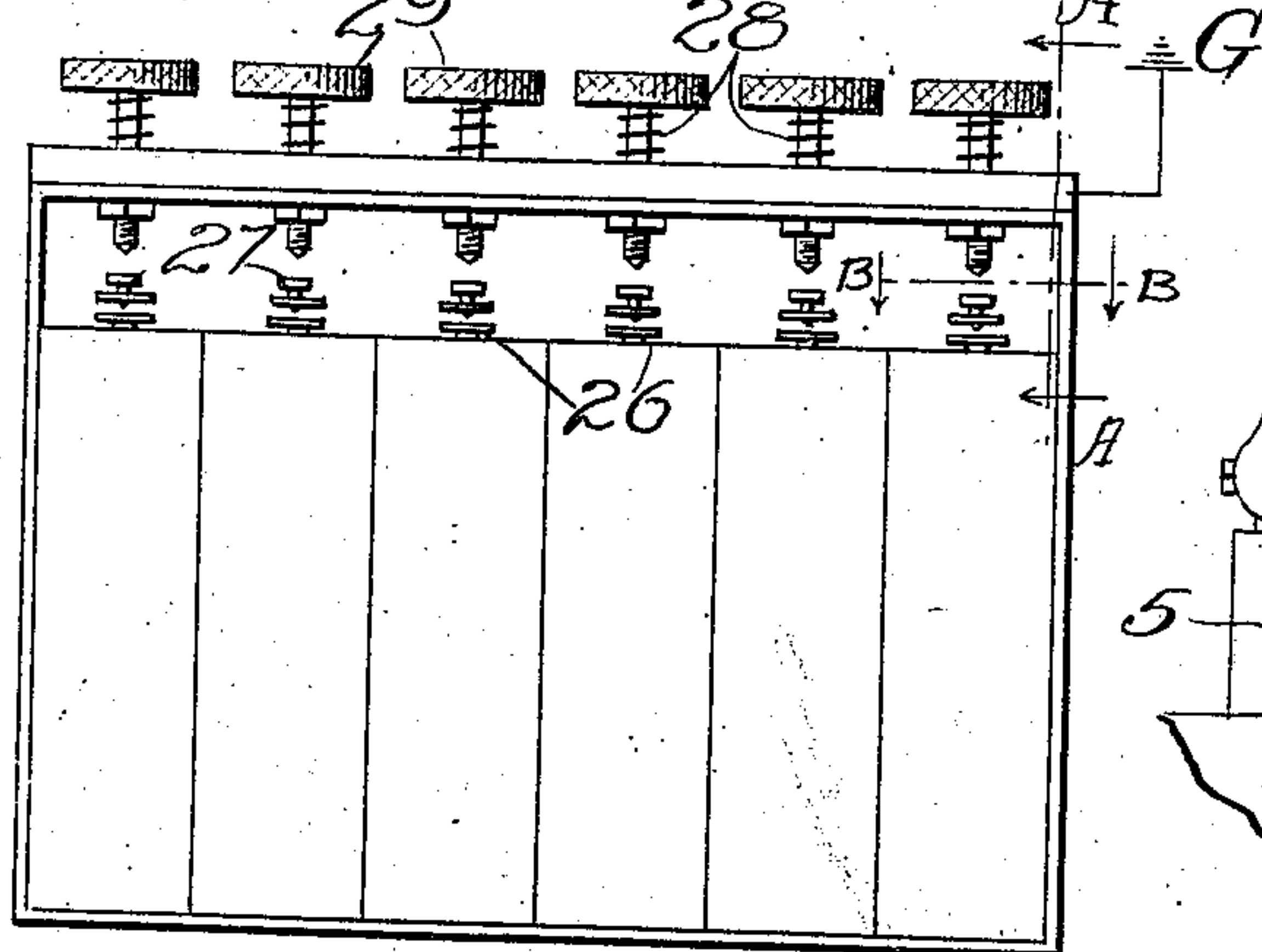


Fig. 5

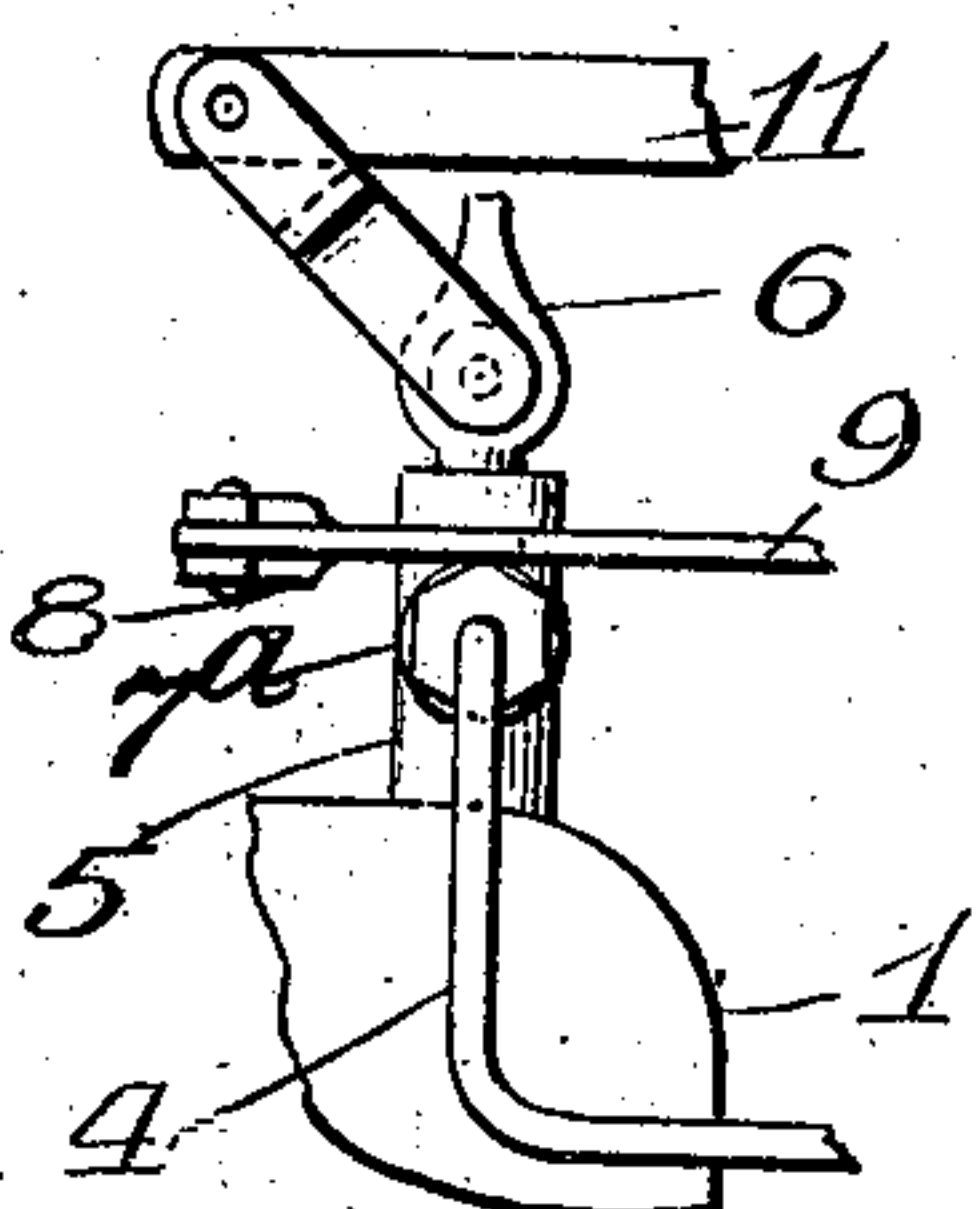


Fig. 6

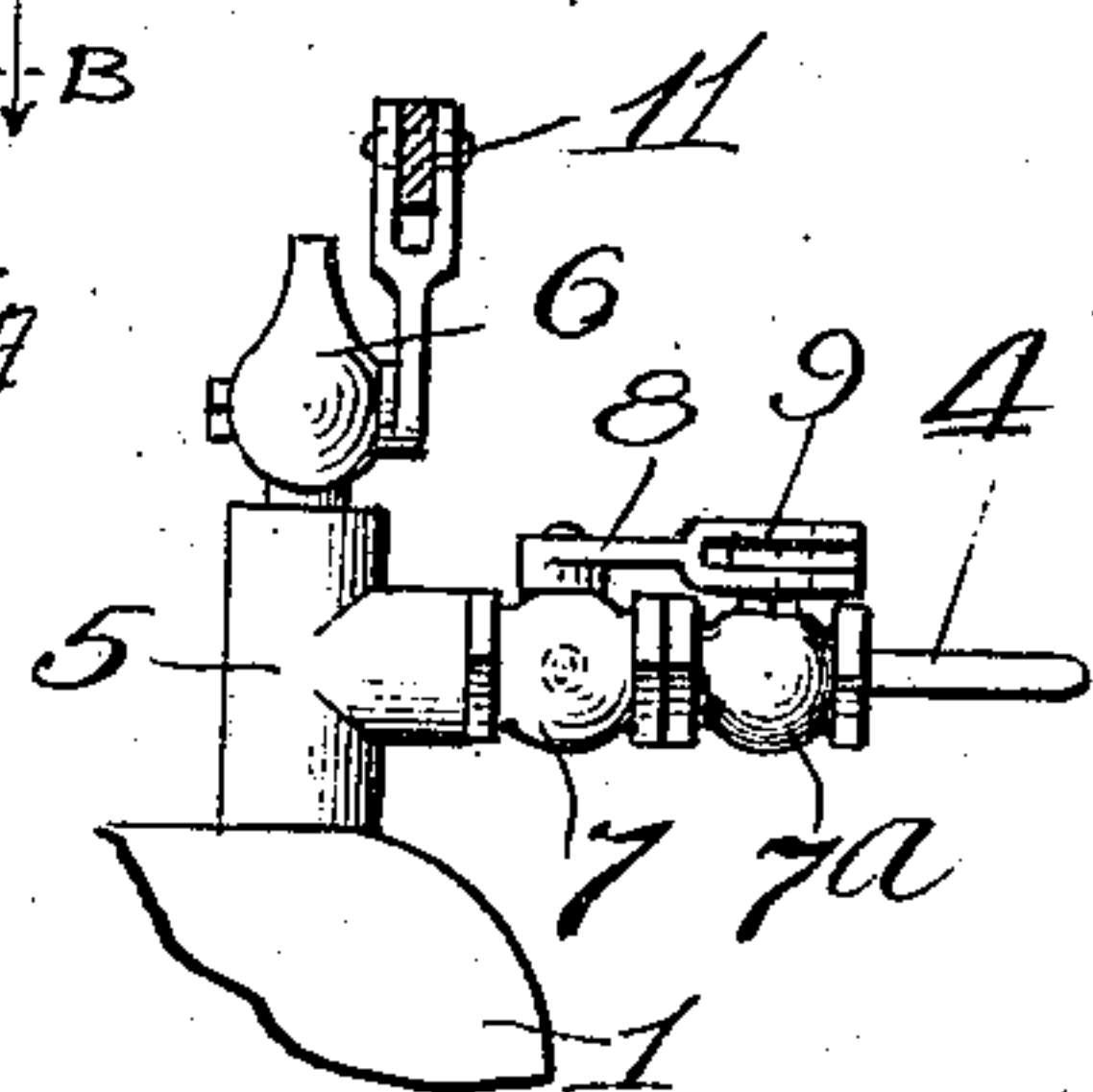


Fig. 8

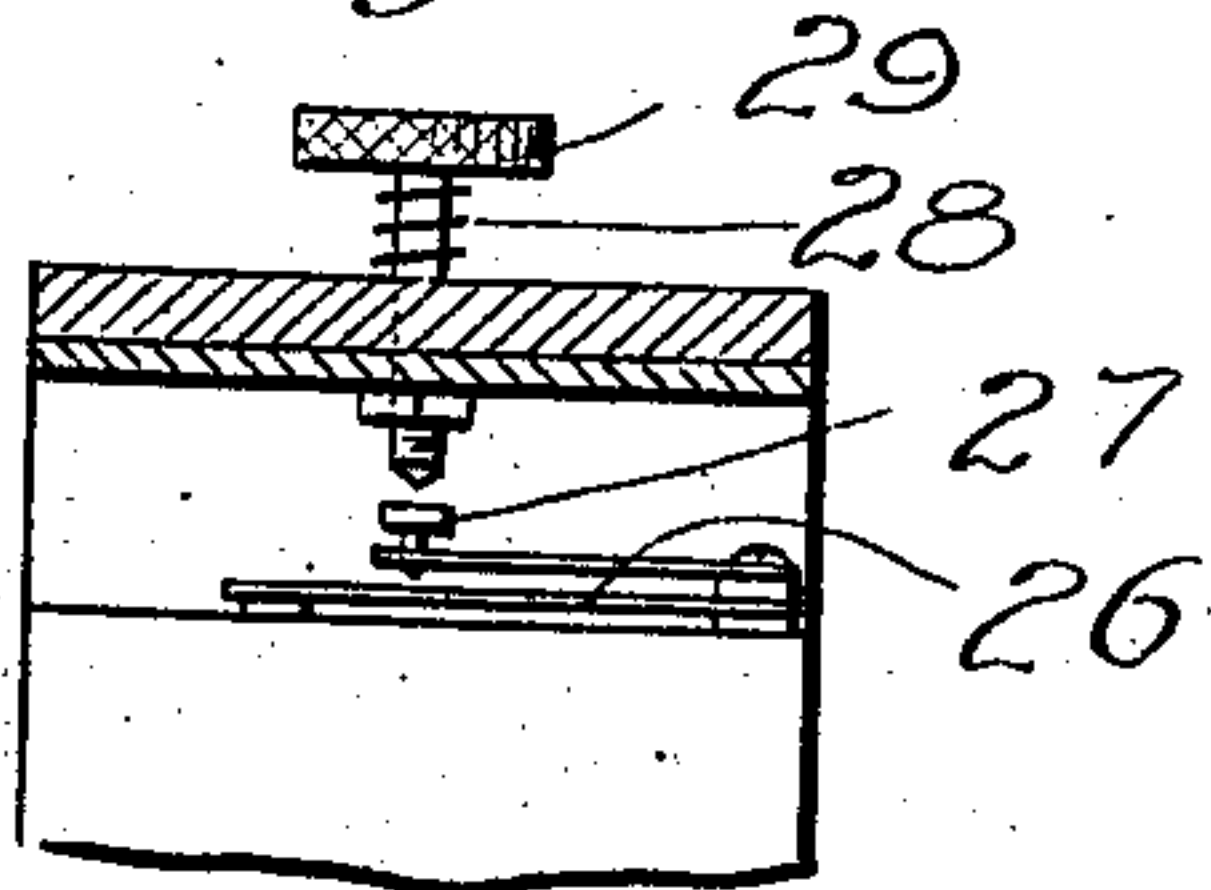


Fig. 9

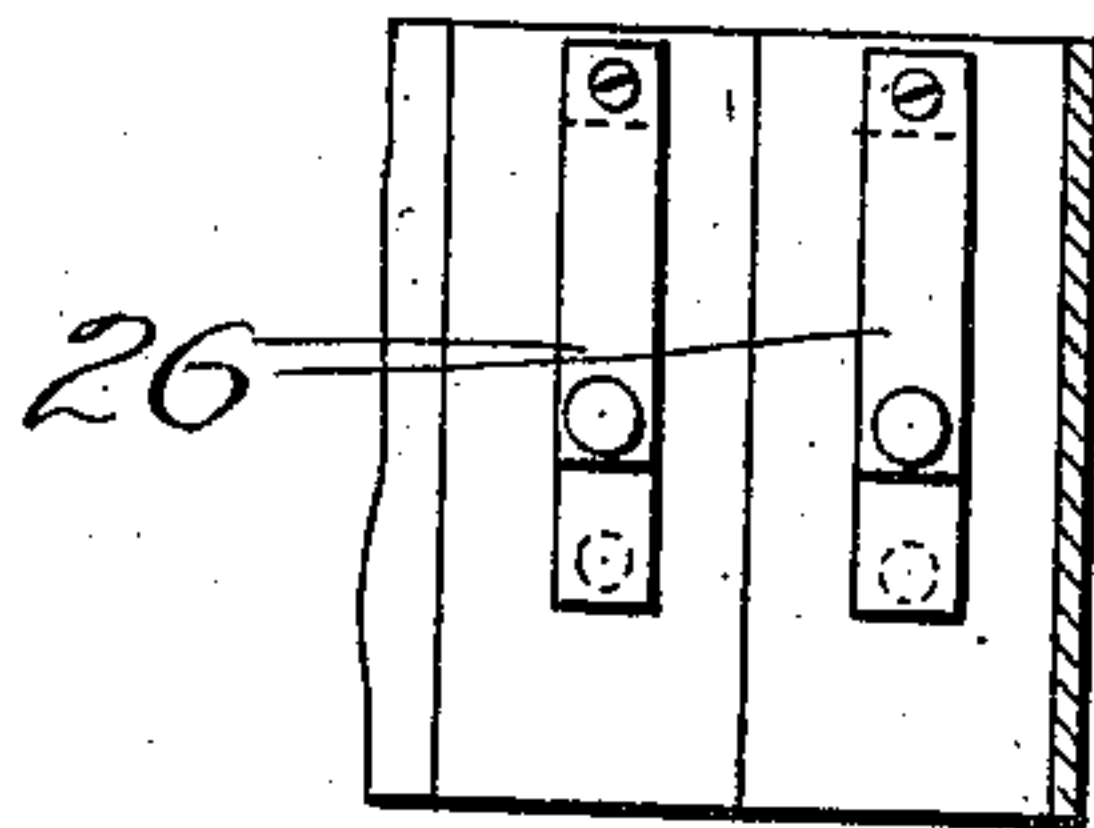
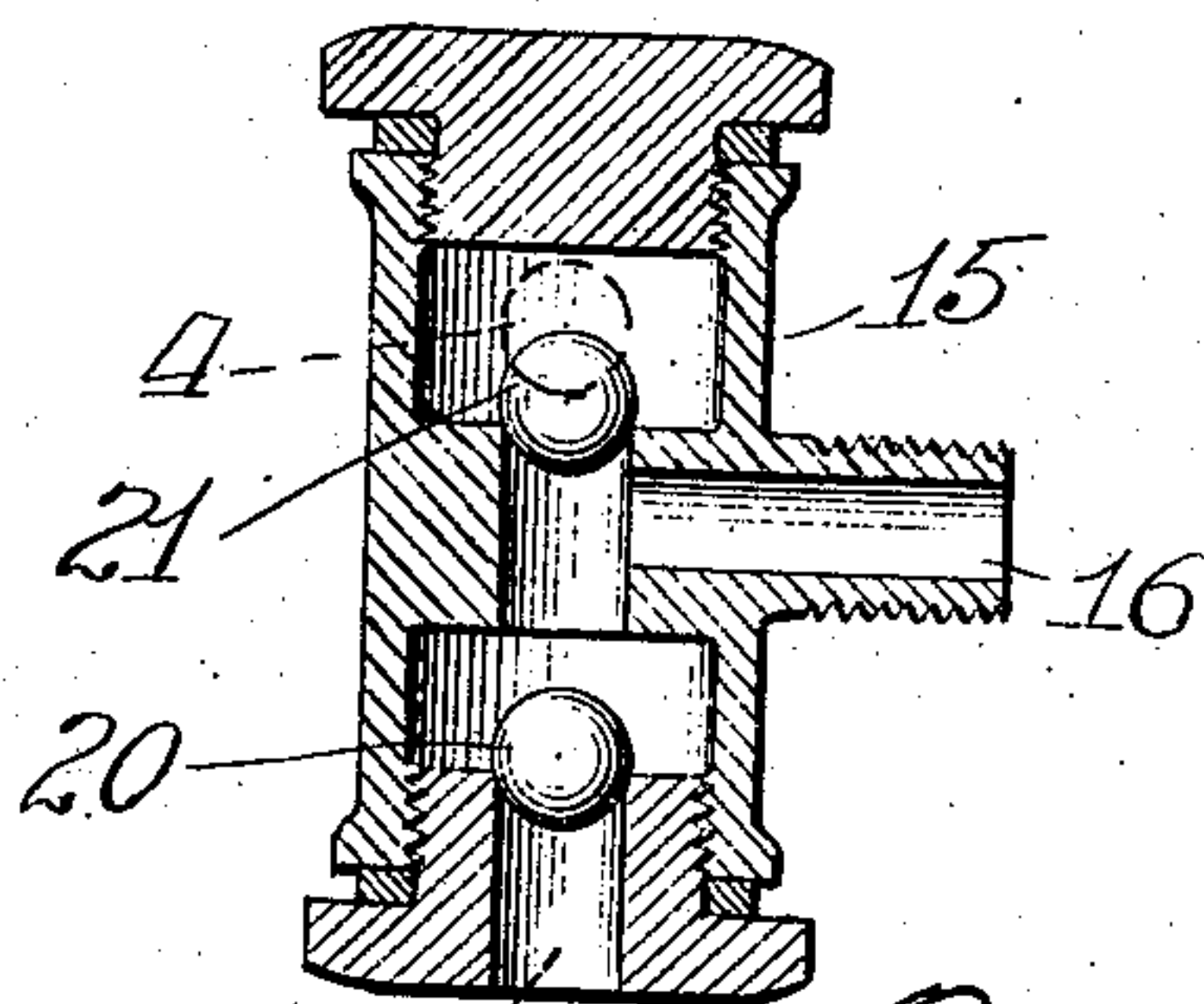


Fig. 10



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# UNITED STATES PATENT OFFICE.

ODILON BRISBOIS, OF CHICAGO, ILLINOIS, ASSIGNOR TO AUTOMATIC STARTER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

STARTER FOR HYDROCARBON-ENGINES.

959,990.

Specification of Letters Patent. Patented May 31, 1910.

Application filed April 17, 1908. Serial No. 427,651.

*To all whom it may concern:*

Be it known that I, ODILON BRISBOIS, a citizen of the United States of America, and a resident of Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Starters for Hydrocarbon-Engines, of which the following is a specification.

The main objects of this invention are to provide improved means for charging the cylinders of hydrocarbon engines so that the same may be started without "cranking" or manually rotating the main shaft; to provide an improved form of starting apparatus which is simple in construction and which is particularly adapted to be operated manually for starting multi-cylinder hydrocarbon engines of high powered automobiles wherein the pistons and their connections are too heavy to be readily "cranked" in the usual manner; and to provide a starter of this class in which the carbureted air is used for the starting charge, and in which all of the cylinders are simultaneously charged so as to insure positive starting of the engine through the act of operating the ignition apparatus thereof. These objects are accomplished by the device shown in the accompanying drawings, in which—

Figure 1 is a top plan of a six-cylinder hydrocarbon engine provided with starting mechanism constructed according to this invention and showing the same in position within the frame of an automobile which is shown partly broken away. Fig. 2 is a top plan of the pump which forms part of the starting mechanism and the auxiliary carbureter. Fig. 3 is an end elevation of the same. Fig. 4 is a side elevation, showing the upper ends of the engine cylinders and their connections with the fuel feed pipes of the starter. Fig. 5 is an enlarged detail showing the arrangement of the fuel inlet valve and priming pet-cock of one of the engine cylinders. Fig. 6 is an end elevation of the same. Fig. 7 is a detail of the device whereby the charge in any cylinder may be ignited, regardless of the position of the brush and distributor of the sparking circuits. Fig. 8 is a sectional detail of the same on the line A—A of Fig. 7. Fig. 9 is a detail of the same on the line B—B of Fig. 7. Fig. 10 is a sectional detail of one of the pump valve fittings.

In the drawings, the engine cylinders are

designated 1, and the frame of the vehicle is designated 2. 3 is the usual transom which separates the motor space from the remainder of the vehicle. As the carbureter, fuel tanks and operating mechanism of the engine do not form a part of the herein described invention, they are omitted from the drawings. The parts herein described as fuel inlets are the auxiliary fuel inlets which form a part of the starting mechanism, and they may be entirely independent of the fuel inlets through which the engine cylinders are charged during the normal operation thereof.

In the construction shown in the drawings, there is an individual auxiliary fuel inlet pipe 4 for each cylinder, and each of these pipes 4 is connected with its individual cylinder 1 by means of a fitting 5 which is inserted between the engine cylinder and the usual priming pet-cock 6. Each pipe 4 is provided with a controlling valve 7, and for convenience of operation, the operating levers 8 of said controlling valves are connected together and controlled by the operating rod 9 which extends through the transom 3 and is provided with a handle 10. Interposed between the controlling valve 7 and the fuel inlet pipe 4 of each cylinder is a check valve 7<sup>a</sup>. The priming pet-cocks 6 also have their levers connected together by a link 11 which in turn is connected with an operating rod 12 extending through the transom 3 and provided with a handle 13.

In the form shown in the drawings, the starting carbureter is separate from and auxiliary to the main carbureter, the former being shown at 14 in the drawings, and the latter being omitted. Each of the pipes 4 connects with the pump valve fitting 15 which is connected by a passage 16 with its individual pumping cylinder 17, and which is also connected by the pipe 18 with a mixing chamber 19 of the carbureter. Valves 20 and 21 in the valve casing 15 control the flow of gas to and from the pump cylinders 17. In the form shown, the pump has as many cylinders as there are engine cylinders, and each pumping cylinder controls the starting fuel supply for its individual engine cylinder.

The piston rods 22 of the pump are rigidly connected to a transverse bar 23 which is connected by a link with the operating lever 24. As the pump is preferably



located below the floor of the vehicle, the lever 24 is connected by operating mechanism indicated by the link 25 with means located in convenient position for manipulation by the operator of the vehicle while he is seated at the steering wheel.

The ignition of the starting charge is accomplished by means of the same ignition apparatus which is used in the normal operation of the engine, but the sparking circuit of each cylinder is provided with a switch which is connected in a shunt so as to be capable of short circuiting the distributor connections and thereby closing the respective sparking circuit when the engine has come to rest in such position that the brush and corresponding distributor segment are out of contact and cannot be brought into contact by shifting the distributor by means of the spark advancing lever, with which automobiles are usually equipped. In the form shown, these switches comprise a series of switch members 29 placed so as to be movable into and out of contact with the stationary contacts 27 of the interrupters 26. The electrical connections which are not shown are assumed to be of the usual form in which the primaries are grounded. It is then only necessary to ground the switch members 29 as indicated to complete the shunt circuit around the distributor contacts. Springs 28 normally urge the members 29 away from the contacts 27 so that the shunts are normally open.

The operation of the device shown is as follows:—Assume that the engine is at rest. The starter fuel-feed valves 7 are opened by pulling the handle 10. Then, when the pump 17 is operated, oil is drawn into the carbureter, vaporized and mixed with air. Each individual pumping cylinder draws a quantity of the gaseous mixture from the mixing chamber of the carbureter and forces it into its respective engine cylinder. Thus, every one of the engine cylinders is simultaneously charged with fresh gas under pressure. After a few strokes of the pump 17, the valves 7 are closed by means of the handle 10, and then the sparking circuit is closed by means of the usual controlling switch, not shown in the drawings. Frequently the engine will start on the closing of said switch. If the engine, however, happens to have come to rest in such position that all of the sparking circuits are open at the distributor, then by rocking the distributor by means of the usual spark-

advancing lever (not shown), it may be possible to close one of the circuits and start the engine. If the engine fails to start after closing the switch and shifting the distributor, the operator presses the buttons 29, one at a time, thus closing the respective primary circuits and igniting the charges in the compression spaces of the respective cylinders. There is therefore no position of the main shaft from which the engine cannot be started. Even in two and four-cylinder engines, where the cranks are so arranged that there is a position of "dead center", the jar due to the successive explosions in the cylinders has been found to rock the shaft away from "dead center" and start the engine without requiring the shaft to be manually turned away from dead center.

What I claim as my invention and desire to secure by Letters Patent is:—

1. The combination of a multicylinder hydrocarbon engine, a carbureter, a battery of pumps, one for each cylinder, having the plunger rods connected to a single transverse bar, passages connecting each pump with the carbureter and with its respective engine cylinder, and mechanism for causing the oscillation of said bar for forcing an explosive mixture into the engine cylinders.

2. In an automobile the combination of a multicylinder hydrocarbon engine, a carbureter, a battery of pumps, one for each cylinder, having the plunger rods connected to a single transverse bar, passages connecting each pump with the carbureter and with its respective engine cylinder, and mechanism controlled from the seat of the operator, for causing the oscillation of said bar for forcing an explosive mixture into the engine cylinders.

3. The combination of a multicylinder hydrocarbon engine, a carbureter, a battery of pumps, one for each cylinder, having the plunger rods connected to a single transverse bar, passages connecting each pump with the carbureter and with its respective engine cylinder, and a single mechanism for causing the oscillation of said bar for forcing an explosive mixture into all of the engine cylinders.

Signed at Chicago this 23rd day of March, 1908.

ODILON BRISBOIS.

Witnesses:

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