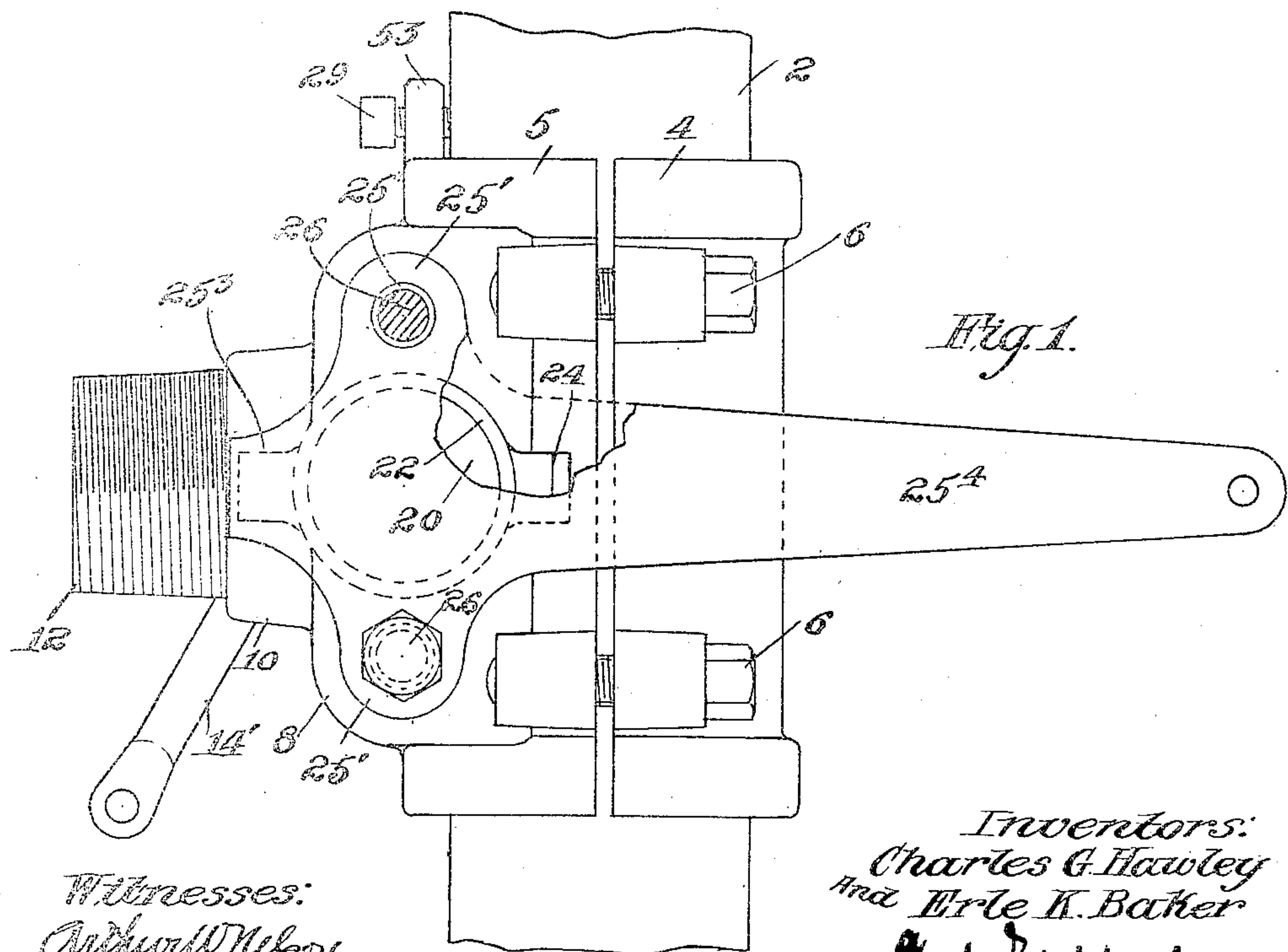
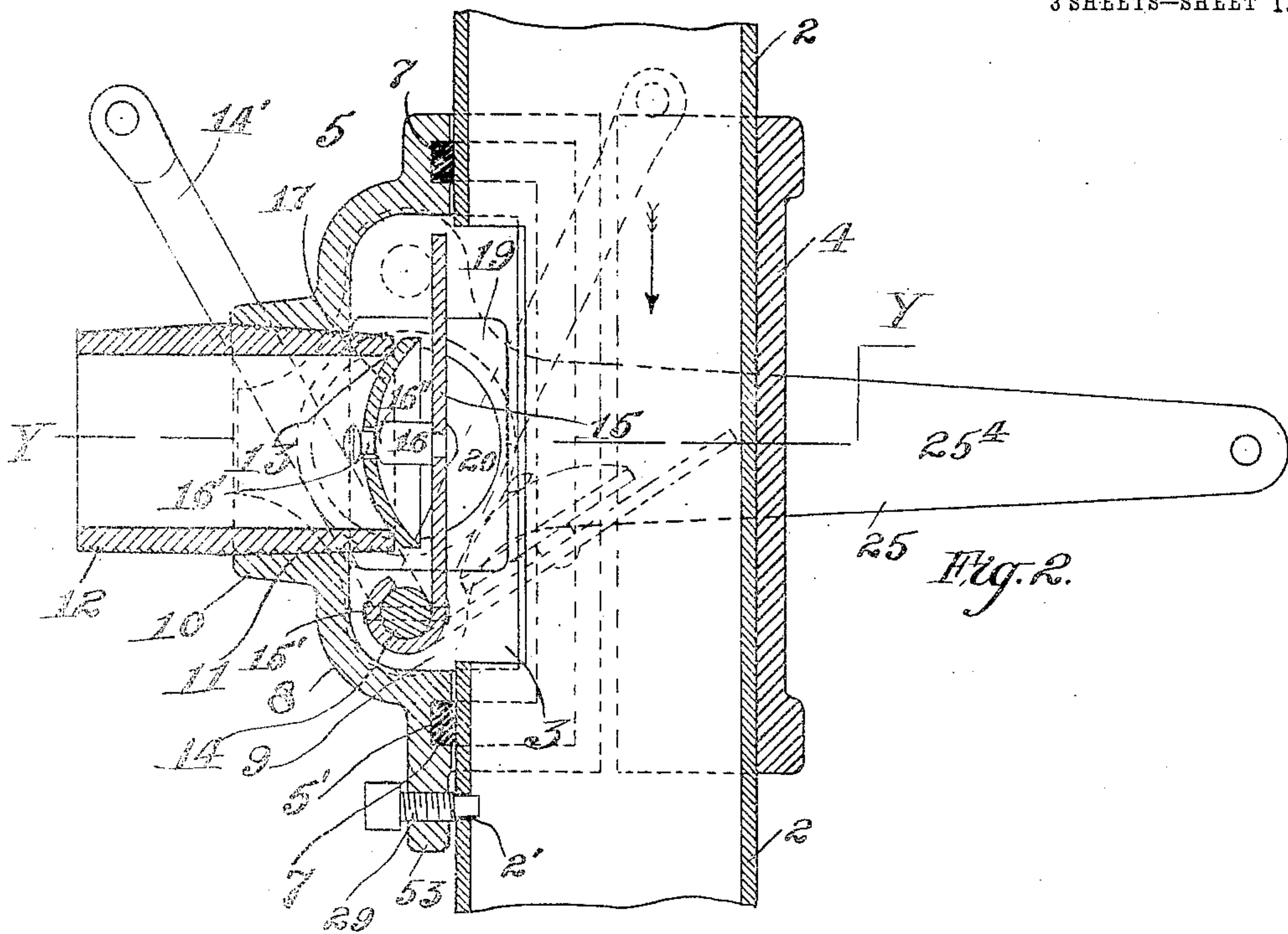


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 COMBINED MUFFLER CUT-OUT AND HORN VALVE.
 APPLICATION FILED OCT. 16, 1908.

929,944.

Patented Aug. 3, 1909.

3 SHEETS—SHEET 1.



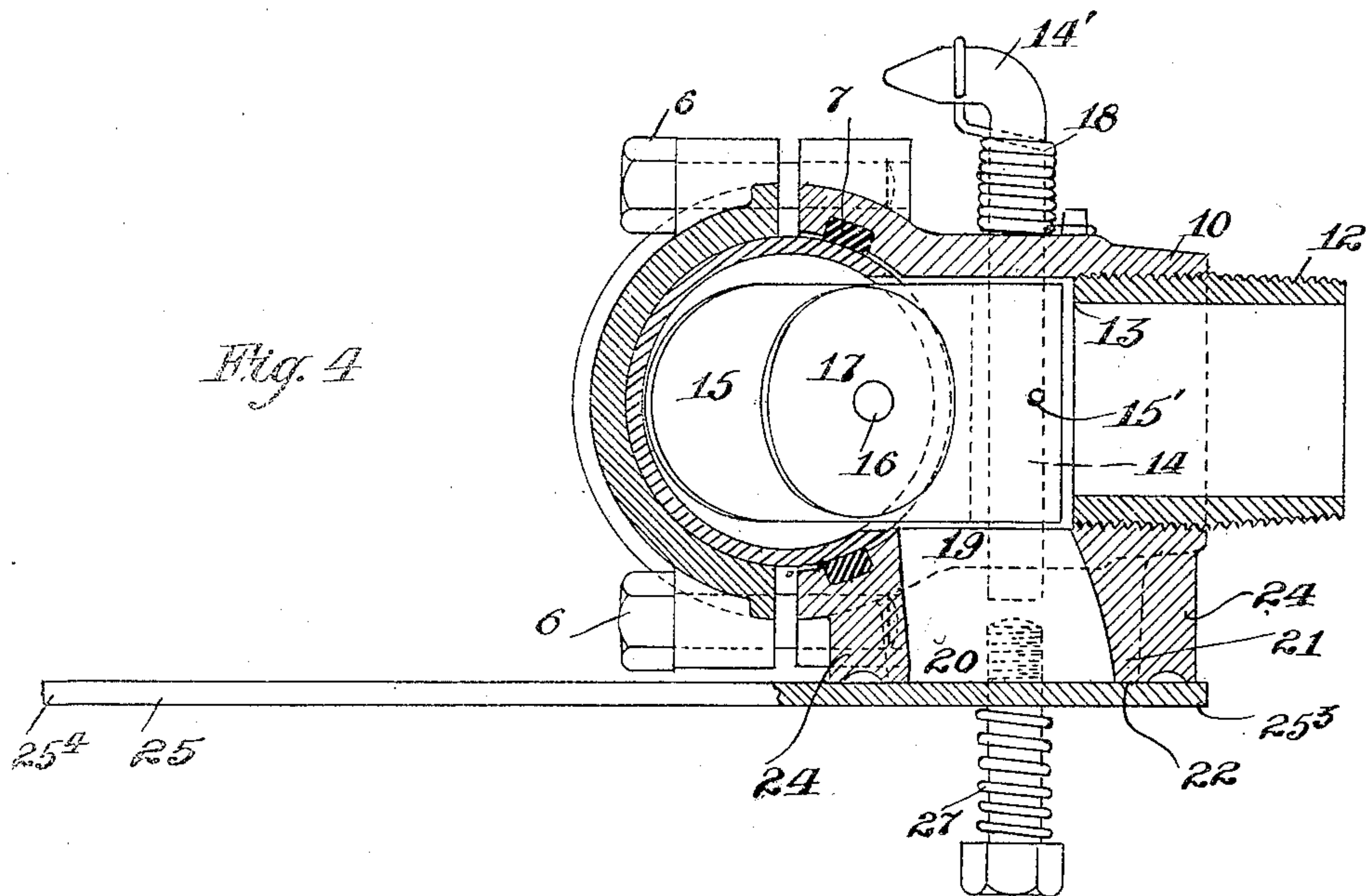
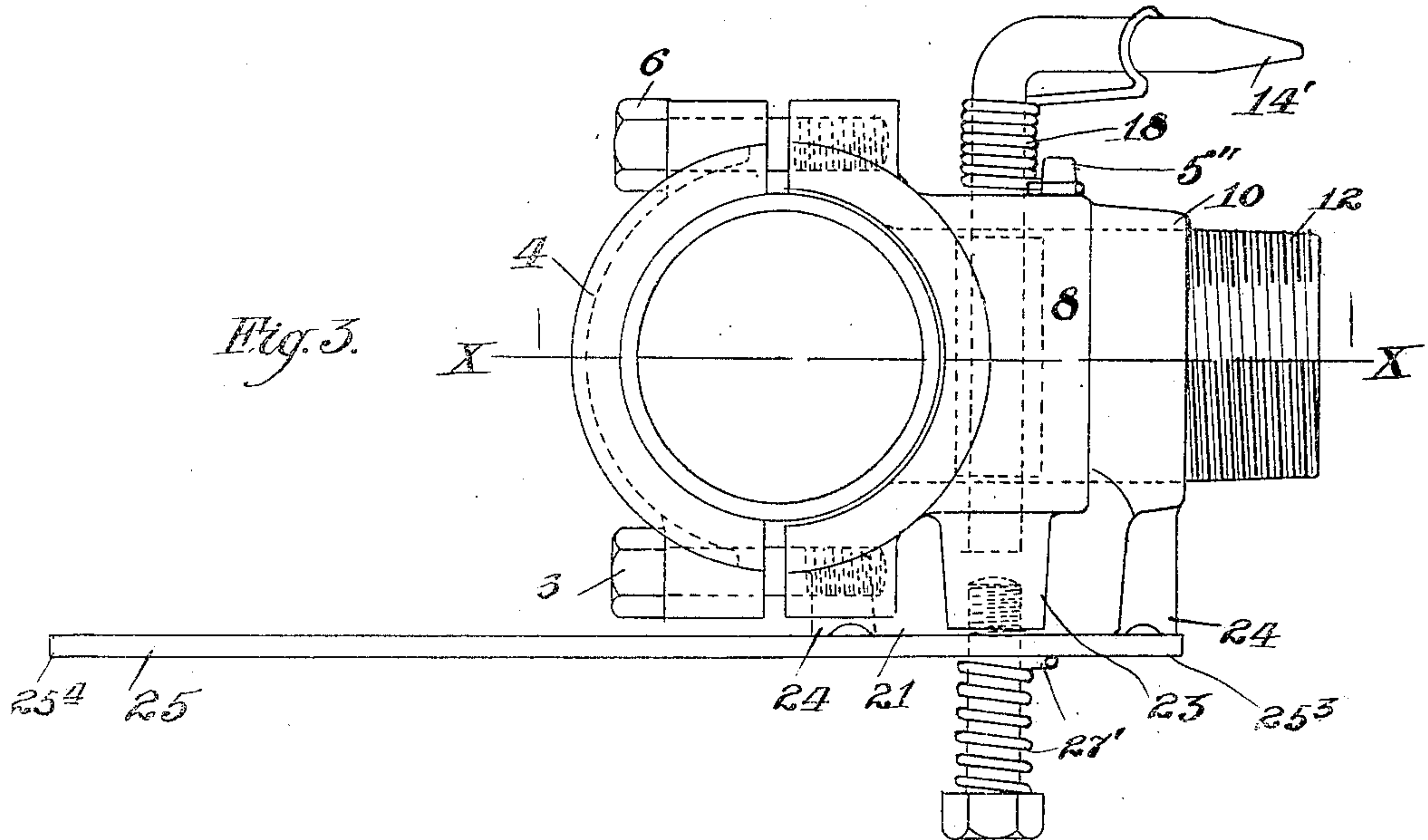
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 John R. Lippert

Inventors:
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Witnesses:
 Arthur Wilson
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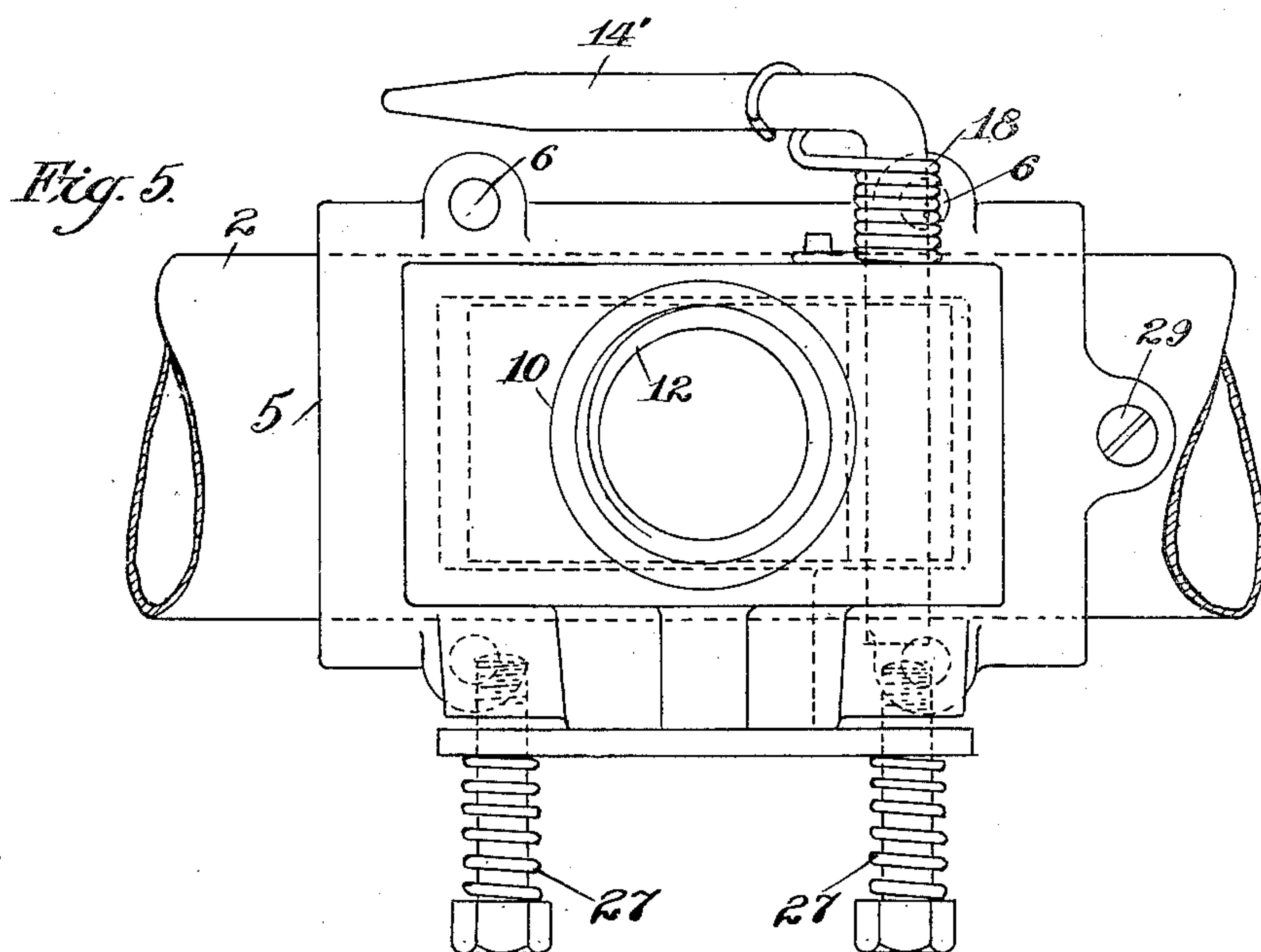
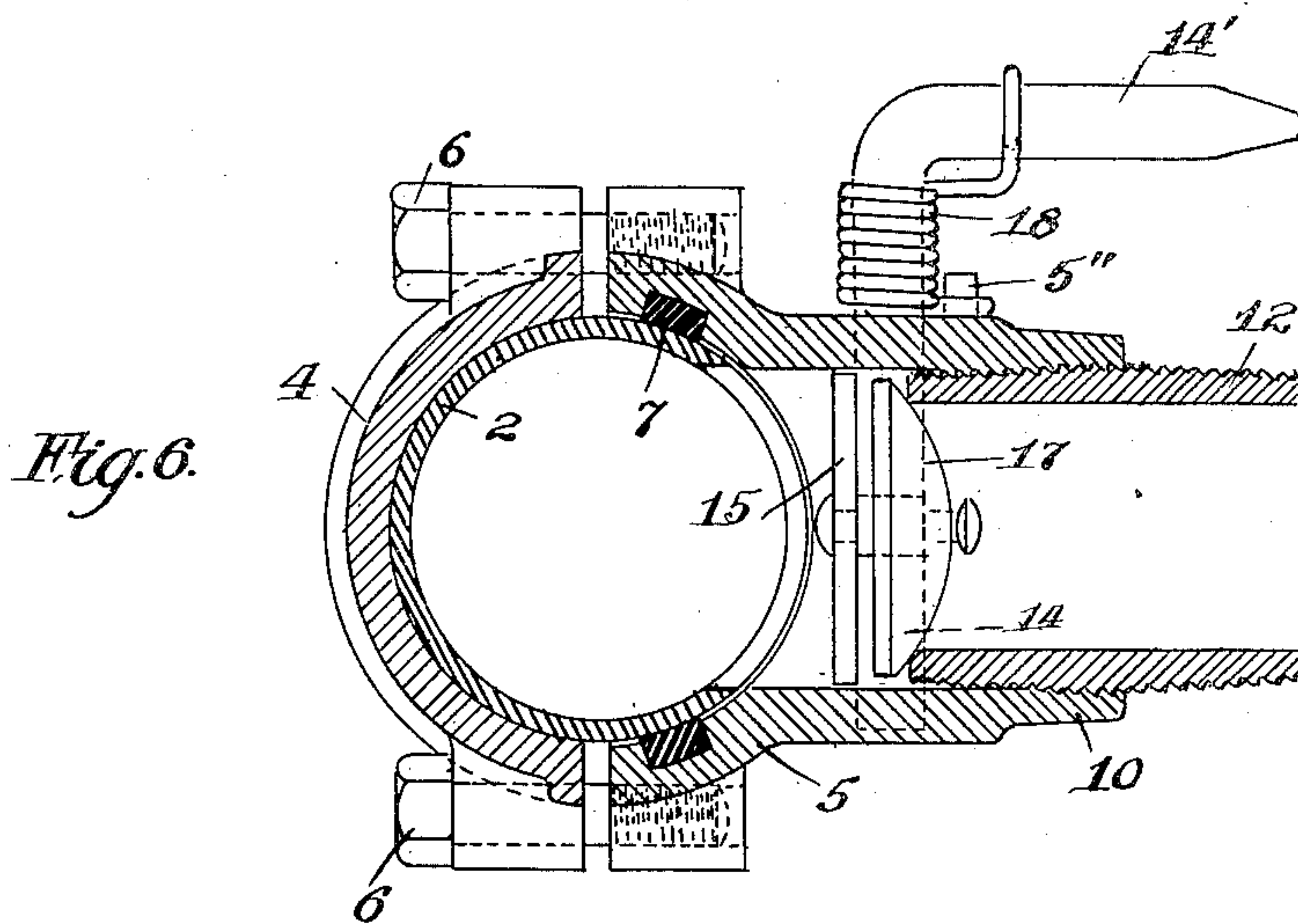
Inventors:
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

CHARLES GILBERT HAWLEY AND ERLE K. BAKER, OF CHICAGO, ILLINOIS.

COMBINED MUFFLER CUT-OUT AND HORN-VALVE.

No. 929,944.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed October 16, 1908. Serial No. 458,068.

To all whom it may concern:

Be it known that we, CHARLES GILBERT HAWLEY and ERLE K. BAKER, citizens of the United States, and residents of Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Combined Muffler Cut-Outs and Horn-Valves, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to make and use the same.

Our invention relates to improved means for relieving and utilizing the exhaust gases of hydro-carbon engines and has particular reference to improvements in valves for application to the exhaust pipes of such engines, at points between the engine and the muffler.

The primary object of the invention is to provide a device which may be applied to a muffler pipe with a minimum of labor; and which when applied, shall be adapted to relieve the pressure of gases in the muffler by permitting their escape before entrance thereto.

Other objects of the invention will appear hereinafter.

This present invention is an improvement upon and modification of that which is shown in our copending application, Serial No. 426414—filed April 10, 1908. It also preferably embodies certain of the features of the muffler cut-out disclosed in our application filed Sept. 8, 1908, Serial No. 451953.

Our invention in its preferred form comprises a sleeve or valve body adapted to be secured upon an exhaust pipe and provided with a two ported outlet recess for communication with the pipe and two valves therefor respectively, one upon the inside and the other upon the outside of said valve body.

Our invention also consists in various details of construction and in new combinations of parts, producing new and more perfect results, all as hereinafter described and particularly pointed out in the claims.

The invention will be more readily understood by reference to the accompanying drawings forming a part of this specification, in which:

Figure 1 is a plan view from beneath, of a combined horn valve and muffler cut-out embodying our invention. Fig. 2 is a longitudinal section of the valve on the line X—X of Fig. 3. Fig. 3 is an end view of the valve. Fig. 4 is a transverse vertical section on the line Y—Y of Fig. 2, showing the deflecting or gas diverting valve in open position.

Fig. 5 is a side view of the valve. Fig. 6 is a sectional view like unto Fig. 4 showing a modified form of the valve.

In Figs. 1 to 5 we have shown a single device formed to be placed upon a muffler pipe and adapted to perform the functions of a muffler cut-out or relief valve and a horn valve. In these drawings 2 represents a portion of a muffler pipe, between the explosion engine (not shown) and the muffler (not shown). Instead of cutting the pipe, to insert the valve, necessary to relieve either the pressure of gases or control and divide the flow thereof in the pipe, we simply make a hole 3 in the pipe and place the valve on the perforated part of the pipe. The shape of the hole in the pipe varies with different forms of our invention. It is usually elongated and rectangular. This hole may be made with an ordinary file and without resort to machine tools, also without removing the pipe from the automobile. The body of the valve is in the form of a sleeve; comprising two parts 4 and 5, having ears or lugs and clamped upon the pipe by the screws or bolts 6. The sleeve section 4 need not be made to closely fit the pipe as a gas tight joint is not here required. But the joint between the member or section 5 and the pipe must be tight and we therefore interpose a suitable packing between the member 5 and the pipe. Said member as clearly shown in Figs. 2 and 4, contains a packing groove 5' and packing 7. The groove is substantially rectangular in form and the packing or gasket is preferably somewhat wider and longer than the hole 3 in the pipe. Compressible, fire proof packing is used; and by its use the valve member 5 may be fitted to pipes of various sizes. When the two parts of the valve body are placed on the pipe they are drawn together by means of the bolts 6 and in this way the packing is tightly compressed and made to snugly conform to the side of the pipe, around the opening therein. It will be noted that the section 5 of the valve body is provided with an extension or projection 8 and that in this is a rectangular recess 9 of substantially the same length and breadth as the hole in the pipe. On the projection is a boss 10 and in this a threaded hole 11. A threaded nipple 12 is screwed into the hole 11 to serve as a connection between the valve and the horn (not shown) or another pipe which may be interposed between the valve and the horn.

The inner end of the nipple 12 is machine finished and forms a valve seat 13. One end of the recess 9, that which is distant from the inlet end of the valve (indicated by the arrow in Fig. 2) contains a valve stem or shaft 14, the outer end of which is formed into an operating crank 14'. The nipple 12 communicates directly with the recess 9 and the recess 9 as explained opens into the pipe.

To normally close this passage we employ the swinging or wing valve which is operated by the crank shaft or stem 14. When opened the valve swings through the opening 3 into the pipe and obstructing the same, serves to divert the exhaust gases from the muffler or outlet end of the exhaust pipe, so that substantially the full pressure of gas is available in the horn or whistle connected with the nipple 12.

The wing valve preferably comprises several parts; namely, the member 15, having a curled end secured on the shaft 14 by rivet 15', the stud 16 and the member 17, the latter being preferably a segment of a sphere.

The member 15 is the wing valve proper or deflector. It carries the member 17, which is the closure or valve proper and seats upon the end of the nipple 12. The stud 16 is the connection between the parts 15 and 17 and is either loosely secured in the member 15 or is loosely attached to the member 17 as shown. In a preferred construction the end of the stud 16 is reduced to form the neck 16' which passes through a larger hole in the center of part 17, and is then up-set or headed, to prevent the valve 17 from falling off. The body of the stud is larger than the hole in valve 17 and its shoulder 16'' is beveled or rounded to tightly close in the hole when the parts are pressed against the seat. The member 15 is slightly narrower than the recess 9 so that it may swing freely therein and through the opening 3, and it is long enough to reach across the pipe and strike the opposite wall (see dotted lines in Fig. 2 and full lines in Fig. 4). A spring 18, wound on the outer end of the shaft or stem 14, has one end or arm hooked over the lever 14' and the other end held on a stud 5'' on the member 5. This spring serves to normally hold the wing of member 15 in closed position and hence presses the valve part 17 against the seat 13. The bottom of the recess contains a preferably rectangular opening 19 which merges into a round hole 20 in a boss or projection 21 that is formed on the bottom of the projection 8. The edge of the boss 21 is ground off or otherwise finished to form a (preferably) circular valve seat 22.

At each side of the valve seat are integral lugs 23, preferably on a line that is parallel with the axis of the valve body; and in perpendicular relation to such line are two other lugs 24,—24, also integral with the remainder of member 5. The ends of the lugs are pref-

erably notched or grooved (see Figs. 3 and 4) and are preferably ground or finished at the same time with the seat 22, being in the same plane therewith. The ends or surfaces of the lugs 23 preferably stop short of the plane of the valve seat 22. The passage defined by the openings 19 and 20 constitutes the cut-out or relief passage of the device and is normally closed by the tiltable plate valve 25. This is preferably a flat plate which is stamped from sheet metal and it rests upon and closes tightly against the flat valve seat 22. The plate is provided with ears 25' which overlie the lugs 23, and as the means of holding the plate upon the seat, we employ two bolts 26 and two compression springs 27. The bolts pass through larger holes 25'' in the plate and are screwed into the lugs 23. The ends of the springs are preferably bent out (see 27') to bridge the openings 25'' and the springs exert their pressure between the heads of the bolts and the plate. A short extension 25³ of the plate covers or bears on the outer lug 24 and the longer extension 25⁴ covers the other lug 24 and serves as a handle by which the valve may be operated. Movement of this handle either up or down serves to tilt the plate, one or the other of the lugs 24 serving as the fulcrum therefor. In some cases the handle is bent downwardly and in this form it may be used as a crank to tilt the valve or plate in other directions, the lugs 23 at such times serving as the fulcrums. This cut-out valve is readily operable by means of the usual operating pedals (not shown) and also constitutes an automatic relief or safety valve, it being obvious that it is adapted to yield outwardly when there is an excessive pressure of gas in the exhaust pipe, as when delayed explosions of gas occur therein.

As a means of preventing the valve body from slipping or turning on the pipe 2 we employ a locking screw 29, preferably located in a lug 5³ on the member 5. It is usual to remove this screw while the valve is being placed on the pipe, and when the latter has been properly positioned and clamped thereon, a drill is placed in the lug and a hole 2' is bored in the pipe. The screw is then re-placed and its end, entering the hole 2', serves to securely lock the valve upon the pipe.

In Fig. 6 we have illustrated a modification of our invention in which the cut-out valve is omitted; in other respects the device is the same as above described. Such valves are used when only a horn connection is required or as cut-out upon marine engines, where it is desirable to discharge the gases outboard through a pipe. When the valve shown in Fig. 6 is used as a relief valve or cut-out and is not attached to a horn or other device requiring gas pressure, the member 15 may be shortened as in such cases it is not

required to perform the office of a deflector in the exhaust pipe. The parts in Fig. 6 which correspond to like parts in the other figures are correspondingly numbered.

5 As various modifications of our invention will readily suggest themselves to one skilled in the art we do not confine the same to the specific structures herein shown and described.

10 Having thus described our invention we claim as new and desire to secure by Letters Patent;—

1. A device of the class described, comprising a valve body adapted to be secured to an exhaust pipe and provided with an outlet recess having two outlet ports or openings, in combination with two valves therefor, one upon the inside and the other upon the outside of said valve body, substantially as described.

2. A device of the class described, comprising a valve body having an outlet recess in its side and two outlet ports leading from said recess, in combination with a valve upon the outside of the body for closing one of said ports and a valve in said recess for closing the other port the latter valve when in open position constituting a deflector to divert the gases to its port, substantially as described.

30 3. A device of the class described, comprising a valve body in the form of a split sleeve, in combination with means of clamping the same upon an exhaust pipe, one part of said body containing an outlet recess and two outlet ports or passages, two valves therefor respectively, one within said recess at the inner end of one of said passages and the other upon the outside of said body part at the outer end of the other passage and means for operating said valves independently, substantially as described.

4. A device of the class described, comprising a two part valve body for attachment to an exhaust pipe, one part of said body containing an outlet recess and two outlet passages, in combination with a valve upon the outside of said part at the end of one of said passages, means normally holding said valve closed, means for opening the same, a second valve arranged in said recess for closing the inner end of the other passage, means normally holding the second valve closed, means for opening the same, and said second valve when opened constituting a deflector for directing gases into said recess, substantially as described.

5. A device of the class described, comprising a valve body adapted to be secured to an exhaust pipe and provided with an outlet recess having two outlet passages, in combination with a gas diverting wing valve pivoted in said recess and adapted to normally close the inner end of one of said passages, means for operating said wing valve, a valve seat formed at the outer end of the other

passage and a plate valve yieldingly and tiltably secured upon said seat, substantially as described.

6. A device of the class described, comprising a substantially semi-cylindrical valve body or member having an elongated recess in its side and provided with outlet passages leading from said recess, an elongated wing or deflecting valve pivoted in said recess and normally closing the inner end of one of said passages, a flat valve seat formed at the outer end of the other passage, a plate fitted thereto, spring pressure means for holding said plate upon said seat, and for guiding the same with relation thereto and means for tilting said plate on said seat, substantially as described.

7. In a device of the class described, a valve body in the form of a split sleeve adapted to be secured on an exhaust pipe, one part of said valve being provided with a longitudinally elongated recess and having a passage from said recess, in combination with a wing valve substantially as long as the recess, means pivotally securing it in the recess and for swinging it out of the recess toward the axis of the valve body and the valve part loosely attached to said wing and adapted to close the inner end of said passage, substantially as described.

8. A device of the class described, comprising a substantially cylindrical valve member having a longitudinally elongated recess in its side and provided with relatively perpendicular passages leading therefrom, in combination with a deflecting valve pivotally arranged in said recess and in one position adapted to close one of the passages leading therefrom and a tiltable plate valve closing the outer end of the other passage, substantially as described.

9. In a device of the class described, a member conformed to the side of the pipe and containing a recess and an outside passage of less size than the recess, in combination with a wing valve pivoted in said recess and adapted to be projected into the pipe to which the member is attached, a stud projecting from said wing valve, a member loosely carried by said stud to close the inner end of said passage and means for clamping said member on a pipe, substantially as described.

10. A muffler pipe having an opening in its side, in combination with a valve body clamped to the side of the pipe and having a recess which registers with the opening in the pipe, a nipple extending into said recess the inner end of said nipple forming a valve seat, and an intercepting valve provided in said recess to alternately occupy the pipe and close upon said valve seat substantially as described.

11. A device of the class described comprising a muffler pipe having a longitudinally

elongated opening in the side, in combination with a valve body adapted to be clamped upon said pipe and having a correspondingly elongated recess in its side, a threaded nipple adjustably secured in the recessed side of said body and projecting into said recess the inner end of said nipple forming a valve seat, a wing valve pivoted in one end of said recess, to normally occupy the recess but adapted to be projected across the interior of said pipe a valve member intermediately secured upon said wing valve to seat upon the end of said nipple and means for operating said wing valve, substantially as described.

12. A device of the class described, comprising a muffler pipe having a longitudinally elongated opening in its side, in combination with a valve body adapted to be clamped upon said pipe and having a correspondingly elongated recess in its side, a threaded nipple adjustably secured in the recessed side of said body and projecting into said recess, the inner end of said nipple forming a valve seat, a wing valve pivoted in one end of said recess, to normally occupy the recess but adapted to be projected across the interior of

said pipe a valve member intermediately secured upon said wing valve to seat upon the end of said nipple, means for operating said wing valve, a passage leading from the lower part of recess and terminating in a flat valve seat upon the exterior of the body and a plate valve tiltably held upon said seat, substantially as described.

13. In a device of the class described, comprising a valve body, having an elongated recess in its side, in combination with an adjustable valve seat in said side and recess, an elongated wing pivoted in said recess, a stud projecting from said wing and normally concentric with said valve seat and a valve proper centrally attached to said stud and thereby loosely connected with said wing, substantially as described.

In testimony whereof, we have hereunto set our hands this 14th day of October, 1908, in the presence of the subscribing witnesses.

CHARLES GILBERT HAWLEY.

ERLE K. BAKER.

Witnesses:

M. SIMON,

ARTHUR W. NELSON.