

No. 688,405.

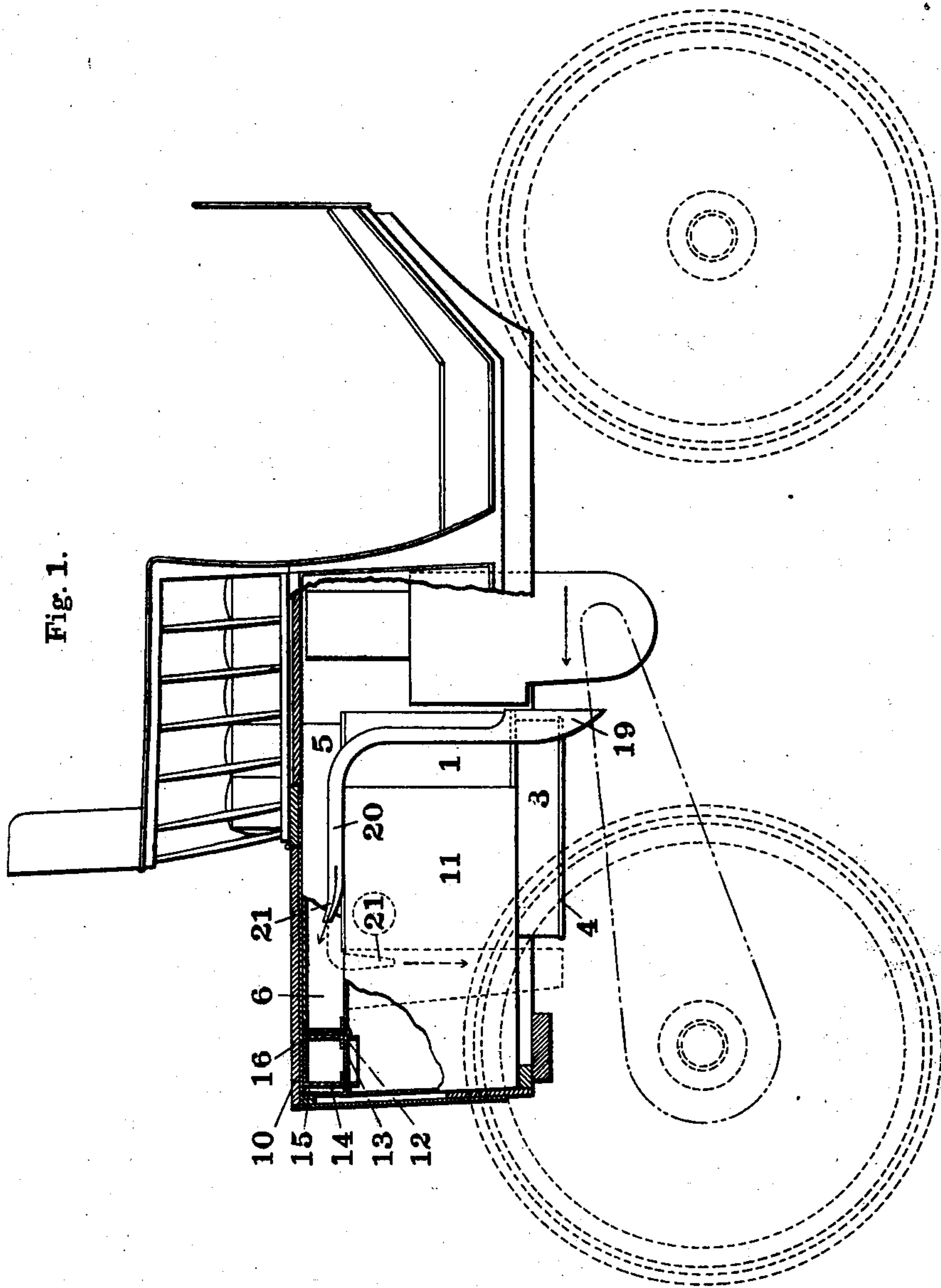
Patented Dec. 10, 1901.

W. L. GARRELS & C. KIMBALL.
MOTOR VEHICLE.

(Application filed Feb. 23, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:

Samuel J. Mutschler
Edw. J. Mutschler

Inventors:

W. L. Garrels and
Clinton Kimball
by Carr & Carr, Attys.

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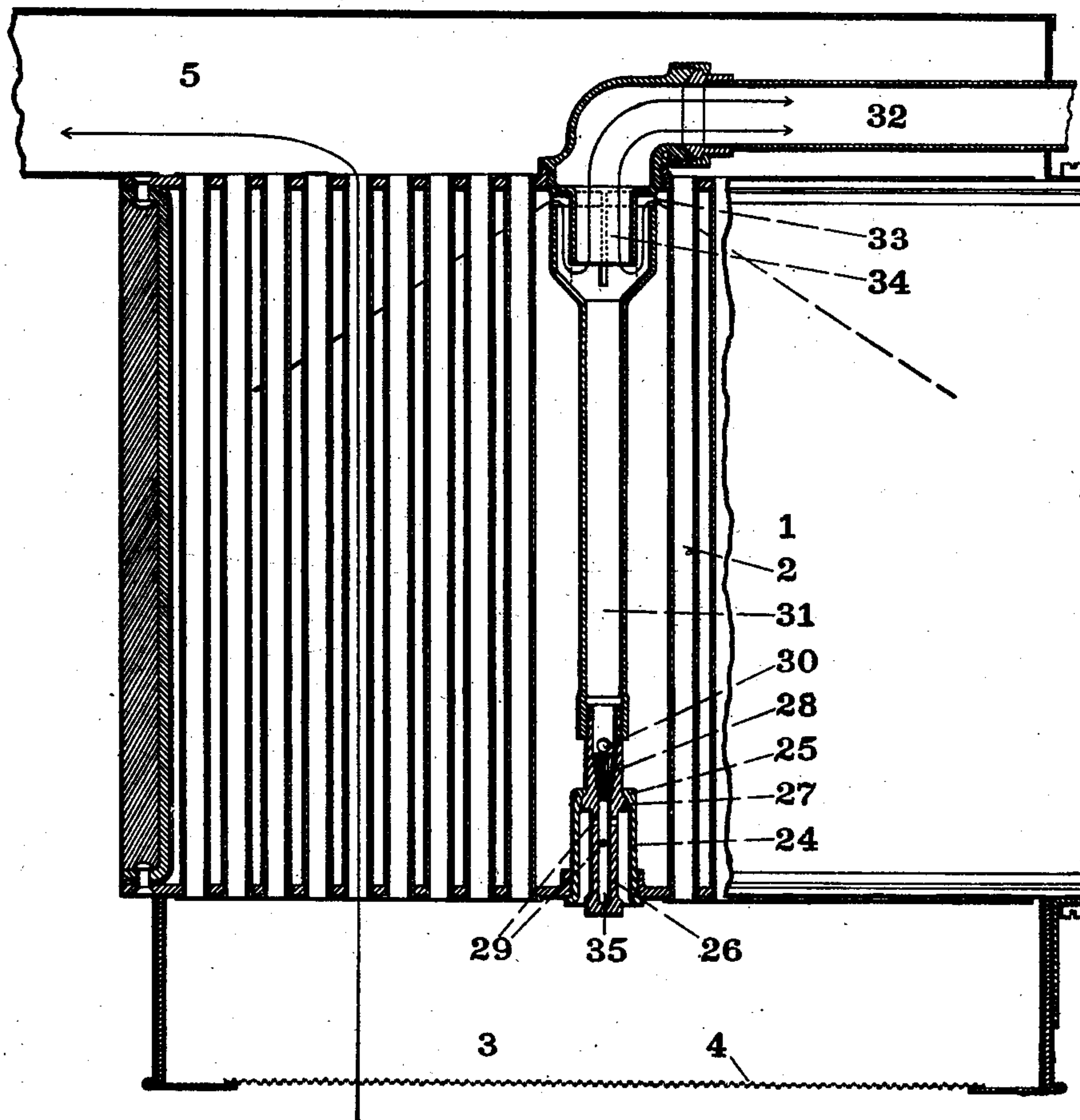
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(No Model.)

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Fig. 2.



Witnesses:

Louis Schmidt
Fred J. Mutschler

Inventors:

W. L. Garrels and
Clinton Kimball
by Carr & Carr, Attys

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3 Sheets—Sheet 3.
Fig. 3.

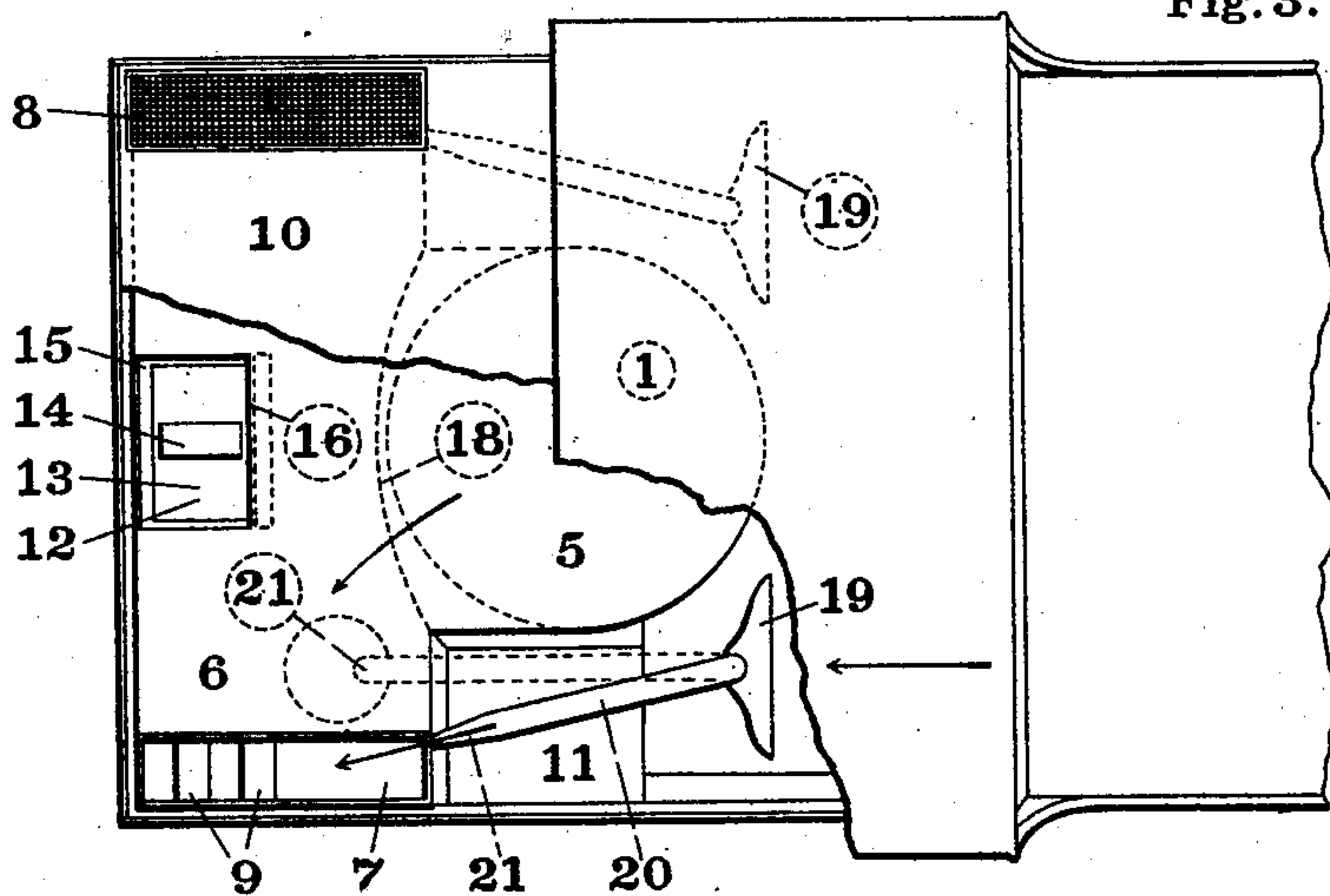


Fig. 4.

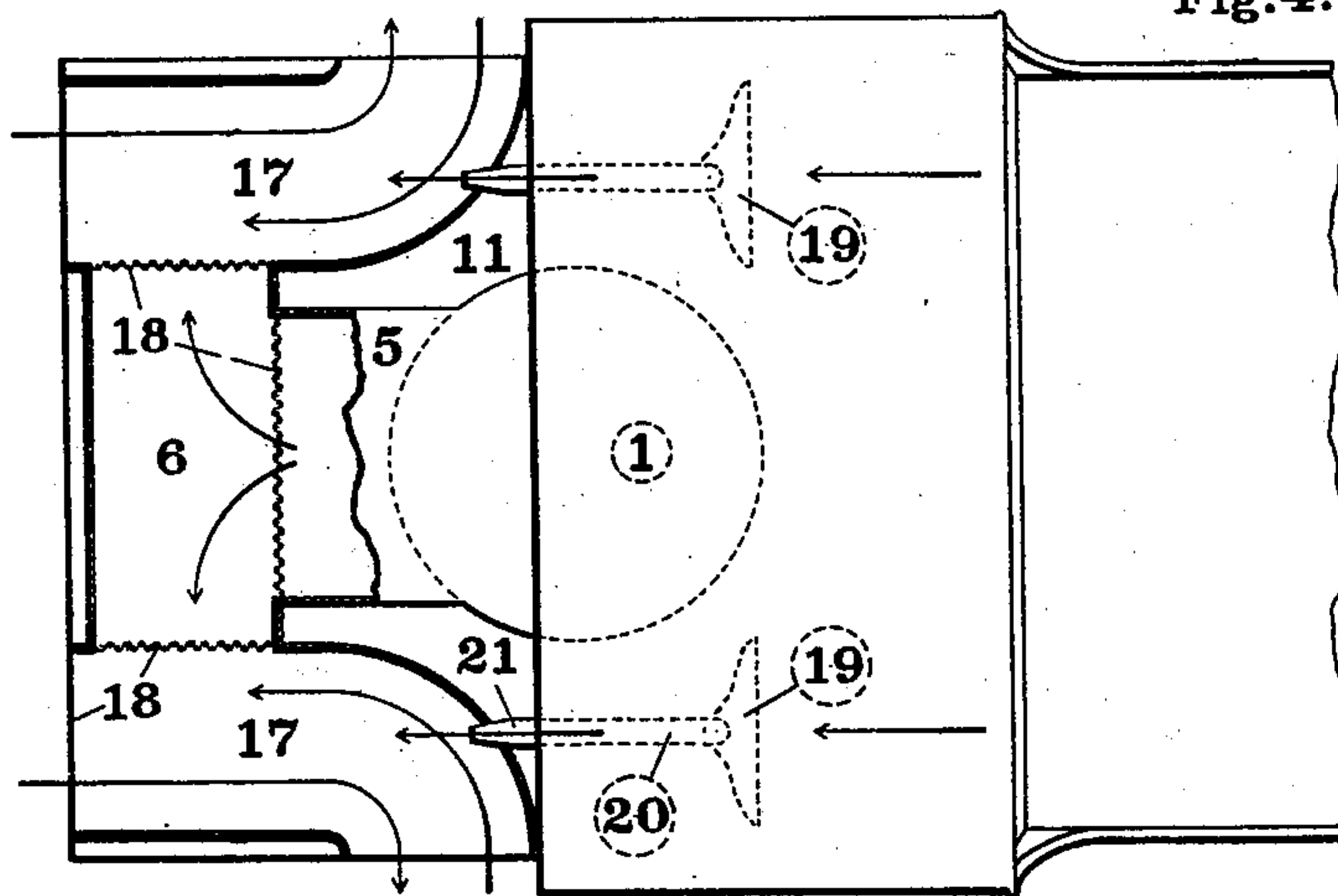
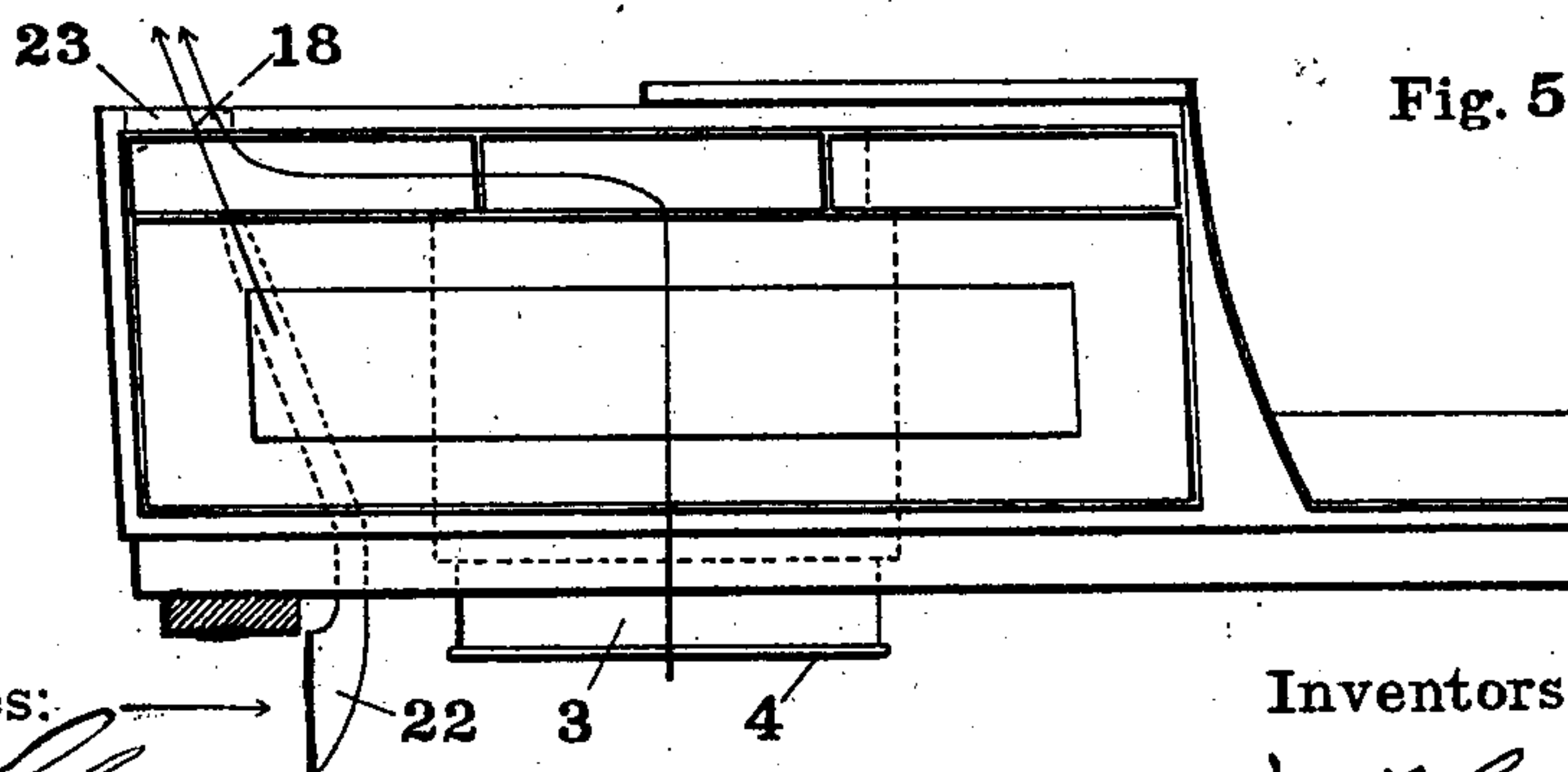


Fig. 5.



Witnesses:

James J. Mutchler
John J. Mutchler

Inventors:

W. L. Garrels and
Clinton Kimball,
by Carr & Carr, Attys.

UNITED STATES PATENT OFFICE.

WILLIAM L. GARRELS, OF ST. LOUIS, AND CLINTON KIMBALL, OF KIRKWOOD, MISSOURI.

MOTOR-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 688,405, dated December 10, 1901.

Application filed February 23, 1901. Serial No. 48,469. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM L. GARRELS, a resident of the city of St. Louis, and CLINTON KIMBALL, a resident of the city of Kirkwood, St. Louis county, State of Missouri, citizens of the United States, have invented certain new and useful Improvements in Motor-Vehicles, of which the following is a specification.

Our invention relates to motor-vehicles, and has for its principal objects to secure and maintain the proper draft and prevent the wind from disturbing the fire; also, to minimize the danger of explosion.

To these ends our invention consists in so arranging the draft-flues that from whatever direction the wind may blow the products of combustion have a direct outlet to the atmosphere without obstruction from the wind. It also consists in wind-funnels arranged to assist the draft.

It also consists in entirely incasing the combustion-chamber by screening all openings.

It also consists in the arrangement hereinafter described whereby a fusible plug is mounted in the boiler in such a position that when it is fused the steam of the boiler quenches the fire beneath the same.

It also consists in the arrangement and combinations of parts hereinafter more fully described and claimed.

In the accompanying drawings, wherein like symbols refer to like parts wherever they occur, Figure 1 is a vertical longitudinal view, partly in section, of the body portion of a vehicle employing our invention. Fig. 2 is a vertical view of the combustion-chamber, boiler, and breeching. Fig. 3 is a plan view of the body portion with a portion of the hinged lid and seat broken away. In this construction the flues open at the top of the vehicle-body. Fig. 4 is a horizontal view, mainly sectional, with each branch of the flue opening at the end and a side. Fig. 5 is an elevation showing a modified arrangement of wind-funnel.

Suitably mounted on the body of our vehicle is a steam-boiler 1, having tubular flues 2 extending vertically through it. Below said boiler 1 is a combustion-chamber 3, within which any suitable burner, preferably a vapor-burner, is located. The bottom of the

combustion-chamber 3 has a large opening therein, which is covered by a wire screen 4. The several flues 2 of the boiler open at the top into a horizontal breeching 5, which extends rearwardly and opens into a horizontal flue 6, extending transversely of the vehicle-body. This horizontal flue 6 communicates with the atmosphere through openings 7 out of alinement therewith. In the construction shown in Figs. 1 and 3 these openings 7 are in the top side of the flue 6 itself and are located in the top of the vehicle-body immediately next to the sides thereof. These openings are preferably protected by wire-gauze covers 8. Obviously said flue 6 may extend beyond the sides of the vehicle-body. In this construction the horizontal position of the wire covering 8 serves to prevent the admission of air-currents into the flue. The admission of air-currents may be further prevented by placing deflector-plates 9 just below the flue-openings, the plates being preferably placed transversely to the vehicle-body and inclined rearwardly. Above the transverse portion 6 of the flue is a hinged lid 10, which is fastened down by any suitable means. The water-tank 11 occupies the space under the flue and partially surrounding the boiler and is provided with an opening 12 of ample dimensions for filling. This opening 12 extends through the bottom of the flue at the middle of its rearmost portion and is closed by a cover 13, having a handle 14. This handle 14 is a fixed bail or other form of slight cross-section arranged to be engaged and firmly held in place by said lid 10. An opening 15 through the top of the transverse portion 6 of the flue makes this cover accessible when the lid 10 is raised. A shield 16 is arranged alongside of the opening 12 and parallel with the side of the flue 6 to prevent any portion of the water intended for the tank 11 from running along the flue 5 and into the combustion-chamber 3. The cover 13 and shield 16 thus arranged do not obstruct the draft from the fire or a draft transversely of the vehicle-body through the flue 6.

Fig. 4 illustrates a modification of the flue whereby the wind is prevented from reversing and is made to aid the draft. In this con-

struction the horizontal flue or passage-way 6, extending transversely of the vehicle-body, opens into curved flues or passage-ways 17, each extending longitudinally of the vehicle-body and opening in the end or back and in one side of the vehicle-body. In this modification also the outlet-openings are out of alinement with the flue 6. Screens 18 of reticulated or perforated metal may be placed across these passage-ways wherever they may aid in deflecting the wind away from the passage-way leading to the combustion-chamber. If the wind comes from the side, it enters the side opening of the flue and is deflected thence and issues at the rear, assisting the draft of the products of combustion. If the wind comes from the rear, it is deflected to the side of the vehicle and issues thence, in which case also it assists the draft.

In order to utilize the wind or the resistance of the air to the movement of the vehicle, wind-funnels 19 and flues 20, communicating with the same and opening into the outlet-flues for the products of combustion, are provided. Thus the draft through said wind-funnels 19 assists the natural draft of the furnace. These wind-funnels 19 are preferably located under the vehicle-body near the sides thereof. They may obviously be placed in the sides, back, or dashboard, and the nozzles 21 or ends of the pipes connected to the funnels 19 may be given any desired direction—for instance, they may be directed so as to cause a downdraft, as shown by the dotted lines in Figs. 1 and 3. The positions of the funnels 19 may be fixed or they may be made to turn automatically conformably to the direction of the wind, as in the ordinary cowl, or they may be made to be turned positively. A funnel 22 may also be used to prevent a reversal of the draft in the case of a flue-opening 23, centrally located near the back of the vehicle-body, when the wind is blowing from the rear. (See Fig. 5.)

It is noted that all flues are concealed and that all openings and passages communicating with the combustion-chamber are covered by wire-cloth screens. The purpose of these screens is, first, to prevent reversal and undue fluctuation of the draft by gusts of wind, and, secondly, to confine the flame in case liquid fuel should accidentally get inside of the combustion-chamber and there ignite. When the flame is not so confined, the danger of the carriage burning or of the heat of the fire reaching the fuel-tanks and causing their explosion is considerably enhanced. To further reduce the dangers connected with the use of a light hydrocarbon or other fuel in connection with a boiler, we provide a device to put out the fire in case the water in the boiler becomes so low as to expose the boiler to danger of being overheated. A sleeve 24 is fastened in the center of the lower tube-sheet and projects into the lower portion of the boiler 1 and has an annular flange 25 on

the inside of its upper end. Extending upwardly through said sleeve is a second tubular sleeve or plug-holder 26, which has a shoulder 27, adapted to abut against the lower end of said annular flange 25. This last-mentioned sleeve projects below the lower tube-sheet and has its lower end formed for the engagement of a wrench. The upper end portion of the bore of this sleeve has a seat formed therein, and on said seat rests a plug 28, of tin or other fusible material. This inner sleeve or plug-holder 26 is closed at its lower end and has one or more perforations 29 between its lower end and the plug 28. Above the top of said plug 28 said plug-holder 26 is provided with one or more holes 30, opening into the water-space of the boiler. The upper end of said plug-holder 26 is screw-threaded and is screwed into the lower threaded end of a tube 31, which is fastened to the upper tube-sheet and opens at its upper end into the steam-pipe 32. This tube has perforations 33 near the upper portion thereof for the admission of steam from the boiler and is otherwise equipped to constitute a steam-separator 34. As we preferably take steam from the center of the top tube-sheet, this device occupies space which would in its absence be wasted, and the device acts as a strong stay between the top and bottom tube-sheets. Without this stay a considerable area of the bottom tube-sheet would be unsupported, which would be an undesirable feature in view of the high pressures used and of the large factor of safety which is desirable in an automobile-boiler. The operation of this construction is as follows: So long as the water covers the fusible plug 28 said plug remains in place and closes the bore of the inner sleeve. When, however, the water-level falls so low as to uncover the plug 28, said plug fuses and the fused metal runs into the pocket 35, formed in the lower part of the plug-holder, thereby leaving a clear passage for the steam from the boiler through the perforations 29 in the plug-holder 26 and the space between the latter and the outer sleeve 24 into the combustion-chamber 3. The steam escapes through said sleeve 26 into the combustion-chamber and smothers the flame of the burner. By locating the fusible plug centrally above the bottom of the boiler said plug will be uncovered by the water when low, so that the plug will fuse and protect the boiler before any portion thereof can be overheated as well when the vehicle is tilted as when it is horizontal. The fused metal does not clog the burner-openings, but is caught in the lower part of the plug-holder.

Obviously the construction hereinbefore described admits of considerable modification without departing from our invention, and we do not wish to be limited to such construction. For instance, the construction shown in Fig. 4 may be modified by omitting the side openings and enlarging the tube 20 from the

funnel 19 into a full-sized flue. So, too, two or more funnels facing in different directions may be connected to a common tube.

What we claim is—

5 1. In a motor-vehicle, a boiler, a burner for said boiler, a flue for the products of combustion above said boiler, a wind-funnel in or beneath the body of said vehicle, said funnel being connected to said flue by a tube opening
10 into said flue, whereby the wind aids the draft, substantially as described.

2. In a motor-vehicle, a boiler, a burner for said boiler and a flue, said flue having a plurality of outlet-openings, one of said openings being directed downwardly, a wind-funnel, and a tube extending from said funnel and communicating with said flue to cooperate with the downward opening thereof, whereby the wind causes a downdraft, substantially
20 as described.

3. In a motor-vehicle, a boiler, a burner beneath said boiler, a flue above said boiler, said flue having an opening for the products of combustion above the boiler and a downturned branch, a wind-funnel operatively connected to said downturned branch by a tube having a nozzle directed downwardly, whereby the wind causes a downdraft, substantially
25 as described.

30 4. A motor-vehicle having a boiler and means for heating the same, a horizontal flue in the body of said vehicle extending transversely of the vehicle-body and openings for said flue into the atmosphere out of line with
35 the flue, substantially as described.

5. A motor-vehicle having a boiler and means for heating the same, a horizontal flue above said boiler, said flue extending transversely of the vehicle-body and opening upwardly at its respective ends, substantially
40 as described.

6. In a motor-vehicle, a burner, a casing therefor, a boiler above said burner, a horizontal flue above said boiler opening upwardly at each side of the vehicle-body, and
45 horizontal screens for said openings and for the bottom of the burner-casing, substantially as described.

7. In a motor-vehicle, a burner, a boiler above said burner, a horizontal flue above
50 said boiler, extending transversely of the vehicle-body and opening upwardly at each side of said body, and deflectors arranged in said openings, substantially as described.

8. In a motor-vehicle, a burner, a casing
55 therefor, a boiler above said burner, a horizontal flue above said boiler, having a portion extending longitudinally of the vehicle-body and a portion extending transversely of the vehicle-body and having outlets opening
60 upwardly at each side of said body, substantially as described.

9. In a motor-vehicle, a burner, a boiler above said burner, a horizontal flue above
65 said boiler extending transversely of the vehicle-body, and curved flues opening into the atmosphere through the sides and end of the vehicle-body, said horizontal flue opening at its ends into said curved flues respectively,
70 substantially as described.

10. A motor-vehicle having a boiler and means for heating the same, a horizontal flue extending transversely of the vehicle-body and opening at the sides of said vehicle-body and means comprising a wind-funnel whereby
75 the motion of the vehicle and the wind aid the draft, substantially as described.

WILLIAM L. GARRELS.

CLINTON KIMBALL.

Witnesses:

JNO. T. POUGH,ER,
LOUIS SCHMIDT.