No. 773,984. PATENTED NOV. 1, 1904.

E. C. RICHARD.

MUFFLER.

APPLICATION FILED JAN. 11, 1904.

NO MODEL.

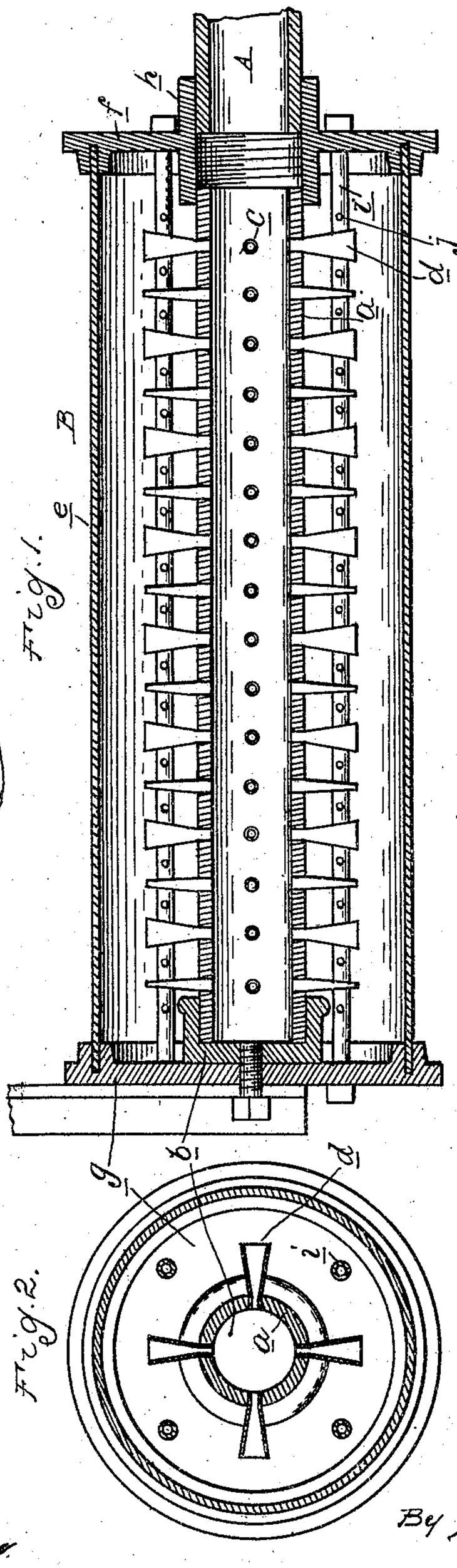

Fig. 1.

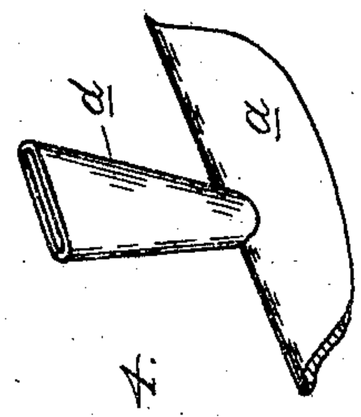

Fig. 4.

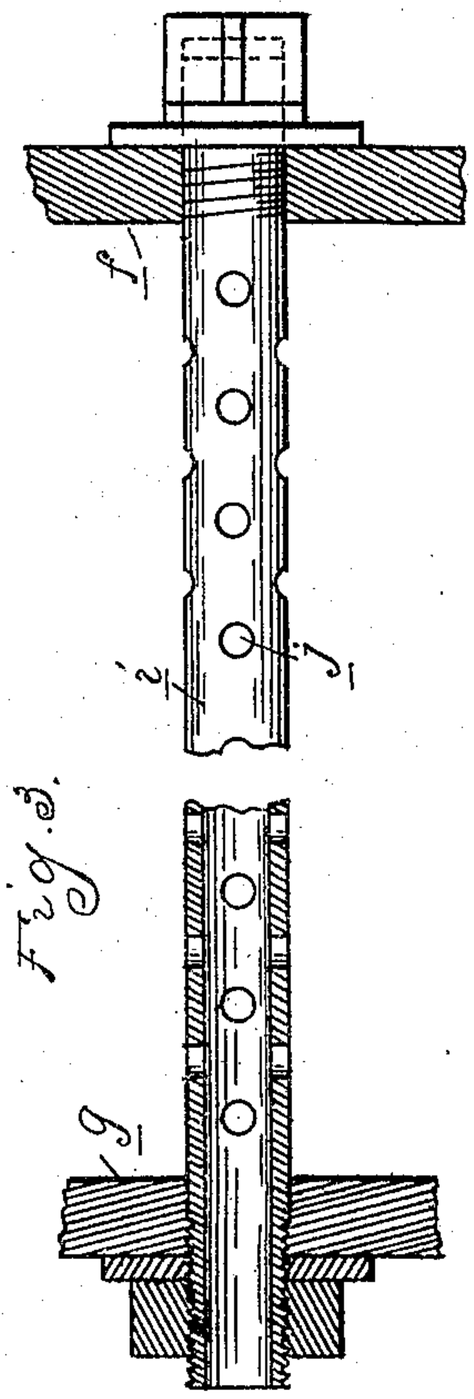

Fig. 3.

Fig. 5.

Fig. 2.

Witnesses
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No. 773,984. Patented November 1, 1904.

UNITED STATES PATENT OFFICE.

EUGENE C. RICHARD, OF DETROIT, MICHIGAN, ASSIGNOR TO THE BUICK MOTOR COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

MUFFLER.

SPECIFICATION forming part of Letters Patent No. 773,984, dated November 1, 1904.

Application filed January 11, 1904. Serial No. 188,569. (No model.)

To all whom it may concern:

Be it known that I, EUGENE C. RICHARD, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Mufflers, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to mufflers especially designed for use in connection with explosion-engines; and it is the object of the invention to obtain a construction in which the noise of the explosion is eliminated as far as possible and without producing back pressure upon the engine.

With this object in view the invention consists in the peculiar construction, arrangement, and combination of parts, as hereinafter set forth.

In the drawings, Figure 1 is a longitudinal section through the muffler. Fig. 2 is a cross-section thereof. Fig. 3 is an enlarged view illustrating the discharge-tubes, and Fig. 4 is a perspective view of one of the discharge-nozzles.

A is the exhaust-conduit, and B is the muffler secured thereto. This muffler comprises a tube *a* of preferably the same diameter as that of the conduit A and connected to the latter in axial alinement. The opposite end of the tube *a* is closed by cap *b*.

c represents a series of apertures formed in the tube *a*, in each of which is secured a radially outwardly extending nozzle *d*. These nozzles are formed of a round cross-section at their inner ends and flattened at their outer, so that the opening is in the form of a narrow slit. The nozzles are also preferably arranged in the series to have the slits alternately turned in different directions.

e is a cylindrical casing inclosing the tube *a* and nozzles *d*.

f and *g* are heads closing the opposite ends of the cylinder, the head *f* having oppositely-extending nipples *h* thereon, which form the coupling means between the conduit A and tube *a*.

i represents tubes arranged longitudinally of the cylinder between the rows of nozzles *d* and extending outward through the heads *f* and *g*. These tubes *i* are perforated, as indicated at *j*.

In operation the exhaust from the conduit A entering the tube *a* will be discharged from the nozzles *d* in a series of thin radially-directed jets. The number of jets is such that their combined area is in excess of the area of cross-section of the conduit A, and thus very little resistance to the discharge of the products is formed. The gaseous products discharged from the jets is confined within the outer drum *e*, but is permitted to escape through the perforations *j* into the tubes *i*, which are open to atmosphere. The effect of discharging the gases in the form of thin jets is to cause the rapid cooling and contraction of the gases, thereby reducing the volume of gas which is eventually discharged through the tube *i*.

What I claim as my invention is—

1. In a muffler the combination with a discharge-conduit of a casing inclosing the same, and a plurality of flattened discharge-nozzles within said casing and connected to said conduit.

2. In a muffler the combination with a discharge-conduit of a plurality of flattened discharge-nozzles connected to said conduit and extending radially therefrom and a cylindrical casing inclosing said conduit, and discharge-nozzles, and provided with discharge-openings.

3. In a muffler the combination with a discharge-conduit of a plurality of longitudinally-extending series of flattened discharge-nozzles each nozzle being connected with said conduit and extending radially therefrom, a casing inclosing said conduit, and discharge-nozzles, and a perforated discharge-conduit within said casing intermediate said discharge-nozzles.

4. A muffler comprising a discharge-conduit and a plurality of flattened nozzles connected thereto, and adapted to discharge the products in thin jets.

5. A muffler comprising a discharge-con-

duit and a plurality of nozzles round in cross-section at their connection to the conduit and flattened at their discharge ends.

6. A muffler comprising a discharge-conduit and a plurality of flattened alternately-arranged nozzles connected thereto.

7. In a muffler, the combination with a discharge-conduit, of a plurality of longitudinally-extending series of oppositely-disposed nozzles extending radially therefrom, a casing inclosing said conduit and discharge-nozzles, and a perforated discharge-conduit extending longitudinally of the casing between each adjacent series of nozzles.

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

EUGENE C. RICHARD.

Witnesses:

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EMMA I. BARNES.