

No. 720,995.

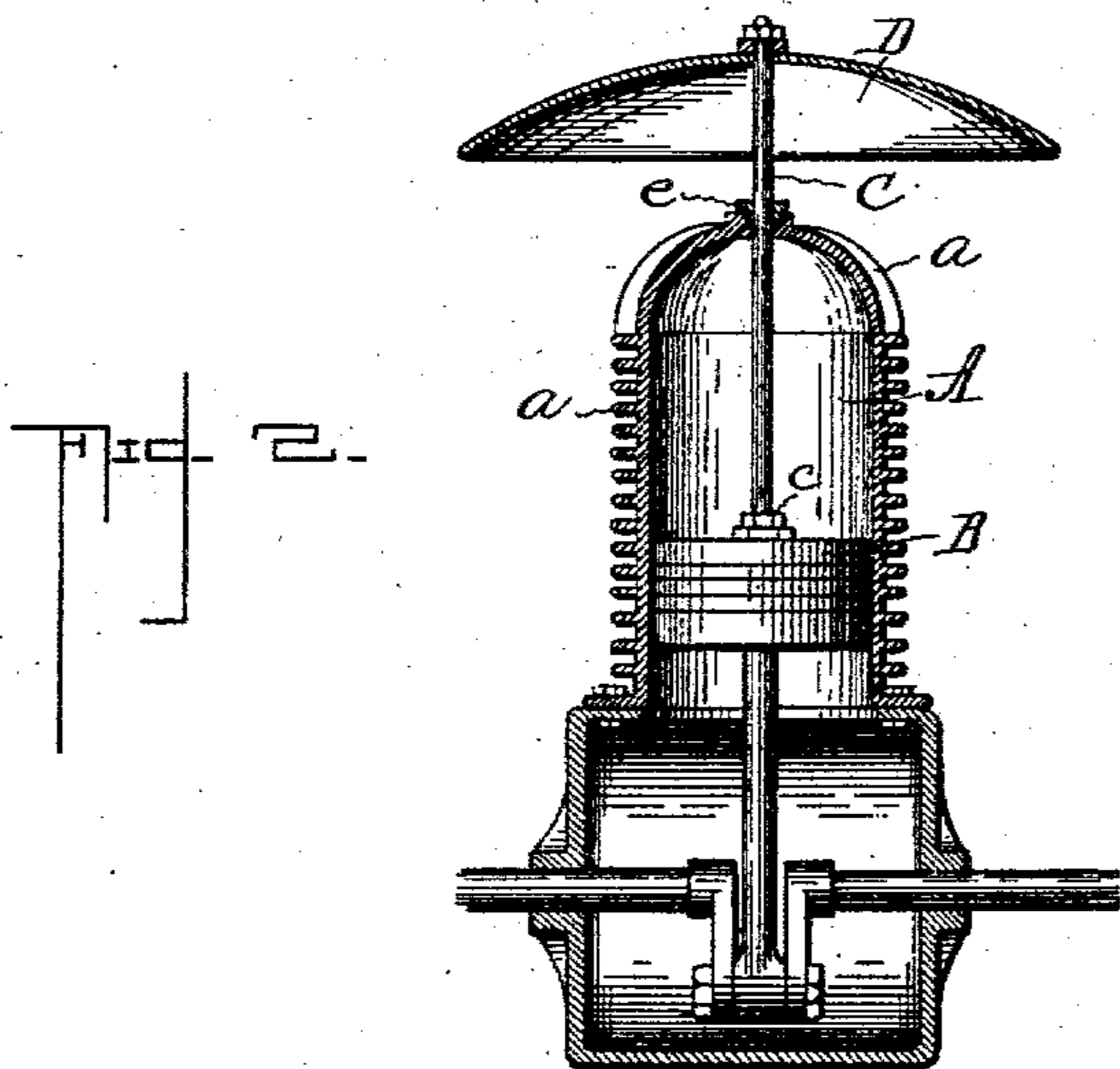
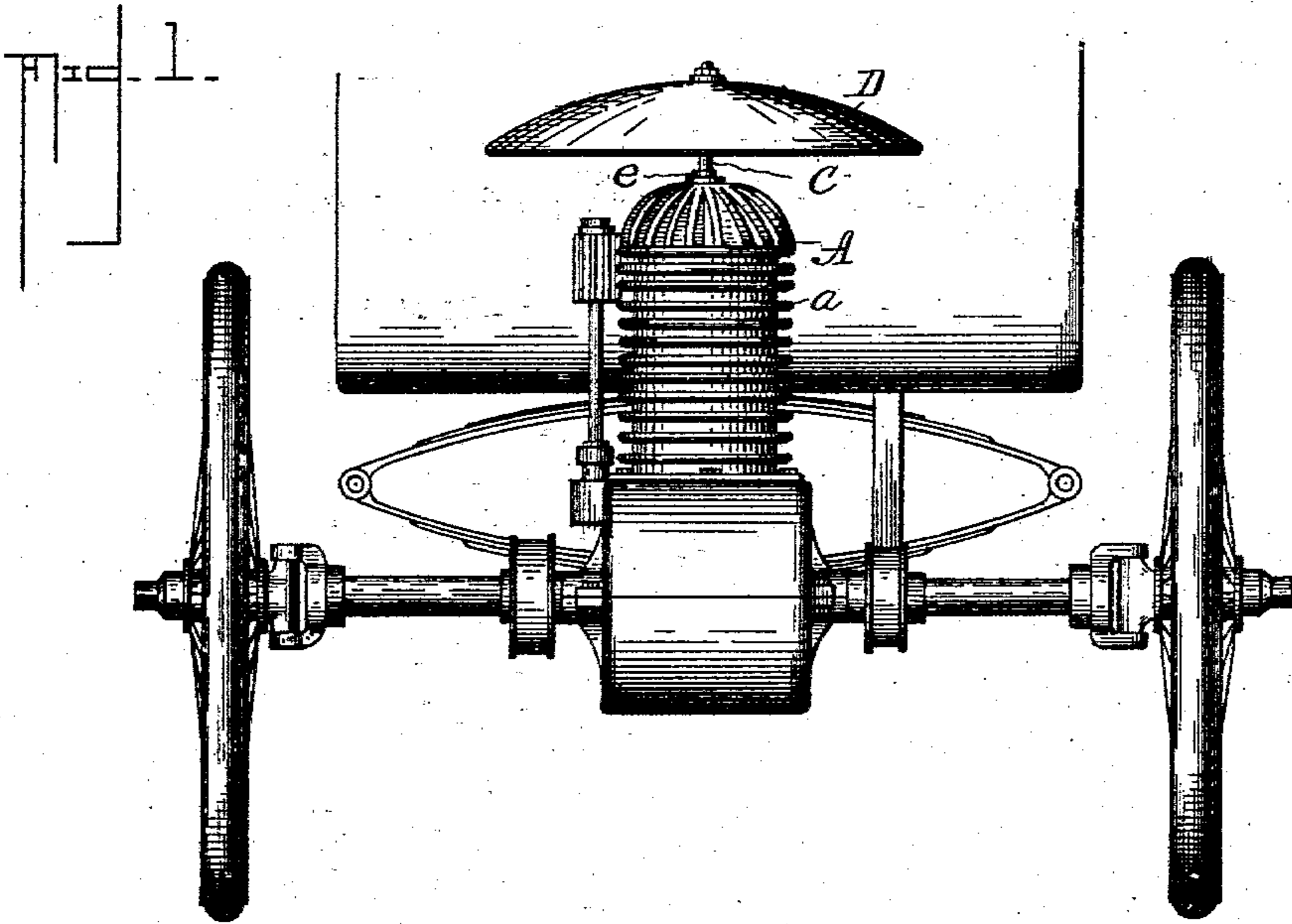
PATENTED FEB. 17, 1903.

C. A. BAILEY.
COOLING DEVICE FOR EXPLOSIVE ENGINES.

APPLICATION FILED OCT. 13, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

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Charles L. Bailey
INVENTOR—

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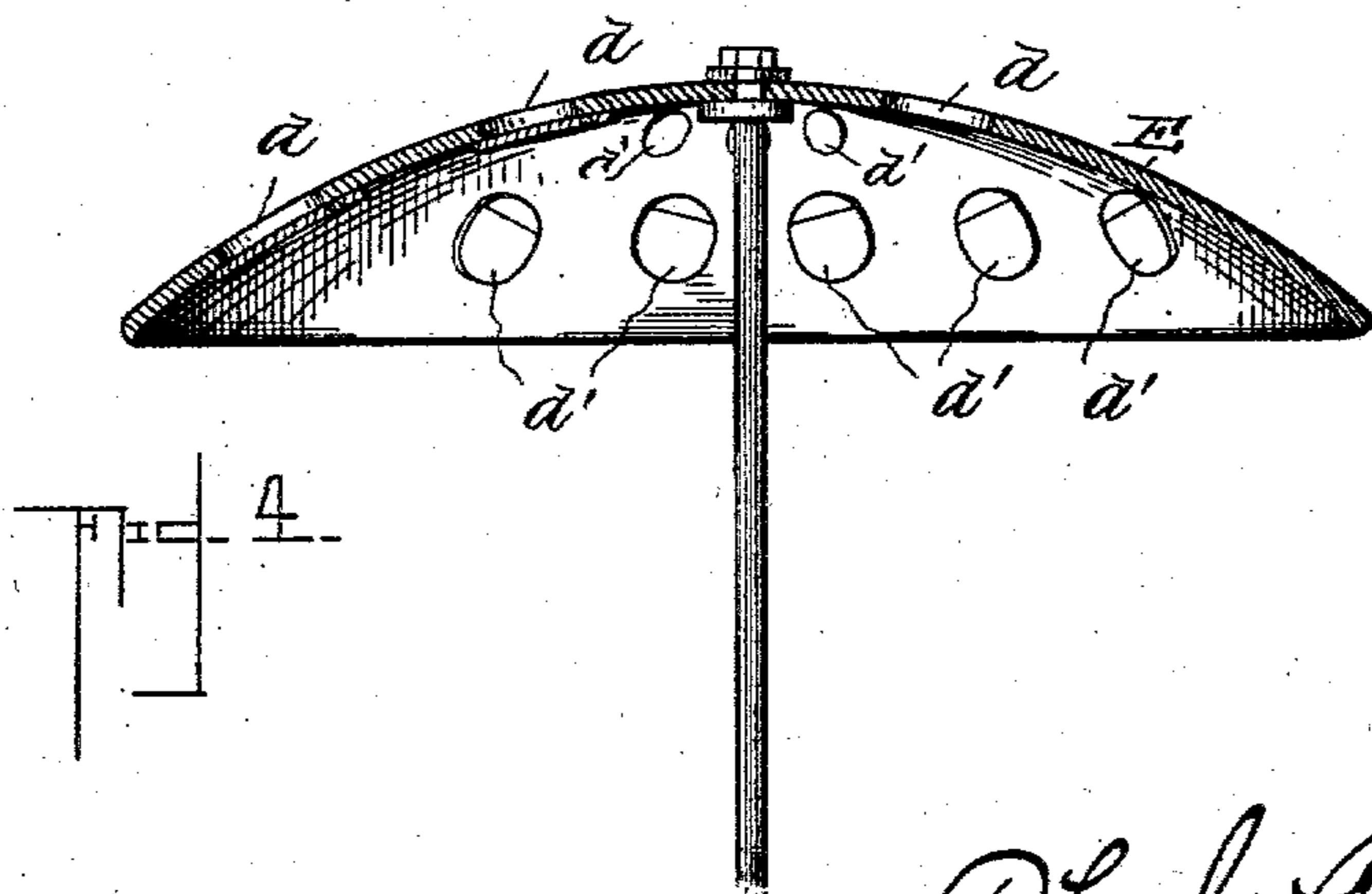
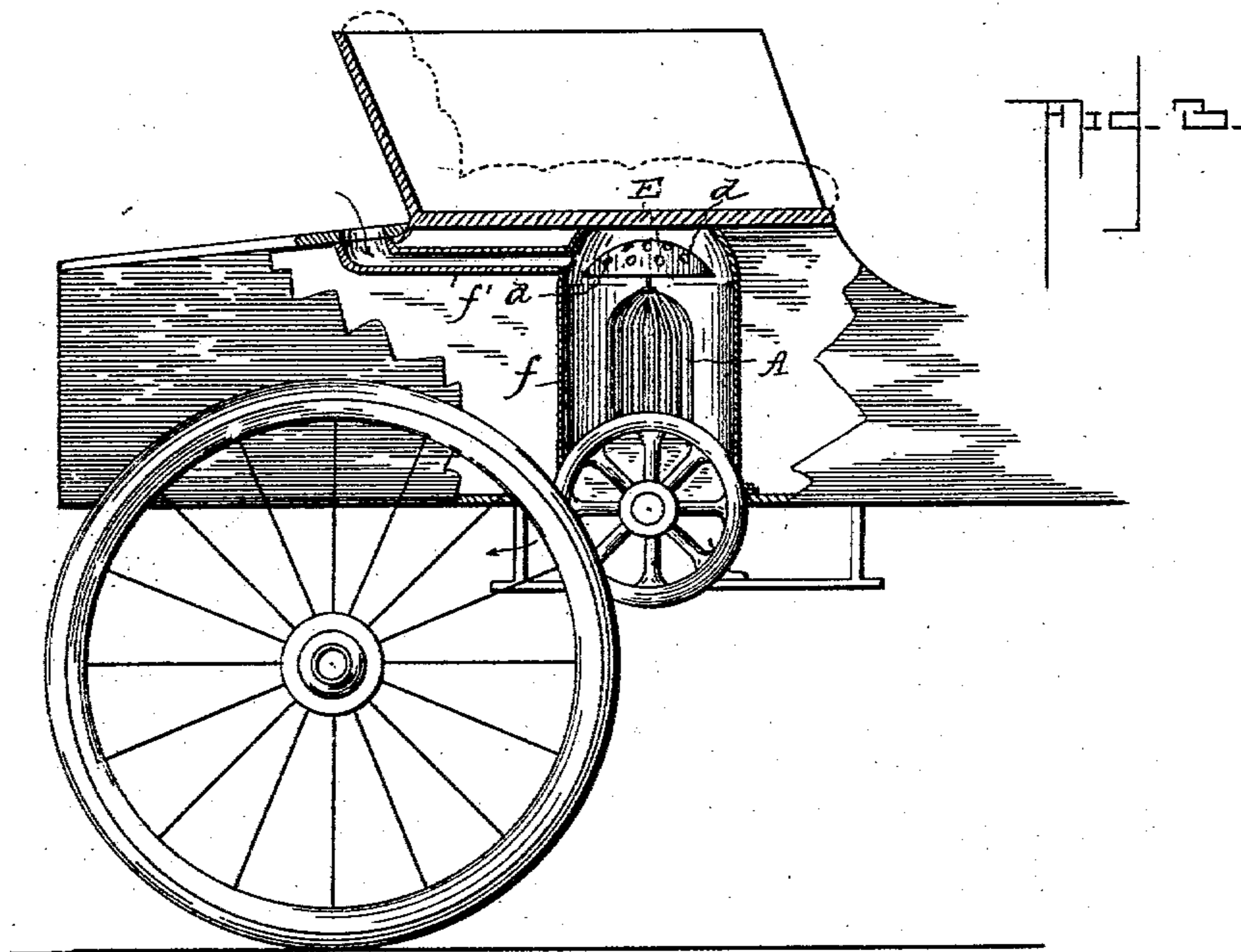
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WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES A. BAILEY, OF CROMWELL, CONNECTICUT.

COOLING DEVICE FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 720,995, dated February 17, 1903.

Application filed October 13, 1902. Serial No. 127,069. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. BAILEY, a citizen of the United States, and a resident of Cromwell, in the county of Middlesex and State of Connecticut, have invented certain new and useful Improvements in Cooling Devices for Explosive-Engines, as set forth in the annexed specification.

This invention has for its object to provide simple and effective means for cooling the cylinder of an explosive-engine, and is more especially adapted for application to the explosive-engines of motor-vehicles and to supplant the usual method of cooling by the circulation of water in a jacket enveloping the cylinder, this latter method requiring the use of a quantity of water, which greatly increases the weight of the vehicle or carriage.

With the above objects in view the invention consists in the provision of a reciprocating-fan located above the head of the cylinder and disposed on a line with the piston, whereby to direct currents of air upon those parts of the cylinder which are heated by the explosion of the gases, the said fan receiving its motion from the piston of the engine by a rod that passes through the head of the cylinder and to which said fan is attached.

The invention further consists in the particular construction and combination of parts, all as will be hereinafter fully described, and more specifically set forth in the appended claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is an elevation illustrating the application of my invention to a motor-vehicle. Fig. 2 is a detail sectional view, enlarged, through the engine-cylinder and fan. Fig. 3 is a view showing a modification of the invention. Fig. 4 is a sectional view of Fig. 3.

Like letters of reference indicate like parts in the several views of the drawings.

In carrying out my invention I purpose to employ a fan similar in shape to an ordinary umbrella and by mounting said fan on a rod connected to the piston of the engine cause it to reciprocate rapidly and fan or change the air around the cylinder, so as to cool the same as much as possible, and to facilitate the action of the fan I purpose to provide the

cylinder with the usual ribs to more quickly radiate the heat.

Referring now to the drawings, A designates the engine-cylinder, which is preferably provided with the webs *a*, which, as illustrated in Figs. 1 and 2, may extend longitudinally and transversely or, as in Figs. 3 and 4, may extend longitudinally the whole length of the cylinder. The cylinder is provided with a piston B and with inlet and exhaust valves and sparking device; but inasmuch as my invention does not relate to the engine, but merely its cylinder and means for cooling same, I have not herein shown any construction of valves and sparking devices.

C designates a rod, one end of which is threaded in the center of the piston B and securely held thereto by a set-nut *c*. Said rod extends through the upper end or head of the cylinder, and to its outer end is attached an umbrella-shaped fan D. Where the rod C passes through the cylinder a suitable stuffing-box *e* is provided. The fan D may be metal and have the rod C cast integral therewith, or it may consist of a metal framework over which is stretched a suitable fabric. In some instances, as indicated in Figs. 1 and 2, the fan may be solid, depending upon the rapid reciprocation to cause a circulation of air over the cylinder, while in the preferred form, Figs. 3 and 4, the said fan E is provided with openings *d*, covered on the under side by ordinary clap-valves *d'*, the downward movement of said valves being limited. In this form of fan the valves open upon an upward stroke to permit fresh air to collect under the fan, so that when the fan descends the fresh air may be forced over the cylinder.

It will be understood that in the operation of the device the fan operates with the piston and is therefore reciprocated very rapidly and that the disposition of the fan is such that it directs the currents of fresh air directly upon the head of the cylinder, so as to effectually cool the same. The device can be applied to an engine at comparatively small expense and being attached directly to the piston will not materially affect the motive power of the engine.

The device will serve to effectually cool the parts of the engine which are heated by the

explosion of the gases, and the cooling will be materially assisted by the provision of webs on the cylinder now generally employed.

Where the engine is located on the front axle of a vehicle, it is subjected to a current of air when the vehicle is in motion, but there is not always a perfect circulation around the cylinder. By the application of this device the air is forced downward to pass under the vehicle, and is not, therefore, liable to pack behind the engine. Where the engine is located in the body of the vehicle, as also shown, a sheet-metal jacket or casing *f* incloses the engine and fan, and the air admitted into the upper part of the said inclosing case through a suitable tube *f'* is forced downward over the cylinder and out under the body of the vehicle. However, though I have shown the two ways of application it is not intended to limit my invention to what is shown, as I reserve the right to make such changes or alterations as come within the spirit and scope of my claims.

I claim—

1. In a cooling device for explosive-engines, a reciprocating fan directing currents of air over the cylinder, and a rod attached to the piston and adapted to impart motion to the fan.

2. In a cooling device for explosive-engines, a reciprocating fan directing currents of air over the cylinder, a rod attached to the piston and to the fan.

3. In a cooling device for explosive-engines, a reciprocating umbrella-shaped fan disposed

on a line with said cylinder, and a rod attached to the piston of the engine and carrying the fan at its outer end.

4. In a cooling device for explosive-engines, the combination with the engine-cylinder having external webs for radiating the heat, of an umbrella-shaped fan disposed on a line with the cylinder, and a rod attached to the center of the piston from which it extends through the head of the cylinder and carries the fan at its outer end.

5. In a cooling device for explosive-engines, the combination, of the cylinder having external webs for radiating the heat, a rod secured to the piston and extending through the head of the cylinder, a stuffing-box through which said rod passes, and an umbrella-shaped fan attached to the outer end of the rod.

6. In a cooling device for explosive-engines, the combination with the cylinder and piston, of an umbrella-shaped fan, a rod connected to said fan and to the piston, and valved openings in the fan adapted to open upon an upward movement of the fan and to close upon a downward movement thereof, whereby to direct currents of air upon the cylinder, substantially as shown and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHAS. A. BAILEY.

Witnesses:

EDWARD H. HUNT,
ARTHUR BOARDMAN.