

(No Model.)

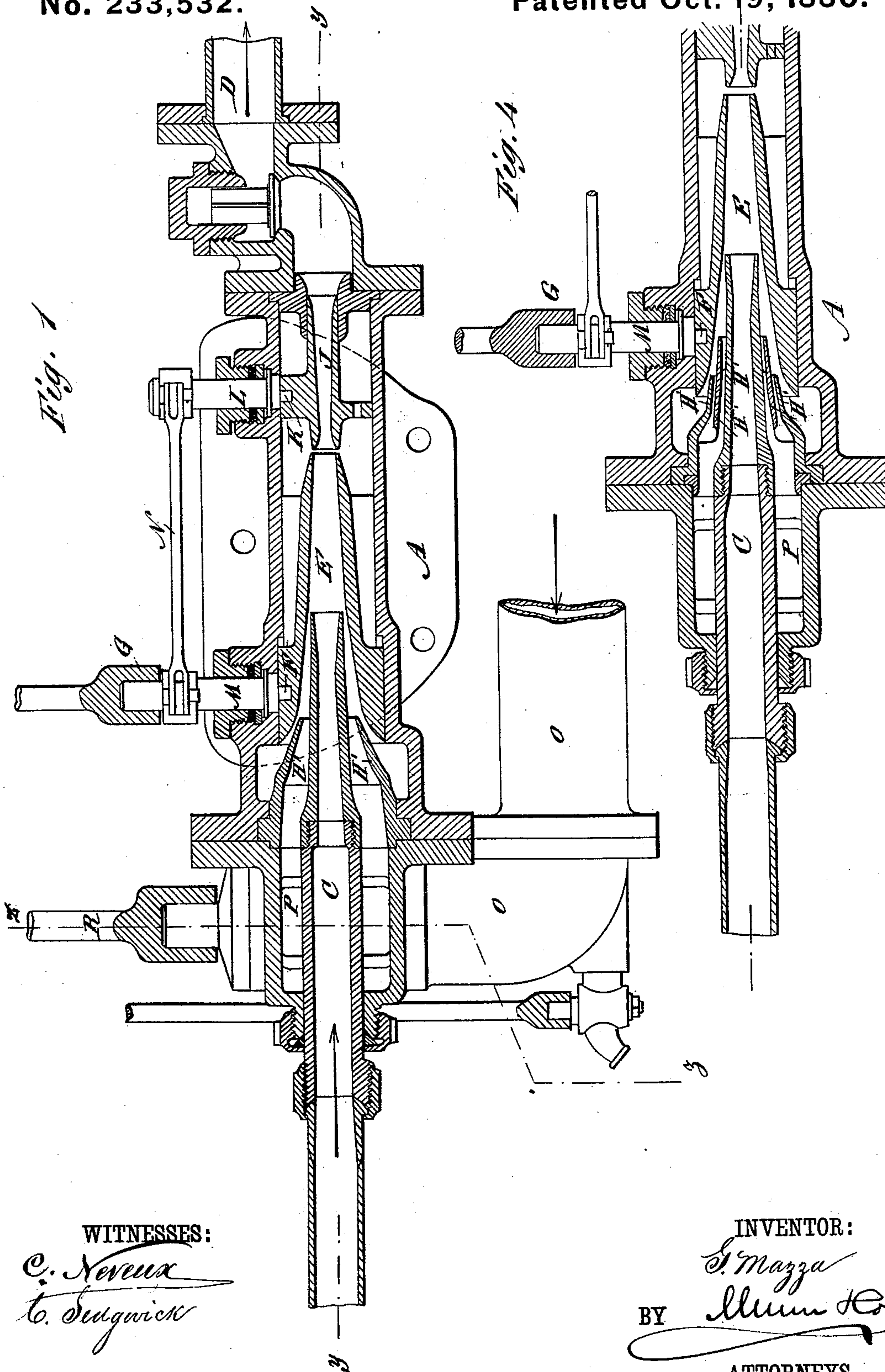
2 Sheets—Sheet 1.

G. MAZZA.

Injector and Condenser.

No. 233,532.

Patented Oct. 19, 1880.



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Fig. 2

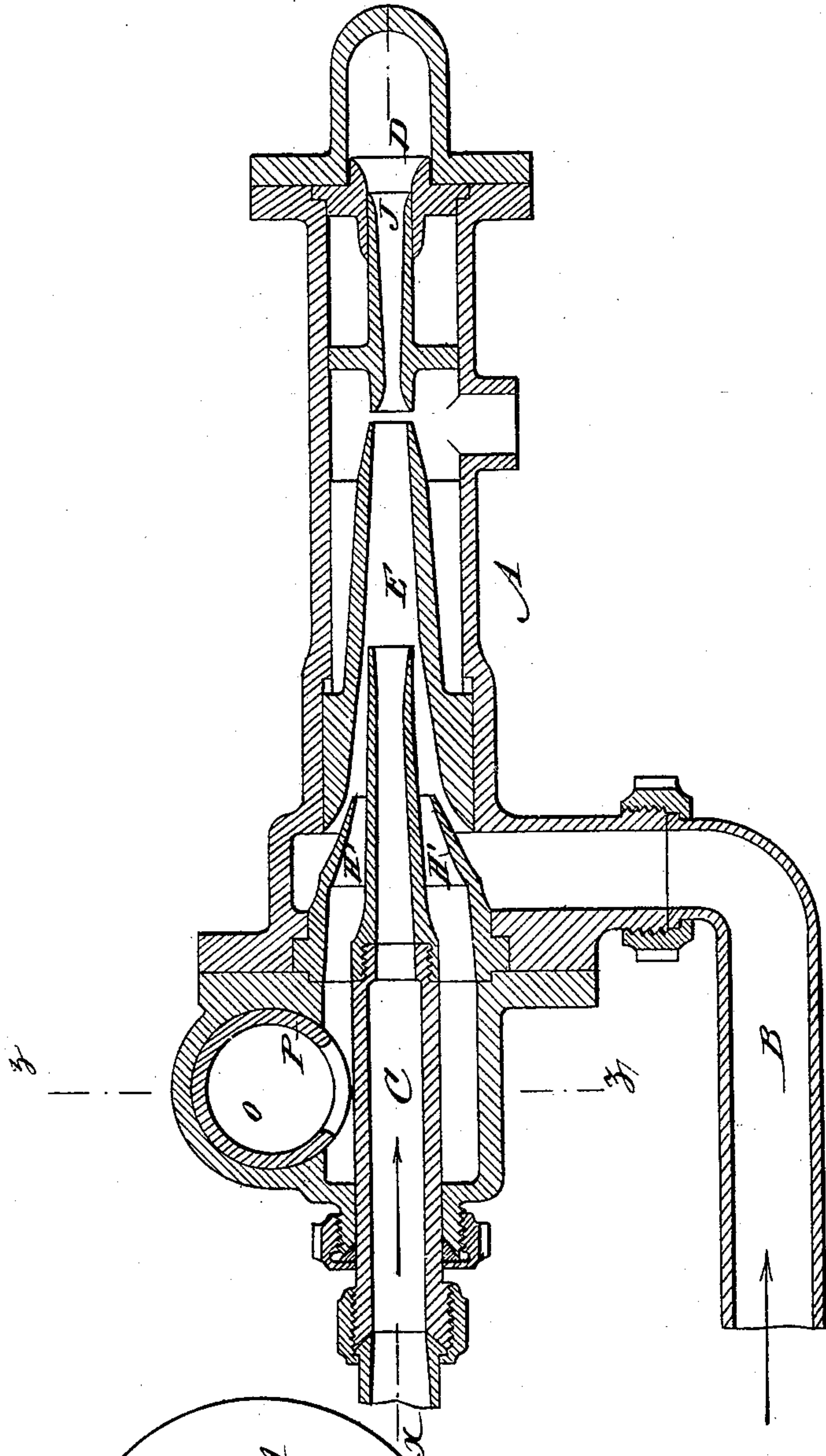
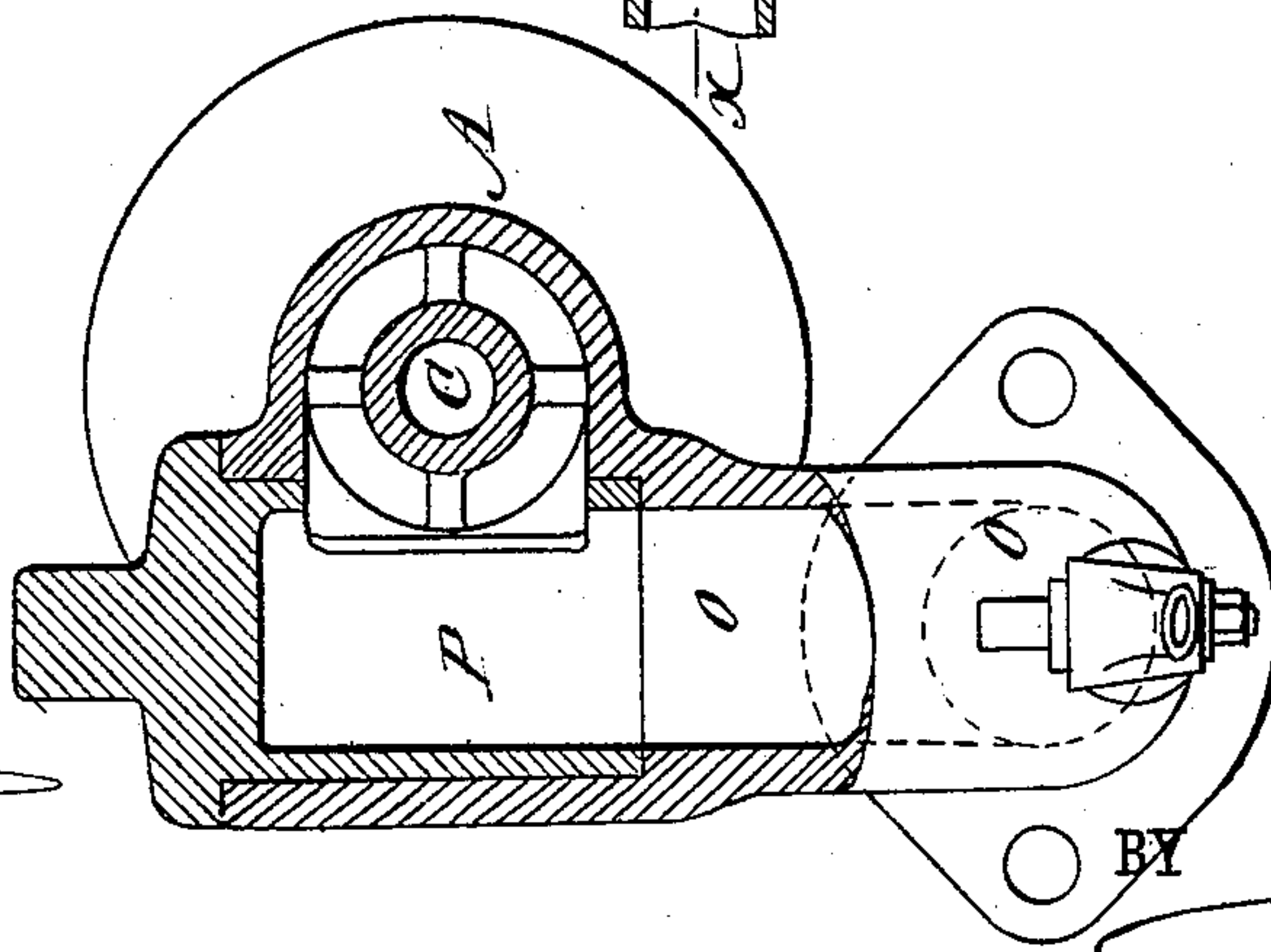


Fig. 3



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UNITED STATES PATENT OFFICE.

GASPARE MAZZA, OF TURIN, ITALY.

INJECTOR AND CONDENSER.

SPECIFICATION forming part of Letters Patent No. 233,532, dated October 19, 1880.

Application filed May 3, 1880. (No model.) Patented in Italy February 13, 1880.

To all whom it may concern:

Be it known that I, GASPARE MAZZA, of Turin, Italy, have invented a new and Improved Injector with Condenser, of which the following is a specification.

The invention consists in combining a boiler-pipe, cones, and connected eccentrics having different throws with a feed-water pipe and a steam-inlet pipe having a cock, as hereinafter described.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of my improved injector and condenser on line *xx*, Fig. 2. Fig. 2 is a horizontal sectional elevation of the same on line *yy*, Fig. 1. Fig. 3 is a longitudinal sectional elevation of the same on the line *zz*, Figs. 1 and 2; and Fig. 4 is a cross-sectional elevation of a modification of the improved injector and condenser.

Similar letters of reference indicate corresponding parts.

B is the pipe through which the feed-water passes. C is the pipe for admitting the steam, and for this purpose is connected with the steam-boiler. This pipe C corresponds to the steam-inlet of the ordinary injector.

O is the pipe which conducts the exhaust-steam from the cylinders. P is a large cock which establishes a communication between the waste-steam pipe O and the condensing-injector. D is a pipe which conducts the mixture of steam and water to the boiler, as in all ordinary injectors.

In order to work the apparatus as an ordinary injector, the cock P is closed, and steam is admitted into the central tube. The amount of water introduced is regulated by the eccentric F, which is worked by a rod, M, or by a lever with a handle. By turning the eccentric F the cone or nozzle E is moved, and thus the port admitting the water is regulated.

K is a second eccentric, by means of which the distance between the cones E and J is regulated. It is advantageous to unite the rods of the eccentrics F and K by a link, N, so as to work them together. It is advisable that when the apparatus is started the cones E and J should be at their greatest distance apart, and that it be reduced to its minimum when the injector is working. To obtain this result the eccentric K has a longer throw than the

eccentric F. By turning the eccentric F for the purpose of regulating the water the cone E moves more slowly than the cone J, and the distance between the two cones increases, while the port-hole for the admission of the water is being restricted. The different stroke of the eccentrics F and K is made for attaining this object, which is particularly favorable for rather tepid feed-water. Still these eccentrics are not indispensable for the proper working of the injector, for the said injector can work with one eccentric, F, by making only the cone E movable, and by fixing the cone J. It may also be made to work, both eccentrics H and F being suppressed, while both cones E and J are fixed or stationary. Naturally it will also work if both cones E and J are movable, but with an equal motion, which is effected by attaching them to the link N, both eccentrics F and K having the same stroke, or by fixing them to pieces which hold them internally in a fixed manner.

The injector works as a condenser if the large cock P is opened while the machine is at work. The waste steam passes through the pipe O in the cone H', and is condensed by its contact with the water. The condensed mixture meets the central steam-jet coming from the boiler through the pipe C, and is driven by this steam into the boiler. Therefore, the injector as above described can work as an ordinary injector or as an injector and a condenser at the same time.

The apparatus works both easier and better when the injector acts also as a condenser, because of a certain amount of vacuum formed by the condensation of the waste steam in contact with the water.

The speed of the waste-steam jet is considerable, and it is communicated to the feed-water, thus aiding in imparting to the same the requisite speed for being driven into the boiler.

Instead of a single cone, H', two or three concentric cones may be arranged, as is shown in Fig. 4, so as to bring the steam little by little in contact with the water. The arrangement shown in Figs. 1, 2, and 3 may be better on account of being simple. This condensing-injector is made to act also by suction if a needle is added to the central steam-cone.

My apparatus is applicable to all kinds of

machines which work with condensation, and may have, beside, the ordinary outlet adapted to be closed, another provided with a spring-valve.

5 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination, with a feed-water pipe, B,

a steam-inlet pipe, C, and an exhaust-pipe, O, having cock P, of the pipe D, leading to the boiler, the cones E J, and the connected eccentrics F K, having different throws, as and for the purpose specified. 10

Witnesses: GASPARE MAZZA.

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