

J. H. GREATHEAD & M. D. MARTINDALE.  
Hydrant or Stand Pipe.

No. 215,603.

Patented May 20, 1879.

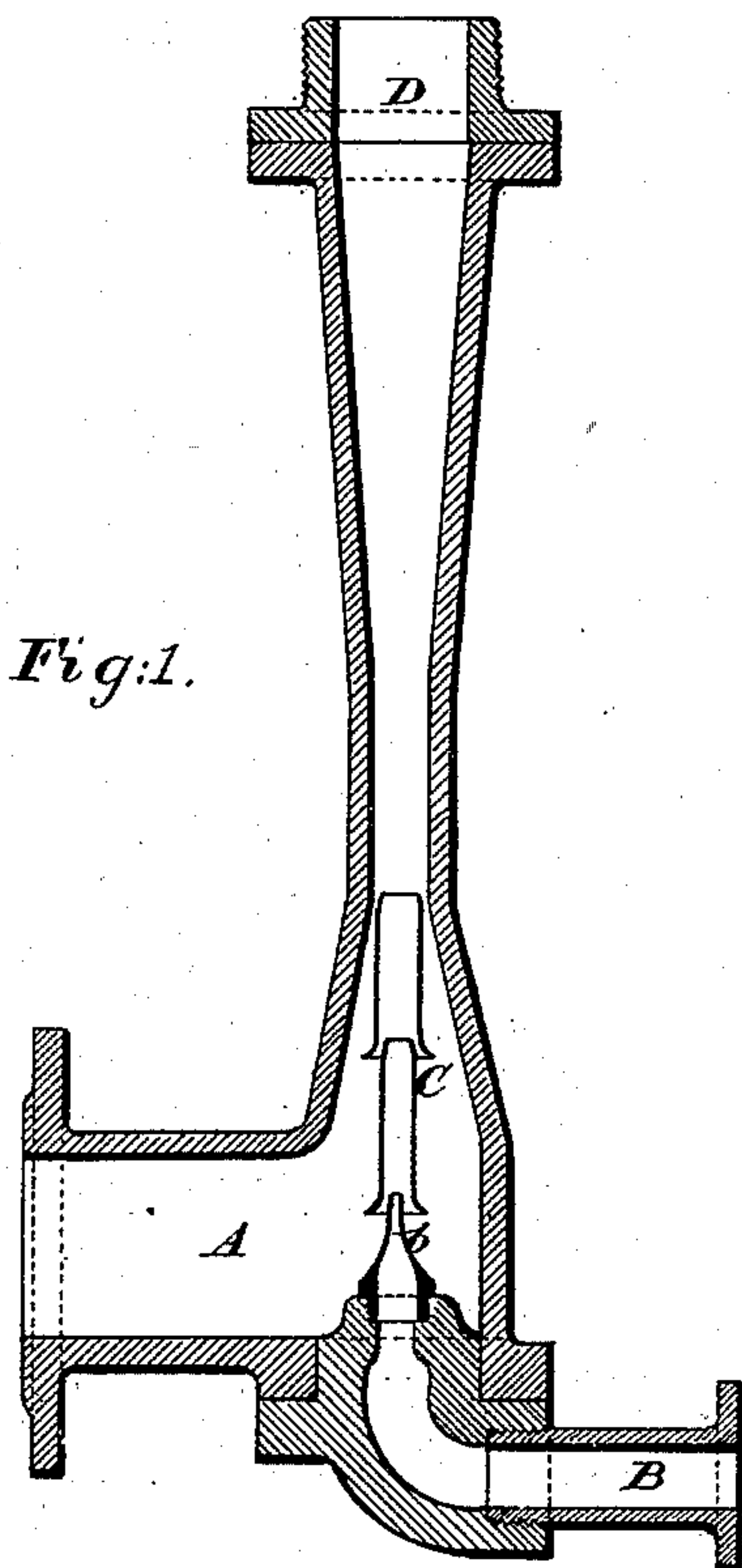


Fig:1.

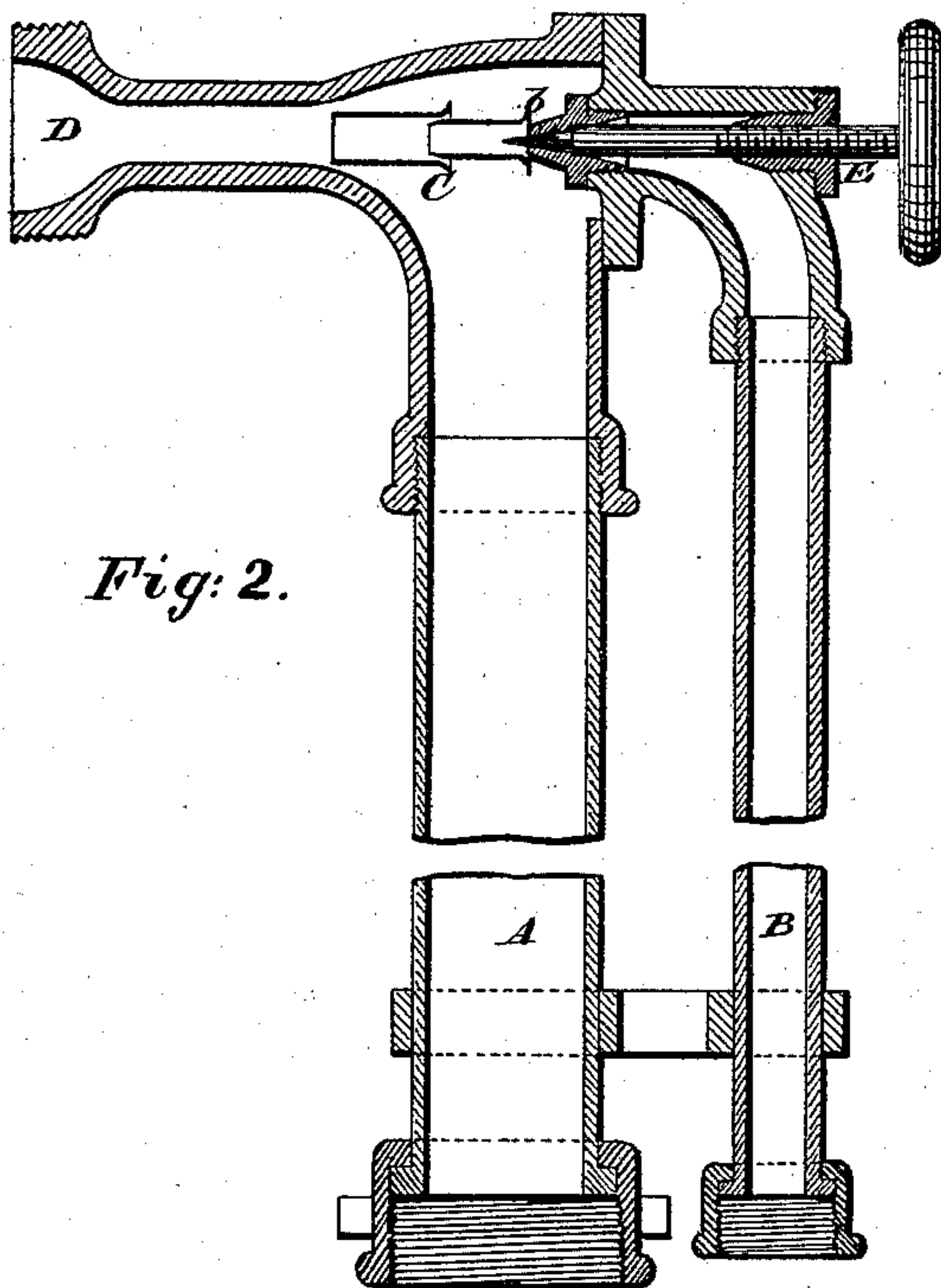


Fig: 2.

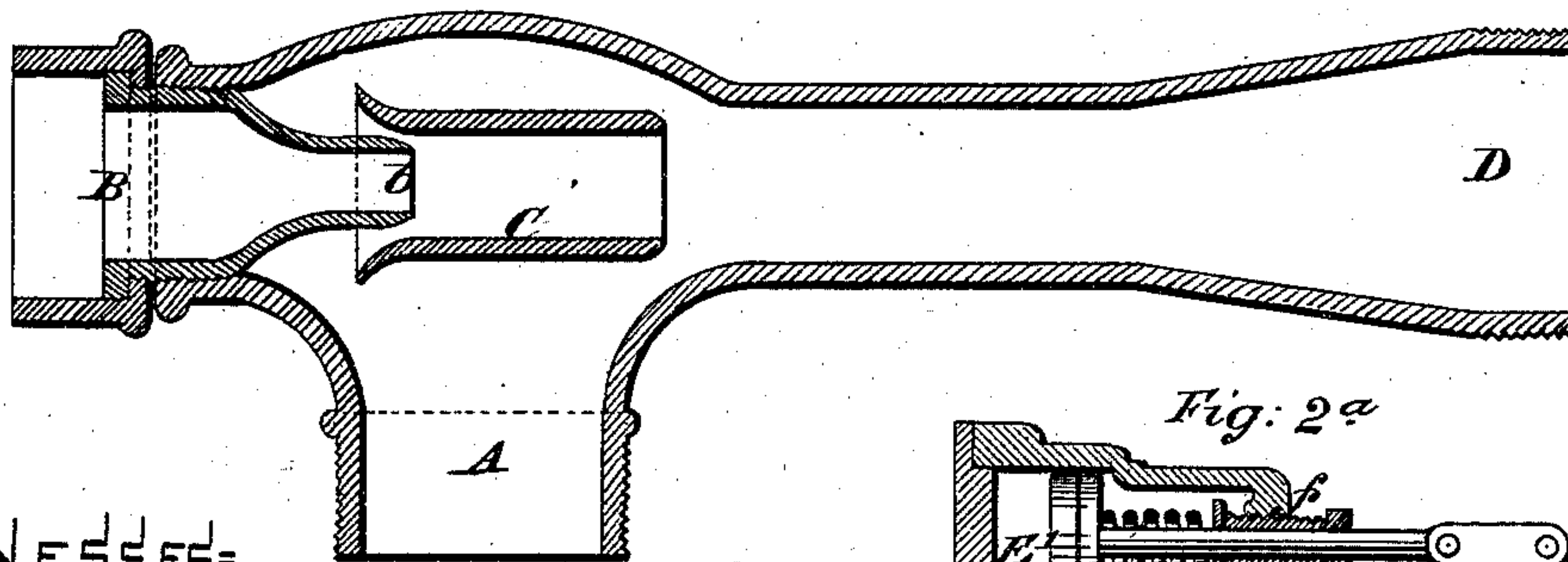


Fig:3.

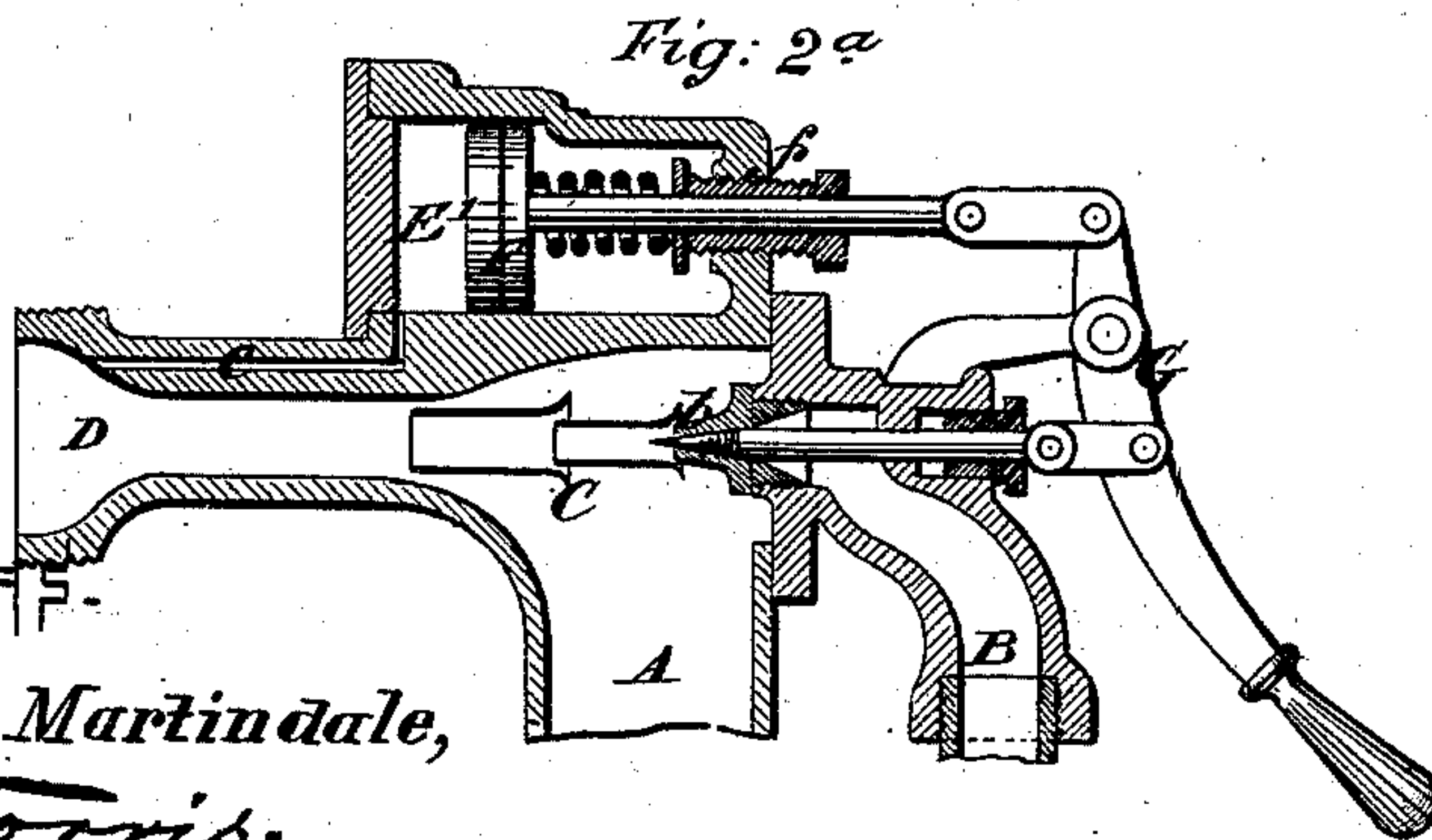


Fig: 2a

WITNESSES=

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# UNITED STATES PATENT OFFICE.

JAMES H. GREATHEAD, OF WESTMINSTER, COUNTY OF MIDDLESEX, AND  
MONTAGU D. MARTINDALE, OF ANERLY, COUNTY OF SURREY, ENGLAND.

## IMPROVEMENT IN HYDRANTS OR STAND-PIPES.

Specification forming part of Letters Patent No. **215,603**, dated May 20, 1879; application filed April 8, 1879; patented in England, November 21, 1878.

*To all whom it may concern:*

Be it known that we, JAMES HENRY GREATHEAD, of Westminster, in the county of Middlesex, England, and MONTAGU DURANCE MARTINDALE, of Anerly, in the county of Surrey, England, have invented an Improvement in Hydrants or Stand-Pipes; and do hereby declare that the following description, taken in connection with the accompanying drawings, hereinafter referred to, forms a full and exact specification of the same, wherein we have set forth the nature and principles of our said improvement, by which our invention may be distinguished from others of a similar class, together with such parts as we claim and desire to secure by Letters Patent—that is to say:

In cases where towns or districts are supplied with water at a low pressure, it is necessary to rely almost entirely on the use of fire-engines when jets at high pressure are required for the extinction of fires and like purposes.

The object of our invention is to provide in such cases means of obtaining the advantages of a high-pressure supply without employing fire-engines, and without establishing a general high-pressure service on an extensive scale, or interfering with the existing low-pressure supply.

We effect this by applying in hydrants or stand-pipes supplied from mains with water at low or moderate pressure the principle known as the "lateral action of fluids," which is applied in the injector—that is to say, a stream of fluid passing at considerable velocity through fluid which is quiescent or moving slowly imparts thereto a portion of its velocity, thus producing a stream of larger volume, though of less velocity, than the original rapid stream.

The construction of hydrants or stand-pipes for use in this manner is shown in the accompanying drawings.

Figure 1 represents a vertical section of a hydrant according to our invention.

A is the branch from the main pipe, supplying water at moderate pressure, its quantity being determined by a sluice or other suitable valve governing the passage to the pipe A in the

usual way. B is a branch from a pipe of comparatively small size, supplied with water at high pressure. The supply by the branch B is also governed by sluice or other valve.

The branch B, bending upward, terminates in a nozzle, *b*, directed into the ascending limb of the hydrant, and beyond this nozzle may be fixed one or more trumpet-mouthed guide-tubes, C, as shown in Fig. 1, for the purpose of obtaining several successive impulses from the central stream.

The ordinary hose or pipe being screwed onto the hydrant at D, the apparatus is worked in the following manner: Water at the low pressure is admitted by the branch A to fill the hydrant. Water at the high pressure is then admitted by the branch B, and the stream of this water, issuing at high velocity by the nozzle *b*, imparts a portion of its velocity to the low-pressure water supplied by A, thereby producing in the hose a pressure greater than that of the low-pressure supply, and less than that of the high-pressure supply.

By properly proportioning the volumes of low and high pressure water, an intermediate pressure can be obtained sufficient to command a jet of considerable height, such as is usually required for fire-extinction. Thus, by the expenditure of a comparatively small quantity of very high-pressure water, conveyed by pipes of small dimensions, jets of large volume are obtained from the ordinary low-pressure supply, without subjecting the low-pressure pipes to such pressure as would be required to command the jets, and without interfering with the ordinary uses of those pipes.

Fig. 2 represents a vertical section of a stand-pipe similarly fitted with a high-pressure nozzle according to our invention. The low-pressure branch A and the high-pressure branch B are both in this case made separable from the service-pipes which supply them, and are attached thereto by screwed unions when required for use.

The nozzle *b* may be fitted with a cone adjustable by a screw, E, to regulate the high-pressure stream; or the high-pressure stream may be governed automatically by the pressure in the discharge-pipe D by the arrange-



ment shown at Fig. 2<sup>a</sup>. A small cylinder, E', is made to communicate, by a passage, *e*, with the discharge-pipe D. The cylinder is fitted with a piston, F, pressed on by a spring, the force of which can be adjusted by a screw-nut, *f*. The piston-rod is linked to one arm of a lever, G, to the opposite arm of which is linked the cone-valve fitting the nozzle *b*. When the pressure in D is sufficient to move the piston F in opposition to the spring, the passage through the nozzle *b* is more or less throttled by the advance of the cone within it; and the high-pressure stream being thus reduced in volume, the pressure in D resulting from its action is likewise reduced.

A flexible diaphragm may obviously be substituted for the piston F.

Fig. 3 represents a longitudinal section of a similar jet arrangement according to our invention, applicable to fire-engines. It consists of a hydrant-pipe having a branch, A, connected by hose or otherwise to a low-pressure pipe, or to any neighboring supply of water at low pressure. The branch B is connected to the discharge of the fire-engine pumps, and a hose is screwed onto the mouth of the pipe at D.

The high-pressure discharge of the fire-engine giving motion to the low-pressure supply creates in the hose an intermediate pressure, as already described, and thus pumps discharging a comparatively small volume of water at a very high pressure are made available for producing jets of larger volume at lower pressure.

Having thus described the nature of our invention, and the best means we know of carrying it into practical operation, we claim—

The combination of a branch pipe and nozzle supplied from a high-pressure pipe with the hydrant or stand-pipe of a low-pressure main, substantially as and for the purposes herein set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 15th day of March, 1879.

J. H. GREATHEAD.  
MONTAGU D. MARTINDALE.

Witnesses:

JOHN IMRAY,  
JNO. P. M. MILLARD.