

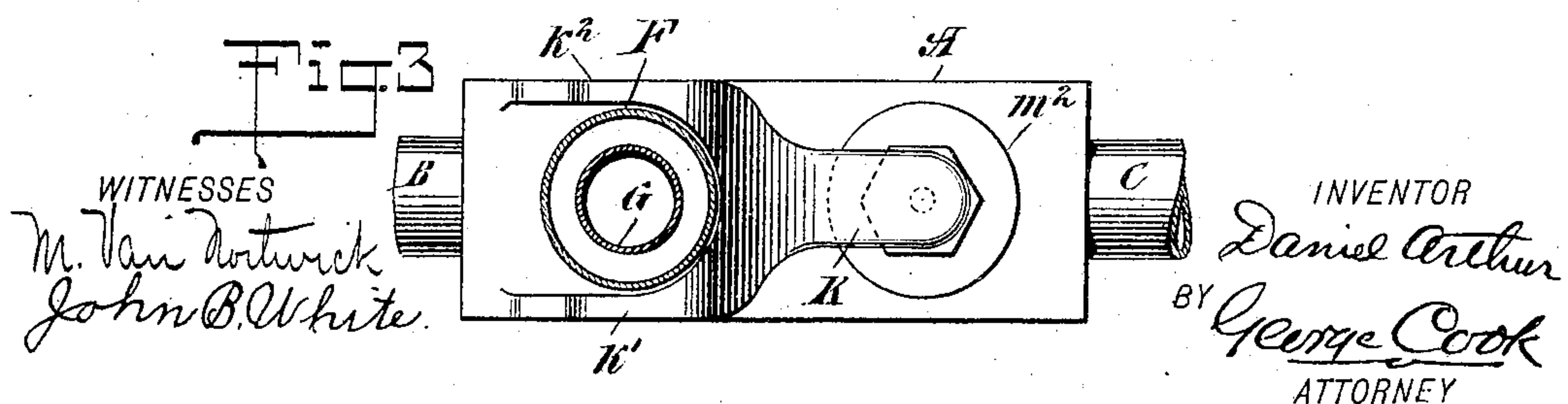
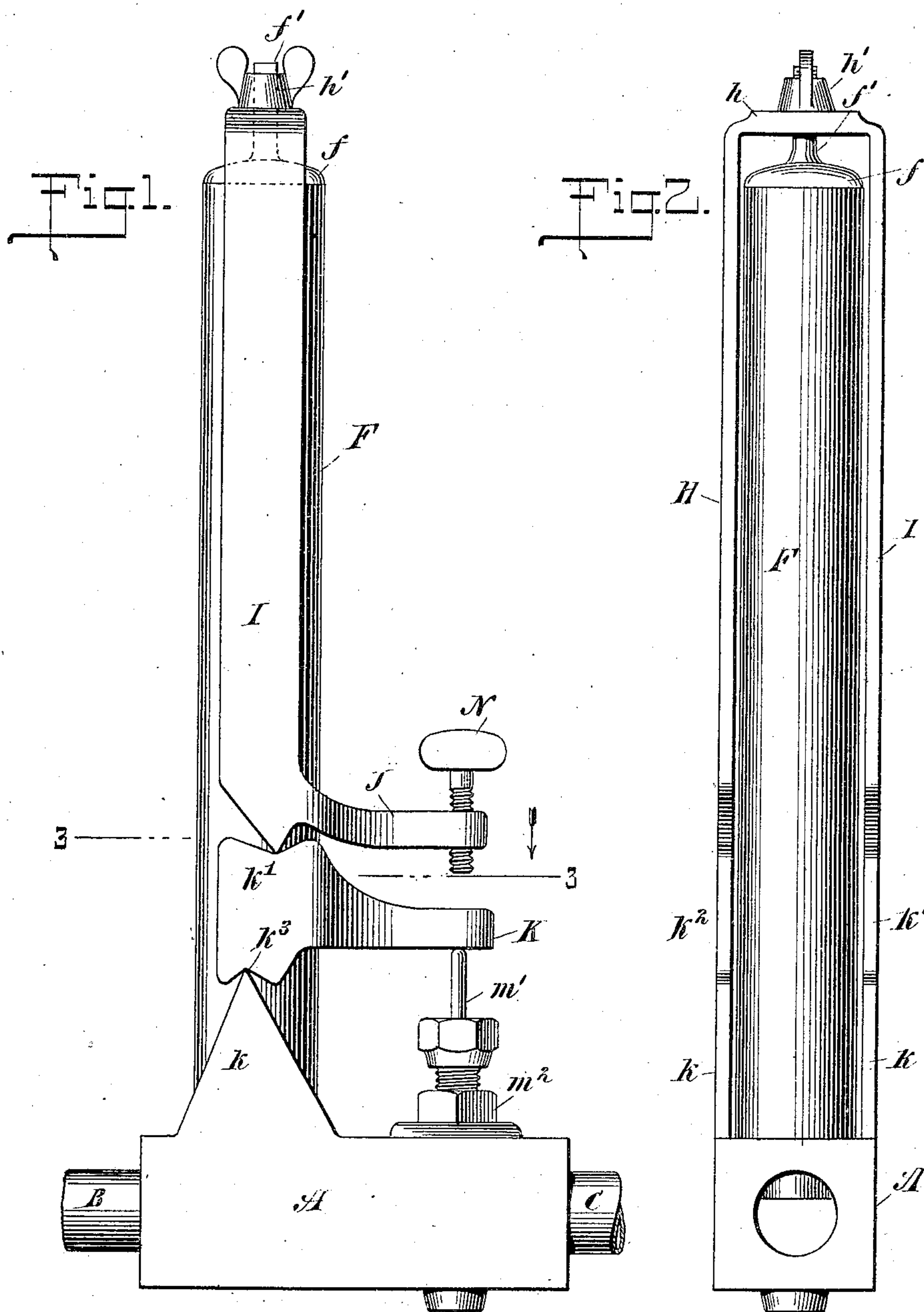
No. 879,997.

PATENTED FEB. 25, 1908.

D. ARTHUR.
STEAM TRAP.

APPLICATION FILED MAR. 7, 1907.

2 SHEETS—SHEET 1.



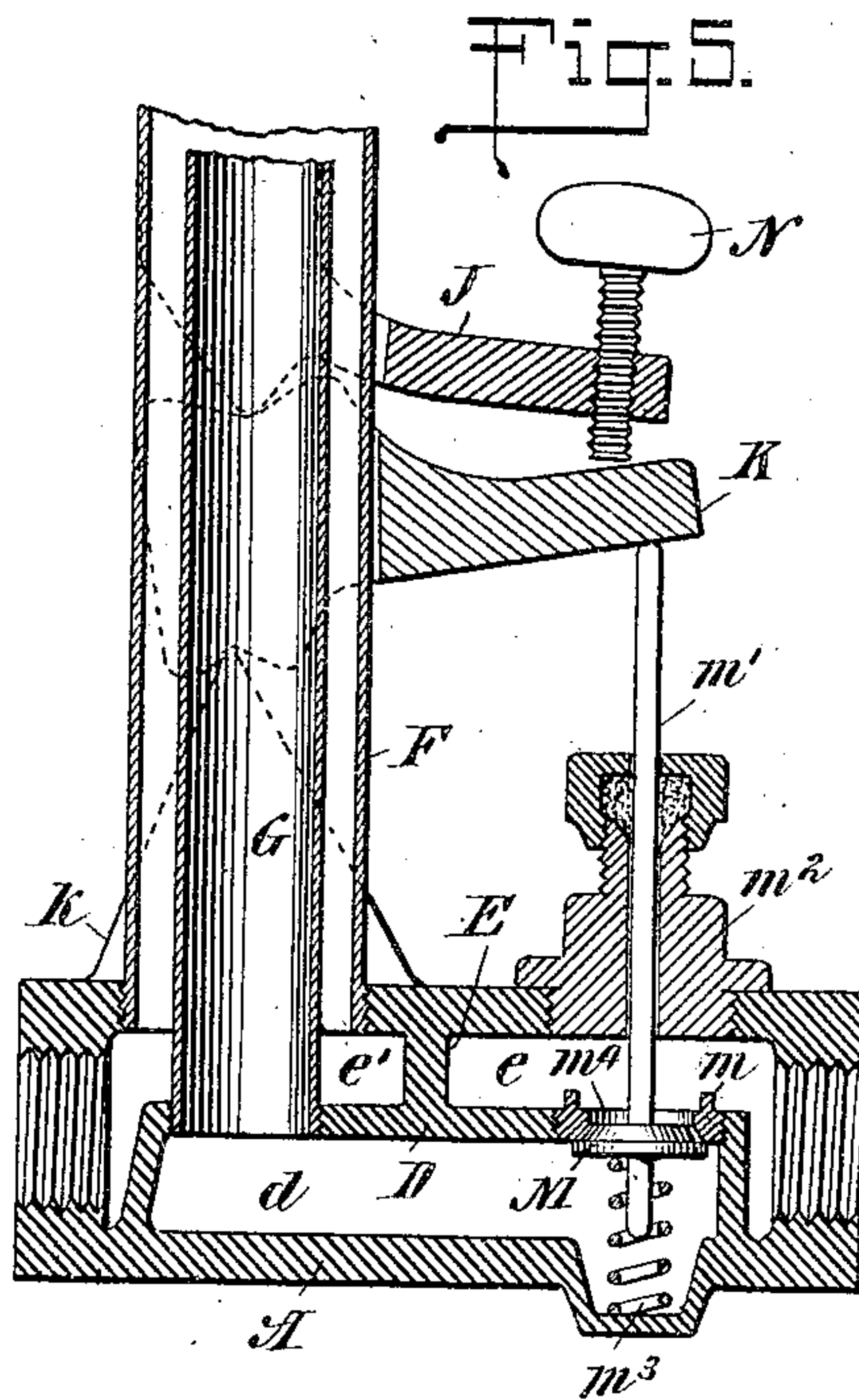
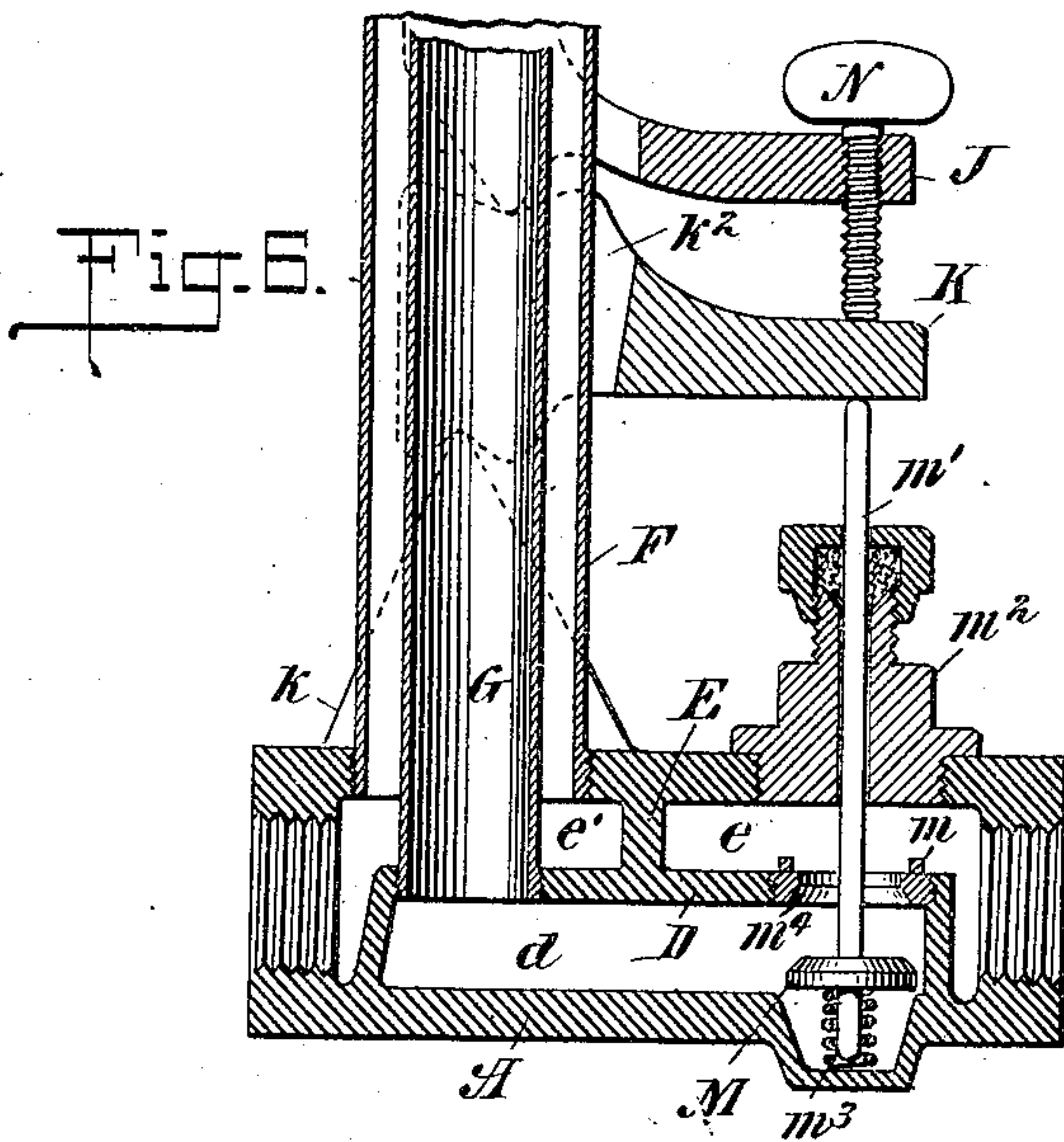
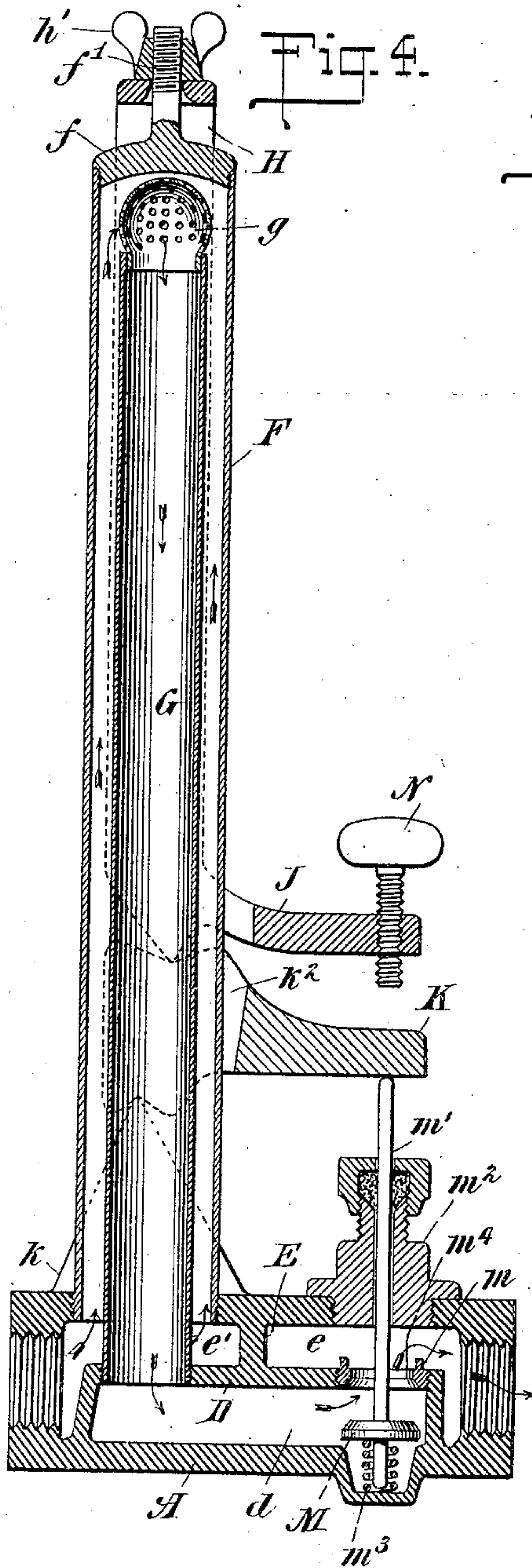
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2 SHEETS—SHEET 2.



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STEAM-TRAP.

No. 879,997.

Specification of Letters Patent.

Patented Feb. 25, 1908.

Application filed March 7, 1907. Serial No. 361,125.

To all whom it may concern:

Be it known that I, DANIEL ARTHUR, a citizen of the United States, and a resident of New York, borough of Brooklyn, in the county of Kings and State of New York, have made and invented certain new and useful Improvements in Steam-Traps, of which the following is a specification.

My invention relates to an improvement in traps for use in a system or line of steam pipes for draining therefrom the water of condensation, and particularly in steam heating systems, and is what I have termed a "contraction trap," in contradistinction to an expansion trap used for like purposes, in that in the latter the expansive force of a metal tube or rod is employed for opening a valve to discharge the water of condensation, and the contraction of said rod or pipe to close the valve, while in my improved device the contraction of the expansible member is utilized to open the valve for the discharge of the water of condensation, and the expansion of said member to close said valve.

The object of the invention is to provide a device for this purpose which shall be simple in construction, effective and certain in its operations, and the parts so arranged that they may be easily and readily assembled or taken apart.

With these and other ends in view, the invention consists in certain novel features of construction and combinations of parts, as will be hereinafter fully described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in side elevation of my improved trap. Fig. 2 is a rear view of the same. Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1, looking in the direction of the arrow. Fig. 4 is a vertical sectional view showing the valve in its open position. Fig. 5 is a sectional view of a part of the trap showing the valve in its closed position. Fig. 6 is a similar view showing the parts so adjusted as to retain the valve in its open position.

Referring to the drawings, A represents a box or casing having formed thereon or secured thereto the wedge-shaped supports *k*, and which casing is threaded at one end to receive the inlet pipe B, and at the opposite end threaded to receive the outlet or discharge pipe C. This box or casing is divided longitudinally by the wall or partition D into a lower compartment *d* and an upper com-

partment, the latter being sub-divided by the wall or partition E into the compartments *e*, *e'*.

In the casing A is threaded the lower end of the pipe F, formed of expansible metal, preferably brass or iron, the upper end thereof being closed by means of the cap or plug *f* provided with the vertical stem *f'*. Within this pipe F is located the pipe G, the lower end thereof being threaded or otherwise secured in the horizontal wall or partition D. The upper end thereof, which extends within a short distance of the cap or plug *f*, is provided with a strainer *g*, this pipe or tube G being preferably made of thin iron, and is employed for the purpose of directing the inflow of steam or water of condensation from the inlet pipe B through the compartment *e'*, and up through the entire length of the expansible tube F, prior to its discharge into the compartment *d* and out through the outlet pipe as hereinafter described, and as indicated by the several arrows. On the upper extreme ends of the wedge-shaped brackets or supports *k* rests the lever K, bifurcated to form the two arms *k'*, *k''*, each of which arms is formed on its lower edge and near the rear end with a recess *k'''* to receive the point of the wedge-shaped support *k*.

In the horizontal partition D is formed an opening *m*⁴ leading from the compartment *d* into the compartment *e*, and provided with the valve seat *m*, against which, when in its raised position, seats the valve M secured to the valve stem *m'*, the latter passing up through the bonnet *m*² threaded in an opening formed in the casing A, and supporting on its upper end the forward end of the lever K. Around the lower end of the stem *m'* is coiled a spring *m*³, one end of which bears against the bottom of a recess formed in the casing, and the other end against the valve M, the function of said spring being to assist in raising said valve and holding the latter tightly against its seat *m*.

From the above description, it will be seen that when the valve is in its lowered position, as illustrated in Figs. 4 and 6, the water of condensation will flow up into the expansible pipe F, down through the pipe G, into the compartment *d*, through the opening *m*⁴ into the compartment *e*, and out through the discharge pipe C. When, however, the valve is in its raised or closed position, as illustrated in Fig. 5, the trap is closed and the passage of steam through it prevented.

On the upper end of the expansible member F is mounted a yoke, consisting of the two arms H, I, connected at the top by the cross piece h , through an opening in which passes the vertical stem f' formed on or secured to the cap f , and is held thereon by means of the adjusting nut h' , the lower ends of said yoke converging into the outwardly extending arm J, the extreme lower ends of said arms H, I, being pointed or wedge-shaped and adapted to bear on the upper edges of the arms k' , k^2 of the lever K, and at points forward of those at which the upper ends of the supports k contact with the lower edges of said arm.

By means of this construction it will be seen that when a downward pressure of the arms H, I, is exerted on the arms k' , k^2 of the lever K, the forward end of the latter will be lowered, said lever being fulcrumed on the upper ends of the supports k and the pressure exerted thereon at points forward of said fulcrum, the length of the lever being the distance between the vertical planes in which the upper pointed ends of the supports k and lower pointed ends of the arms H, I, lie. This leverage may be increased or diminished as desired, it being desirable when the trap is used in high pressure systems, to increase it in order to render the same more powerful.

As the steam condenses in the system in which the trap is employed, it passes into the latter through the inlet pipe B, up through the expansible member or pipe F, down through the pipe G, and into the compartment d . As this water of condensation passes through the expansible member F, the latter is cooled, and by reason of the resulting contraction thereof, the arms H, I, exert a downward pressure on the lever K, the forward end of which latter resting, as before described, on the upper end of the valve stem m' , forcing the latter downwardly, thereby lowering the valve M from its seat m and permitting the water of condensation to flow from the compartment d through the opening m^4 into the compartment e , and out through the outlet pipe.

After the trap has discharged the water of condensation, the steam entering the pipe F expands the same, thereby raising or lifting the arms H, I, relieving the pressure thereof on the lever K. The steam passing down through the pipe G into the compartment d , raises the valve M against its seat m^4 , assisted

by the coiled springs m^3 , and closing the trap against the egress or outlet of the steam, the forward end of the lever K resting on the valve stem, being raised as illustrated in Fig. 5. If, however, it is desired to allow the steam to flow through the trap, the lever K may be lowered by means of the screw N, threaded in the arm J and turned down thereon, as illustrated in Fig. 6.

It will be evident from the foregoing that my improved trap is exceedingly simple in construction, comprises but few parts which are readily assembled or taken apart, and that the same is capable of performing its functions in whatever position it may be employed. Furthermore, it will be evident that all the working parts of the trap may be taken down while the steam is exerting its pressure on the valve, whereas in the ordinary type of expansion trap, such would be impossible, as the pressure of steam would open the trap immediately upon the parts being loosened up.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a trap of the character described, the combination with a valve casing, of a valve seated therein and having an outwardly extending stem, a movable member supported on said casing and bearing on said stem, means for automatically moving said member whereby the valve will be opened, and means carried by said first mentioned means for manually moving the same, substantially as described.

2. In a trap of the character described, the combination with a valve casing, of a valve seated therein and having an outwardly extending stem, a lever supported on said casing and bearing on said stem, an expansible member secured to said casing, means secured to said member and engaging said lever whereby the contraction of said member will move said lever to open the valve, and manually operated means carried by said first mentioned means whereby the lever may be moved, substantially as described.

Signed at New York, borough of Manhattan, in the county of New York, and State of New York, this 5th day of March, A. D. 1907.

DANIEL ARTHUR.

Witnesses:

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JOHN B. WHITE.