

S. M. FULTON.
 Device for Supplying Feed-Water to Boilers.
 No. 216,173. Patented June 3, 1879.

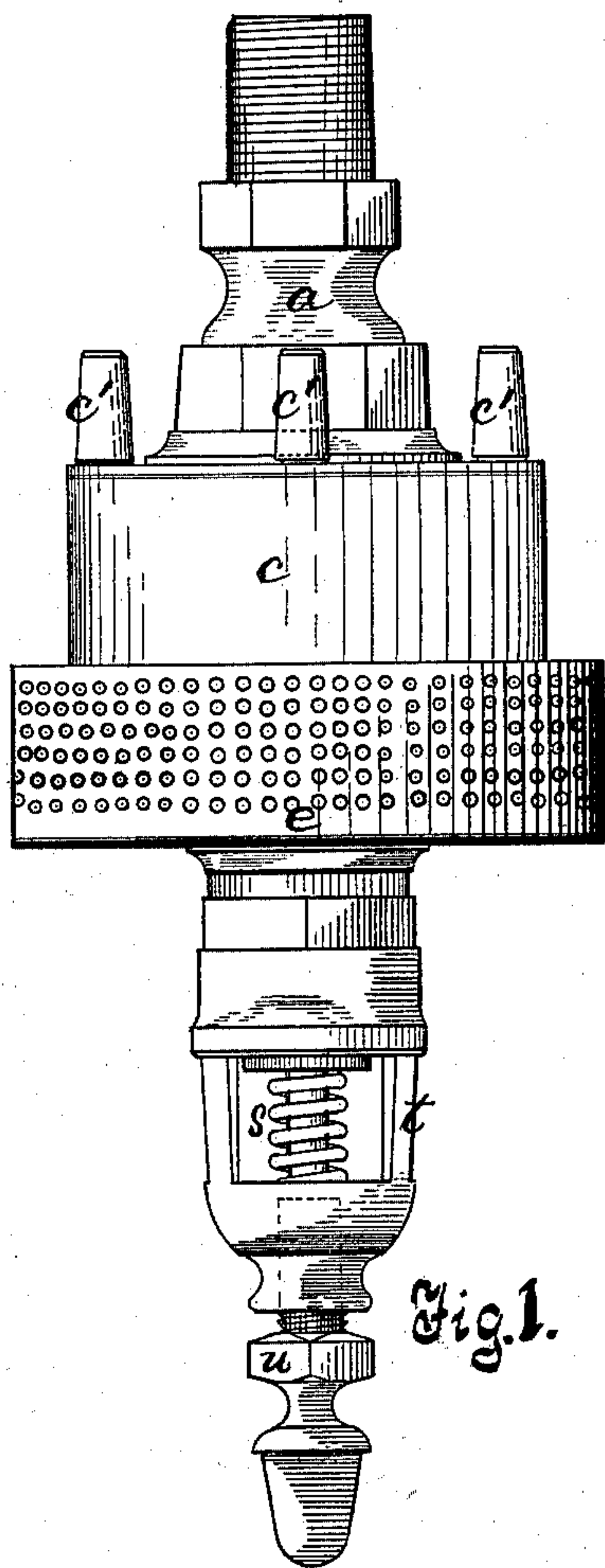


Fig. 1.

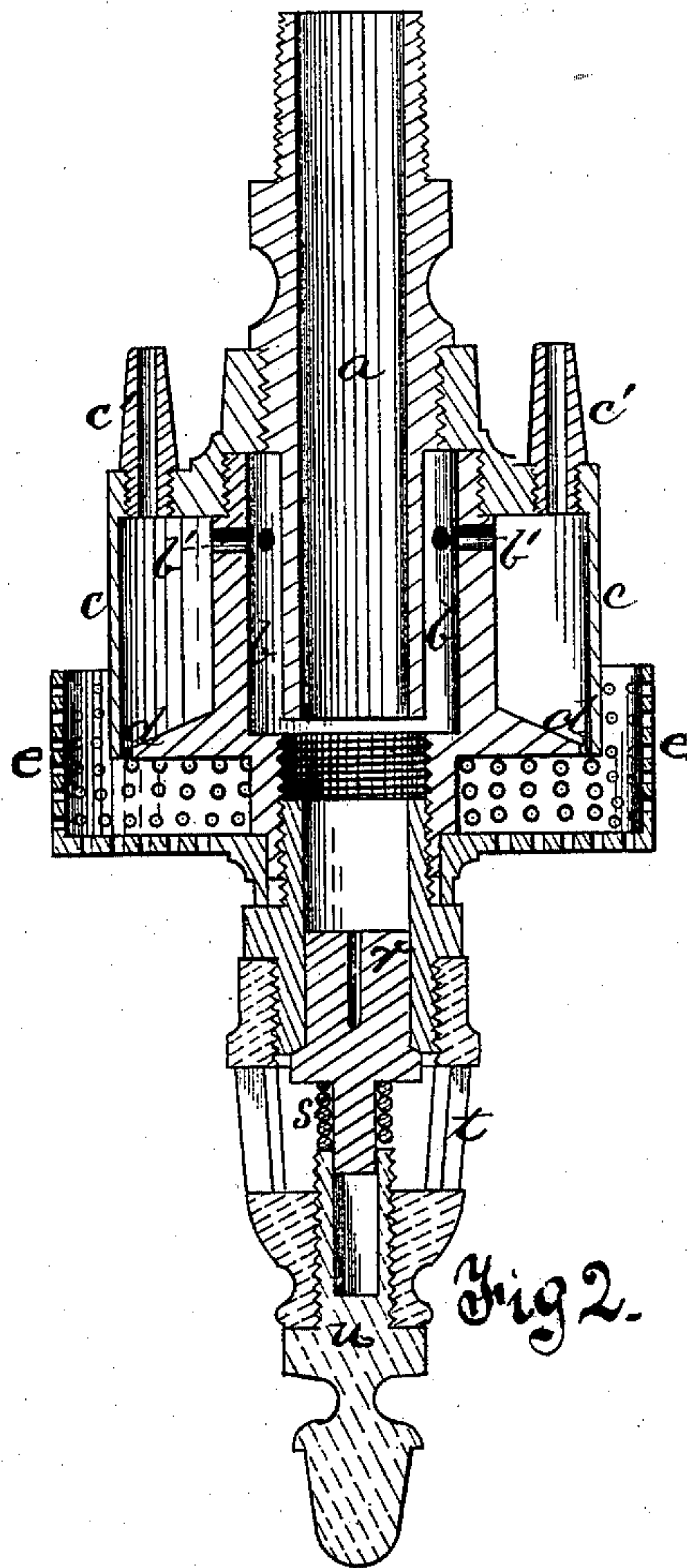


Fig. 2.

Witnesses.

R. C. Wenshale
 J. W. Smith.

Inventor.

Samuel M. Fulton
 by Bakerell & Kerr
 Attys

UNITED STATES PATENT OFFICE.

SAMUEL M. FULTON, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN DEVICES FOR SUPPLYING FEED-WATER TO BOILERS.

Specification forming part of Letters Patent No. **216,173**, dated June 3, 1879; application filed March 3, 1879.

To all whom it may concern:

Be it known that I, SAMUEL M. FULTON, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Devices for Supplying Feed-Water to Boilers; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation, and Fig. 2 is a central section, of devices embodying my invention.

Like letters refer to like parts wherever they occur.

My invention relates to the construction of that class of feed-water devices by means of which the feed-water is delivered in a sheet or film, a spray, or in a like finely-divided state; and it consists, first, in combining with feed-water devices a relief-valve, which will prevent the clogging of the devices by any foreign substances contained in the feed-water; and, secondly, in combining with the relief-valve a regulating-screw, or equivalent means, whereby the valve may be set to operate at any desired pressure.

In the class of feed-water devices specified the delivery ports or orifices are necessarily more or less contracted, and much difficulty will at times arise from the clogging or closing of said orifices by small bits of stick, straw, coke, and like substances contained in the feed-water. When such obstruction occurs the feed-water devices become inoperative in a measure, if not entirely, and to avoid danger the boiler must be allowed to cool, in order that the feed-water devices may be reached and the foreign substances removed. To remove such objectionable substances from the feed-water screens have been employed; but this only in a measure accomplishes the object, as many of the substances which would accumulate in and choke up the feed-water devices, owing to either size or shape, readily pass the screens.

The object of the present invention is therefore to provide a means for relieving the feed-water devices when, as will more or less frequently happen, they become choked.

I will now proceed to describe my invention, so that others skilled in the art to which it appertains may apply the same.

In the drawings, *a* indicates the tube or pipe into which the supply-pipe opens, or to which the supply-pipe is connected, said pipe extending into a chamber, *b*, perforated above, as at *b'*, thereby forming a trap or water-seal. Surrounding the chamber *b* is a hood perforated above, and provided with jet-tubes *c'*, the lower edge of the hood and chamber *b* being so constructed as to form an annular discharge-orifice, *d*. The hood *c* dips within the perforated cup or delivery-box *e*.

To the extent specified the devices may be those described in Letters Patent No. 202,535, granted to me on 16th April, 1878, (to which reference is made for a more full and specific description,) or they may be of any of the several well-known devices used for supplying the feed-water in a spray or thin film or sheet.

At a suitable point—as, for instance in the bottom of chamber *b*—I place a valve, *r*, opening outward, so as to be operated by any excessive pressure in the feed-water, and of such size as to permit the free escape of any and all foreign substances which could possibly be brought in by the feed-water. This relief-valve *r* is provided with a suitable cage, *t*, and a spring, *s*, the spring being of such strength as to counteract the ordinary pressure of the feed-water supply, so that under usual conditions the valve *r* will be held upon its seat and close the chamber *b*, or its equivalent.

The strength of spring *s* will, of course, vary according to the varying pressures at which the feed-water is supplied to different boilers; but in order to allow some latitude for adjustment, and also to provide for adjustment necessitated by loss of power in the spring, I provide a set-screw, *u*, or equivalent means for compressing the spring *s* as required.

The operation of the devices will be as follows: When, from the accumulation of foreign substances, the deposit of mud, or from other cause, the fine delivery-orifices of the feeder become clogged or obstructed, the extra pressure brought on valve *r* forces the same off its seat, and permits the obstruction to escape from the feed-water devices, after which the

spring s forces the valve back upon its seat, and the feed-water will be delivered in the usual manner by the delivery-orifices.

The advantages of my invention are the automatic manner in which the feed-water devices clear themselves of obstruction and the consequent impossibility of their becoming inoperative.

The relief-valve may be readily applied to other construction of feeders; and I do not expect or intend to be limited, because I have for the purposes of this specification shown it in connection with devices heretofore patented by me.

Having thus set forth the nature and advantages of my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with a feed-water device of the class specified, which delivers the water in a spray, film, or finely-divided state, of the relief-valve, substantially as and for the purpose specified.

2. The combination, with a feed-water device of the class specified, which delivers the water in a spray, film, or finely-divided state, of the relief-valve having the regulating-screw, substantially as and for the purpose specified.

In testimony whereof I, the said SAMUEL M. FULTON, have hereunto set my hand.

SAMUEL M. FULTON.

Witnesses:

R. H. WHITTLESEY,

F. W. RITTER, Jr.