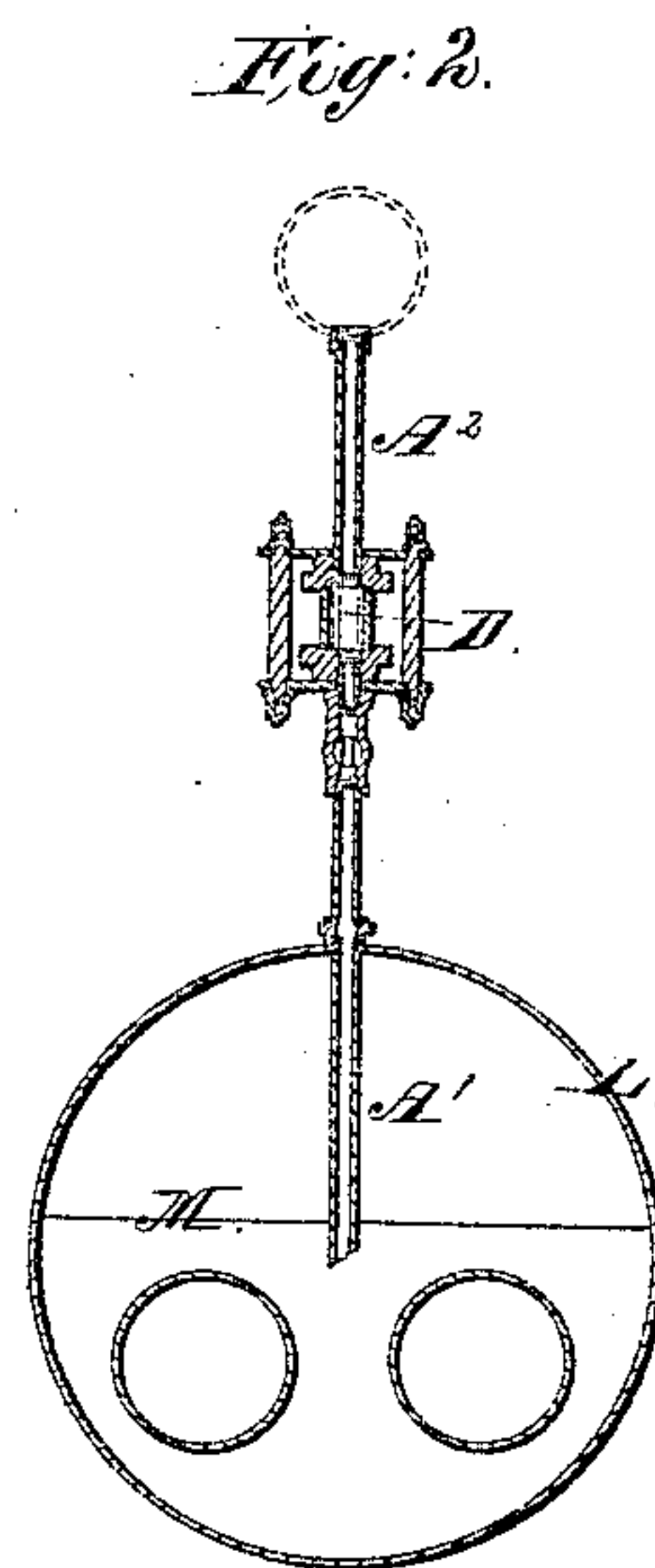
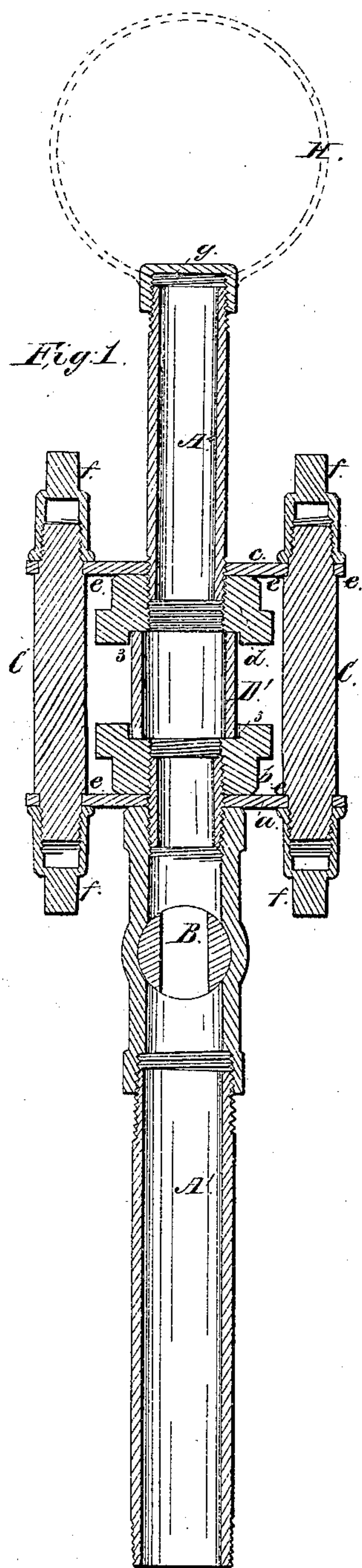


*J. Ashcroft,
Steam Safety Valve.*

N^o 27,508.

Patented Mar. 20, 1860.



Witnesses:

*Wm. R. Rouch
J. C. Deschamps*

Inventor:

John Ashcroft

UNITED STATES PATENT OFFICE.

JOHN ASHCROFT, OF LYNN, MASSACHUSETTS.

LOW-WATER SAFETY APPARATUS FOR STEAM-BOILERS.

Specification of Letters Patent No. 27,508, dated March 20, 1860.

To all whom it may concern:

Be it known that I, JOHN ASHCROFT, of Lynn, in the county of Essex and State of Massachusetts, have invented an Improved Fusible Metal Safety-Tube for Steam-Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which is represented a vertical section through my improved safety tube.

Figure 1 is a section through my improved safety tube and the parts immediately connected therewith. Fig. 2 is a section through the same upon a reduced scale showing the manner in which it is applied to the boiler.

I am aware that a plug or disk made of a fusible alloy has been used to close an opening in a pipe so connected with a steam boiler, that when the water in the boiler falls to a level below which it would be unsafe for it to go, the steam is admitted into contact with the fusible plug or disk and by melting it opens a passage for the steam and relieves the pressure in the boiler, but such plug or disk is liable to be coated by sediment deposited from the water which is in contact with it, as there is no circulation of water over the surface of the metal and when so coated the plug or disk will not be so readily acted on by the steam admitted to it, and should the pipe below the plug become closed by an accumulation of sediment the steam will not be brought into contact with the fusible plug on the descent of the water in the boiler.

My present invention consists in the employment for this purpose of a tube or pipe of fusible alloy which is introduced into the length of, and forms part of the pipe which is connected with the boiler, so that the water from the boiler may circulate over its interior surface and prevent the incrustation of the metal. And should the pipe beneath the tube at any time be closed by sediment or other obstruction the cooling of the water or vapors above the fusible tube will throw the pressure within the boiler upon the obstruction which will thus be instantly removed. The fusible tube thus becomes self clearing of any matter or obstruction that could be interposed between it and the stream.

That others skilled in the art may understand and use my invention I will proceed

to describe the manner in which I have carried it out.

In the said drawings A', A² is a vertical pipe which is connected with the boiler at the proper level. As seen in Fig. 2 the pipe entering the boiler L and descending about three inches below the water line M. This pipe is furnished with a stop cock B, for the purpose of shutting off the steam when the apparatus is to be examined, cleansed or repaired, and is divided into two portions A' and A² which are connected together in the following manner—An oval plate *a* is screwed over the end of the portion A' and over this is screwed a nut *b*, which is turned out or recessed at 3. The portion A² is in like manner furnished with a similar plate *c*, and nut *d*. The two plates *a* and *c*, are connected together by two pillars C one on each side which pass through holes in the plates and have cap nuts *f*, which screw over the ends of the pillars. Each pillar has a shoulder at *e*, on which the plates rest when the nuts *f*, are screwed down onto the plates.

A short section of fusible alloy tube D, is introduced between the nuts *b*, and *d*, the ends of this tube resting in the recess 3, in each nut. The tube D, is placed in position before the portion A² of the pipe is put on, the nuts *f*, are then screwed up tight and the whole apparatus is held firmly together. A hollow ball or air reservoir, H may be attached at *g* to the upper end of the pipe A' A², as shown in red.

When in operation the water from the boiler rises in the pipe A' A², and fills it, as well as the ball H, when this is used. The circulation through this pipe is however so imperfect as to maintain the water within it at a very low temperature compared with that of the water in the boiler, and this is particularly the case where the conducting surface is increased by the use of the ball H, or where a considerable length of pipe intervenes between the boiler and the fusible tube. Should the water in the boiler fall below the level of the lower end of the pipe A' A² the latter is instantly emptied of water and filled with steam which then comes in contact with the fusible tube D, and having the full temperature of the water in the boiler melts it off and allows the steam to escape.

It is evident that there are other methods by which my invention may be carried out,

for example the fusible tube may be square or polygonal—or it may be replaced by a short metallic box in one or more sides of which is placed a plate of fusible metal. In every case however there should be a passage through or past the fusible metal, that the surface of the latter may be kept free by circulation of the water and the pipes beneath it kept free by the pressure within the boiler.

The whole of the connection between the two portions of the pipe A' , A^2 , may be inclosed in a casing so that the steam which escapes from the pipe A' when the tube D , has been melted off, may be employed to sound an alarm whistle or be conducted to

the furnace to extinguish the fire. The two plates a and c , may be made circular and be screwed into the opposite ends of a cylinder which will thus surround the connection and from which the steam may be led off.

What I claim as my invention and desire to secure by Letters Patent as an improvement in safety tubes for steam boilers, is—

A fusible tube D or its equivalent, arranged in a pipe communicating with the boiler as set forth for the purpose described.

JOHN ASHCROFT.

Witnesses:

THOS. R. ROACH,

P. E. TESCHEMACHER.