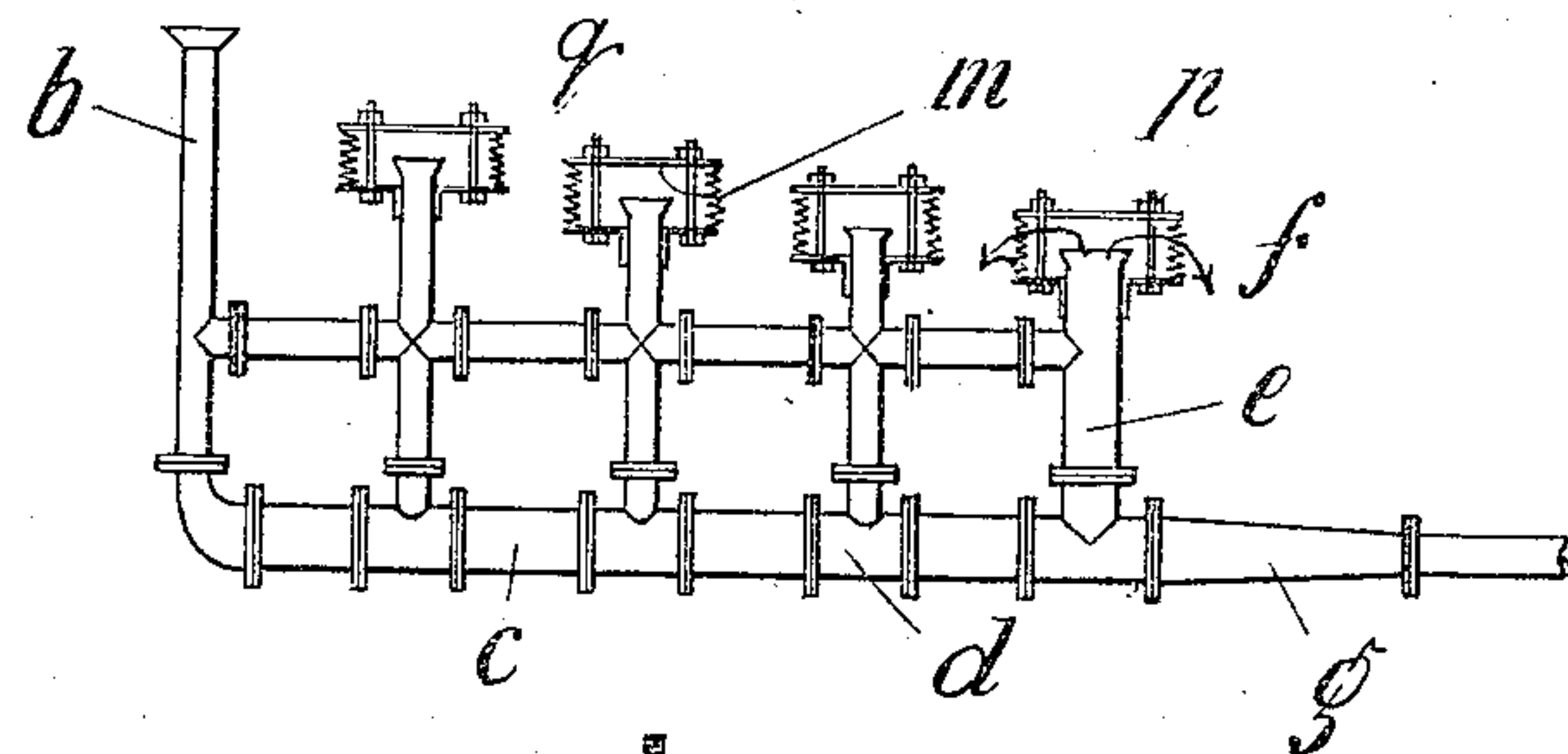
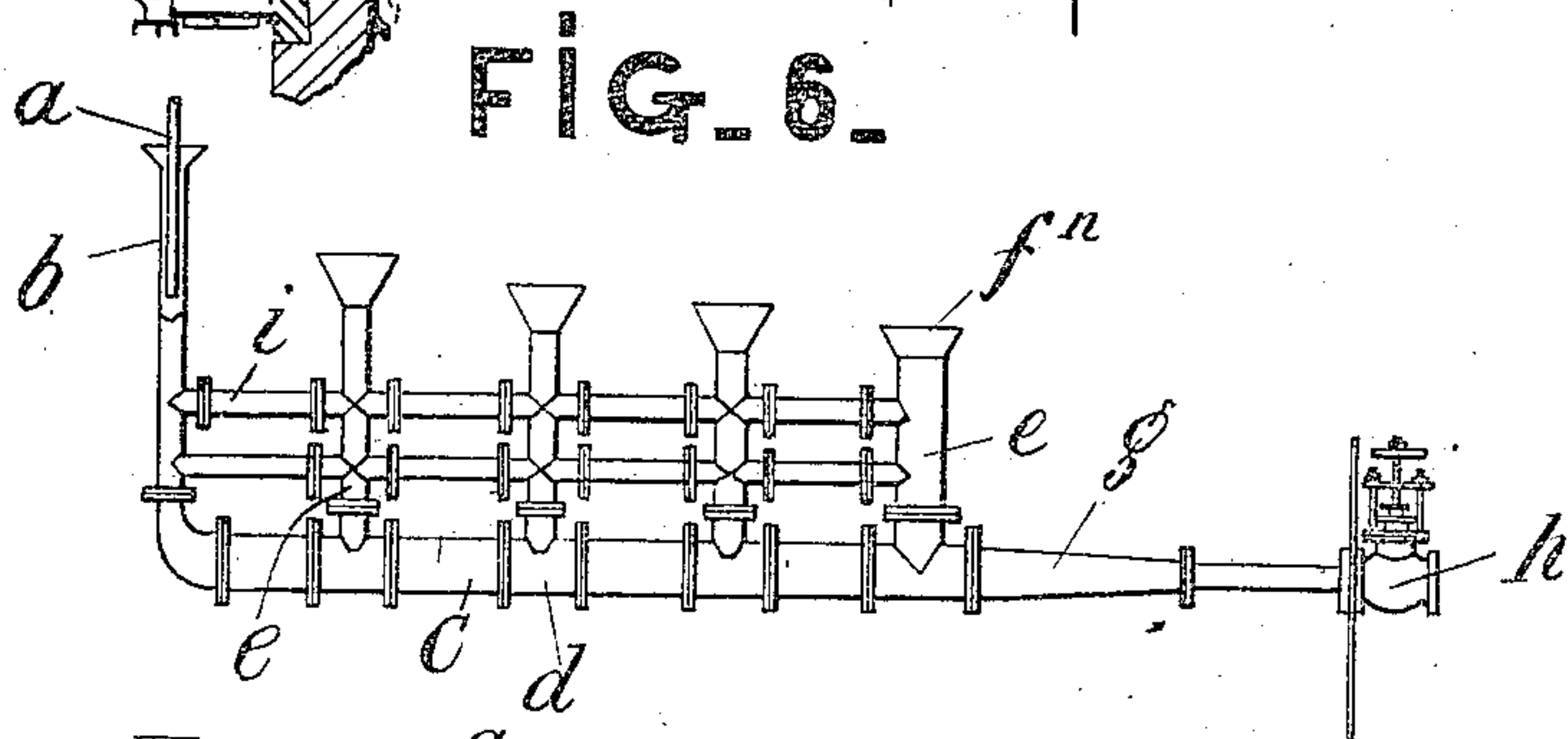
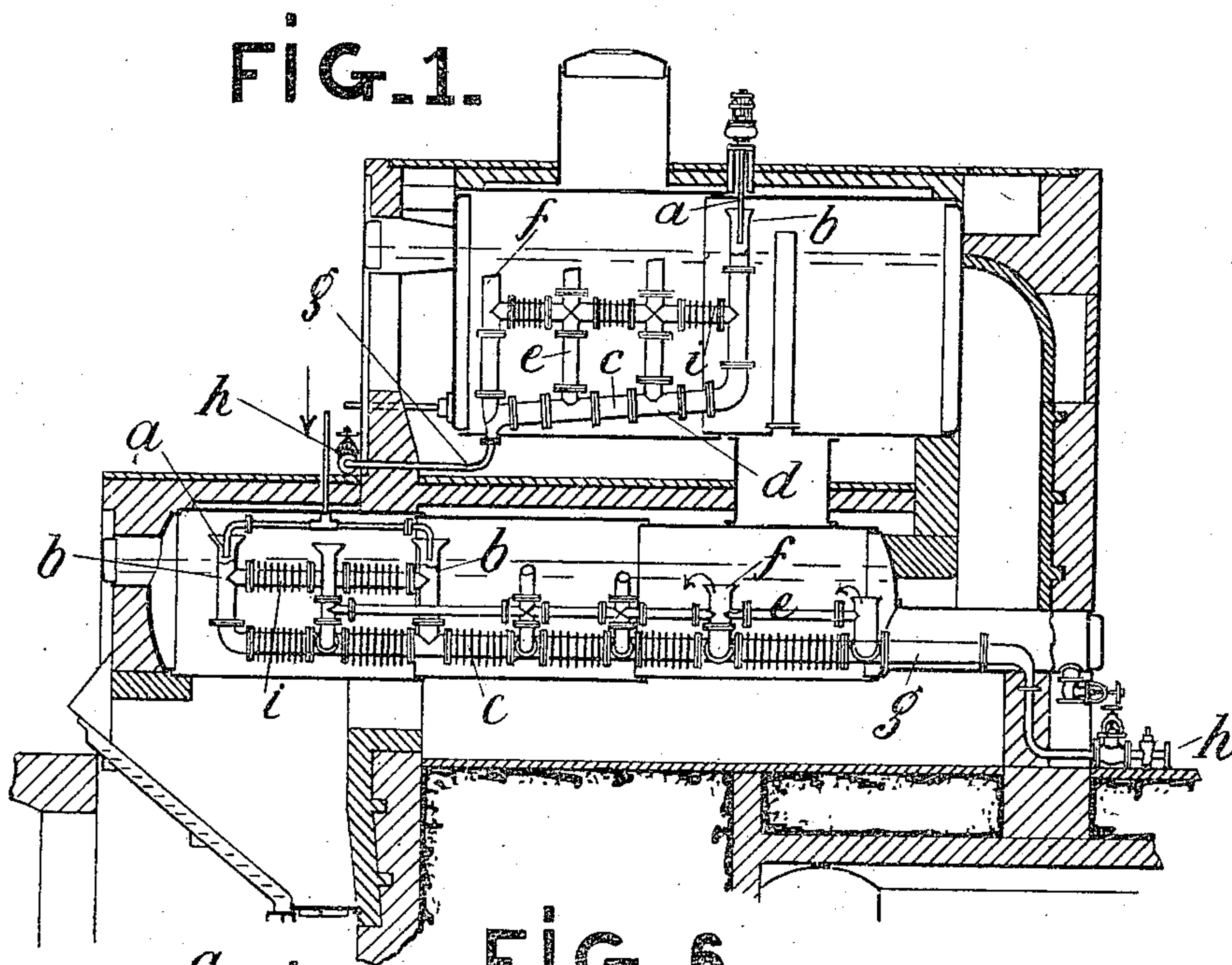


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FEED WATER PURIFIER FOR BOILERS.
APPLICATION FILED JULY 27, 1907.

961,060.

Patented June 7, 1910.

2 SHEETS—SHEET 1.



WITNESSES
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2 SHEETS—SHEET 2.

FIG. 2.

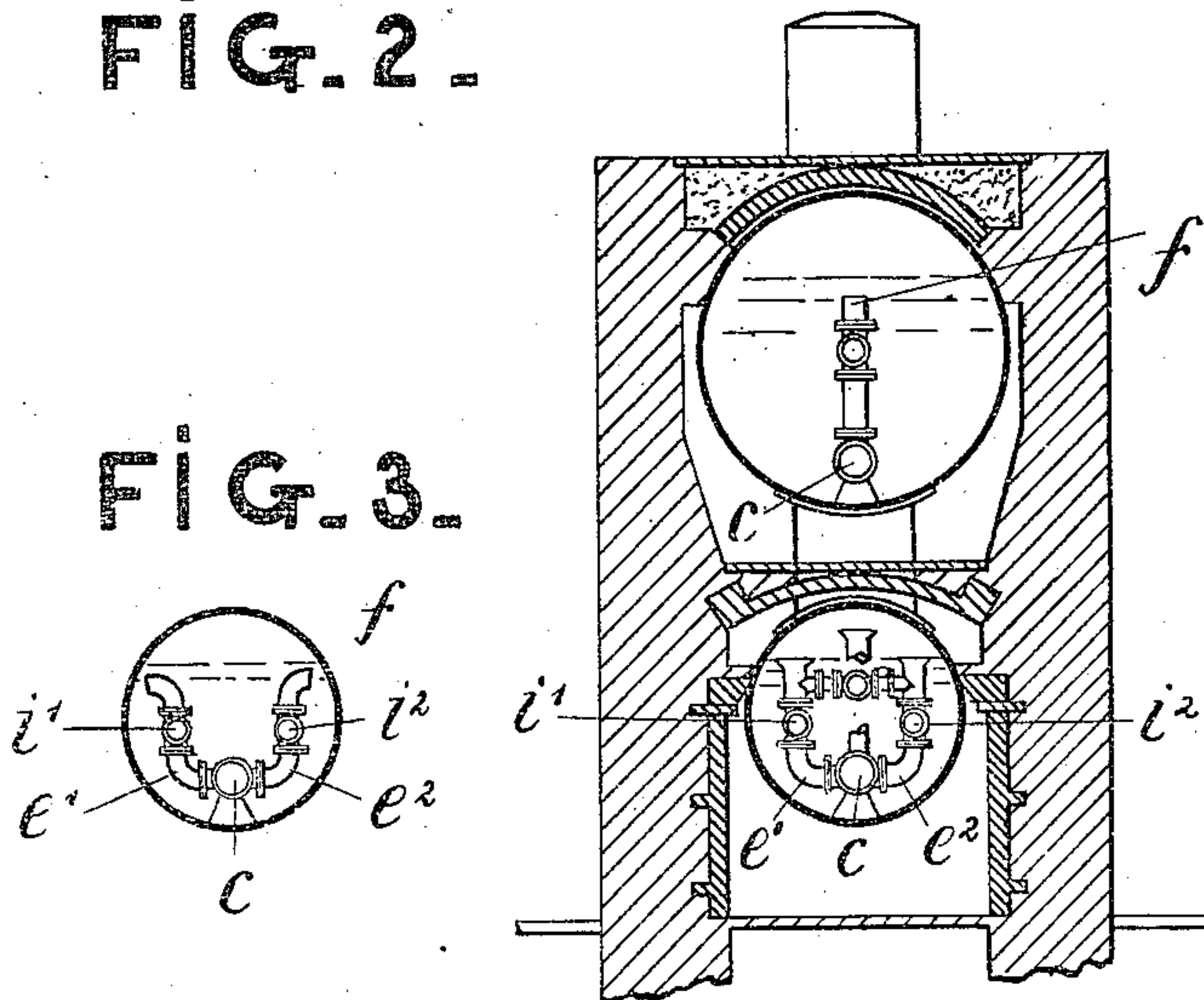


FIG. 3.

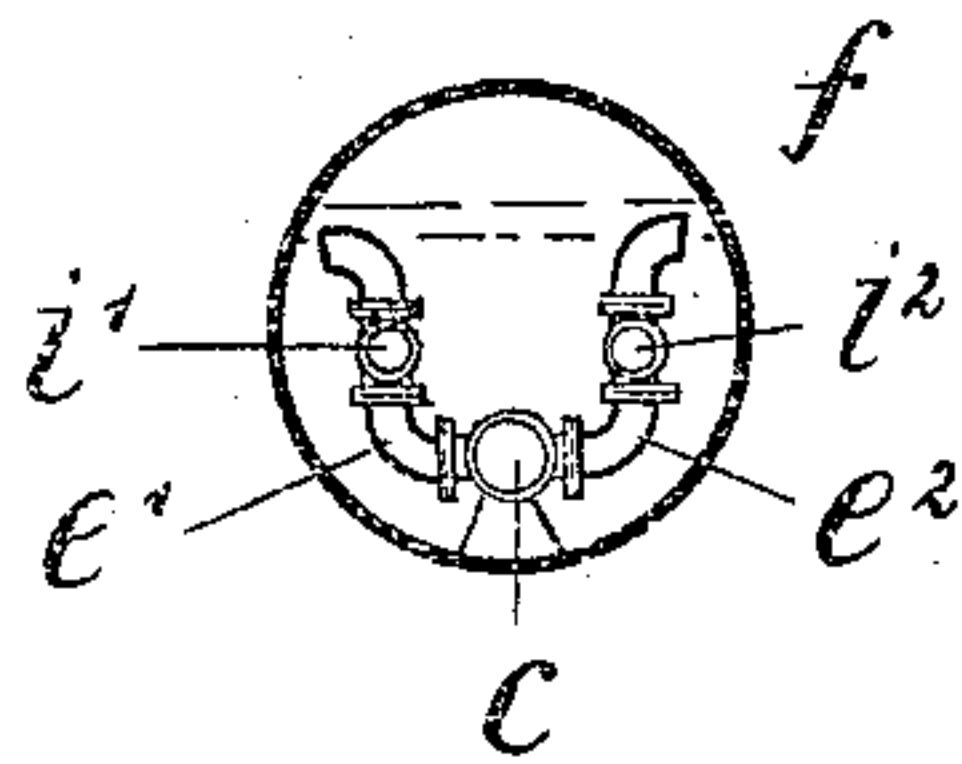


FIG. 8.

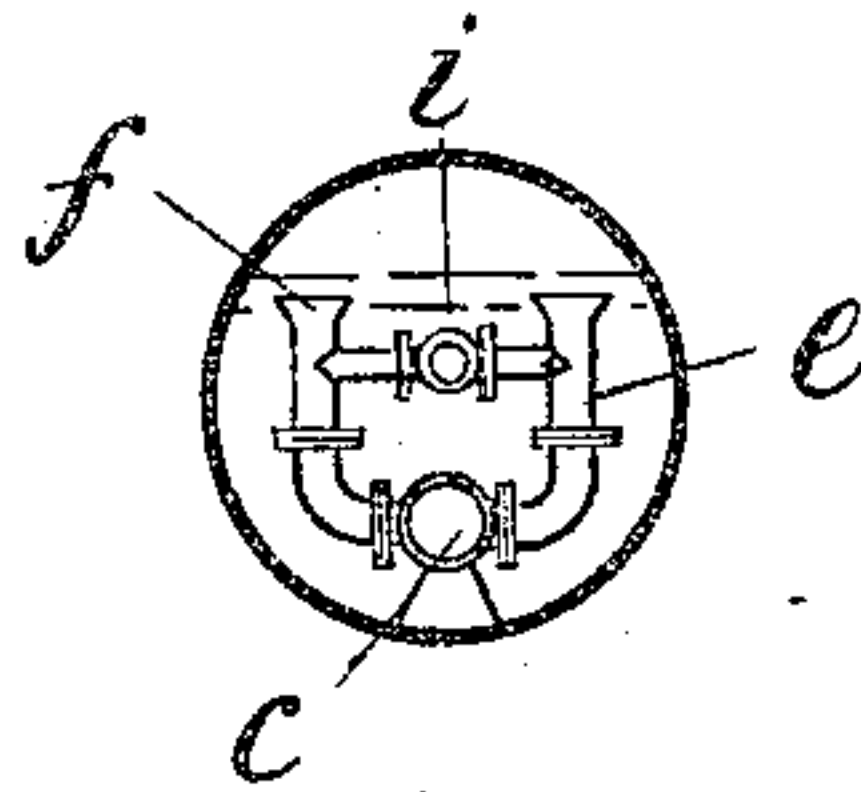


FIG. 5.

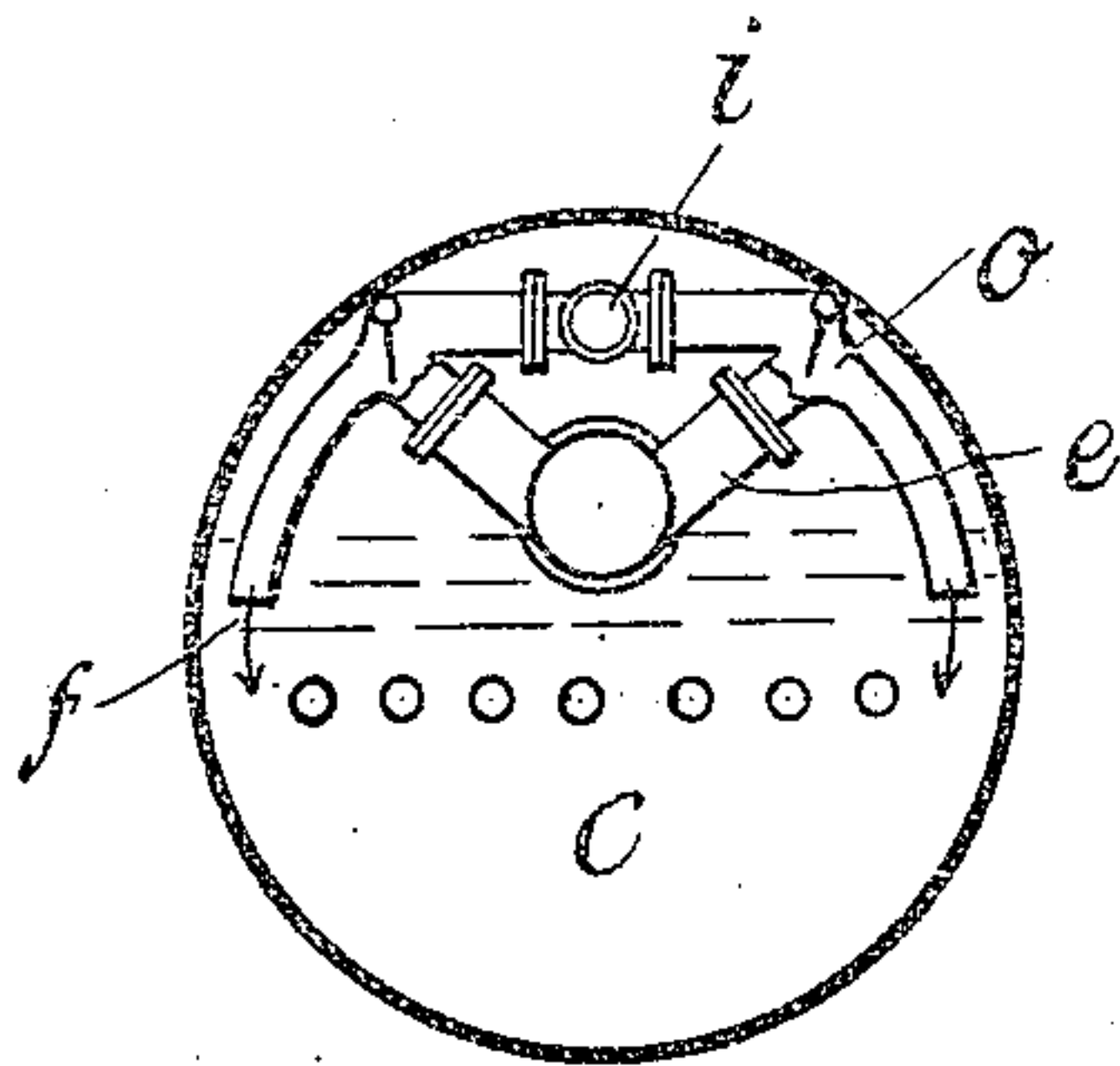
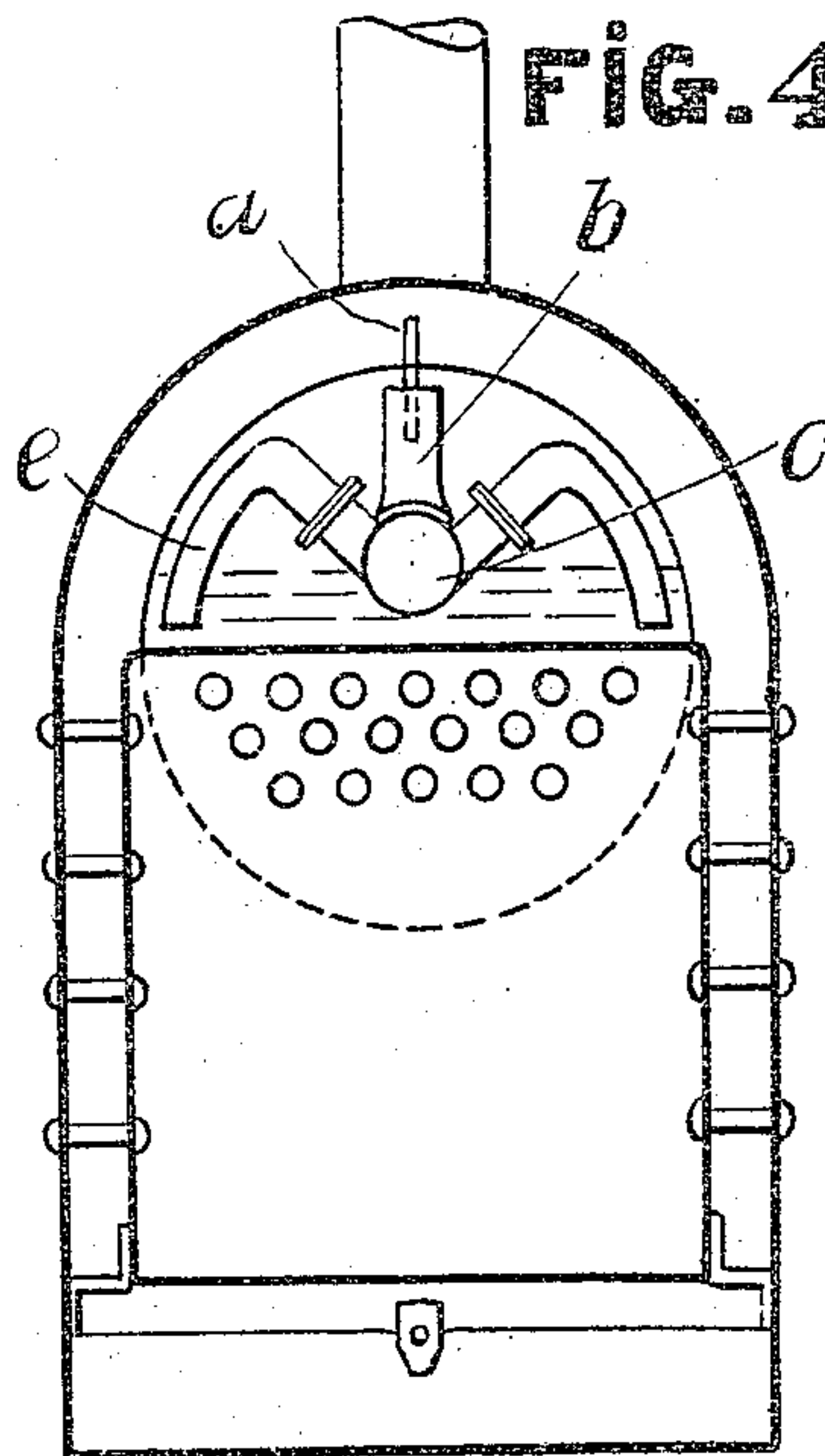


FIG. 4.



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FEED-WATER PURIFIER FOR BOILERS.

961,060.

Specification of Letters Patent.

Patented June 7, 1910.

Application filed July 27, 1907. Serial No. 385,880.

To all whom it may concern:

Be it known that I, IGNAZ ADLER, a citizen of the Kingdom of Hungary, and resident of Susine-Gjurgjenovac, district of Croatia, Kingdom of Hungary, have invented certain new and useful Improvements in Feed-Water Purifiers for Boilers, of which the following is a specification.

This invention relates to a device for the removal of contaminations or impurities forming scale, from boiler feed water, and consists in improvements in that class of apparatus in which a mud-collecting device, for example a cylinder provided with rising pipes is arranged within the interior of the boiler, the feed water being introduced into one of the rising pipes and discharged from the others into the boiler, and the mud blown off from the cylinder through a pipe which leads out of the boiler.

According to the present invention the outlet of the rising pipes is unobstructed and the width of the pipes and the outlets thereof are such that their clogging by mud is obviated owing to the velocity of the inflowing water at all points of its path. The feed water is introduced through a feed pipe which projects freely into one of the open rising pipes. If desired the water may be fed into several rising pipes simultaneously.

In the accompanying drawings several constructional forms are illustrated by way of example.

Figure 1 is a longitudinal section through a boiler with the invention installed; Fig. 2 is a transverse section through the same; Figs. 3, 4 and 5 are transverse sections through modifications; Figs. 6 and 7 are detail elevations of the invention; and Fig. 8 is a detail section through another embodiment.

The feed pipe *a* projects into the open upper end of the rising pipe *b* from which the feed water flows into the mud-collecting cylinder consisting of several members *c*. These members are connected with one another by sockets *d* from which the water, in the meantime heated to the boiler temperature, passes into the rising pipes *e* after having, in its course, deposited the mud in the members *c*. On leaving the openings *f* the heated and purified water flows into the boiler chamber. From the mud collecting members a pipe *g* leads to the blow-off cock *h*. If the latter be opened the mud collected in the sections is driven out in a known manner by the boiler

pressure without necessitating a stoppage of work.

When, for instance owing to the negligence of the attendant, the mud-collecting cylinder *c* becomes clogged, safety pipes *i* connect the rising pipes *b* and *e* in such manner that the feed water passes through the safety pipes *i* into the rising pipes so as to deposit the mud in the safety pipes and in their connections with the mud-cylinder. If also the safety pipes are clogged the feed water can still pass from the widened opening of the inlet pipe *b* into the boiler.

The various members or sections may have the form of ribbed pipes in order to increase the absorption of heat, as is shown for instance, in Fig. 1 for the safety pipes *i*.

According to the construction of the boiler the terminals of the rising pipes may be also directed downwardly, for inst. in locomotive or portable engine boilers, according to Fig. 4, thus extending into the water space in order to prevent priming, as owing to the fire tubes in this case no room is left for the arrangement of a system of pipes at such a low point as to prevent upwardly directed rising pipe terminals from projecting over the water level. According to the construction illustrated in Fig. 5 the rising pipe terminals are also brought back into the water chamber and accordingly, oblique rising pipes *e* are provided which in this case are connected to the safety pipes *i*. It is moreover preferable to so arrange the rising pipe terminals that the height of their outlets decreases with its distance from the water inlet so that the lowest terminal is as remote as possible from the same in order to cause the water which has traveled the longest path in the pipe system and which therefore is most efficiently heated and purified, to pass first into the boiler, whereby most of the mud collects in the members farthest from the water inlet. In the construction according to Fig. 6, this takes place in the member having the lowest outlet *fⁿ* which is the farthest away from the water inlet *a*. Moreover, it is preferable to widen the upper terminals of the rising pipes and to make them funnel shaped, as shown in Fig. 6, in order that the feed water, owing to the further retardation of the speed of its flow, caused thereby, is repeatedly forced to deposit mud.

In Figs. 1 and 2 is shown a double steam chamber generator, having different areas.

The upper smaller portion is equipped with the invention as above described, while the device in lower portion possesses in addition thereto further features found to be
 5 advantageous in generators of larger area. Here, as shown, in order to more generally distribute the inflowing feed water and thus facilitate its settling and equable heating, the feed water inlet pipe is divided into a
 10 plurality of branches before discharging into the pipes *b*, and the rising pipes *b* and *e* are duplicated by branching off to each side as viewed longitudinally of the boiler into two series of pipes *e*¹ and *e*². The rising
 15 pipes *e*¹ and *e*² of the branches being connected by safety pipes, *i*¹ on the one side and *i*² on the other.

As shown in Figs. 1, 2 and 3 the safety pipes extend longitudinally of the chamber
 20 connecting up the rising pipes of each series, although the safety pipes may extend transversely connecting the rising pipes of one series with those of the other. Here, as shown in Figs. 1 and 2 the feed water inlet
 25 pipe is branched off into plurality of sections before entering the plurality of pipes *b*.

Experiments have shown that the cylinder *c* is best cleaned during the blowing out of
 30 the mud if the boiler pressure acts only on that side (*b*) opposite the mud outlet. To this end the rising pipes *e* or the terminals *f* are provided with simple flaps *o* (Fig. 5), or plate valves *m* (Fig. 7) guided on bolts *p*
 35 and supported by springs *q* that hold the valve at a certain distance from the terminals and allow the water to pass from the pipe system into the boiler, but yield sufficiently to permit the valve to be closed by
 40 the boiler pressure when the mud outlet is open.

It may here be stated that several lengths of safety pipes can be arranged side by side or one above the other if desired.

45 I claim:

1. In a feed water purifier for boilers a

mud collecting cylinder consisting of tubular members with rising pipes opening freely into the water or steam space, one or more
 50 of the rising pipes also serving as water inlet, the cross sectional area of the said rising pipes and the outlet thereof being so dimensioned that the speed of flow of the feed water introduced is reduced in its pas-
 55 sage therethrough thereby assisting the deposition of the mud.

2. In a feed water purifier for boilers a mud collecting cylinder consisting of tubular members with rising pipes opening
 60 freely into the water or steam space, one or more of the rising pipes also serving as water inlet, safety pipes arranged in the pipe system of the mud collector and connecting the rising pipes with one another
 65 in order to safeguard the flow of water to the rising pipes in the event of clogging of the mud cylinder.

3. In a feed water purifier for boilers a mud collecting cylinder provided with branched rising pipes opening freely into
 70 the water or steam space, one or more of the rising pipe branches also serving as water inlet, branched feed pipes projecting into the open upper ends of the rising pipe
 75 branches and having a smaller diameter than each single rising pipe.

4. In a feed water purifier for boilers a mud collecting cylinder provided with a plurality of rising pipes opening freely into
 80 the water or steam space, rising pipes dividing into two branches, the branches forming two series, a safety pipe connecting the branches of the same series with one another, branched feed pipes of smaller diameter
 85 than the rising pipes and projecting into the open upper ends of the latter.

In witness whereof I have hereunto set my hand in presence of two witnesses.

IGNAZ ADLER.

Witnesses:

NEUFELD AMIN,

CHARLES EDWARD ZALMO.