

No. 724,815.

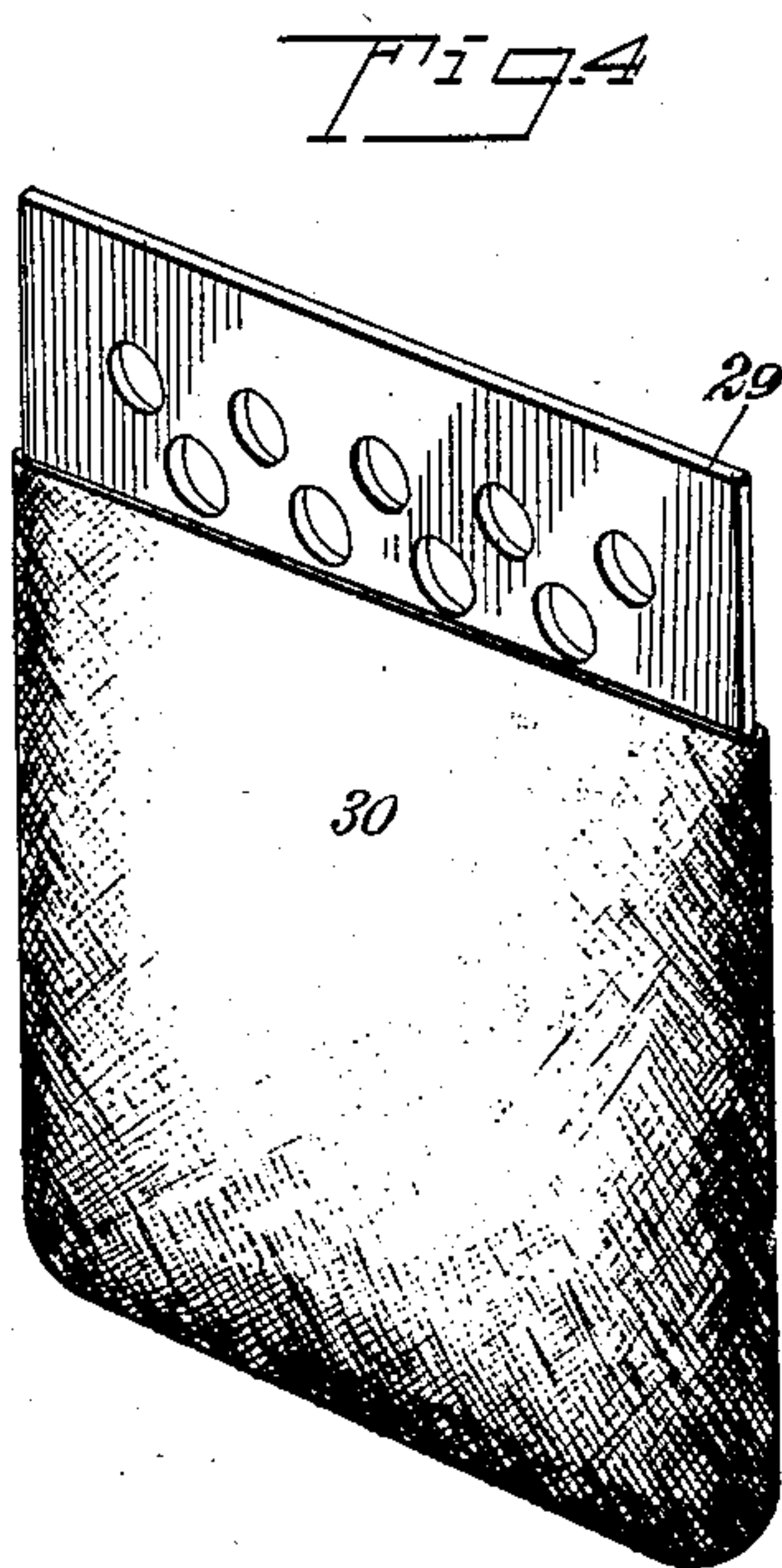
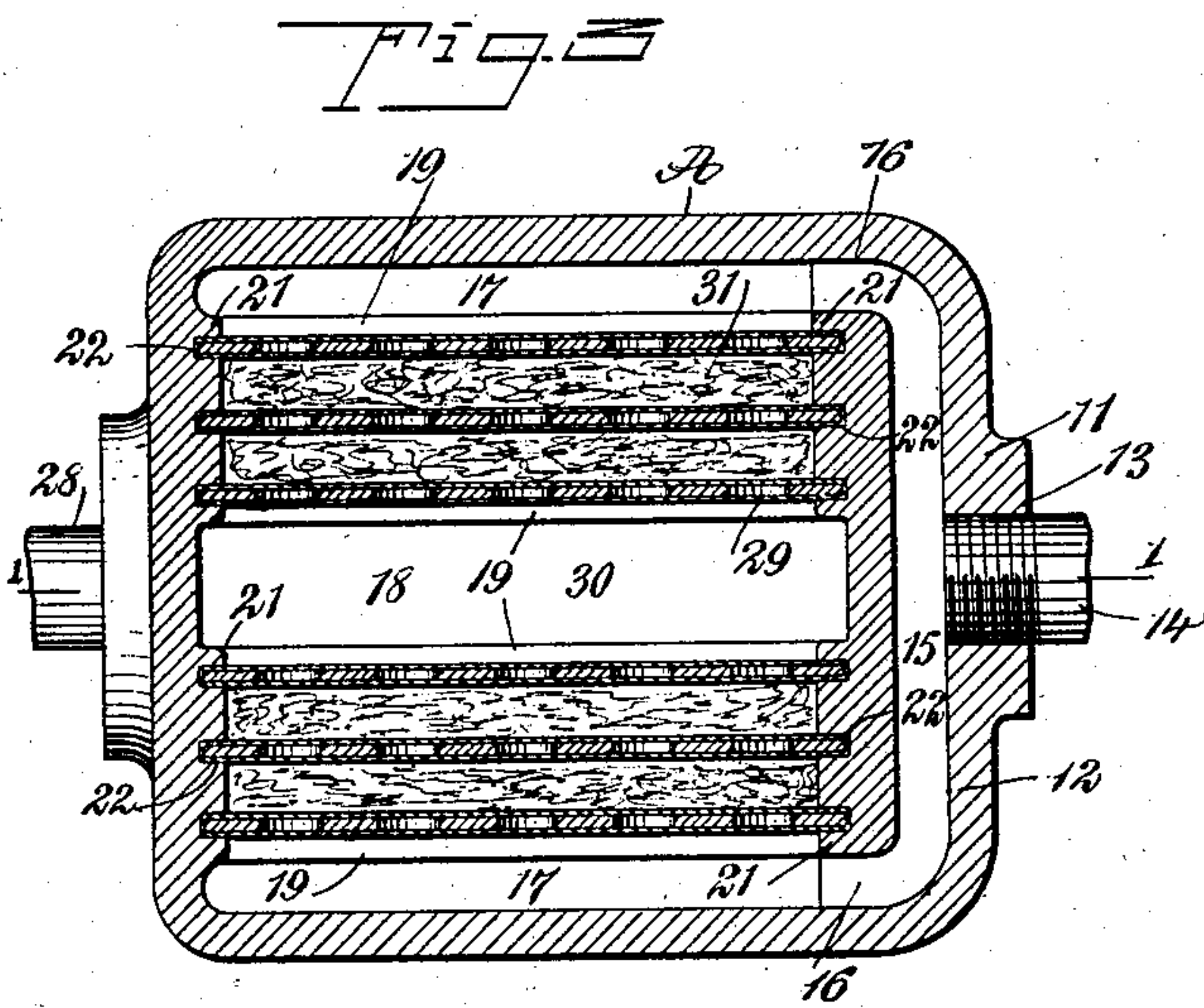
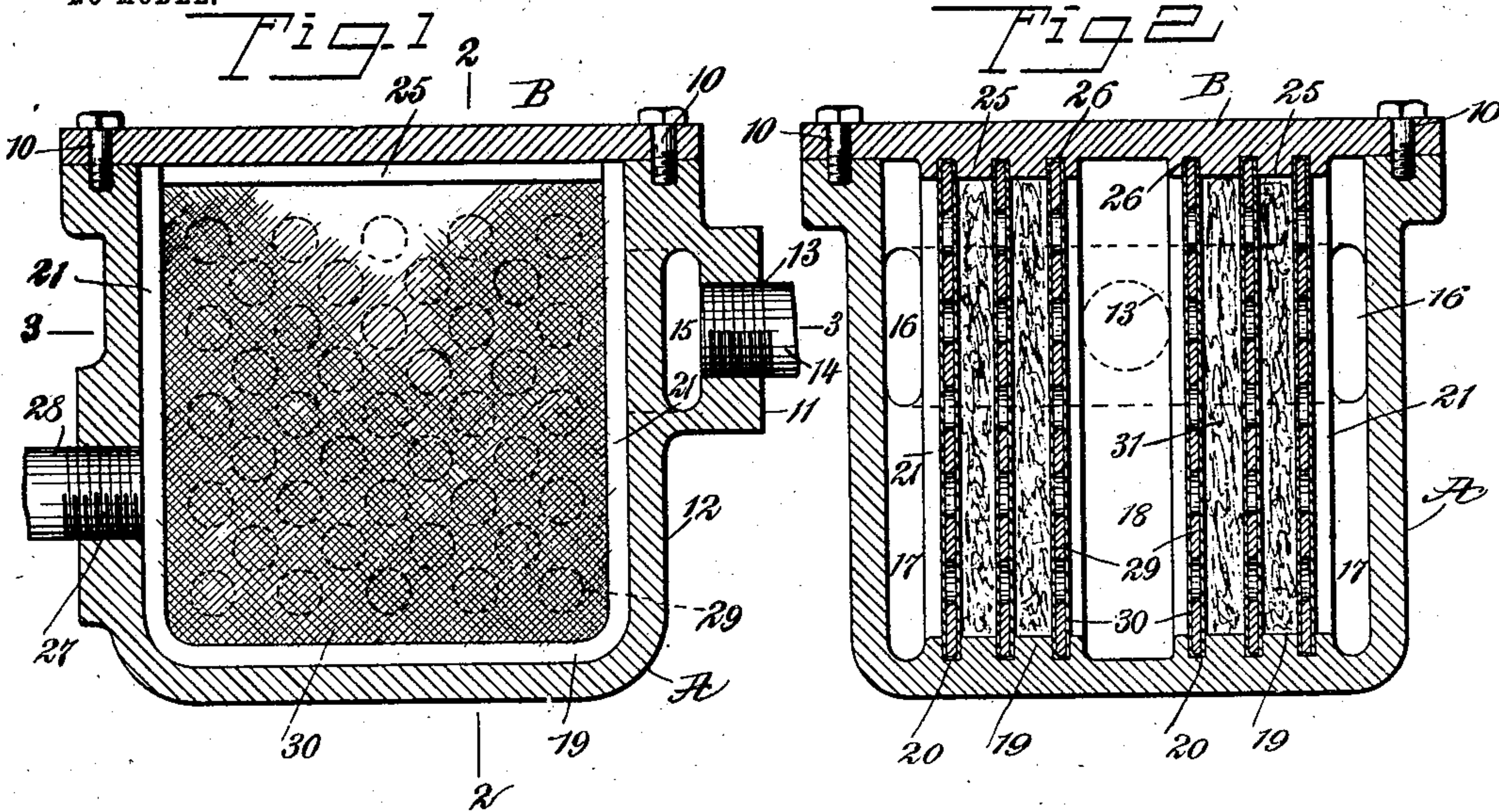
PATENTED APR. 7, 1903.

G. T. CONKLING & C. C. MITCHELL.

DEVICE FOR REMOVING IMPURITIES FROM BOILER FEED WATER.

APPLICATION FILED JUNE 7, 1902.

NO MODEL.



WITNESSES:

J. A. Brophy
J. H. Decker

INVENTORS
George T. Conkling
Charles C. Mitchell
BY *Mumford*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE T. CONKLING AND CHARLES C. MITCHELL, OF PLAINFIELD, NEW JERSEY.

DEVICE FOR REMOVING IMPURITIES FROM BOILER FEED-WATER.

SPECIFICATION forming part of Letters Patent No. 724,815, dated April 7, 1903.

Application filed June 7, 1902. Serial No. 110,815. (No model.)

To all whom it may concern:

Be it known that we, GEORGE T. CONKLING and CHARLES C. MITCHELL, citizens of the United States, and residents of Plainfield, in the county of Union and State of New Jersey, have invented a new and Improved Device for Removing Impurities from Boiler Feed-Water, of which the following is a full, clear, and exact description.

Our invention relates to a device for removing mechanical impurities from boiler feed-water, but which may be used for analogous purposes.

The purpose of the invention is to combine in the simplest possible manner those principles and details of filtration which practice has proved most efficient and to construct a filter of the type described which comprises a suitable hollow body having a removable cap and inlets and outlets in the body-section, together with straining-cloths carried by perforated supports of metal or other rigid substances, which supports and their straining-cloths are fitted in grooves in the body and cap at each side of the center of the body and are readily removable, the inlet being so formed as to deliver the incoming material to the sets of filtering members between said members and the wall of the body, the outlet being so placed as to take the filtered liquid from the central portion of the body.

Another purpose of the invention is to provide a packing between sundry of the filtering members of fibrous material—such as excelsior, sponge, &c.—which packing need only be employed when a great body of filtering material is required.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical central section taken practically on the line 1 1 of Fig. 3, and Fig. 2 is a section taken substantially on the line 2 2 of Fig. 1. Fig. 3 is a horizontal section taken practically on the line 3 3 of Fig. 1, and Fig. 4 is a perspective view of the perforated sup-

porting-plate and coöperating filtering material.

The body A is hollow and is of metal, cast or otherwise formed, and while preferably rectangular in cross-section, as shown, may be of any appropriate shape. The body A is open at the top and receives at such portion a cover B, secured thereto by bolts 10 or their equivalents, so that the cover may be readily removed at any time. A projection 11 is preferably made at one end 12 of the body between its top and bottom portions and extending from side to side. In the central part of the projection 11 an inlet-opening 13 is made to receive a supply-pipe 14, and within the projection 11 a horizontal channel 15 is produced, having end branches 16, which lead into side chambers 17, extending from end to end of the body and from top to bottom thereof. In the central portion of the body another chamber 18 is provided parallel with the side chambers 17. These chambers 17 and 18 are produced in the following manner:

Interior offsets 19 are formed at the bottom of the body at each side of the center, extending from end to end of the body, and in these offset portions 19 longitudinal grooves 20 are made, the bottom and side walls of which are preferably straight. At the inner faces of the end portions of the body vertical offsets 21 are provided corresponding to the bottom offsets 19 and having similar and corresponding longitudinal grooves 22 therein. The cover B has offsets 23 upon its under face parallel with and immediately above the bottom offsets 19, as is shown in Fig. 2, and in the offsets 23 longitudinal grooves 24 are made, which connect with the end grooves 22 and are immediately over the bottom grooves 20. All of the grooves above referred to are of the same construction.

An outlet-opening 27 is made in the end of the body opposite the inlet end 12, preferably at a lower point than the inlet-opening 13, and the said outlet-opening 27 is in direct communication with the central chamber 18 and is adapted to receive a feed-water pipe 28 for the boiler.

A perforated or reticulated plate 29 is provided for corresponding top, bottom, and end grooves, being adapted to fit therein, and

each plate carries a filtering material 30, of a suitable cloth—such as toweling, cotton-flannel, or fabric—and the said filtering medium is in the form of a sack initially open at the top to admit of the ready introduction of a plate 29, which is the support or carrier for the filtering medium. After a plate 29 has been placed in position in a filtering-sack the open end of the latter is sewed or otherwise closed over the plate in such manner that it fits the plate tightly.

When the plates and filtering mediums carried thereby are in position in registering or connecting grooves in the body and the cap or cover B, they completely fill the said grooves, and if they do not do so any liquid which may force itself through the said grooves will be as well filtered as the liquid which passes through the filtering mediums between their ends or side portions. Thus it will be observed that the filter is provided with filtering joints or unions made by the filtering material directly between the supporting and containing or inclosing members of the filter.

When it is desired to cleanse the filter or to renew the filtering fabric or cloth, it is simply necessary to remove the cap or cover B, whereupon the plates 29 and the filtering material carried thereby may be readily withdrawn from the body A and cleaned in any approved manner.

When a large body of filtering material is desirable for any purpose, a filling or packing 31, of excelsior, sponge, or the like, preferably excelsior, is placed between the opposing faces of the sets of filtering material, as is shown in Figs. 2 and 3.

In operation the liquid to be filtered in entering through the inlet-pipe 14 spreads out into the channel 15 and is delivered into the side chambers 17 at the outer faces of the outer plates and their filtering-envelops and is compelled to pass through the side portions of the casing through all of the filtering plates and envelops to the central chamber 18, from whence the filtered material finds a ready exit through the outlet-pipe 28.

Although our invention has been described with reference to filtering boiler feed-water, it is obviously adapted to purifying any other kind of water or other liquids—oil, for example. The nature and kind of the filtering medium depends upon the character of the impurities to be removed. Such impurities as oil, grease, sand, mud, and other mechanical matter are usually dealt with. However, organic matter may be treated by placing charcoal between the enveloped filtering-plates.

In operation the impure water enters the filter at the channel 15 and flows to the side chambers 17, from whence it flows through the perforated plates or screens and the filtering media which they support to the outlet or central compartment 18, from whence the water is discharged to the outlet 27.

It has been found by experience that cylinder-oil can be removed from condensed steam by straining the steam through Turkish toweling, sponges, or flannel, and several types of such filters are now in use commercially; but they are more or less bulky and complicated, and we claim the following advantages over such: simplicity of construction and operation, ease of cleaning and keeping in order, economy in constructing, large effective filtering area for the size of the apparatus, and efficiency of the filtering-joint heretofore referred to. With reference to the excelsior packing, experience has proved the efficiency of excelsior supported between layers of cloth and as a means for removing sediment from water, and we claim advantages for our invention in this respect and the same for removing oil. Pressure-gages, blow-offs, and safety inlet and outlet valves have been omitted, because they may be added to suit the pleasure of those who install the apparatus and have no direct bearing on the novelty and advantages of our invention and are not essential to the operation of the apparatus.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination with a filtering-casing or confining member having an inlet and an outlet and grooves between the inlet and outlet, and a cover grooved correspondingly to the casing, of perforated or reticulated plates, and envelops of a filtering material covering said plates, which plates slide accurately in the casing-grooves and are held in place by the grooved portions of the cover, as described.

2. In a filter, a grooved body, and a filter proper, comprising a perforated or reticulated support and a filtering material completely enveloping the support, the filter fitting in the grooves of the said body, as and for the purpose set forth.

3. In a filter, the combination with the body-casing a removable cover for the same, the said body being provided with interior grooves in its bottom and ends, corresponding grooves in such portions being in communication, the cover being likewise provided with grooves in its inner surface connecting with and corresponding to the grooves in the body, the said body being provided with an inlet at one end and an outlet at the opposite end, chambers located between the sides of the body and the outer series of grooves, said body being also provided with a channel connecting the inlet with the side chambers, and a central chamber not connected with the channel of the inlet but connected with the outlet of the said body, of perforated plates, and envelops of a filtering material completely covering said plates, the enveloped plates being fitted in corresponding grooves in the body and cover, the filtering-envelop material being held in contact with the said body and the said cover, for the purpose set forth.

4. In a filter, the combination with a body

and a cover for the same, the body being provided with an inlet and with an outlet, the inlet being in communication with the side portions of the body and the outlet with the 5 central portion of the body, of a series of apertured plates located in said body at each side of the center thereof, between the inlet and the outlet portions of the body, and envelops of filtering material completely covering the said plates, for the purpose described. 10

5. In a filter, the combination with a body and a cover for the same, the body being provided with an inlet and with an outlet, the inlet being in communication with the side 15 portions of the body and the outlet with the central portion of the body, of a series of ap-

ertured plates located in the said body at each side of the center thereof between the inlet and the outlet portions of the body, envelops of filtering material completely covering the 20 said plates, and a packing of excelsior between said plates, said packing being omitted from the space between the opposing centrally-located plates, as described.

In testimony whereof we have signed our 25 names to this specification in the presence of two subscribing witnesses.

GEORGE T. CONKLING.

CHARLES C. MITCHELL.

Witnesses:

Mrs. J. A. FESMIER,
ANDREW ANDERSON.