

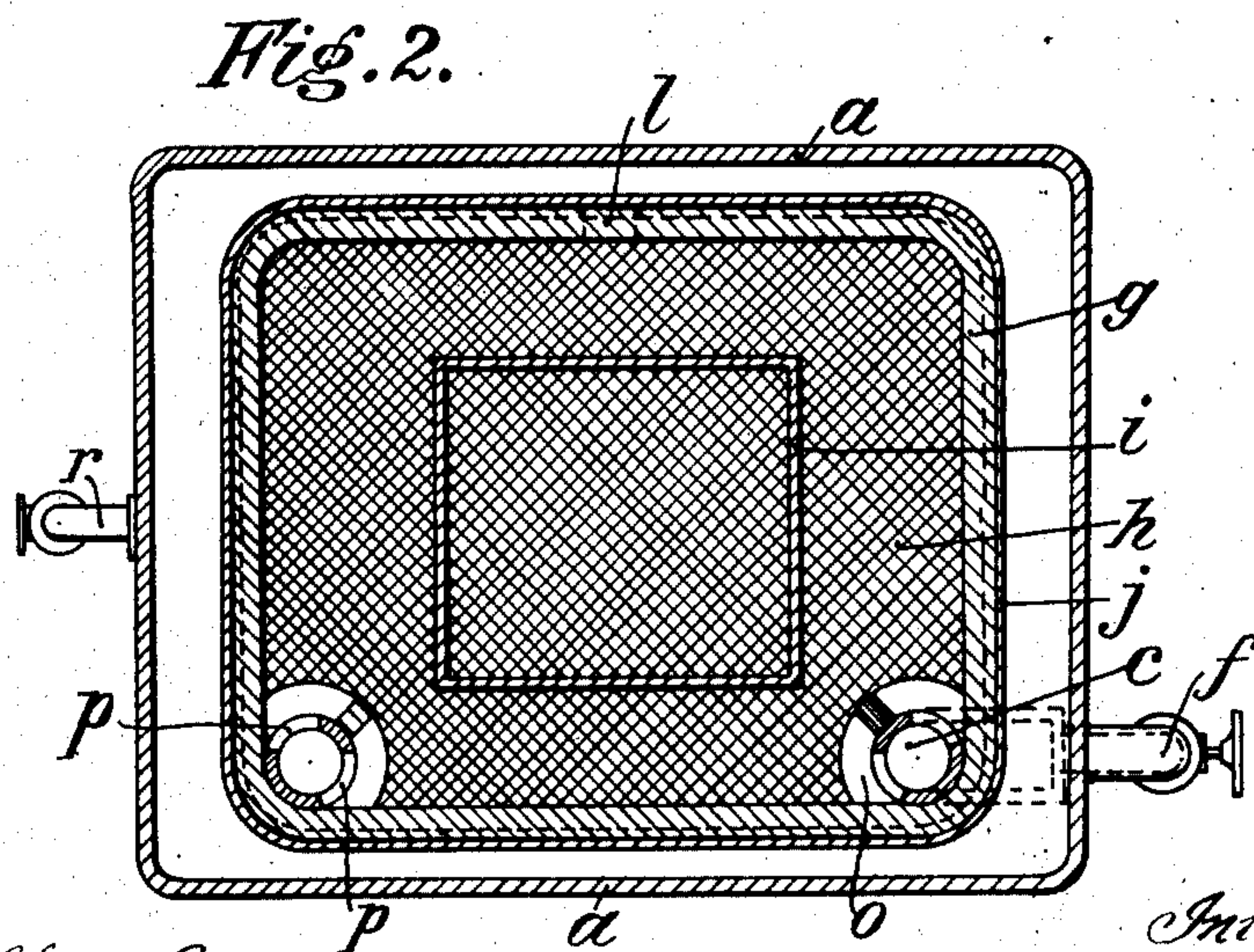
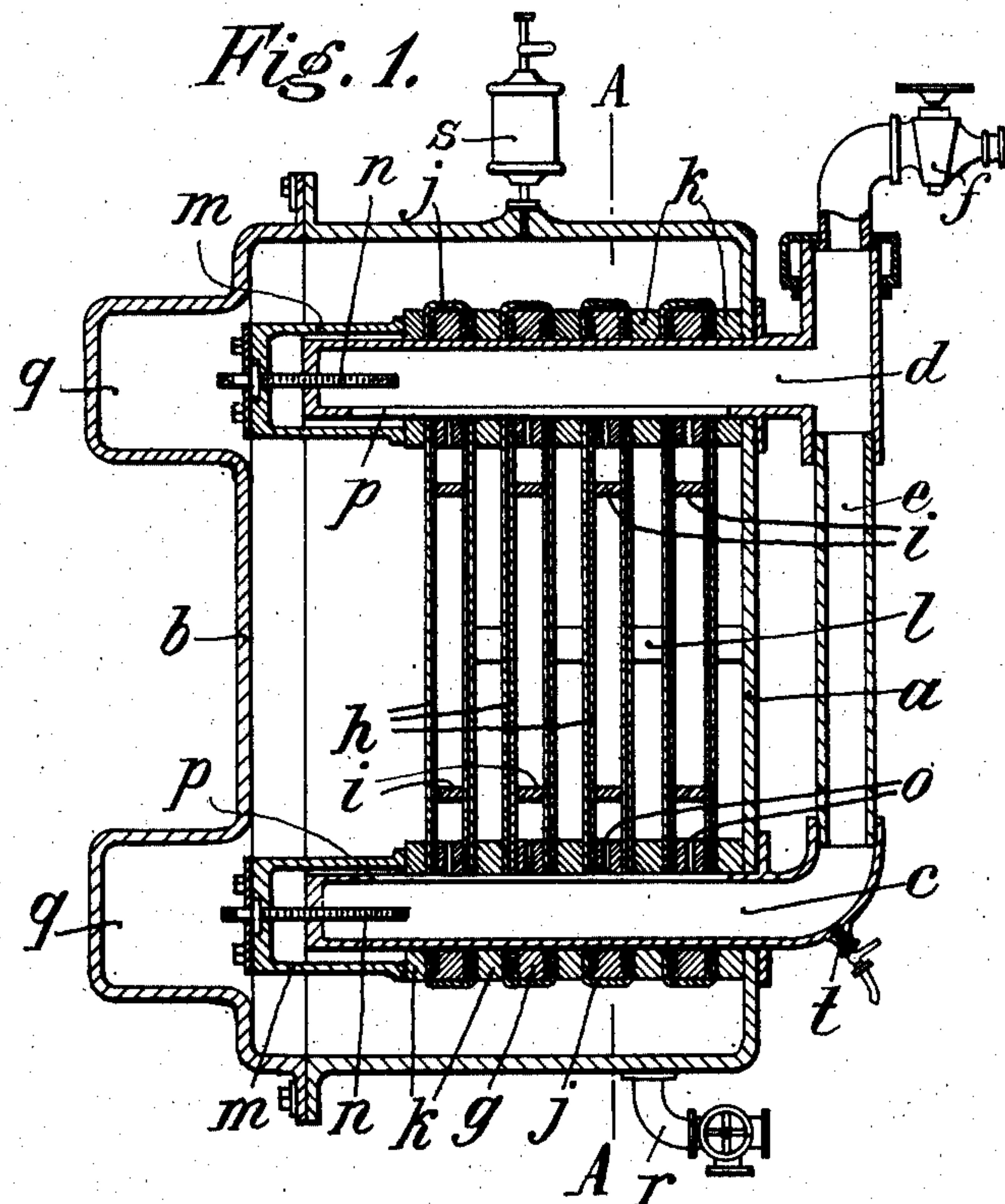
No. 846,582.

PATENTED MAR. 12, 1907.

H. LIEBERICH.

FILTER.

APPLICATION FILED JUNE 2, 1905.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## FILTER.

No. 846,582.

Specification of Letters Patent.

Patented March 12, 1907.

Application filed June 2, 1905. Serial No. 263,413.

*To all whom it may concern:*

Be it known that I, HEINRICH LIEBERICH, residing at Neustadt-on-the-Hardt, Palatinate of the Rhine, Kingdom of Bavaria, Germany, have invented new and useful Improvements in Filters, of which the following is a specification.

This invention relates to an improved construction of filter suitable for filtering liquids of various kinds; and it has for its object to provide means whereby a filtrate may be obtained which is perfectly clear to the last drop.

In the improved filter the several elements are slipped, by means of rings provided at the corners of their frames, onto the delivery-pipes, which are closed at their inner ends and which extend through the filter, intermediate strips of rubber being inserted which are also provided with rings at both ends. The elements are fixed, by means of long caps which abut against the rings of the last strip of rubber and the end of each of which is traversed by a screw-spindle, (in the same manner as the closed ends of the delivery-pipes,) so that said elements are jointed against one another and against the bottom or end of the casing by screwing up said screw-spindles. The liquid enters the filter elements under pressure and passes thence to the outside through horizontal slots which are provided in the interior of the frame and which are in communication with longitudinal slots in the delivery-pipes. This arrangement has the advantage that a greater or less number of filter elements, according to requirements, can be mounted upon and jointed to the delivery-pipes which are always kept closed by means of the long caps.

The invention is illustrated in the accompanying drawing, in which—

Figure 1 is a central longitudinal section of the filter, and Fig. 2 is a cross-section on the line A A of Fig. 1.

*a* is the casing of the filter, (preferably made capable of being axially rotated,) provided with a removable cover *b* and in which the several filter elements are built one upon the other in the usual manner.

*c d* are two parallel delivery-pipes for delivering the filtered liquid. They are connected to each other outside of the elements by means of a connecting-pipe *e*, fitted with a draw-off cock *f*.

Each element comprises a frame *g*, of metal or other suitable material, upon the upper and lower sides of which is placed a fine-meshed woven-wire fabric *h*. Said frame *g* is provided with rings at those of its angles which correspond in position to the delivery-pipes *c d* for the purpose of enabling the said frame to be slipped onto the delivery-pipes *c d*. In order to prevent the sheets of wire fabric *h* from being forced into contact with one another by the pressure acting upon them from the outside, a thin frame *i* is preferably inserted between them.

The elements constructed as above described are inserted in the usual manner in bags *j* and are separated one from the other by the interposition of rubber strips *k* between them. Each of these rubber strips *k* is formed at its two ends with rings by means of which it can be slipped onto the delivery-pipes *c d*. The elements are held apart at their other sides by means of distance-pieces *l*, whereby equal intervals are maintained between them.

When the elements have been placed one upon the other, then, according to the present invention, long caps *m* are placed upon the two rings of the last rubber strip, the diameter of each cap *m* being somewhat greater than the diameter of the delivery-pipes *c d*. Screw-spindles *n* are then passed through the covers of the caps *m* and through the closed ends of the delivery-pipes *c d*, so that by screwing up the spindle *n* the caps *m* are pressed tightly against the rings of the last rubber strip, and the jointing of the elements one with the other and with the end of the filter-casing is completed.

The rings of the frames *g* of the elements are formed with horizontal perforations *o*, which coincide with the longitudinal slots *p* of the delivery-pipes when the elements are put together on the delivery-pipes, so that the interior of the delivery-pipes *c d* are in communication with the interior of each element, irrespective of whether there are many or few elements combined together in a filter.

The caps *m* are made of considerable length so as, even when only a few elements are employed, to allow of efficient jointing being effected. In order that when many elements are employed room may be afforded for the caps while avoiding as far as possi-



ble dead space in the filter, pockets or extensions *q*, closed at their outer ends, are provided in the filter-casing opposite to said caps.

5 The operation of the improved filter is as follows: The filter elements having been assembled and properly secured by screwing up the screw-spindles and the filter having been closed by its cover being placed in position and fastened the liquid to be filtered 10 (wine, beer, water, or the like) is admitted into the space surrounding the filter elements through a pipe *r*, which extends through the under side of the filter-casing and which can 15 be closed by a cock. The liquid then passes through the filter-cloth and the woven-wire fabric into the interior of the elements and thence through the apertures in the frames of the elements and the longitudinal slots in 20 the delivery-pipes into the interior of the latter. By the provision of the horizontal apertures in the frame of the elements and the longitudinal slots in the delivery-pipes the air is completely removed from the elements, 25 and consequently a perfectly steady filtering effect is produced, while the filtrate is free from all cloudiness.

If air should be present in the filter-casing, it can be removed by means of a vent 30 furnished with an observation-glass *s*. Finally, by means of the small cock *t* at the lowest point of the delivery-pipes the last

remnant of the filtered liquid can be withdrawn from the filter.

As the filter is equally adapted for use with 35 a small or a greater number of elements, it can be employed in filtering liquids of the most varied characters—such as wine, beer, water, or the like.

What I claim as new and of my invention, 40 and desire to secure by Letters Patent, is—

1. A filter comprising an apertured discharge-pipe, a series of filtering elements mounted on said pipe, a cap surrounding one end of the discharge-pipe to cover the 45 apertures of said end, and means for adjusting said cap lengthwise of the pipe to clamp the filtering elements.

2. A filter comprising an apertured discharge-pipe, a series of filtering elements 50 mounted on said pipe, a cap surrounding one end of the discharge-pipe to cover the apertures of said end, means for adjusting said cap lengthwise of the pipe to clamp the filtering elements, and a casing formed with a 55 pocket to accommodate said cap.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 17th day of May, 1905.

HCH. LIEBERICH.

Witnesses:

MICHAEL ZIMMERMANN,  
FRIEDRICH SCHAEGLER.