

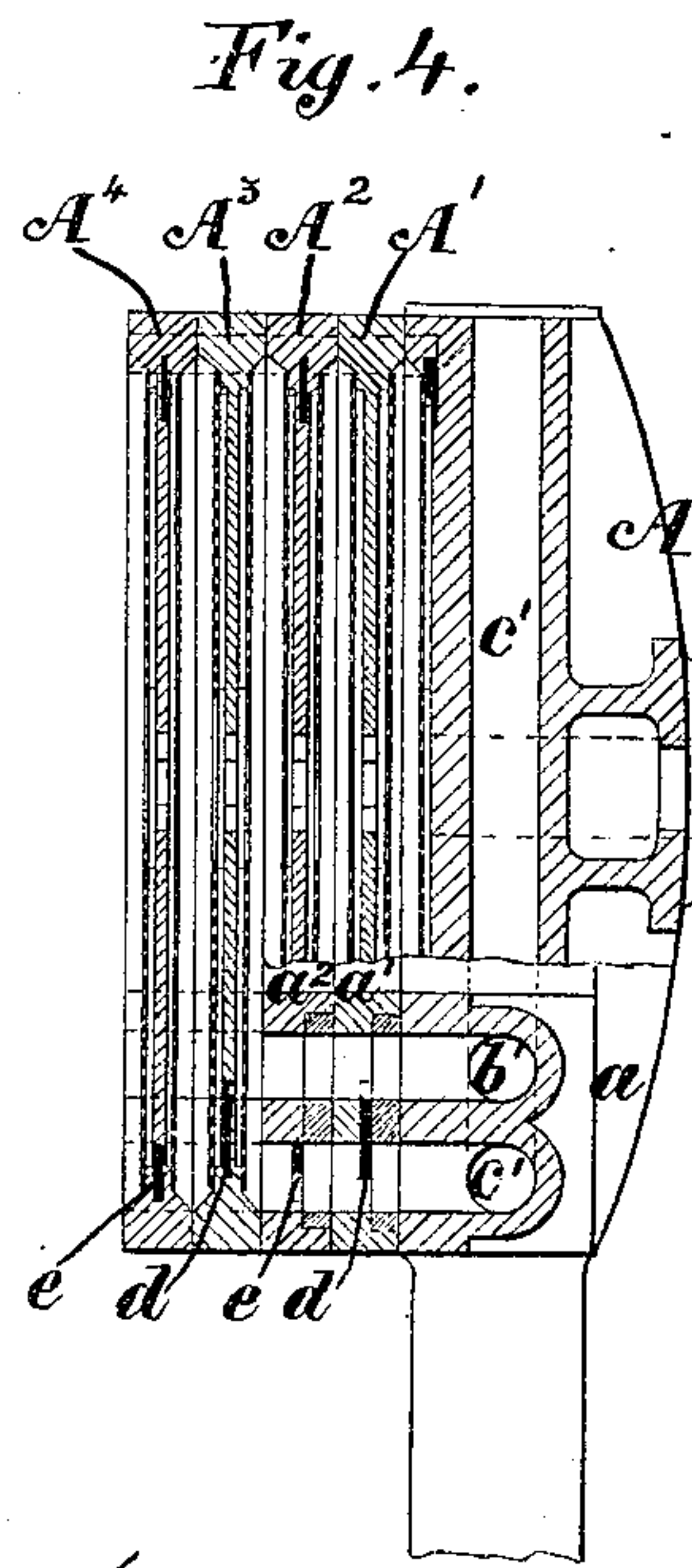
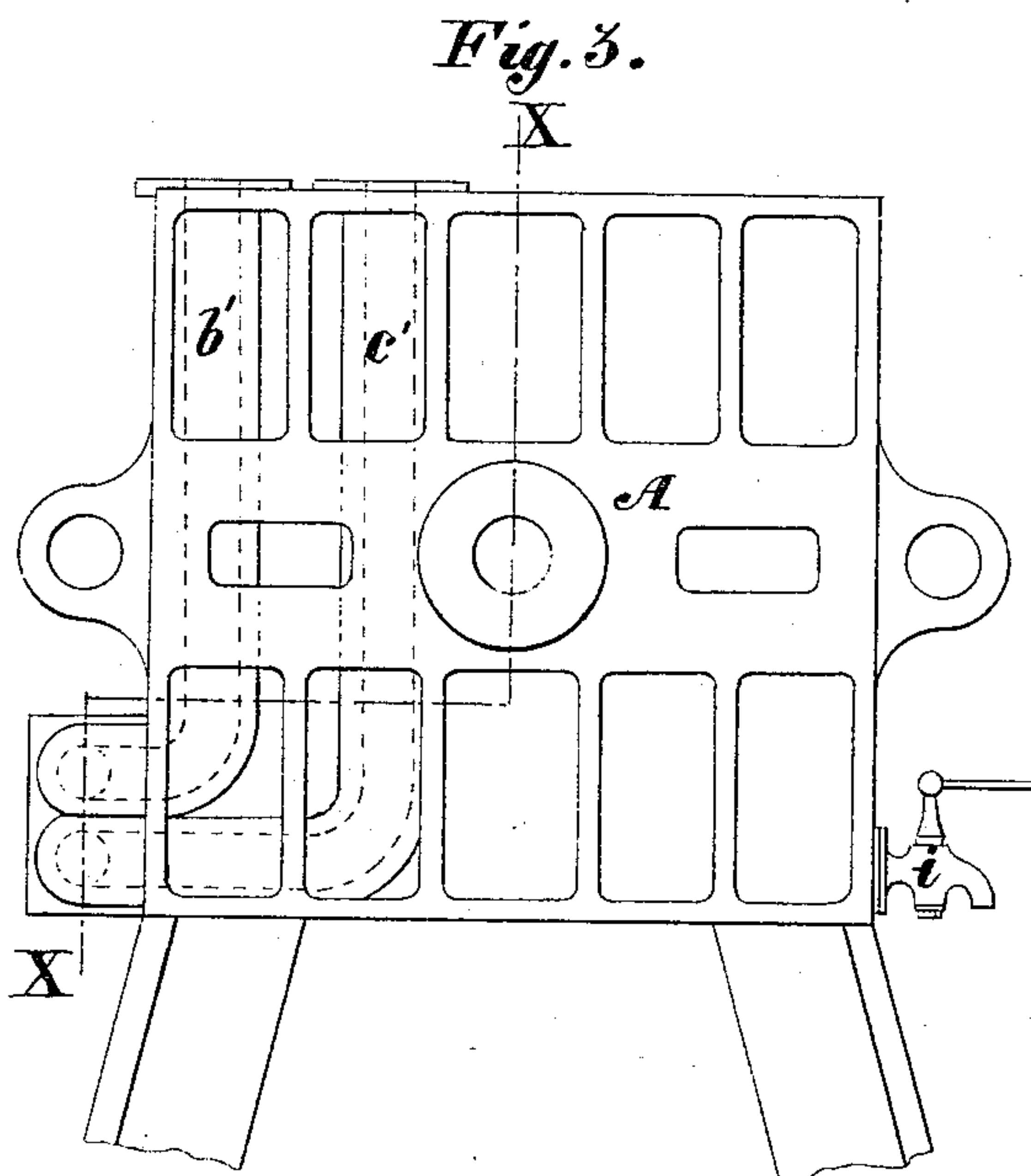
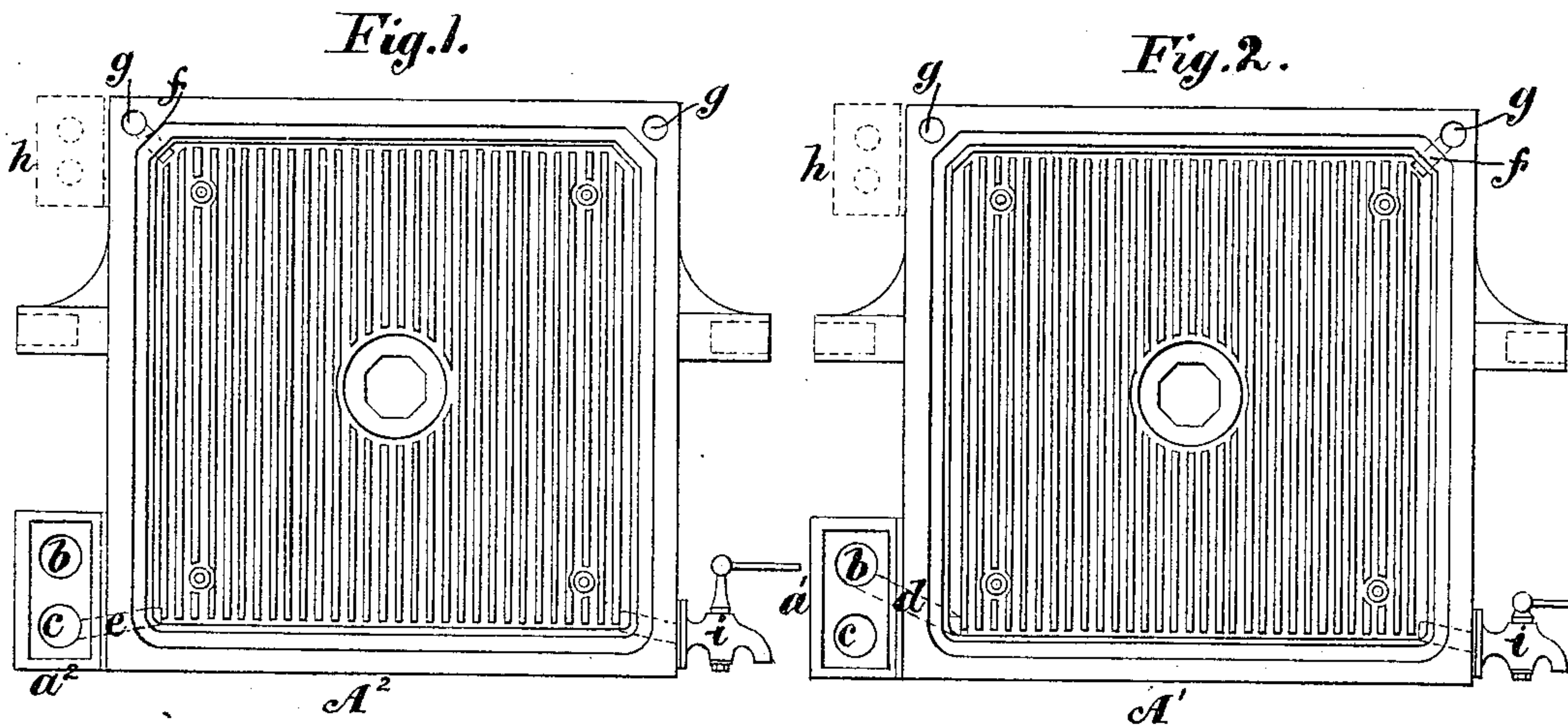
(No Model.)

B. H. REMMERS & J. WILLIAMSON.

FILTER PRESS.

No. 338,553.

Patented Mar. 23, 1886.



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UNITED STATES PATENT OFFICE.

BERNHARD H. REMMERS AND JOHN WILLIAMSON, OF GLASGOW, COUNTY OF LANARK, SCOTLAND.

FILTER-PRESS.

SPECIFICATION forming part of Letters Patent No. 338,553, dated March 23, 1886.

Application filed January 27, 1886. Serial No. 189,965. (No model.) Patented in England September 7, 1885, No. 10,570.

To all whom it may concern:

Be it known that we, BERNHARD HEINRICH REMMERS and JOHN WILLIAMSON, citizens of the United Kingdom of Great Britain and Ireland, residing at Glasgow, in the county of Lanark, Scotland, have invented new and useful Improvements in Filter-Presses; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the manufacture or art to which it relates to make and use the same.

The object of our invention is so to improve the construction of filter-presses that we may effect more complete lixiviation of the cakes or sludge formed between the plates in filtering sugar-liquors or other substances through filter-presses. To that end we form upon each plate of the filter-press, at or near the lower side, a projecting snug or piece, through which we bore two holes in such position that when the plates are fitted together in the press these holes form two continuous but separate longitudinal water-ways or channels.

In each of the alternate plates of the press *e* *g*, numbers 1 3 5 7, &c., we form a passage or port to connect the filter-space of the plate with one of the longitudinal water-ways, and in each of the other series of alternate plates *e* *g*, numbers 2 4 6 8, &c., we in a similar manner form passages or ports connecting the filter-spaces of these plates with the second longitudinal water-way. The two longitudinal channels terminate in the front plate of the press in two vertical passages or pipes, to which cocks or valves are fitted, and they discharge at the level of the upper sides of the plates or top of the press. By this arrangement the wash-water which is forced into the one longitudinal channel passes through the passages or ports into the filter-spaces of the one series of alternate plates, fills such spaces, passes through the cakes or sludge and escapes by the passages or ports in the adjoining series of plates to the other longitudinal channel. The heavy sweet water or liquor, which tends to lie at the bottom or lower edges of the plates, and in the outlet-channel, is carried forward and forced up the discharge pipe and outlet in front of the lighter clear water which follows the first washing of the cakes. The orifices or

channels which are provided for lixiviating under the existing arrangement at the top corners of the plates are utilized for permitting the discharge of air.

In the drawings, Figures 1 and 2 are elevations of two adjoining plates of the improved filter-press. Fig. 3 is an elevation of the front plate of the press, and Fig. 4 is a longitudinal section of part of the press, the section being taken through the middle of two of the plates, and, as at the line X X in Fig. 3, through the front plate and the two adjoining plates of the press.

The general form or construction of the press and of the plates may be of any of the usual types in common use, but differing therefrom as regards provision for lubricating, for which purpose there is formed upon each plate *A A'* *A*², &c., of the press a snug or projection, *a a'* *a*², &c., through which two holes are bored to form, when the plates are in position in the press, two longitudinal water ways or channels, *b c*, terminating at the front plate, *A*, in two channels, *b' c'*, or in pipes outside thereof extending to the upper side or top of said plate.

In each of the alternate plates *A' A*³, &c., a port, *d*, is formed, communicating with the filter-space on each side of the plate and the upper longitudinal channel, *b*, and in each of the alternate plates *A*² *A*⁴, &c., a similar port, *e*, is formed, communicating between the filter-spaces on each side and the lower channel, *c*. Pipes provided with stop-cocks or valves are connected to the vertical channels *b' c'*, and the water for lixiviation is admitted through either of these channels, while the other channel serves for the outlet of the sweet water, the lixiviation being conducted, by preference, by using the channels *b b'* and *c c'* alternately for the admission of the wash-water, the water entering the channel *b b'* passing through the series of ports *d* in the plates *A' A*³, &c., into the filter-spaces through the cakes or sludge formed therein and displaces the air, which is driven off through the ports *f* and the channels *g* at the top of the plates, and after passing through the cakes or sludge the wash-water passes out by the ports *e* in the plates *A*² *A*⁴, &c., to the channels *c c'*, which for the time being, form the outlet. By forming the lixiviating-channels *b c* and the communicating ports

d e at the lower sides or bottoms of the plates and connecting them to the vertical channels *b' c'*, as above described, the heavy sweet water, which tends to lie at the bottom and is not carried off by the wash-water in the ordinary arrangements for lixiviating, is carried forward and forced up the discharge-pipe in advance of the clear water.

In the snugs *a' a'*, &c., on the filter-plates recesses are formed, whereinto blocks of cork, rubber, or similar elastic material are fitted to project slightly above the faces of the plates, so that when the plates are pressed together water-tight joints are formed between the snugs around the lixiviating-channels *b c*. The blocks of cork or similar material replace the usual jointing of filter-cloth, which by capillary attraction is apt to cause leakage at the joints.

The air-outlets are formed by the ports *f* and passages *g*, usually provided for lixiviation, either in the top corners of the plates or in snugs or projections formed on them, as indicated by the dotted lines *h*.

The filter-plates are provided with the usual drain taps, *i*.

Having now described the invention, what we desire to claim and secure by Letters Patent is—

1. In a filter-press, the improved construction of the filter-plates with snugs or projections having lixiviating-channels *b c* formed therein, and ports *d e*, communicating between the filter-spaces and alternately with the upper and lower channel throughout the series of plates, vertical inlet and outlet channels or pipes reaching to the top of the press being provided, substantially as and for the purpose set forth.

2. In a filter-press having lixiviating-channels formed in snugs or projections on the filter-plates, forming recesses in said snugs and fitting therein blocks of cork, rubber, or similar elastic material, as and for the purpose set forth.

In witness whereof we have hereunto set our hands and seals this 14th day of January, 1886.

B. H. REMMERS. [L. S.]
JOHN WILLIAMSON. [L. S.]

Witnesses: *Quirk*

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