

C. FURBISH.
Filter-Press.

No. 223,333.

Patented Jan. 6, 1880.

Fig. 1.

Fig. 4.

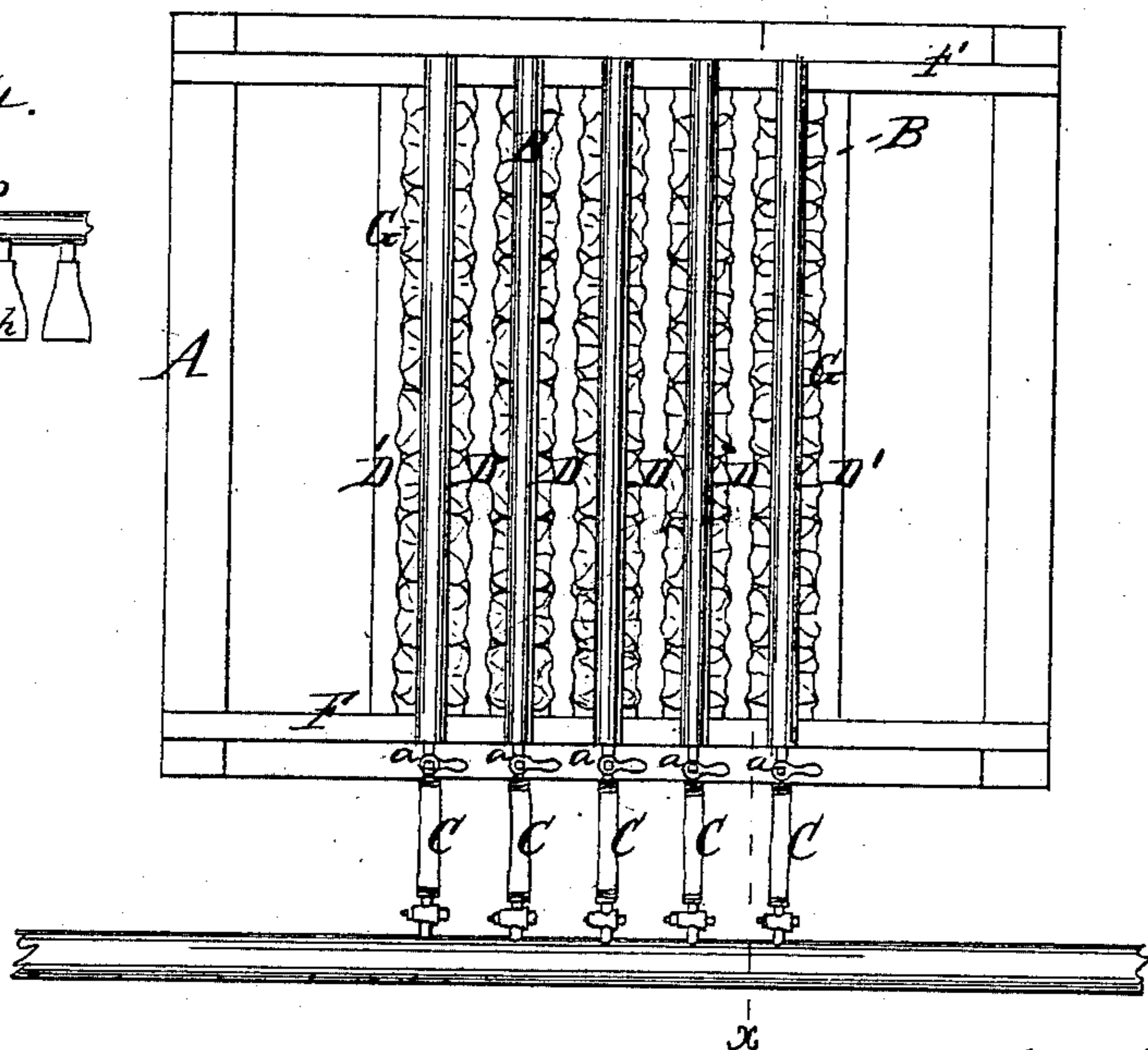
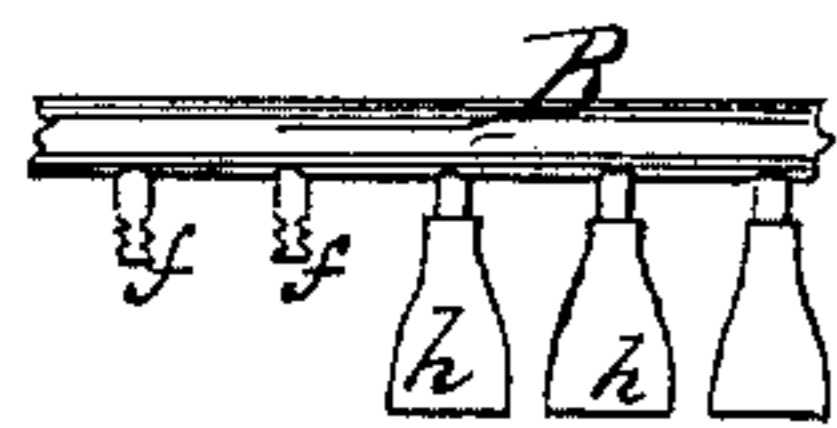
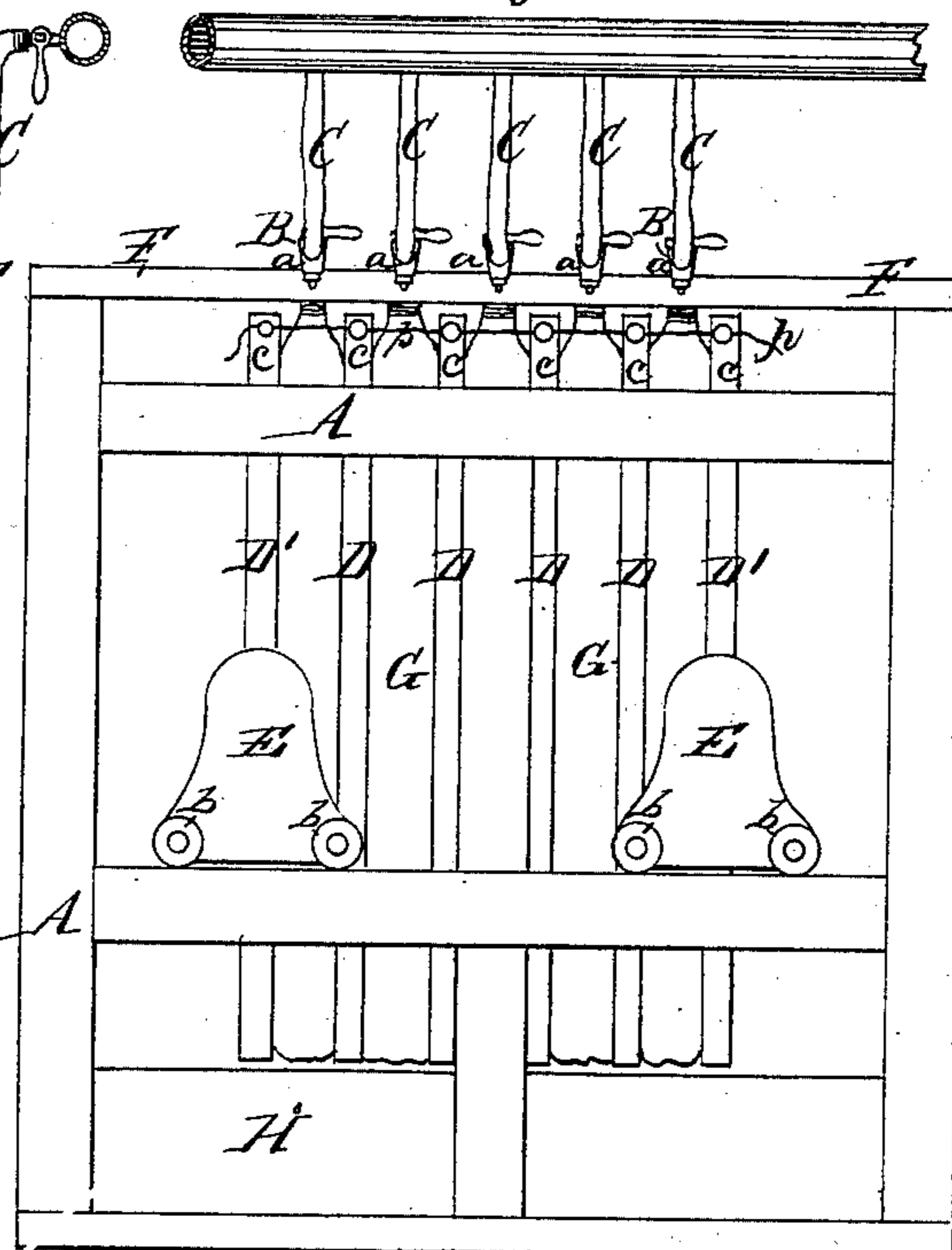
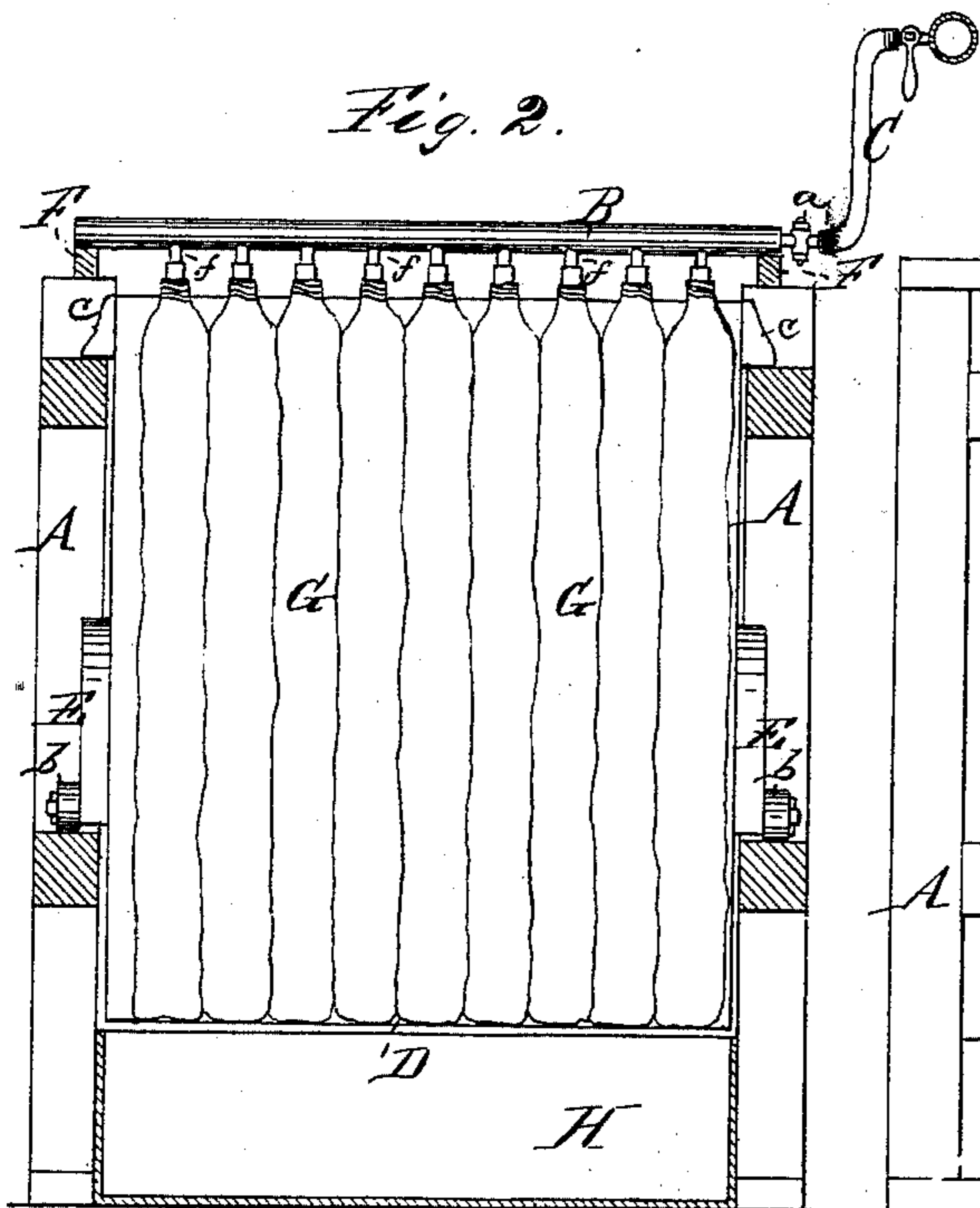


Fig. 3.



Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

CLINTON FURBISH, OF BROOKLYN, NEW YORK.

FILTER-PRESS.

SPECIFICATION forming part of Letters Patent No. 223,333, dated January 6, 1880.

Application filed July 8, 1879.

To all whom it may concern :

Be it known that I, CLINTON FURBISH, of Brooklyn, in the county of Kings and State of New York, have made an invention of certain new and useful Improvements in Filter-Presses; and I do hereby declare that the following is a full, clear, and exact description and specification of the same, reference being had to the accompanying drawings and letters of reference marked thereon.

The object of my invention is to furnish a filter-press through which can be passed a liquor containing a large quantity of solid or undissolved matter from which the solution is to be freed, and to press from such undissolved matter as much of the liquor as is practicable, and to accomplish this result economically.

Previous to my present invention the filtration of such substances has been mainly effected by two general systems—first, by means of the ordinary bag-filter, from which the bags are removed and subjected to pressure to obtain the liquor remaining in them; second, by means of devices similar to those known to the trade as “German filter-presses,” in which the liquor is filtered through sheets of cloth held in position between vertical plates. Both of these systems are objectionable, because the undissolved matter quickly clogs the bags or sheets before they are well filled, which prevents the further filtration of the liquor, and renders necessary the removal and washing of the bags or sheets, and the consequent loss of time and labor.

In the drawings, Figure 1 is a top view of my filter-press. Fig. 2 is a cross-section of the same at the line *xx* of Fig. 1. Fig. 3 is a side elevation. Fig. 4 is a view of a section of one of the tubular arms *B B*, showing the nipples and bottle-connections of the bags.

A A A is the frame of the press, which may be made of stout wooden timbers or of iron, or of both combined. *B B B* are tubular metal arms running across the top of the press, and resting at each side on the iron beams *F F F*. For convenience in moving these arms, they may be provided with small rollers at the point of contact with the iron beams *F F*.

C C C are flexible tubes connecting the ends of the cocks *a a*, attached to the arms *B B B*, with the main leading-pipe, through which

the liquor is to run, and they may be made of rubber or of metal, with universal joints, care being taken to allow for the necessary movement of the tubular arms *B B B* when opening and closing the press.

D D D are platings fitted within the frame *A A A* and resting on a suitable shoulder on the upper beam of the frame *A A A*. These platings should be made to fit loosely between the sides of the frame *A A A*, and should extend from near the bottom of the tank *H H* to within a short distance of the mouth of the bottles *h h h*. They may be of either wood or metal, or both combined, and should be grooved or perforated, like the plates of the German filter-press, to allow the liquor to run off freely when under pressure.

D' D' are two movable heads, against the outer sides of which the power is applied. These heads should be made strong, with a grooved inner surface, and should correspond in size with the platings *D D D*.

To the outer edges of the movable heads *D' D'* are bolted the carriages *E E*, which run on the rollers *b b*, resting on the middle beams of the frame *A A A*. The cocks *a a a* are fitted to the ends of the tubular arms *B B B*, and are connected with the flexible tubes *C C C*.

G G G are strong cloth bags, like those used in ordinary bag-filters, suspended by suitable bottles *h h* to the nipples *f f* on the tubular arms *B B*. The bags *G G G* hang in the spaces between the platings *D D D* and the head-pieces *D' D'*, and should be so hung that when full their lower ends will be near the lower edges of the platings *D D D*. The chain *p p p* is fastened to the outer edges of the platings *D D D* and the movable head-pieces *D' D'* in such a manner that when the press is closed the chain hangs in loops, and when the pressure is removed and the movable head-pieces *D' D'* are drawn back the chain draws the platings *D D D* to about equal distances from each other.

The tank *H H* is to receive the liquor as it runs from the bags, and is fitted closely inside of the frame *A A A*, and may be made of any desired depth.

If desired, one of the movable head-pieces *D' D'* may be made stationary, and power applied to the other; but in case of a large press it

is found more convenient to have both head-pieces movable, on account of the distance required to be traveled by the tubular arms B B B. The power to operate the press may thus
 5 be applied to one or both of the head-pieces D' D', and may be obtained either by means of an ordinary screw and toggle-joint or by a hydraulic pump, as may be desired.

The liquor to be filtered is drawn through a
 10 leading-pipe, to which are attached the flexible tubes C C C, and through these tubes into the tubular arms B B B, and thence into the bags G G G. The liquor drains from the bags G G G into the tank H H, and is drawn thence
 15 to suitable settling or receiving tanks. The bags retain the insoluble matter, and when the liquor runs slowly, by reason of the partial filling of the bags, the cocks *a a a* are closed to keep the liquor from being forced back by
 20 the pressure, and power is applied to one or both of the head-pieces D' D' to draw or push them together, and thus express the liquid from the bags G G G, and compress the insoluble matter in such a way that when the pressure
 25 is withdrawn and the head-pieces D' D' drawn back and the cocks *a a a* again opened, the liquor flows freely, as before. This operation is repeated until the bags are properly filled, if
 30 desired, when power is applied for the final pressing, and the liquid is expressed, leaving

the insoluble matter in the bags in a comparatively dry state.

I claim as my invention—

1. The movable tubular arms B B B, in combination with the platings D D D and the
 35 movable head-pieces D' D' and the bags G G G, substantially as described.

2. The flexible tubes C C C, in combination with the movable tubular arms B B B and the platings D D D and the movable head
 40 piece or pieces D' D' and the bags G G G, substantially as described.

3. In combination with the flexible tubes C C C and the movable tubular arms B B B and the platings D D D and the movable head
 45 piece or pieces D' D' and the bags G G G, the chain *p p p*, substantially as described.

4. In combination with the flexible tubes C C C and the movable tubular arms B B B and the platings D D D and the movable
 50 head piece or pieces D' D' and the bags G G G and the chain *p p p*, the frame A A A and the tank H H, substantially as described.

In witness whereof I have affixed my hand this 3d day of July, A. D. 1879.

CLINTON FURBISH.

Witnesses:

W. L. BENNEM,
 H. H. ISAACS.