

(No Model.)

2 Sheets—Sheet 1.

L. A. ENZINGER.

APPARATUS FOR MANUFACTURING FILTERING PLATES.

No. 605,706.

Patented June 14, 1898.

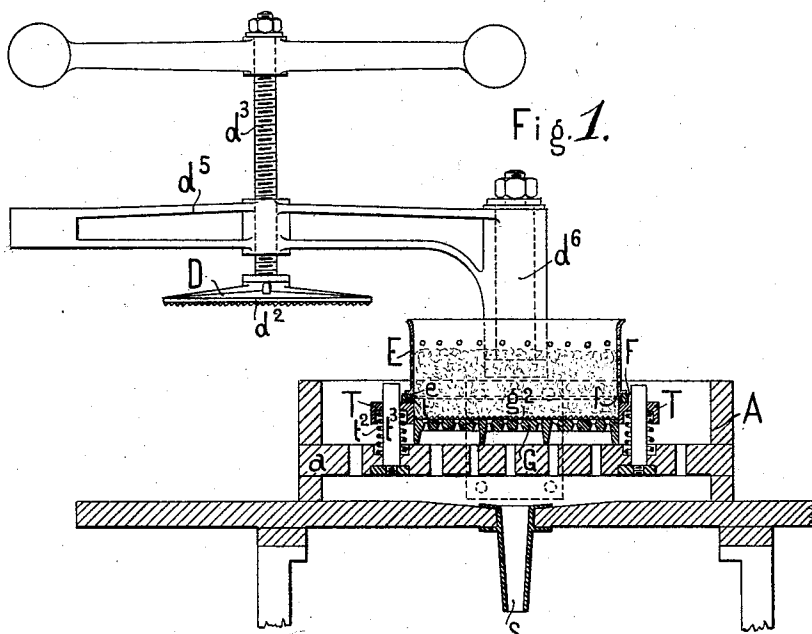


Fig. 1.

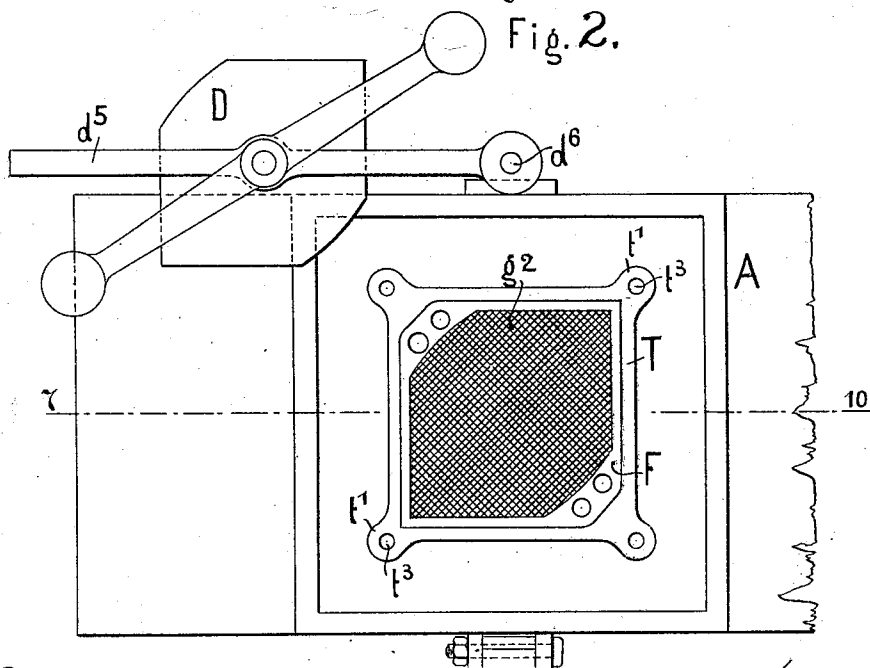


Fig. 2.

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Inventor:
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(No Model.)

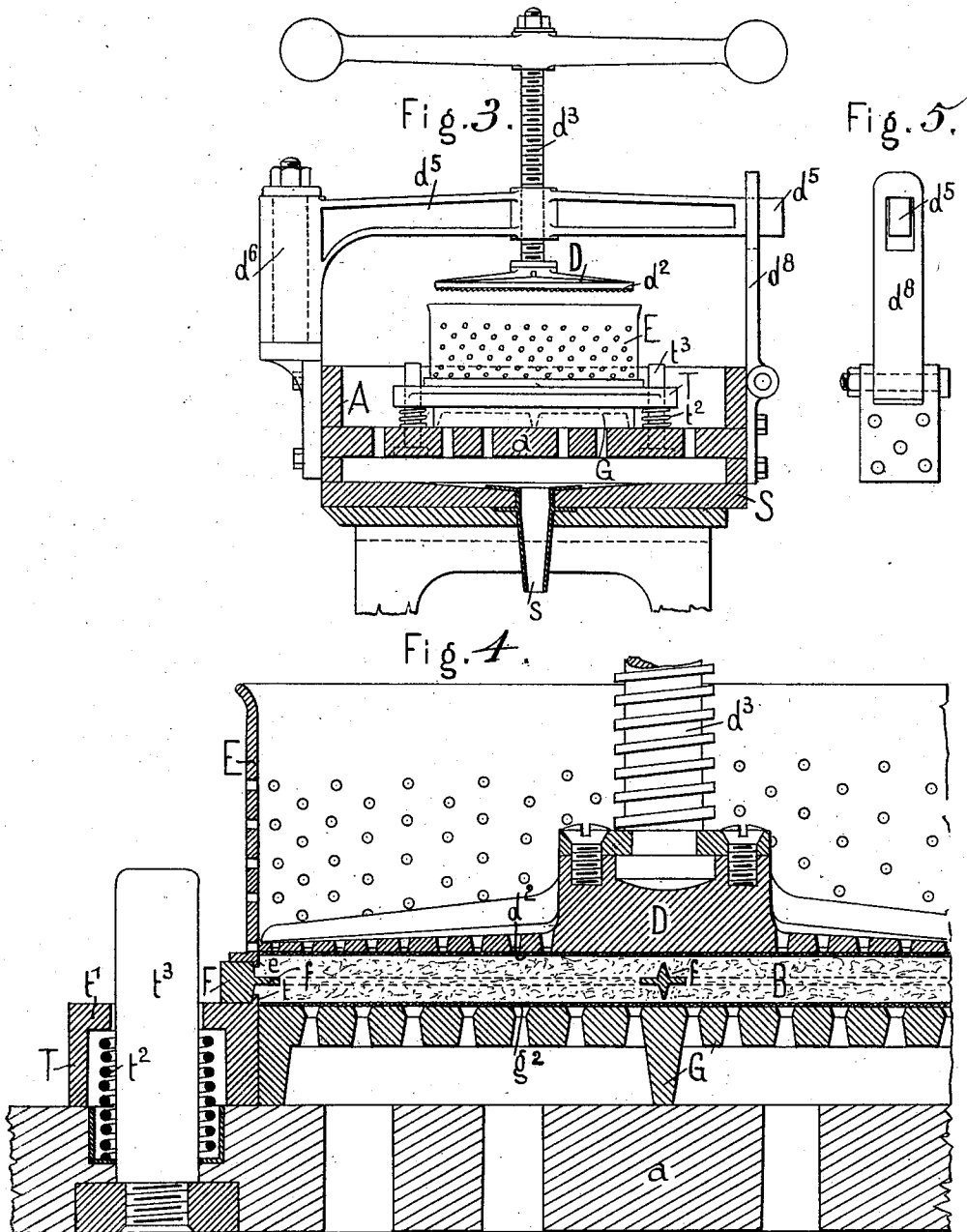
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Attest:
Harry S. Perkins.
Walter E. Allen.

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UNITED STATES PATENT OFFICE.

LORENZ ADALBERT ENZINGER, OF WORMS, GERMANY.

APPARATUS FOR MANUFACTURING FILTERING-PLATES.

SPECIFICATION forming part of Letters Patent No. 605,706, dated June 14, 1898.

Application filed July 26, 1892. Serial No. 441,338. (No model.) Patented in Germany April 26, 1892, No. 69,045; in France April 27, 1892, No. 221,221; in Belgium May 18, 1892, No. 99,716; in Sweden May 23, 1892, No. 4,459; in Norway May 23, 1892, No. 2,728; in Italy May 23, 1892, LXII, 437; in England June 20, 1892, No. 11,489; in Switzerland July 2, 1892, No. 5,506; in Austria October 21, 1892, No. 26,099; in Hungary October 21, 1892, No. 49,807; in Luxemburg January 6, 1893, No. 1,745, and in Russia May 7, 1894, No. 6,248.

To all whom it may concern:

Be it known that I, LORENZ ADALBERT ENZINGER, a subject of the Grand Duke of Hesse, residing at Worms, in the Grand Duchy of Hesse, German Empire, have invented new and useful Improvements in Apparatus for Manufacturing Filtering-Plates, whereof the following is a specification, and on which invention I have obtained Letters Patent in England, No. 11,489, dated June 20, 1892; in Switzerland, No. 5,506, dated July 2, 1892; in Germany April 26, 1892, No. 69,045; in Austria October 21, 1892, No. 26,099; in Hungary October 21, 1892, No. 49,807; in Luxemburg January 6, 1893, No. 1,745; in Russia May 7, 1894, No. 6,248; in Sweden May 23, 1892, No. 4,459; in France April 27, 1892, No. 221,221; in Norway May 23, 1892, No. 2,728; in Belgium May 18, 1892, No. 99,716, and in Italy May 23, 1892, No. 437, Vol. LXII.

My invention relates to the construction of apparatus to be used in the manufacture of filtering-plates. The apparatus for making the plates according to this method will now be fully described.

Figure 1 is a sectional elevation of the apparatus corresponding to lines 7 10, Fig. 2. Fig. 2 is a plan showing the lower pulp-box with the filter-plate in position, the presser-plate being in the figures shown as raised and turned aside together with the parts carrying the same. Fig. 3 is a side view with a section of the lower part, showing the means for holding the pulp and the presser-plate, the presser-plate being in operative position. Fig. 4 is a view showing a portion of Fig. 1 in section—namely, the presser-plate and bottom plates and the filter-plate frame in position with the pulp compressed and drawn to a larger scale, the parts being, however, represented in different positions. Fig. 5 is a front view of the clasp d^8 , Fig. 3.

The method of making the filter-plate consists in placing the filter-plate frame covered above and below with the pulp in a permeable frame and simultaneously condensing said pulp above and below upon the filter-plate frame, thereby uniting the pulp and the said frame. The filter-plate frame upon which

the pulp is to be condensed is shown generally in Figs. 2 and 4, consisting, as there shown, of an external rim adapted to fit the filter and having an inwardly-projecting lip which the pulp is to embrace. I do not limit myself to this kind of plate or frame, however.

The covering of the filter-plate frame with pulp is accomplished by placing in a receiver T a sufficient amount of the pulp, then placing the filter-plate frame in position within the receiver upon the pulp, and then placing in a perforated casing E above the receiver a sufficient amount of said pulp, swinging a perforated presser-plate D into position within the casing and pressing the same upon said pulp, causing the said plate D to compress the pulp above and below the filter-plate frame F.

The method of manufacturing the filtering-plates—i. e., of depositing the filtering material in the filter-plate frames—has already been described in the foregoing. The apparatus for carrying out this manufacture consists in a lower part mainly comprising the perforated bottom plate G, faced at the top with fine wire-gauze g^2 , a perforated box-like stand a , in which the bottom plate G rests, and the receiver T, fitting around the edges of the bottom plate G and adapted to slide up and down thereon, while the upper part mainly comprises the perforated casing E, the perforated presser-plate D, faced on the under side with wire-gauze d^2 , and a screw-press the spindle d^3 whereof carries the plate D. The perforations of the plates G and D are connected together on the face of the plates by grooves in view of facilitating the outflow of the water passing through the sheets of gauze d^2 and g^2 , and the plate G is provided at the bottom with ribs in order to allow of free communication between its own perforations and those of the stand a . The water finally flows out through the funnel s , fitted in a table S, on which the apparatus is placed. The receiver T and casing E are made of the same form as the filter-plate frame F, to which they are to be applied; but they are inside a little smaller than the latter, and on the inner edges of the respective upper and

lower faces of the receiver and casing are formed narrow ledges *t* and *e*, adapted to project into the filter-plate frame F when the casing E, frame F, and receiver T are put together, as shown in Figs. 1 and 4, the filter-plate frame being then prevented by the ledges of the receiver and casing from shifting its position. The filter-plate frame F consists of a surrounding rim, as shown in Fig. 2, having inward projections *f*, as shown in Fig. 4, suitable for retaining the filter material when compressed. The receiver T is guided by four posts *t*³, secured to the stand *a* and passing through lugs *l'*, and it is carried by springs *t*², resting on the stand, the said springs operating to keep the receiver raised relatively to the bottom plate G so long as there is no pressure on the same, as shown by Fig. 1. The screw-spindle *d*³ works in a beam *d*², turning on a post *d*¹, and which when the presser-plate *d* is in operative position within the casing E can be secured at its free end by the clasp *d*³.

After the receiver T, filter-plate frame F, and casing E have been assembled the pulp of filtering material is run into the space formed by the said parts, and the bottom plate G and the beam *d*² are swung around to bring the presser-plate D over casing E, in which position it is secured by clasp *d*³, the presser-plate D being then screwed down on the pulp. By the pressure thus produced the greater portion of the water is gradually expressed from the pulp, and when the latter is condensed to a certain extent a pressure will be brought to bear on the upper surface of the lug *f* of the frame F through the medium of the pulp, whereby the filter-frame F and receiver T are pressed down against the force of the springs *t*², the casing E following by its own weight. By these means the pulp is condensed uniformly on both sides of lug *f*. At the end of the operation the parts are in the position shown by Fig. 4, the filtering-plate B being then free from water as far as this is requisite for its employment.

The material principally used for the filtering-plates is paper-pulp. If plates of greater permeability are required, however, these may be obtained by adding wood-pulp to the ordinary paper-pulp, while by the addition of ground asbestos the permeability is reduced.

What I claim as my invention is—

1. In a press for manufacturing filtering-plates, the combination of a casing, a perforated bottom plate below the casing, a perforated presser-plate working in the casing, and means for conducting off the expressed liquid,

the casing and bottom plate being separated to permit a filter-plate frame to be inserted between them, substantially as set forth.

2. In a press for manufacturing filtering-plates, the combination of a perforated bottom plate G, a receiver T fitting loosely around said plate, resilient means of support for said receiver, a casing E above the receiver T, and a presser-plate working in the casing E, so as to compress the filtering material between itself and the bottom plate G, and cause the casing E and receiver T to move downwardly, substantially as set forth.

3. In a press for manufacturing filtering-plates, the combination of a movable casing and a movable receiver between which the frames of the plates are confined, a presser-plate adapted to move the casing and receiver downwardly through the working medium of the filtering material, and a perforated bottom plate on which the filtering-plate frames are pressed, substantially as set forth.

4. In a press, the combination of a casing and a bottom plate separated from the casing to permit a frame to be inserted between them, and a presser-plate adapted to reciprocate in the casing to compress material upon the frame, substantially as described.

5. In a press, the combination of a casing and a bottom plate separated therefrom to permit a frame to be inserted between them, a presser-plate within the casing, and means for reciprocating said plate within the casing and for moving it laterally to one side thereof, substantially as described.

6. In a press, the combination with a casing and a bottom plate separated therefrom to permit a frame to be inserted between them, a presser-plate adapted to be reciprocated in the casing, and means for positively holding the frame against displacement, substantially as described.

7. In a press, the combination of a bottom plate adapted to support a filter-plate frame, a receiver surrounding and normally extending above the bottom plate, a casing separated from the receiver to permit a filter-plate frame to be inserted between the two, a presser-plate within the casing, and means for moving said presser-plate vertically therein, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LORENZ ADALBERT ENZINGER.

Witnesses:

ALVESTO S. HOGUE,
FRANK H. MASON.