

E. HAEFELY.

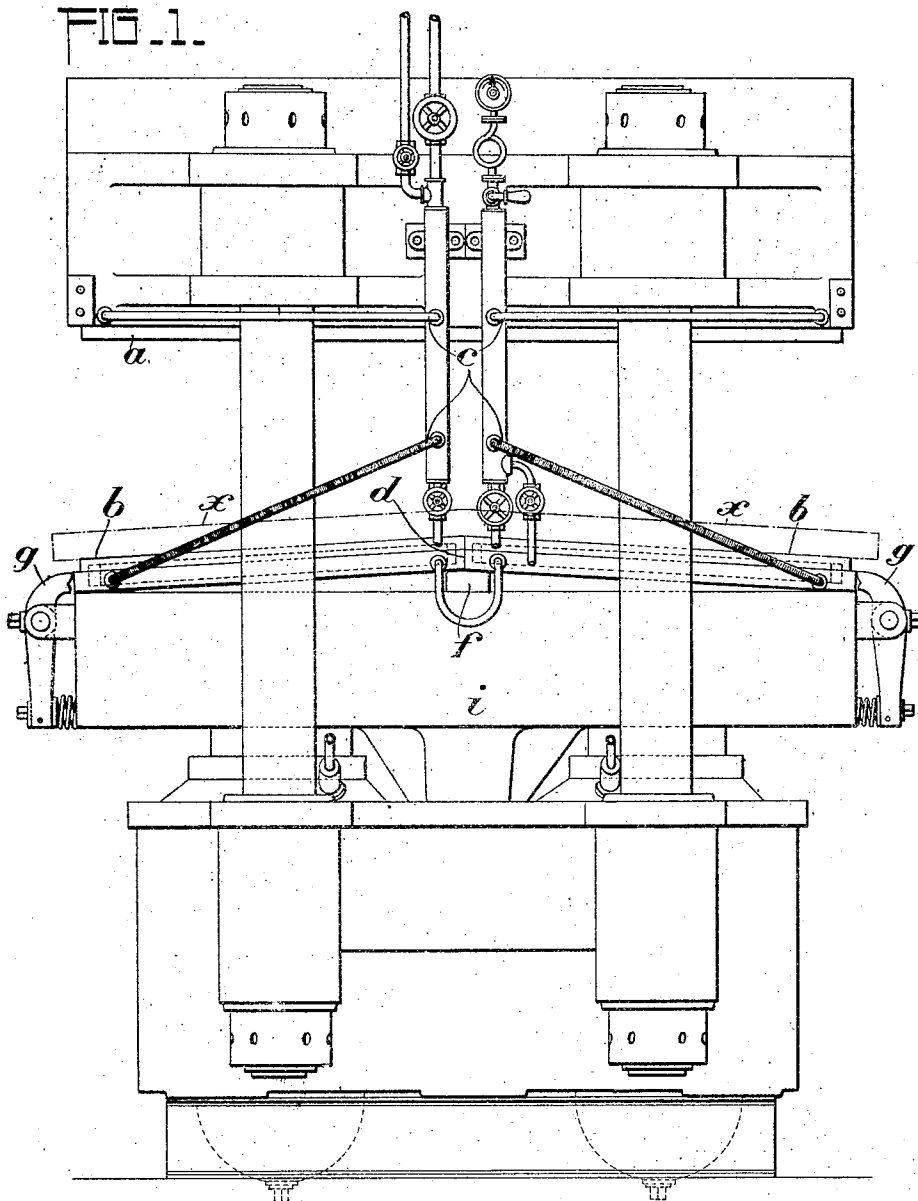
PLATE PRESS FOR THE MANUFACTURE OF PRESSED COMPOSITE INSULATING SHEETS OR PLATES.

APPLICATION FILED MAY 14, 1917.

1,246,740.

Patented Nov. 13, 1917.

2 SHEETS—SHEET 1.

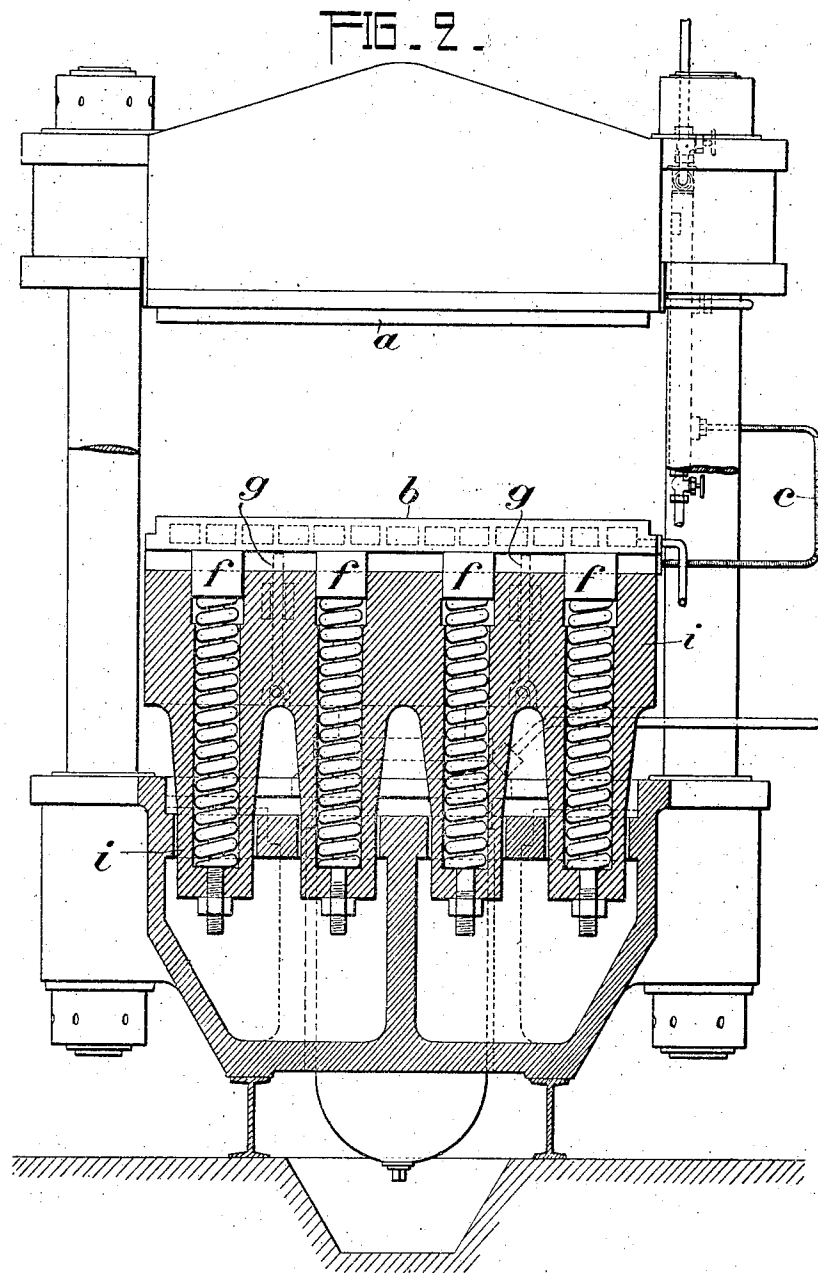


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UNITED STATES PATENT OFFICE.

EMIL HAEFELY, OF BASEL, SWITZERLAND.

PLATE-PRESS FOR THE MANUFACTURE OF PRESSED COMPOSITE INSULATING SHEETS OR PLATES.

1,246,740.

Specification of Letters Patent.

Patented Nov. 13, 1917.

Application filed May 14, 1917. Serial No. 168,543.

To all whom it may concern:

Be it known that I, EMIL HAEFELY, a citizen of the Swiss Republic, and resident of Basel, Switzerland, have invented a new and useful Plate-Press for the Manufacture of Pressed Composite Insulating Sheets or Plates, of which the following is a full, clear, and exact specification.

Plate-presses are known in which the pressure is brought into operation upon the work-piece from the middle part toward the sides thereof. For this purpose some kinds of machines employ elastic intermediate layers, other kinds employ elastic counter-pressure rails. Both kinds of presses have the disadvantage that in the closed condition of the press the pressure as a rule is not distributed uniformly over the whole extent of the material to be pressed, apart from the consideration that they are not suited for high pressures.

The invention relates to a plate-press for the manufacture of composite insulating sheets or plates of paper or the like in layers glued together under a high pressure gradually progressing toward the sides, which is not only suited for high pressures (for instance 300 atmospheres), but also acts with uniform pressure upon the material treated in the final stage of the pressing process. This plate-press comprises two press-plates one of which is roof-like sloping, and acted upon by an elastic pressure medium transmitting the applied pressure, is arranged to finally be brought into level position and to be supported therein by a rigid back-bearing, so as to distribute from this moment the pressure with uniform strength over the whole extent of the insulating material.

With a press of this kind compressed sheets of insulating material, for instance paper, of a suitable thickness (2 inches and more) can easily be manufactured free from blisters and creases.

Either one or both of the press-plates, according to the kind of material to be pressed, can be arranged so as to be heated, for example by means of steam, hot air, hot oil and the like, or their heating may be dispensed with.

A special constructional form of this plate-press is the one in which the press-plate acted upon by the elastic pressure medium is divided or sectioned in the middle and has its parts or sections positioned by

the elastic pressure medium toward both sides like a sloping roof.

In that case the divided press-plate is with advantage supported in the neighborhood of the division joint by the pressure medium, for instance compression springs, and is spring-supported on side rams at its sides parallel to said joint, so that the parts or sections of the plate during the pressing process can yield in the vertical direction and toward the sides, but at the joint remain in contact with one another in every position of the press.

The accompanying drawings show a constructional example of the subject of the invention:

Figure 1 is a front view, and

Fig. 2 is a partial vertical section of the same.

a is the upper and b the lower press-plate. The upper press-plate a is fixed while the lower b is displaceable perpendicularly to the upper press-plate by means of hydraulic raising pistons. Both press-plates, in the example shown, are provided in their interiors with heating channels (see Fig. 2) adapted to receive a heating medium which is supplied to them through the pipes c , nevertheless under certain circumstances it may suffice to arrange for only one of the press-plates to be heated.

The lower press-plate b is transversely divided or sectioned in the middle at d , and its parts or sections rest at that point upon spring acted pistons f , which are held in the rigid back-pressure head i , the sections of the plate in normal condition forming a ridge and being adjusted sloping in such a manner that the same are inclined to the horizontal from the middle toward both sides like a roof, as appears from Fig. 1. At the sides parallel to the division joint d the two sections of the press-plate b are supported on spring buffer levers g (Fig. 1).

In the use of the press a pile of insulating material x , for instance consisting of sheets of paper layered and stuck together by means of varnish, is placed upon the lower press-plate b , and then the press is set in operation so that the lower press-plate b with the insulating material is raised against the upper press-plate a , the press-plates being heated if desired. During this rising movement first the middle part of the pile of insulating material lying over the ridge

formed by the junction of the two half-plates comes into contact with the upper press-plate *a*, so that the pressure first begins to be applied in the middle of the mass of insulating material. In the further course of the pressing process in which the spring acted pistons *f* are gradually pressed down and the inclination of the sections of the press-plate *b* becomes gradually less, the pressure is then propagated gradually and uniformly toward the sides so that the layers of insulating material under the gradually progressing pressure toward the sides are compressed without creases against one another, by smoothing away excess amounts of adhesive, inclosed air, moisture and the like, so that the layers are stuck solid together. Finally, as soon as the sections of the divided press-plate *b* are supported in their horizontal position by the rigid back-bearing *i*, the pressure becomes distributed with uniform strength over the whole extent of the insulating material and there now follows a uniform final pressure over the entire surface under treatment. In this manner a compressed article of suitable thickness is obtained free from blisters and creases. In the course of the pressing process the sections of the press-plate *b* are somewhat displaced in a lateral direction and the lateral buffer levers *g* tend to push same back so that these levers hold the sections of the plate at the joint continuously in contact with one another. Upon the pressing process ceasing the levers *g* shift the sections of the plate back again into their slightly inclined starting position.

What I claim is:

1. In a plate-press for the purpose described, two press-plates for pressing composite insulating material between them, one of which is sloping in the lateral direction, yielding means supporting said sloping press-plate and power means for producing relative approaching movement between said press-plates to cause a gradually progressing pressure upon the material, substantially as set forth.

2. In a plate-press for the purpose described, two superposed press-plates for pressing composite insulating material between them, the lower of which is sloping in the lateral direction and vertically movable with respect to the upper which is stationary, and power means for raising said lower press-plate against the upper to cause a gradually progressing pressure upon the material, substantially as set forth.

3. In a plate-press for the purpose described, two press-plates for pressing com-

posite insulating material between them, one of which is sloping in the lateral direction, yielding means supporting said sloping press-plate and power means for producing relative approaching movement between said press-plates to cause a gradually progressing pressure upon the material, one at least of the said press-plates being provided with heating means, substantially as set forth.

4. In a plate-press for the purpose described, two press-plates for pressing composite insulating material between them, one of which is divided in the middle so as to form two sections and has both its sections roof-like sloping from the middle toward the ends of the plate, yielding means supporting the said two plate sections near their joint and power means for producing relative approaching movement between said press-plates to cause a gradually progressing pressure upon the material, substantially as set forth.

5. In a plate-press for the purpose described, two press-plates for pressing composite insulating material between them, one of which is divided in its middle so as to form two sections and has both its sections roof-like sloping from the middle toward the ends of the plate, yielding means supporting the said two plate sections near their middle joint, means to constantly maintain the said two plate sections in contact with one another at the middle joint and to reset them in sloping position, and power means for producing relative approaching movement between said press-plates to cause a gradually progressing pressure upon the material, substantially as set forth.

6. In a plate-press for the purpose described, two press-plates for pressing composite insulating material between them, one of which is sloping in the lateral direction, yielding means supporting said sloping press-plate, power means for producing relative approaching movement between said press-plates to cause a gradually progressing pressure upon the material, and a back-bearing to rigidly support said sloping plate when being brought to level position for a uniform final pressing stage, substantially as set forth.

In witness whereof I have hereunto signed my name this 18th day of April, 1917, in the presence of two subscribing witnesses.

EMIL HAEFELY.

Witnesses:

CARL O. SPAMER,
JOHN R. GARNANS.