

L. BARTELSTONE.
COMPENSATING PRESS.
APPLICATION FILED AUG. 8, 1919.

1,334,588.

Patented Mar. 23, 1920.
2 SHEETS—SHEET 1.

Fig. 1

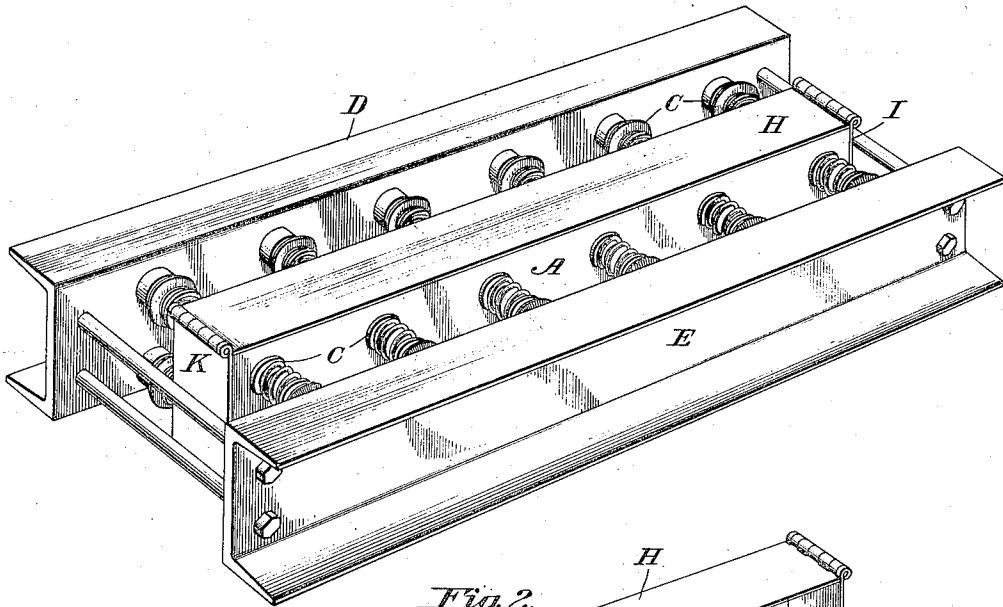


Fig. 2

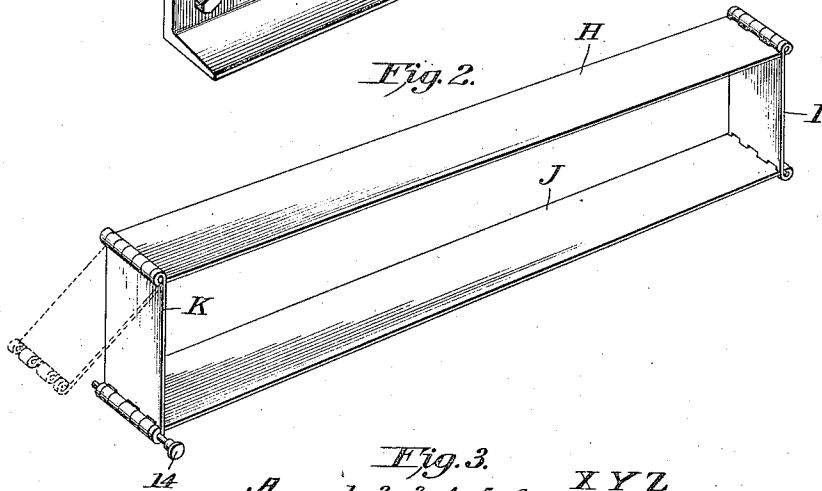
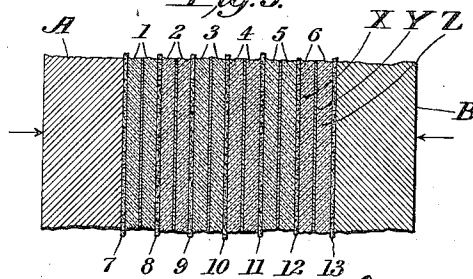


Fig. 3



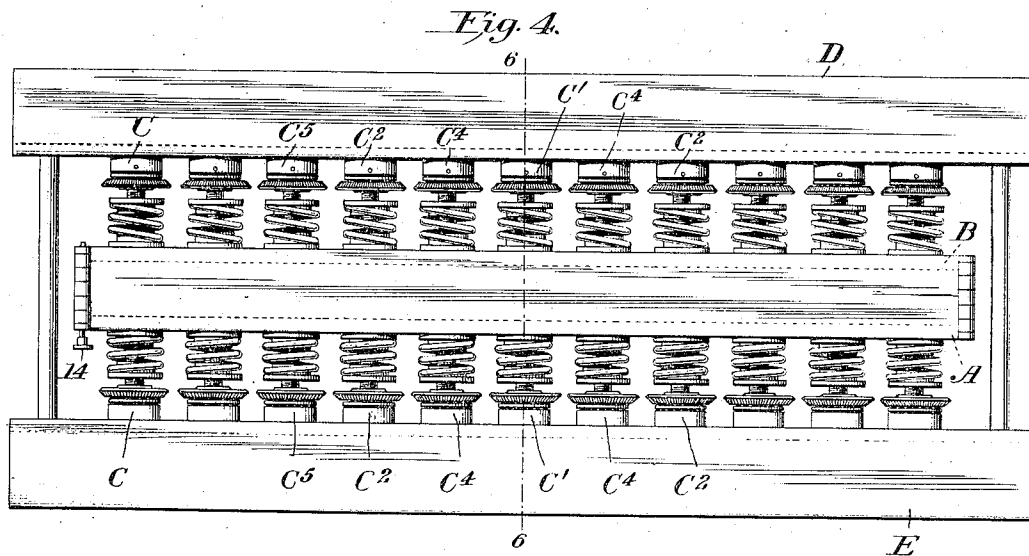
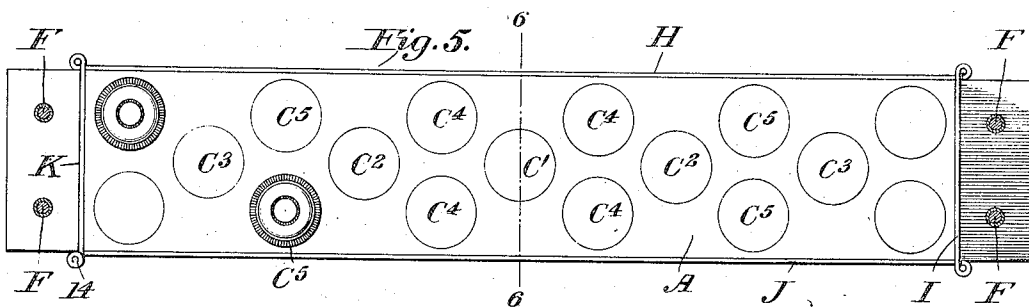
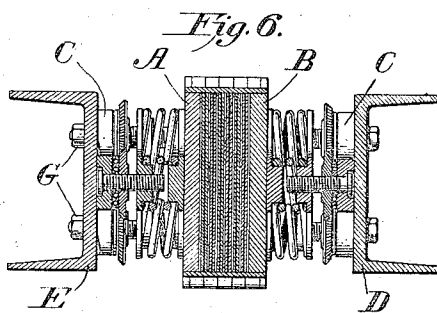
By

Inventor
Louis Bartelstone
Attorney
Albert F. Nathan

L. BARTELSTONE.
COMPENSATING PRESS.
APPLICATION FILED AUG. 8, 1919.

1,334,588.

Patented Mar. 23, 1920.
2 SHEETS—SHEET 2.



Inventor
Louis Bartelstone
By Attorney
Albert P. Nathan

UNITED STATES PATENT OFFICE.

LOUIS BARTELSTONE, OF BROOKLYN, NEW YORK.

COMPENSATING PRESS.

1,334,588.

Specification of Letters Patent.

Patented Mar. 23, 1920.

Application filed August 8, 1919. Serial No. 316,082.

To all whom it may concern:

Be it known that I, LOUIS BARTELSTONE, a citizen of the United States, and residing at Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Compensating Press, of which the following specification is a full disclosure.

This invention proposes an apparatus for the purpose of subjecting plates or sheets to graduated pressures, especially under conditions demanding peculiar local distributions of pressure, or of progressive increases in pressure from one or more points of localized intensity.

In certain industries, use is made of so-called glass "sandwiches"; these consisting of two plates of glass securely cemented to an intervening sheet of some non-brittle, transparent material. These so-called "sandwiches" are regarded as defective unless the adhesion is perfectly continuous and free from any weakly adhering areas since the latter would shortly form what are known as blisters. The aforesaid plates are cemented together through the application of a very considerable amount of pressure together with an application of heat. Unless this pressure is applied very carefully, and unless it is caused to increase in a properly distributed manner, the resulting "sandwiches" will be defective, either through breakage or lack of continuous adhesion.

The apparatus herein disclosed, is perfectly adapted to retain a plurality of the aforesaid "sandwiches" while in process of formation; to hold the plates securely against premature slippage, and to enable the pressure to be applied initially at a single point and to subsequently be applied to more remote points until the proper continuity of adhesion has been attained.

Other objects will be in part obvious from the annexed drawings and in part indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combination of parts and in the unique relation of the members and in the relative proportioning and disposition thereof; all as more completely outlined herein.

To enable others skilled in the art so fully to comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and

relation contemplated by this invention, drawings depicting a preferred form have been annexed as a part of this disclosure, and in such drawings, like characters of reference denote corresponding parts throughout all the views, of which:

Figure 1 is a perspective of an apparatus embodying this invention showing a plurality of plates under compression while detained against lateral slippage. Fig. 2 is a perspective of a cage or knock-down frame adapted to inclose the edges of the plate and to preserve alinement thereof. Fig. 3 is a fragmental cross section showing a plurality of "sandwiches" with their respective separators, arranged in a pile between two pressure members. Fig. 4 is a top view of the device shown by Fig. 1. Fig. 5 is a side elevation of one of the movable pressure bars showing two of the spring jacks in place and indicating by circles the location of the other spring jacks; and Fig. 6 is a section through line 6-6 of Fig. 4 and Fig. 5.

Continuing now by way of more detailed description, Figs. 3 and 6 show in cross section a number of "sandwiches" 1, 2, 3, 4, 5 and 6, separated by means of spacers 7, 8, 9, 10, 11, 12 and 13, consisting of sheets of blotting paper or other suitable material. These "sandwiches" consist each of two plates of glass X and Z with an intervening sheet of transparent material Y rigidly and continuously adhering thereto. The pile thus formed lies between two similarly shaped pressure plates A and B, and by means of the instrumentality to be described hereinafter, all of these parts are strongly pressed together, and the pressure is maintained during a suitable heating period.

A peculiarity of my process for effecting adhesion of the elements constituting the so-called "sandwiches" resides in the unique manner in which the pressure is initially started and ultimately brought to its final continuing status. That is to say, when the elements constituting each "sandwich" are initially brought together, their contacting surfaces are smeared with a conditioning and a cementing fluid. This fluid is applied rather copiously and excess must be eliminated in the press by a peculiar application of the pressure. That is to say, the central regions most remote from the edges must first receive the pressure stresses so that a tendency is set up toward expel-

ling the excess of fluid together with any air bubbles in an outwardly direction toward the edges. While the pressure in the central area is on the increase, pressures must then
 5 originate in immediately adjacent regions, and also gradually increase; and in like manner, pressures must subsequently originate and gradually increase in successively adjacent regions, until the entire area is uni-
 10 formly subjected to an evenly distributed pressure. During this process, there will be, of necessity, a noticeable decrease in the initial thickness of the pile and accordingly the pressure applying elements must possess
 15 the ability to follow up the retreat of the outer pressure members without disproportionately affecting the general distribution of the pressure and must prevent any outermost regions from receiving more severe pressures than the central regions,
 20 otherwise air bubbles or excesses of the cementing fluid would remain imprisoned and the continuity of the adhesion would be impaired.

25 This invention accordingly contemplates a plurality of resilient or elastic pressure elements so arranged and constructed that the central elements may be brought into action in advance of the outlying elements,
 30 and cause to exert the pressure which grows in intensity at a rate at least equal to that of the outlying elements, until they all are exerting substantially equal pressure. In this present form, these pressure elements
 35 consist of spring jacks C constructed as disclosed in my co-pending application, Serial No. 306,027 filed on June 23, 1919. These jacks are preferably arranged to bear at one end against a rigid inclosed frame consisting of two channel bars D and E held
 40 together near their ends by tension rods F which preferably are threaded at one end to receive nuts G whereby the distance between the channel bars may be regulated. The spring jacks C are distributed in some
 45 such manner as is indicated by Fig. 5, so that their inner ends bear against the pressure members A and B. After these jacks are arranged in place with the pile intervening, as shown by Fig. 6, the inter-
 50 posing central jacks C' are first adjusted until they indicate a predetermined pressure. The jacks C² are then adjusted, but not in excess of the pressure registered by
 55 the jacks C'. The jacks C³ are then likewise adjusted but not in excess of the pressure indicated by jacks C². Then the jacks C⁴, C⁵, and so on, are adjusted in like manner. This operation may be repeated until
 60 finally all of the jacks may register equal pressures.

65 In order to prevent any side slip during the foregoing development of pressure, a collapsible frame shown by Fig. 2 may be employed. This frame consists of side

members H, I, J and K which are hinged together at their ends, and which are preferably composed of comparatively heavy heat conducting material, such as brass, so that the heating and cooling of the plates in-
 70 closed thereby may be exploited. In order to enable said aforesaid frame to be readily removed and applied, one of its hinged pins, indicated by 14, may be constructed so as to be easily withdrawn; or any other clasp
 75 may be employed.

In operation, it has been found that the foregoing apparatus is eminently adapted to effect a correct development of pressures so that articles presenting rather extensive
 80 areas may be caused to adhere perfectly. The apparatus possesses the characteristic of being self-compensating so that any irregularities or variations in thickness in the plates of glass (which are commercially unavoidable)
 85 will be compensated for correctly and effectively. Any flexing of the pressure members A and B due to such irregularities will not affect the distribution or the development of the pressures, and consequently, it has been found by means of this
 90 apparatus, that "sandwiches" may be made without breakage and without imperfections in adhesion. While coil springs have been illustrated as a means of obtaining re-
 95 silient pressures, it will be understood that other equivalents therefor, such as pneumatic plungers, or magnetic solenoids may be used.

Without further analysis, the foregoing
 100 will so fully reveal the gist of this invention that others can by applying current knowledge readily adapt it for various applications without omitting certain features that, from the standpoint of the prior art, fairly constitute essential characteristics of the generic or specific aspects of this in-
 105 vention, and therefore such adaptations should and are intended to be comprehended within the meaning and range of equivalency of the following claims.

Having thus revealed this invention, I claim as new and desire to secure the following combinations of steps and elements, or equivalents thereof, by Letters Patent of
 115 the United States:

1. An apparatus of the nature disclosed combining two pressure members and a multiplicity of independently acting resilient elements arranged to operate against the re-
 120 spective external faces of said pressure members.

2. A compensating press combining a pair of pressure members; a series of individually adjustable pressure elements operating
 125 the respective external faces of said pressure elements; and non-yielding means for receiving the counter-thrusts of said elements.

3. A pressure distributing apparatus com- 130

binning a press-head; a plurality of resiliently acting devices distributed throughout the area of said press-head; means for receiving the counter-thrust of said devices; and adjustment means adapted to be regulated whereby the thrust against said press-head may be progressively increased in its respective portions at a rate inversely proportional to the intensity of the pressure at a central region thereof.

4. A self-compensating press combining two pressure members adapted to receive therebetween sheets of material to be pressed; a non-yielding base, a series of individual pressure-exerting devices intervening between said base and one of said pressure members; and a marginal frame element coöperating with said pressure members.

5. A press combining two flat pressure members, adapted to receive therebetween sheets to be subjected to pressure; a removable margin frame adapted to bear against the edges of said sheets to prevent lateral movement thereof; and resilient mechanism for exerting pressure on said sheets through the agency of said pressure members.

6. An apparatus of the nature disclosed combining two pressure members; a margin-frame circumscribing said members; and a multiplicity of independently acting resilient elements arranged to operate against the respective external faces of said pressure members.

7. A compensating press combining a pair of pressure members; a margin-frame circumscribing said members; a series of individually adjustable pressure elements operating the respective external faces of said pressure elements; and non-yielding means

for receiving the counter-thrusts of said elements.

8. A pressure distributing apparatus combining a press-head; a margin-frame circumscribing said head; a plurality of resiliently acting devices distributed throughout the area of said press-head; means for receiving the counter-thrust of said devices; and adjustment means adapted to be regulated whereby the thrust against said press-head may be progressively increased in its respective portions at a rate inversely proportional to the intensity of the pressure at a central region thereof.

9. A self-compensating press combining two pressure members adapted to receive therebetween sheets of material to be pressed; a non-yielding base, a series of individually adjustable pressure-exerting devices intervening between said base and one of said pressure members; and a marginal frame element coöperating with said pressure members.

10. A press combining two flat pressure members, adapted to receive therebetween sheets to be subjected to pressure; a removable margin-frame adapted to bear against the edges of said sheets to prevent lateral movement thereof; and universally adjustable resilient mechanism for exerting pressure on said sheets through the agency of said pressure members.

In witness whereof, I hereunto subscribe my name, as attested by the two subscribing witnesses.

LOUIS BARTELSTONE.

Witnesses:

BERTHE MUELLER,
ALBERT F. NATHAN.