C. H. GRAY.

PRESS FOR VULCANIZING MOLDS.

APPLICATION FILED NOV. 7, 1916.

1,234,330.

Patented July 24, 1917.

2 SHEETS—SHEET 1.

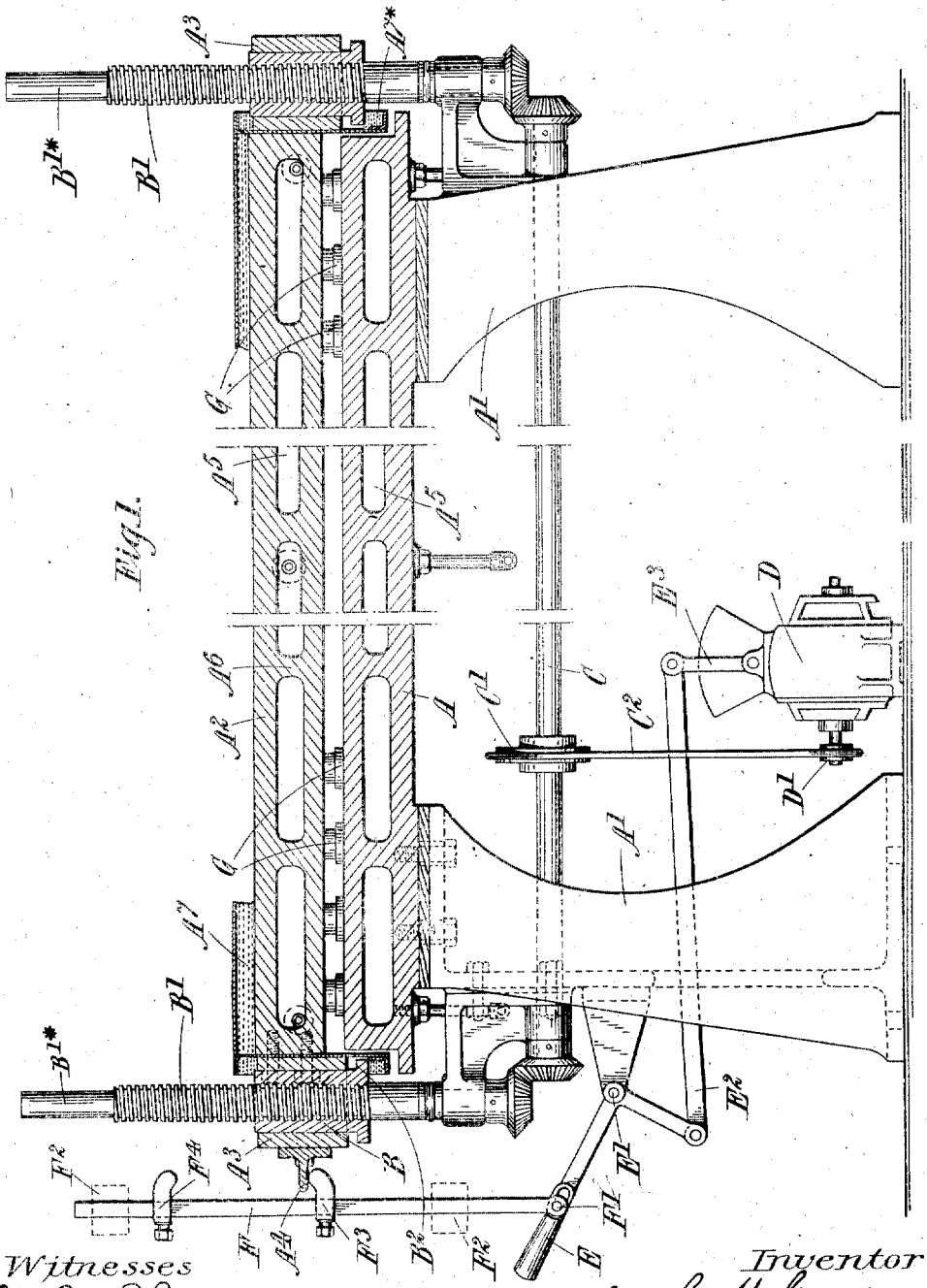


Fig. 1.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

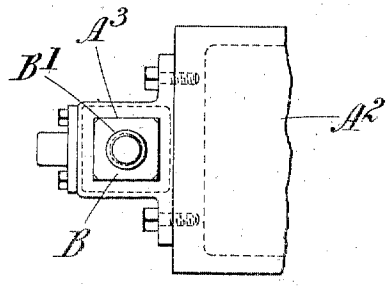
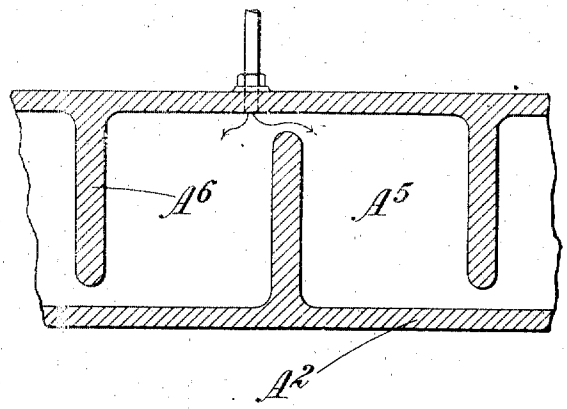


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

CHRISTIAN HAMILTON GRAY, OF ESSEX, ENGLAND.

PRESS FOR VULCANIZING-MOLDS.

1,234,330. Specification of Letters Patent. Patented July 24, 1917.

Application filed November 7, 1916. Serial No. 129,949.

To all whom it may concern:

Be it known that I, CHRISTIAN HAMILTON GRAY, a subject of the King of England, residing in Essex, England, have invented certain new and useful Improvements in Presses for Vulcanizing-Molds, of which the following is a specification.

This invention is for improvements in or relating to presses for vulcanizing-molds, and has for its object to provide a press which cannot be operated to put such pressure on the molds as to either damage them or itself.

According to the present invention, a press for vulcanizing molds is characterized by the press-plate being supported above the bed upon guiding members constructed to engage with the plate to exert an upward thrust thereon but to be movable downward relatively to the plate without exerting a downward thrust thereon, and power-driven mechanism to raise the plate by means of the said members and permit it to descend under the action of gravity alone.

It has before been proposed to raise and lower a top-plate of a vulcanizing-mold by means which cannot exert downward pressure upon it, but in use this plate was intended to be locked in position prior to applying pressure by a specially constructed ram.

It has also been proposed to force down the ram of an electrical press by a lever having one end connected to a nut engaged by a spring-controlled screw-threaded spindle, so that the ram would be positively lowered and forced down by the operation of the screw-threaded spindle until the pressure of the controlling spring was overcome, when the spindle would advance against the spring, the nut and ram meanwhile remaining stationary, and in its movement operate a switch to cut off the driving current. It will be seen that neither of these proposals anticipates the employment of the dead weight of a press-plate to apply the required pressure.

In the accompanying drawings which illustrate one method of carrying out this invention—

Figure 1 is a vertical section through the press showing a few molds in position;

Fig. 2 is a plan of an end-portion of the press, and

Fig. 3 is a horizontal section through a portion of one of the plates of the press.

The same letters indicate the same parts throughout the drawings.

The bottom plate A of the press is a fixture being carried on supports A^1. The upper plate A^2 has guide-lugs A^3 secured one at each end. Each of these lugs has a square hole which takes a nut B whose exterior is square to fit the lug loosely and whose interior is screw-threaded to engage the thread of a vertical lifting-spindle B^1. The bottom of each nut is flanged at B^2 to engage the under-face of the lug A^3. The spindles B^1 are geared by miter gearing to a driving-shaft C which receives motion from an electric motor D through pulleys D^1 and C^1 and a driving-belt C^2. The motor is controlled by a bell-crank lever E pivoted at E^1 and connected by a link E^2 to a switch-arm E^3 on the motor. Pivoted to the lever E at F^1 is a vertical rod F which slides in bearings indicated in dotted-lines at F^2. Fixed to the rod are stops F^3, F^4 respectively which coöperate with a tongue A^4 on the left-hand lug A^3 of the top plate of the press.

The operation of this apparatus is as follows:—

To raise the top plate of the press, the lever E is pulled down so that the switch-arm E^3 will be thrown over to the "up" position indicated on the motor D, and with this movement of the lever E, the vertical rod F will be drawn down so that the stop F^4 is brought nearer to the tongue A^4 on the lug A^3 of the press-plate A^2. The motor being started by the movement of the switch-arm E^3, operates the shaft C and thus drives the spindles B^1 through the miter-gearing by which they are connected to the said shaft, and in this manner the nuts B are made to travel up the spindles B^1. As they advance, they pick up the plate A^2 by means of the flanges B^2 which lie under the lugs A^3 and raise the plate free of the molds in the press, which molds are indicated at G. As soon as the plate is free of the molds, the tongue A^4 on the lug A^3 strikes the stop F^4 and raises the rod F, so that by this means the lever E is raised, and thus the switch-arm E^3 of the motor is brought over to the "stop" position, whereupon the motor stops and the

plate A^2 is held in the position to which it has been raised.

To return the plate A^2 the lever E is raised and thus the switch-arm E^3 is brought over to the "down" position on the motor D. This reverses the motor so that the operation of the parts is reversed and the plate A^2 is lowered until it rests on the molds G. By this time the tongue A^4 has come into contact with the stop F^3 and has thus moved the switch-arm E^3 of the motor D over to the "stop" position. The motor does not immediately stop so that the nuts B still continue to travel down slightly, but this has no effect upon the plate A^2 as the nuts B are free in the lugs A^3 and thus the plate A^2 only lies on the molds with its own weight.

It will thus be seen that in no circumstances can greater pressure be put upon the plate A^2 than is due to its own weight, and this plate is made sufficiently strong to support itself without damage. The weight of the plate is made sufficiently great to put the required pressure upon all the molds when the press is full, all molds put in at one time being made of equal thickness.

The construction of the plates is the same as that commonly employed for steam-heated press-plates, the whole interior A^5 being provided with a series of baffles A^6 which provide a sinuous course for the steam and also serve as ties between the top and bottom walls of each hollow plate. The upper plate may be lagged, as indicated at A^7, and the lagging may extend down in the form of a hood over the sides of the bottom plate, as indicated at A^{7*}, though at the ends where this downward extension is shown, a slot is necessarily provided in the lagging for the lugs A^3.

Should the automatic mechanism for stopping the motor become deranged at any time, no harm will accrue to the press, as the spindles B^1 are provided with plain extensions B^{1*} which would receive the nuts B so that the plate would not be thrown from the spindles but would merely rest at the top of the same while the spindles continued to rotate.

Obviously other means may be employed for raising and lowering the plate A^2 according to this invention, for example, instead of the nuts B, the plate could be lowered by chains or other flexible means which cannot exert any downward thrust upon the plate, so that when brought down upon the molds, a thrust equal to its own weight only, would be exerted upon the latter. Further, where it is preferred to make the plate itself lighter than will give the required pressure, weights may be placed upon it to the required amount, the object being never to allow the pressure to exceed the predetermined maximum value.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a press for vulcanizing molds, the combination of a bed, a press-plate supported above the bed upon guide members constructed to engage the plate to exert an upward thrust thereon but to be movable downward relatively to the plate without exerting a downward thrust thereon, and power-driven mechanism to raise the plate by means of said members and permit it to descend under the action of gravity alone, substantially as described.

2. In a press for vulcanizing-molds, the combination of a bed, a press-plate supported above the bed upon guide-members constructed to engage with the plate to exert an upward thrust thereon but to be movable downward relatively to the plate without exerting a downward thrust thereon, and power driven mechanism provided with automatic stop-gear controlled by the position of said plate relatively to the bed to raise the plate by means of the said members and permit it to descend under the action of gravity alone, substantially as set forth.

In testimony whereof I have signed my name to this specification.

CHRISTIAN HAMILTON GRAY.