

No. 741,516.

PATENTED OCT. 13, 1903.

J. D. LUTTRELL & W. C. CANTRELL.

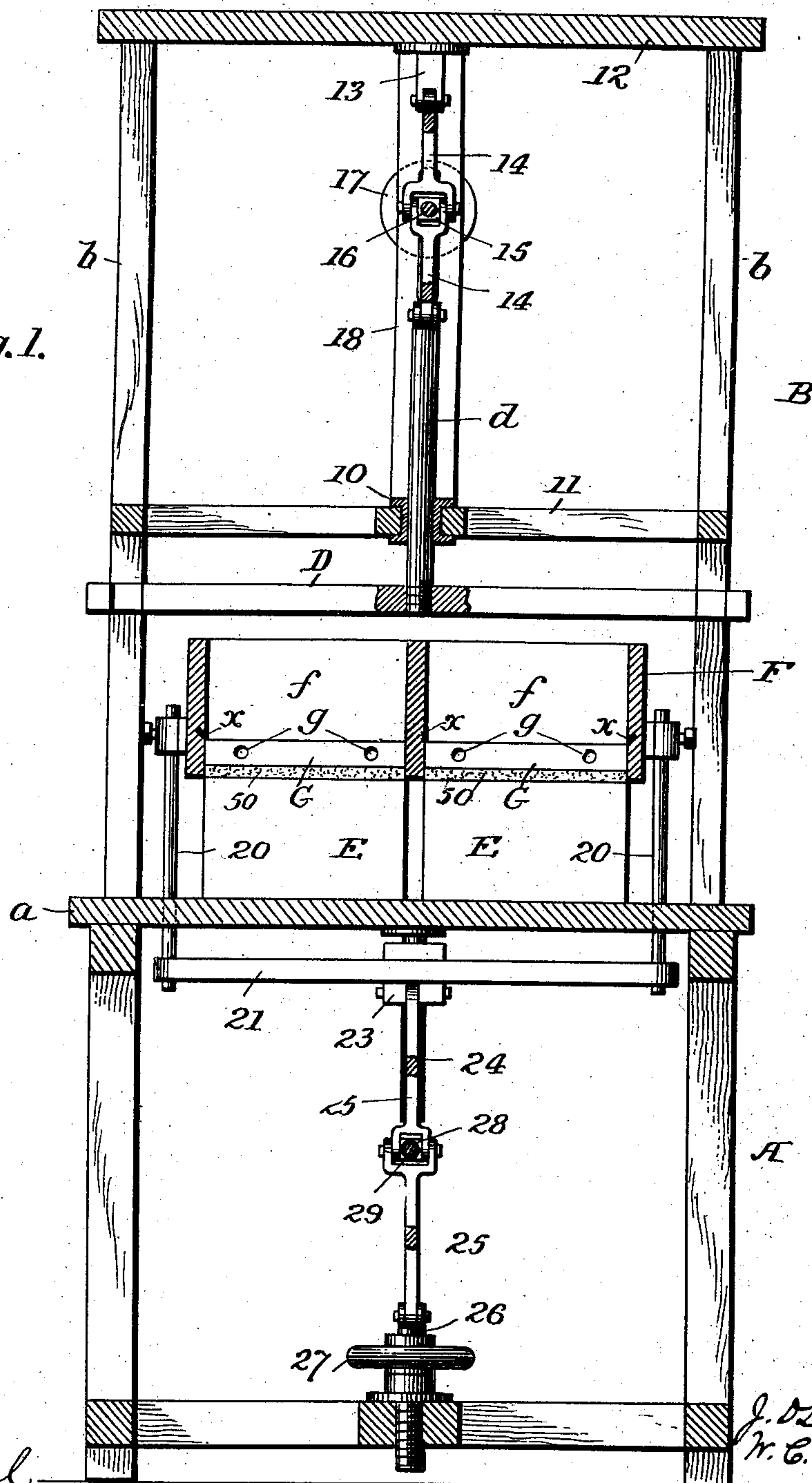
CEMENT BRICK MACHINE.

APPLICATION FILED SEPT. 30, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



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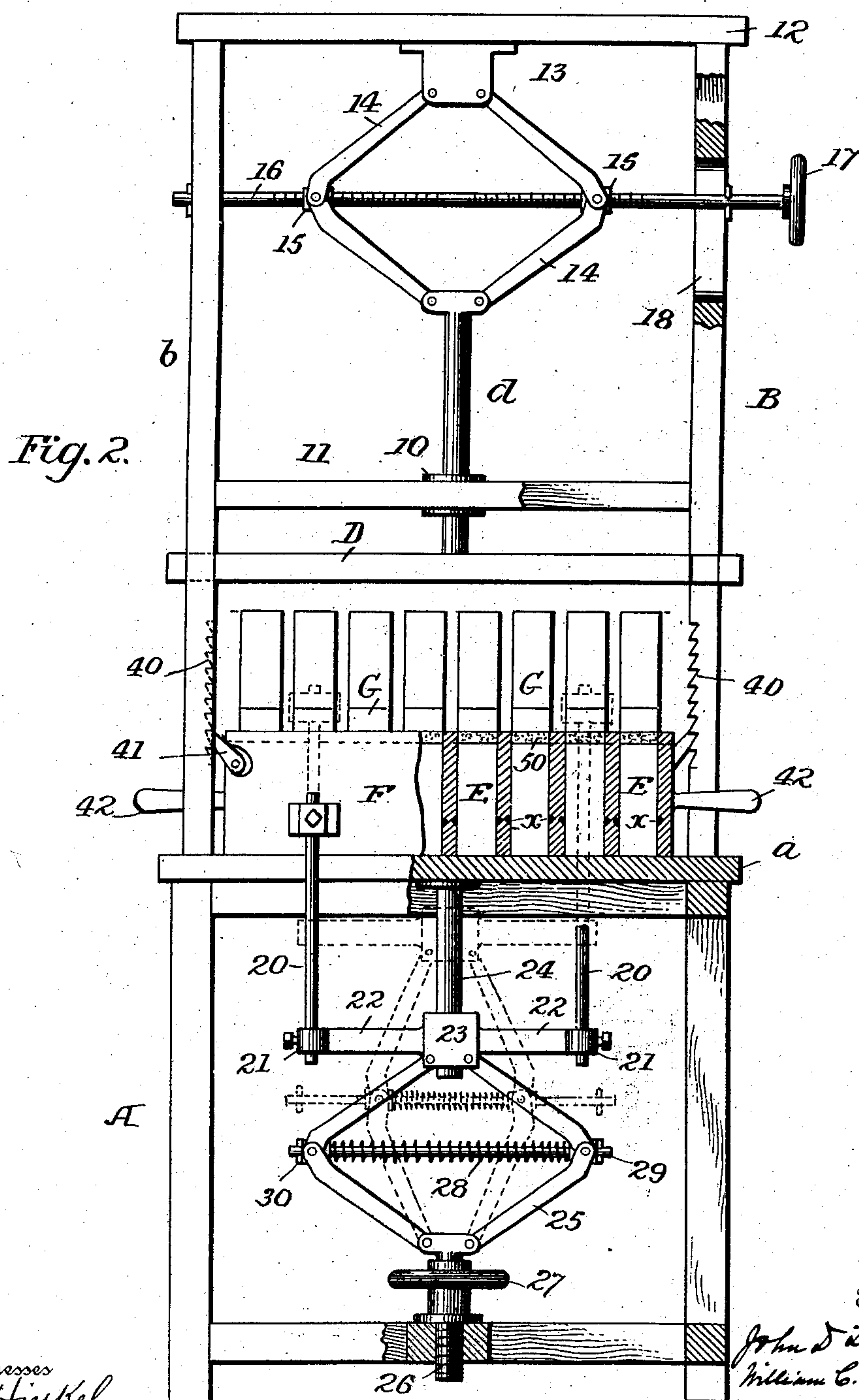
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 3.

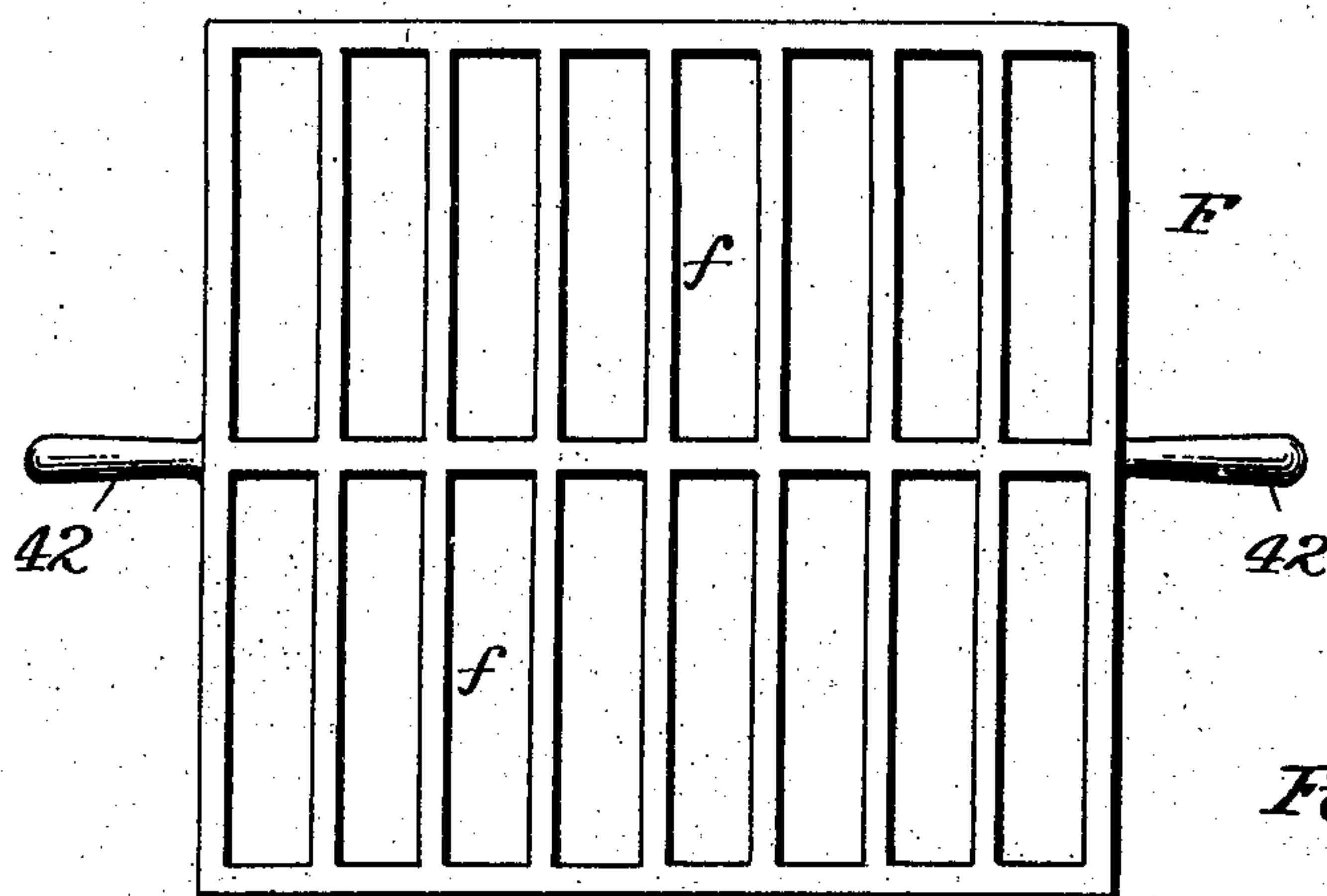


Fig. 7.

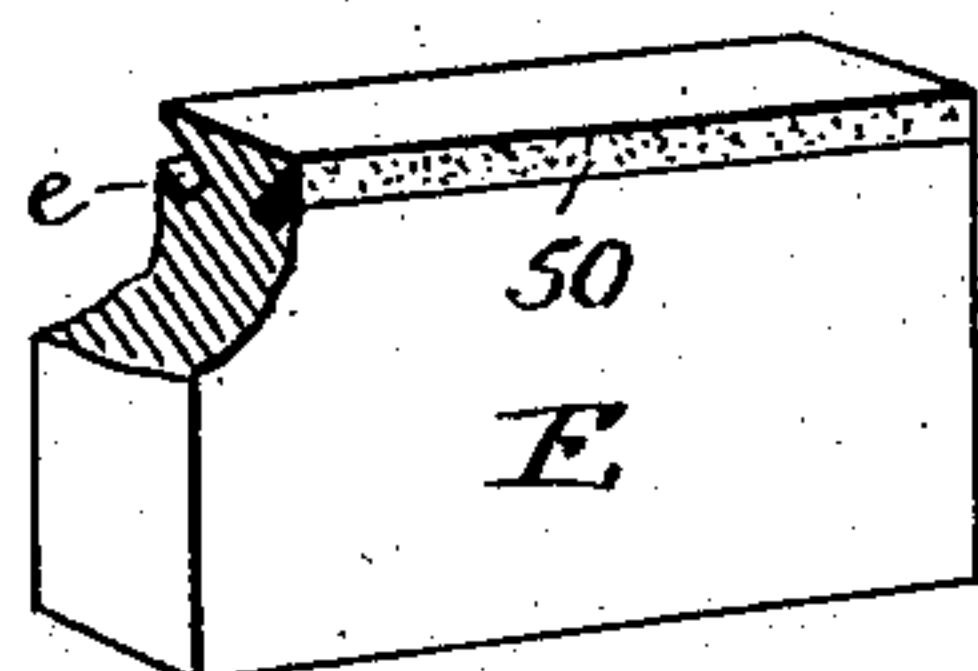


Fig. 4.

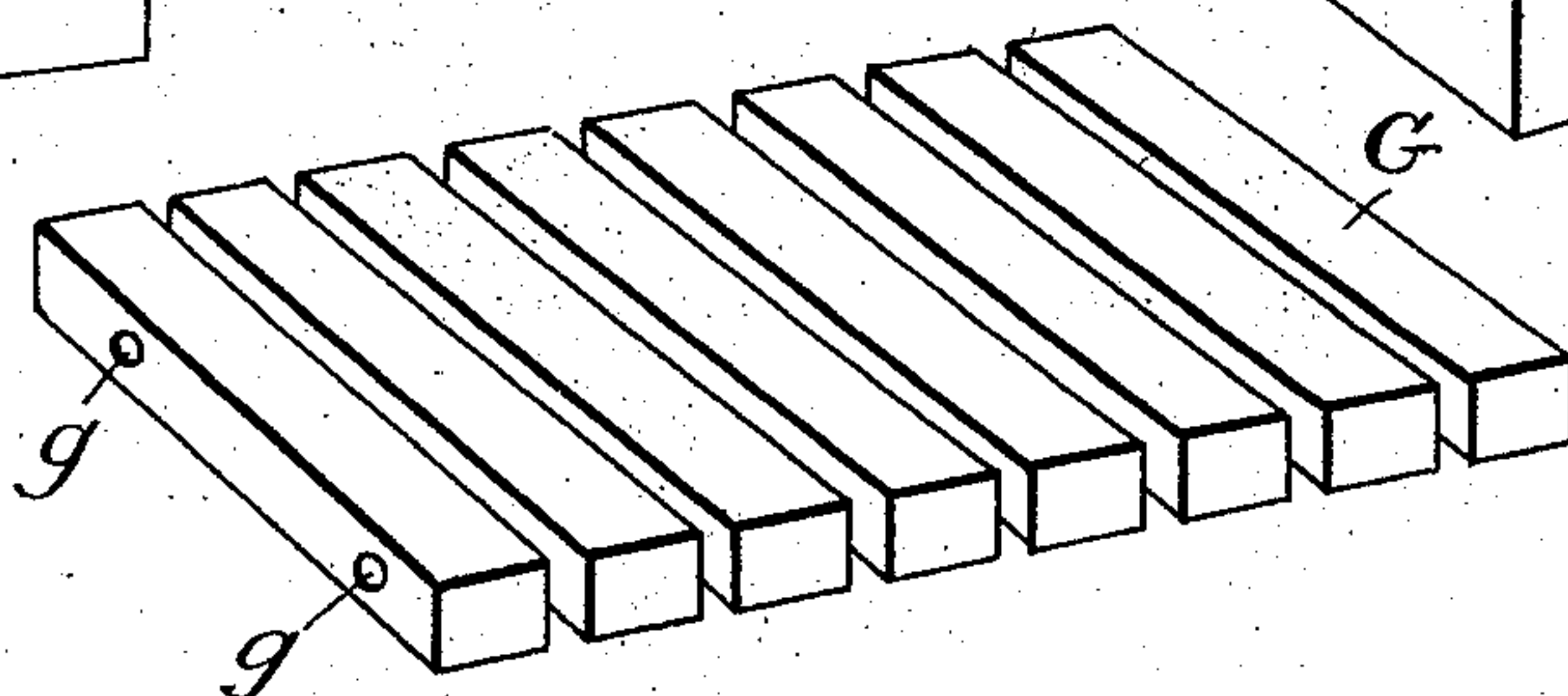


Fig. 6.

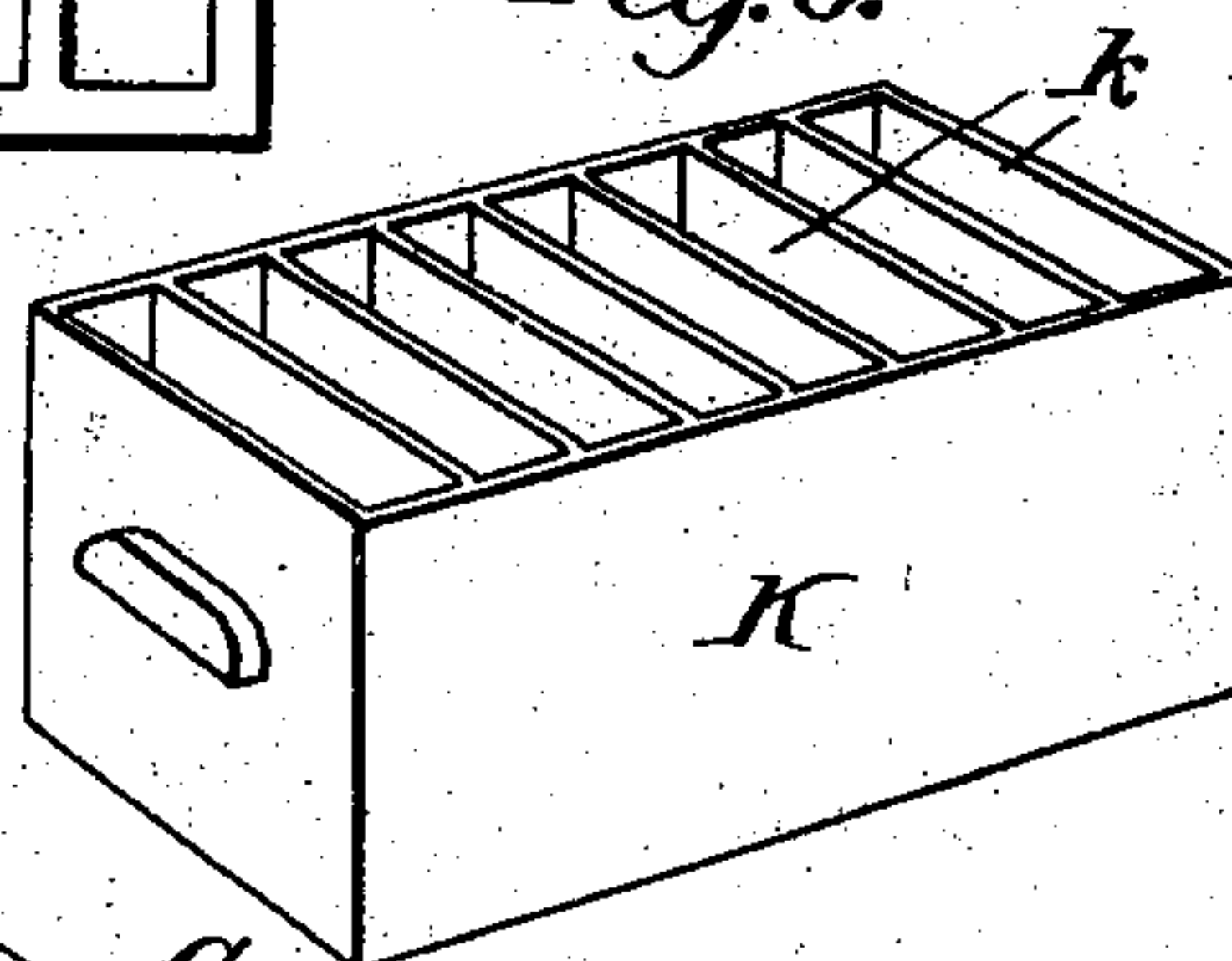
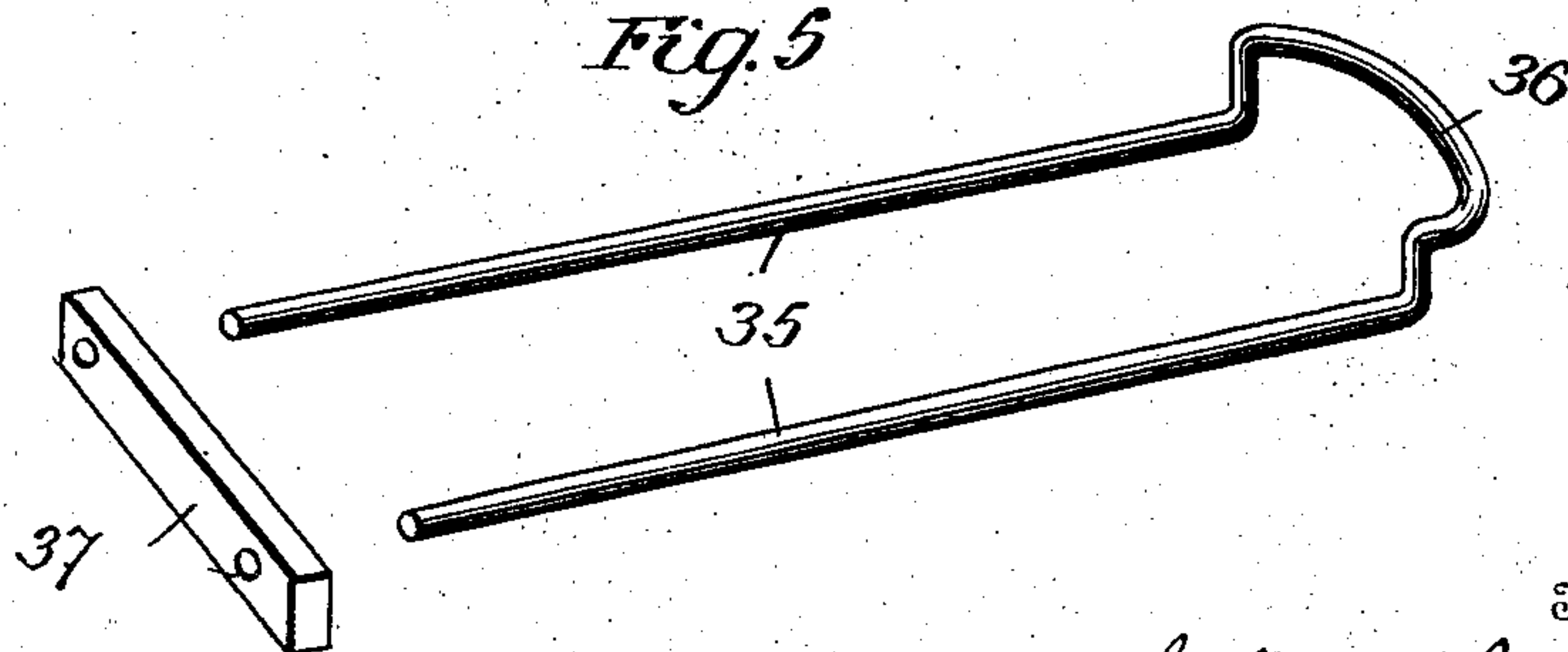


Fig. 5.



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UNITED STATES PATENT OFFICE.

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CEMENT-BRICK MACHINE.

SPECIFICATION forming part of Letters Patent No. 741,516, dated October 13, 1903.

Application filed September 30, 1902. Serial No. 125,428. (No model.)

To all whom it may concern:

Be it known that we, JOHN D. LUTTRELL, a subject of the King of Great Britain, and WILLIAM C. CANTRELL, a citizen of the United States, both residing at Benton Harbor, Berrien county, State of Michigan, have invented certain new and useful Improvements in Cement-Brick Machines, of which the following is a specification.

10 This invention relates to machines for molding and pressing bricks or building-blocks, and more particularly to machines of this class for making bricks or blocks from a cohesive composite material, such as a mixture
15 of sand, cement, and other ingredients.

The object of the invention is to simplify and generally to improve the structure and mode of operation of machines of this class, whereby the bricks are more perfectly made
20 and may be handled with less danger of injuring them in transferring them from the machine to the place where they are subsequently cured.

The invention will be fully described hereinafter, reference being had to the accompanying drawings, in which we have illustrated a preferred embodiment of our invention, although it is to be understood that we do not
30 thereby intend to limit ourselves to the particular details of construction illustrated and described, and particularly of what may be termed the "actuating" parts of the machine.

In the said drawings, Figure 1 is an elevation, partly in section, of a machine embodying our invention. Fig. 2 is a vertical transverse section of Fig. 1. Fig. 3 is a plan view of the mold-box. Fig. 4 is a perspective view of a series of mold-boards. Fig. 5 is a view of a lifting device for the mold-boards. Fig.
40 6 is a perspective view of a filling-box on a reduced scale. Fig. 7 is a perspective view, partly in section, of one of the supporting blocks over which the mold-box slides.

There is a suitable frame (indicated generally by A) which supports a table *a*. Extending upwardly from the table is another frame B, consisting of corner-standards *b* and various cross and vertical bars, to be hereinafter more specifically referred to. The standards *b* serve as guides for a vertically-mov-
50 able platen D. Some means must be pro-

vided for moving the platen D up and down and for exerting considerable pressure upon it when desired, and various means may be employed for this purpose. Thus, as shown, we
55 secure to the platen a bar *d*, which extends through a guide-collar 10 in a cross-bar 11, forming part of the frame B. To another cross-bar 12 is secured a bracket 13, to which the upper ends of a pair of toggle-links 14 are
60 pivoted, and the lower ends of the links are pivotally connected to the upper end of the bar *d*. Each link at its middle joint is provided with a threaded nut 15, through which
65 nuts a threaded rod 16 extends, said rod having a hand-wheel 17 at one end, by which it may be turned. The rod is supported to turn in slotted bearings in vertical bars 18, which form part of the frame B, but is prevented from having longitudinal movement therein.
70 One of the nuts 15 has a right-hand thread and the other a left-hand thread, and the rod 16 is correspondingly threaded. By turning the rod 15 the toggle-links will operate to raise or lower the platen D, as the case may
75 be, and it is obvious that great pressure may be exerted upon the platen.

Supported upon the table *a* are a series of blocks E, which form the supports for the bricks while being pressed. The blocks may
80 be secured to the table *a*; but preferably they will be loosely supported thereon, and the mold-box, to be described, will hold them in proper position.

The mold-box is indicated by F and is di-
85 vided up into a series of compartments *f* open at top and bottom, each compartment being of a length and width to correspond with the length and thickness of the brick to be made, and the blocks E are of a size to fit snugly
90 within the mold-compartments, but permit the mold to move freely over them.

It is necessary to provide some means for guiding and supporting the mold-box, and preferably we provide a yielding and adjust-
95 able support. Various devices may be employed for this purpose. Thus to each of two opposite sides of the mold-box we secure the upper ends of a pair of rods 20, which rods extend down through openings in the table *a*
100 and are connected at their lower ends by bars 21, and these bars 21 are in turn connected

by a bar 22, provided midway its length with a collar 23, fitting over a guide-rod 24, depending from the table *a*. A pair of toggle-links 25 are pivotally connected at their upper ends to the bar 22 and at their lower ends to a threaded shaft 26, which extends through the threaded hub of a hand-wheel 27, supported to turn in the frame A, but to have no vertical movement. The middle joints of the toggle-links 25 are connected by a spiral spring 28, which tends normally to straighten out the links 25, and thereby yieldingly support the mold-box in its highest position, as indicated by the dotted lines in Fig. 2, while the full lines indicate the mold-box in its lowest position. By adjusting the hand-wheel 27 the normal upper position of the mold-box may be varied to adapt the machine to make bricks of different widths.

To properly support the spring 28, a rod 29 is loosely fitted in the middle joints of the links 25 to permit sliding movement of the joints on the rod, and said rod extends through the spring 28 and is provided with any suitable device, as pins 30, to prevent it from being displaced lengthwise.

One of the greatest difficulties that has been encountered heretofore in the manufacture of cement bricks has been the proper removal of the bricks from the machine after being molded and pressed, and one of the principal objects of the present invention is to provide means by which each brick may be separately removed from the machine without injuring it in any manner or by which a series of bricks may be moved simultaneously also without injury. For this purpose a mold-board or pallet G is provided for each compartment of the mold-box, such board being of a size to fit snugly within the compartment and be supported upon the block E within such compartment. The mold-boards G may be of any desired material, and each is provided with means by which it may be engaged by a lifting device without touching the brick, and for this purpose we have shown each board provided with two openings *g*, extending transversely through it. The upper face of the mold-boards G may either be plain or they may have any suitable design formed in or on them should it be desired to have such design upon the brick.

To obtain the most satisfactory results in molding cement bricks, it is desirable to lubricate the mold-box prior to introducing the plastic material, and heretofore this has usually been accomplished by hand. Kerosene-oil is considered the best lubricant at present known for this purpose, and usually the operator takes a swab or a handful of cotton-waste saturated with kerosene-oil and wipes the inside of the mold-compartment. This consumes considerable time, and in order to economize in this respect we provide means for automatically lubricating the mold-box at every operation. This automatic lubrication may be effected in various ways. Thus

we form a recess or groove *e* around the upper end of each block E and pack it with cotton-waste or other absorbent material, (indicated by 50,) and this will be saturated with the lubricant. The mold-blocks G will assist in holding the waste in place, and it is obvious that every time the mold-box slides on the blocks E the several compartments will be lubricated. Grooves *x* may also be formed in the walls of the mold-compartment *f* for the reception of waste and lubricant, which lubricant will be transferred to the block E in the downward movement of the box and from them to the walls of the compartments *f* in the up-and-down movement of the mold-box. It is also desirable that the plastic material shall be supplied in equal and uniform quantities to the several mold-compartment at each operation, and for this purpose we preferably employ a filling-box, indicated by K and having in the present case eight compartments *k* of equal size. These compartments are each designed to hold just the proper amount of material to form a brick of the desired dimensions, and when filled the operator will then be enabled to properly charge eight of the compartments *f* at the same time each with its exact quota of plastic material.

Such being a preferred form of apparatus for carrying our invention into effect, the operation is as follows: The mold-box F, under the influence of the spring-actuated toggle-links 25, will be at its normally highest position and the platen D will be sufficiently above the mold-box to permit the compartments to be filled with the composition, the mold-boards G being on the top of the blocks E within the compartments. When the compartments are filled, the screw-rod 16 will be operated to straighten out the toggle-links 14, which will cause the platen D to engage the upper end of the mold-box F and force the latter down over the blocks E. The toggle-links 25 will spread out as the box moves down and distend the spring 28. When the composition has been sufficiently compressed between the blocks G and the platen, the mold-box will be temporarily retained in its depressed condition by some suitable means provided for this purpose, and the platen D will then be again elevated. The mold-box F will then be still further depressed, either by hand or by any suitable mechanism, until its upper edges are flush with the upper surfaces of the blocks E, and the mold-boards G and the pressed bricks upon them will be entirely clear of the mold-box and can readily be removed from the machine either singly or a series of them simultaneously. To remove a series of the bricks simultaneously, we provide some means for engaging the mold-boards, shown as two parallel rods 35, connected together at one end to form a handle 36, which rods are inserted through the openings *g* in a row of mold-boards G, and then a detachable handle, as 37, can be connected to the free ends of the rods and the entire se-

ries of mold-boards and bricks be lifted out of the machine and conveyed to the place where they are to be cured without the necessity of touching a brick, thereby avoiding any possibility of injuring them. It will be observed that the mold-box moves over the composition in one direction only during the period of compression and also subsequently, and this is important and results in giving the two wide surfaces and the ends of the bricks a smooth finish, the coarse particles near the surface being forced into the interior of the brick, leaving the cement or finer particles on the surface. This movement has the same effect upon the bricks substantially as what is produced by troweling on artificial-stone pavements and which results in forming a smooth surface on the latter.

As before stated, it is preferable to provide some means for temporarily retaining the mold-box F at any point of its movement from its highest to its lowest position, and various devices may be employed for this purpose. Thus a rack 40 may be secured to the table adjacent to the mold-box, with which a pawl 41 on the mold-box will engage, and preferably there will be two such rack-and-pawl devices, one at each of two opposite sides of the mold-box. As before stated, it is also necessary to provide some means for moving the mold-box down after the compression has been completed, and as this will not require much power it may be accomplished manually, and for this purpose the mold-box may be provided with two handles 42, one on each of two opposite sides. Any suitable power mechanism may, however, be provided for this purpose, if desired.

After the bricks have been removed from the machine the pawls 41 will be disengaged from the racks 40, and the spring-actuated links 25 will automatically return the mold-box to its elevated position, when another set of mold-boards G can be inserted in the compartments *f* and the operation be repeated.

We have illustrated a machine capable of making sixteen bricks at one time; but obviously this number may be increased or diminished, as desired.

Another important advantage of our invention is that we are enabled to form any desired design on the face of the brick without danger of injuring it. By "face" we mean that side of the brick which is exposed when the brick is laid. In our machine the face of the brick is that side which during the process of molding is in contact with the mold-board G, and if it is desired to form a design on the brick the mold-board G will have the necessary design formed on it, and such design will be transferred to the brick during the process of molding. Moreover, the brick after being pressed and having the design formed on it remains in contact with the mold-board until it is partially cured, and thus the design is not injured by removing the mold-board

from the brick while in its plastic condition. As before stated, the mold-boards and the bricks are removed together from the machine and transferred to the place where the bricks are to be cured, and after about twelve hours treatment the bricks will be sufficiently set, so that they can be handled without danger of breaking them, and they can then be lifted off the mold-boards and turned over, this turning being necessary to enable all sides of the brick to be sprayed with water during the process of curing. When removed from the mold-boards, the bricks may be placed upon any other support and the mold-boards be again used in the molds.

Heretofore it has been found very difficult to mold cement bricks and then remove them from the molds without injuring them. By the use of our invention the platen D, which forms a compression-surface common to all the mold-compartments, is after the bricks have been sufficiently compressed released from engagement with the top surface of the bricks while the mold is held stationary, and the result is that the bricks are not injured. If the mold were moved to uncover only a portion even of the sides and ends of the bricks while pressure was still exerted on the bricks by the platen, then the bricks would collapse, because there would be no lateral support for them, and it is obvious, therefore, that it is very essential that the compressive force be removed while the bricks are fully supported against lateral movement.

What we claim is—

1. In a machine for making cement brick, the combination of a mold-box, a yielding support for said box, a stationary block over which the mold-box fits, a platen movable to engage the upper end of the mold-box, means for depressing the platen and the mold-box, means for depressing the mold-box independently of the platen, and means for detachably locking the mold-box at any point in its downward movement, substantially as set forth.

2. In a machine for making cement bricks, the combination of a table, a series of separated blocks supported on the table, a mold-box having compartments open at the top and bottom and into which the blocks project, a mold-board supported on each block, a yielding support for said mold-box, a platen movable to engage the upper end of the mold-box and forming a compressing-surface for all the compartments, means for depressing the platen and the mold-box, means independent of the platen for depressing the mold-box below the mold-boards, and means for lifting a series of the mold-boards simultaneously from the blocks, substantially as set forth.

3. In a machine for making cement brick, the combination of a series of brick-supporting mold-boards arranged side by side and each having openings extending transversely therethrough, and rods adapted to be inserted through the openings in said boards and

serve to lift them simultaneously, substantially as set forth.

4. In a machine for making cement brick, the combination of a mold-box, a yielding support for said box, a stationary block over which the mold-box fits, means for depressing said mold-box, means for detachably locking the box in its depressed position, and means for automatically elevating the box when the locking devices are released, substantially as set forth.

5. In a machine for making cement brick, the combination of a mold-box, a yielding support for said box, a stationary block over which the mold-box fits, a mold-board or pallet loosely supported on the said block, a platen movable to engage the upper end of the mold-box, means for depressing the platen and mold-box, means for depressing the mold-box independently of the platen below said pallet, and means for detachably locking the mold-box at any point in its downward movement, substantially as set forth.

6. In a machine for making cement brick, the combination of a mold-box, a yielding support for said box, a stationary block over which the mold-box fits, a mold-board or pallet loosely supported on the said block, a platen movable to engage the upper end of the mold-box, means for depressing the platen and mold-box, means for depressing the mold-box independently of the platen below said pallet, means for detachably locking the mold-box at any point in its downward movement, and means for automatically elevating the box when the locking devices are released, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN D. LUTTRELL.
WILLIAM C. CANTRELL.

Witnesses:

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W. P. BARNES.