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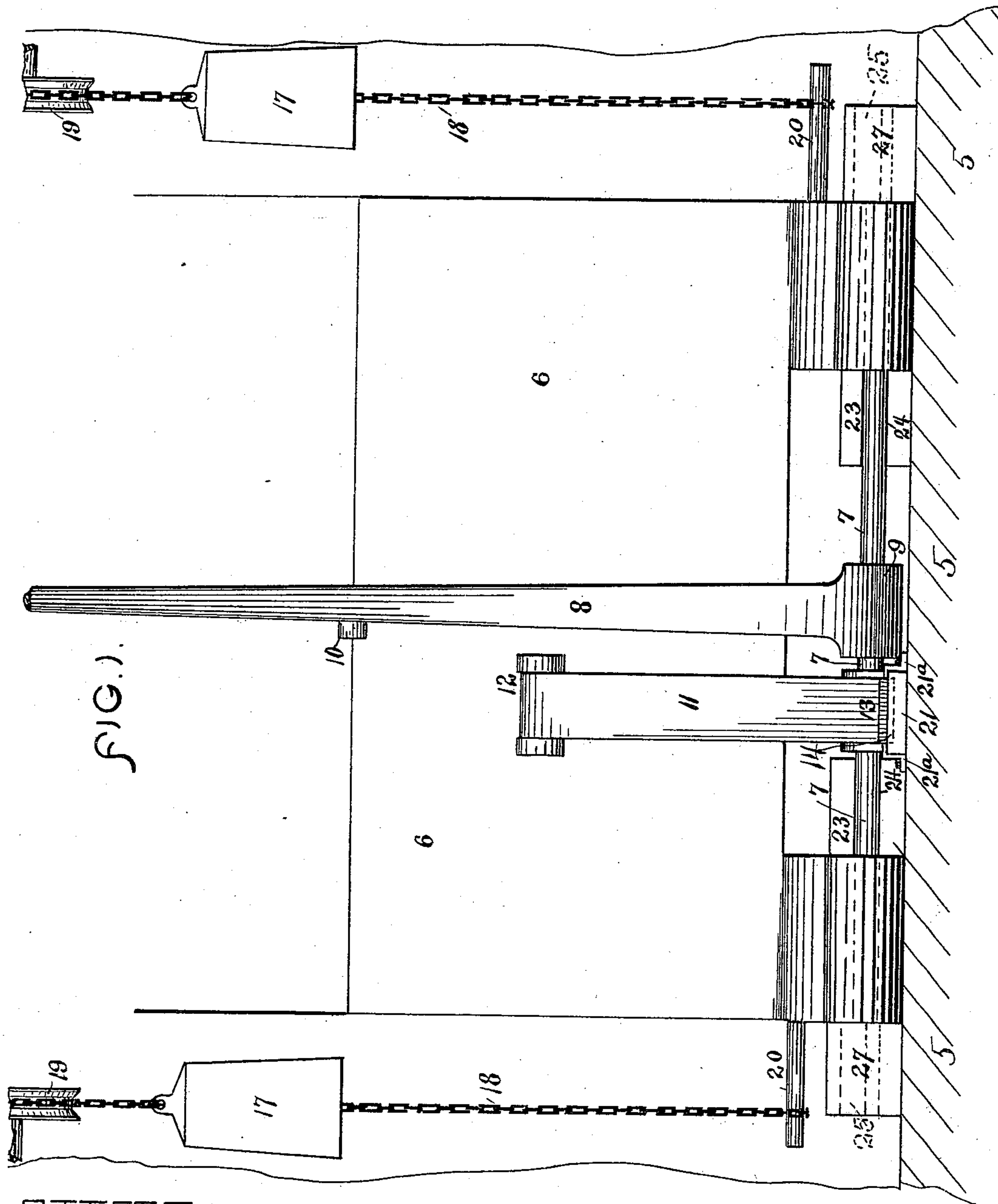
3 Sheets—Sheet 1.

F. S. HOLMES.

REMOVABLE SILL FOR VAULTS OR SAFES.

No. 557,389.

Patented Mar. 31, 1896.



ATTEST—

Walter E. Allen.  
Edward M. Knight.

INVENTOR—

FREDERICK S. HOLMES.

BY

Knight Bros  
ATTYS.

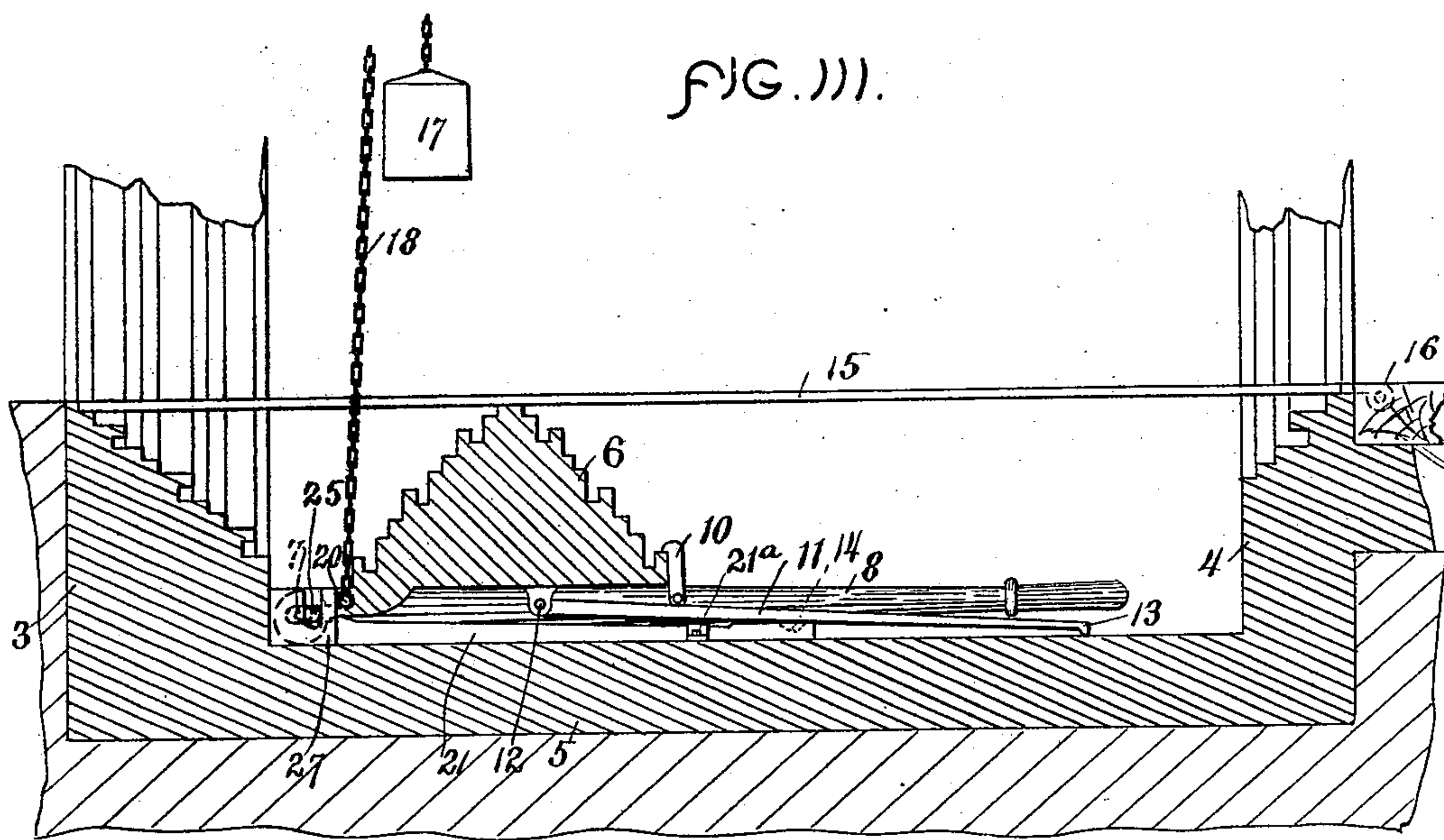
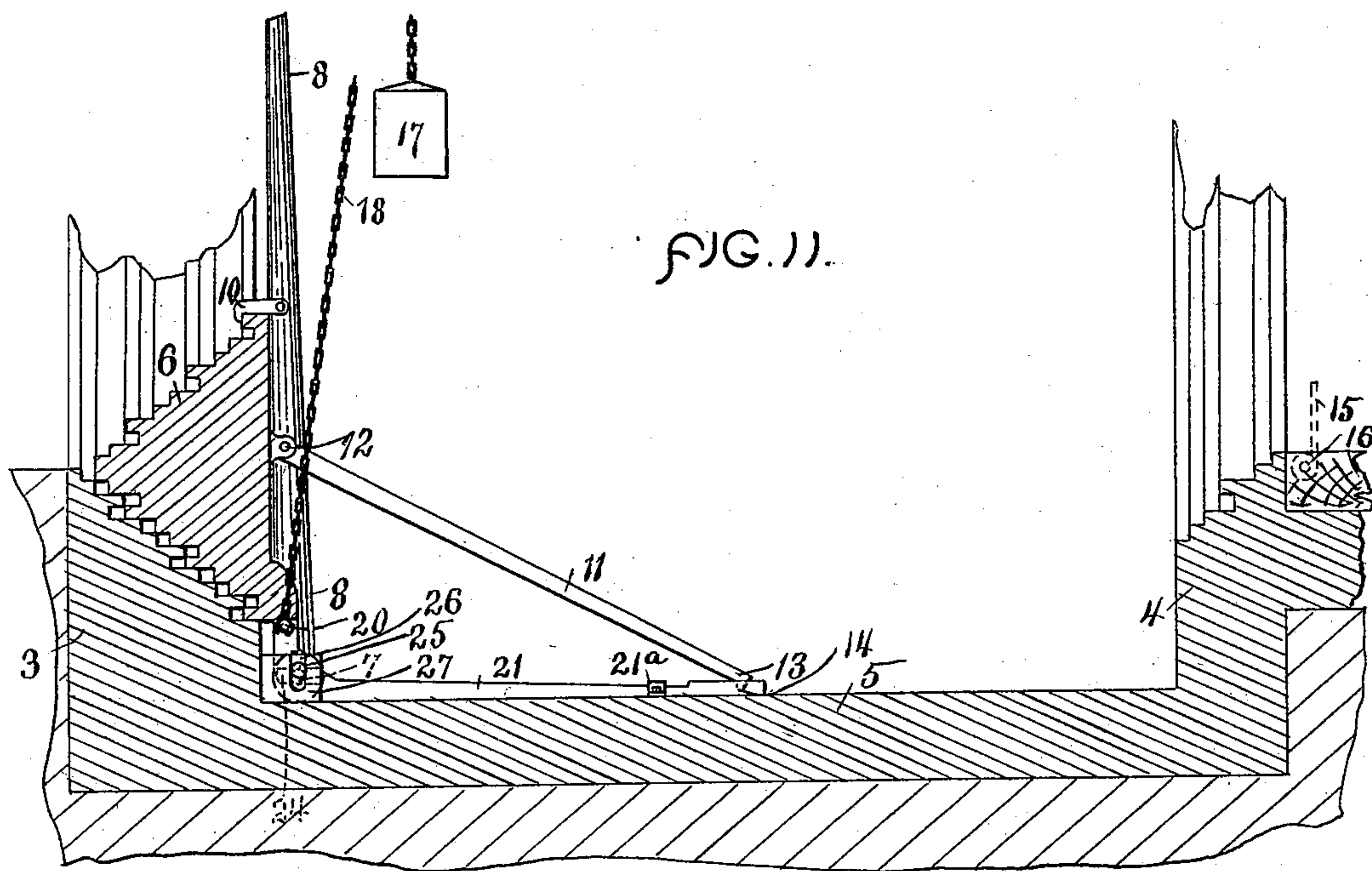
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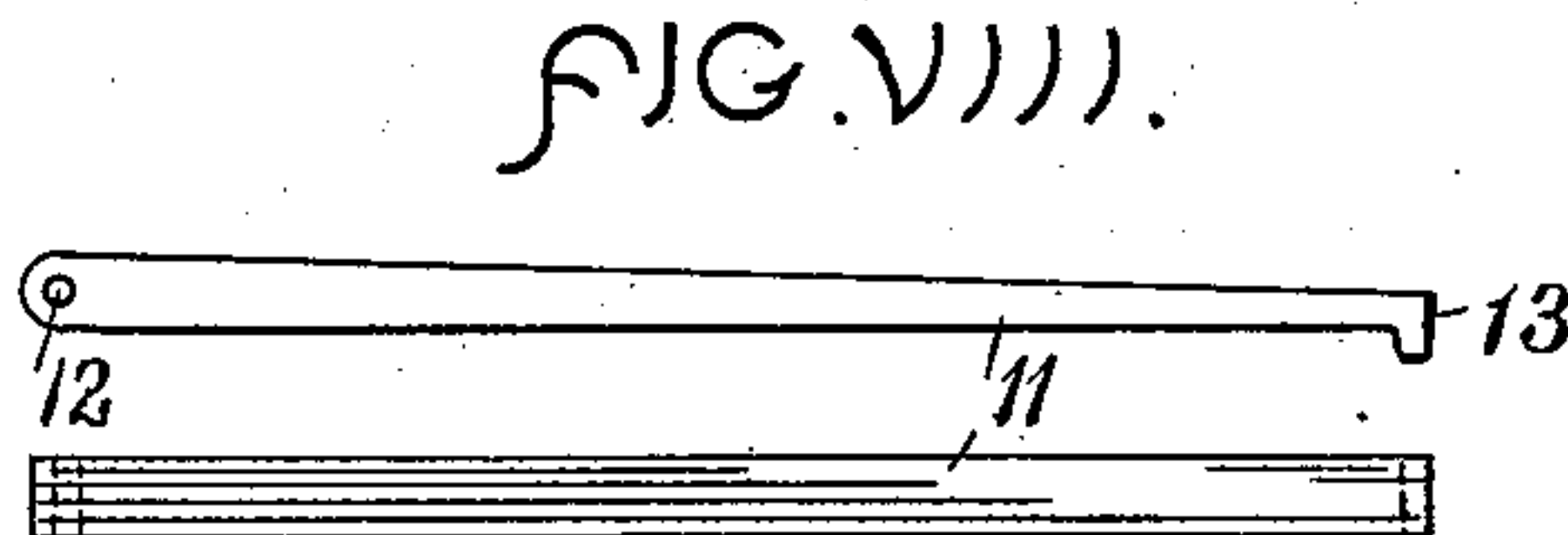
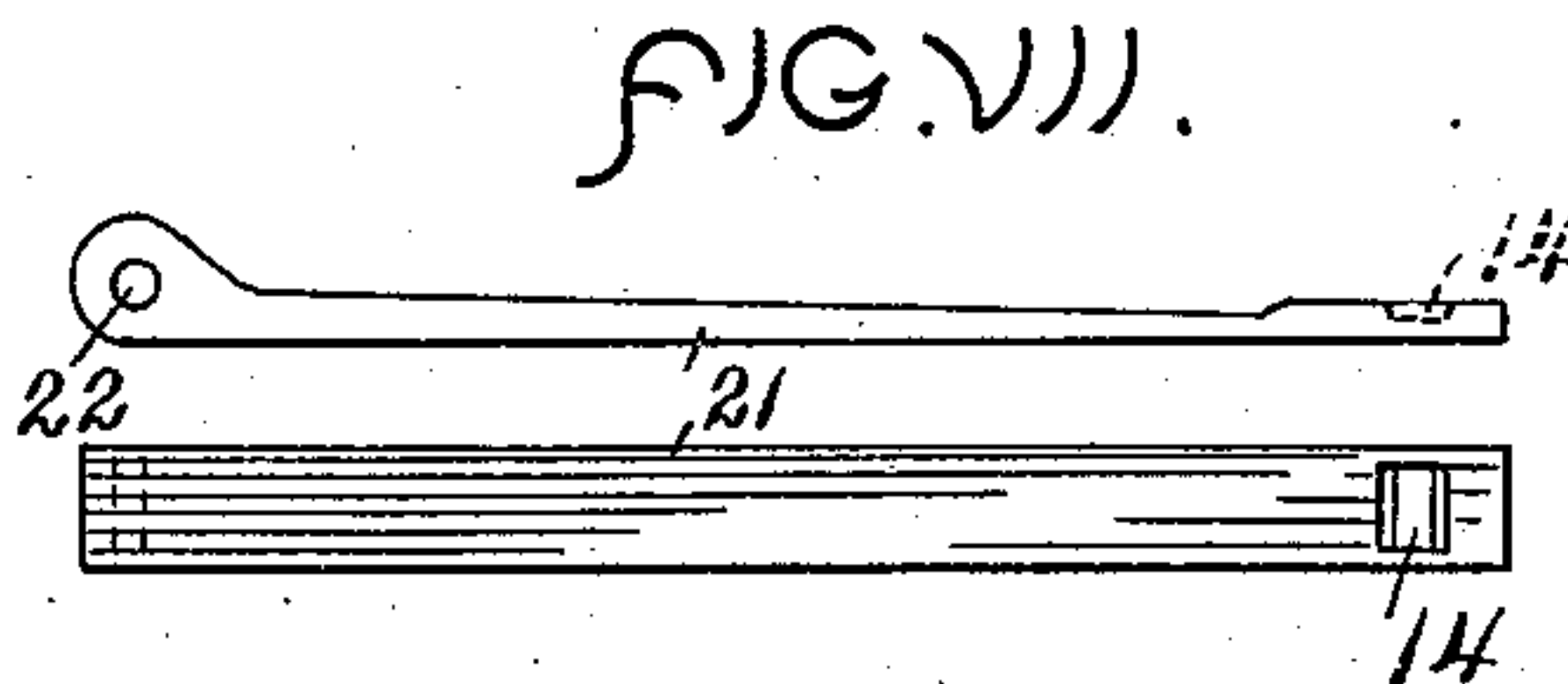
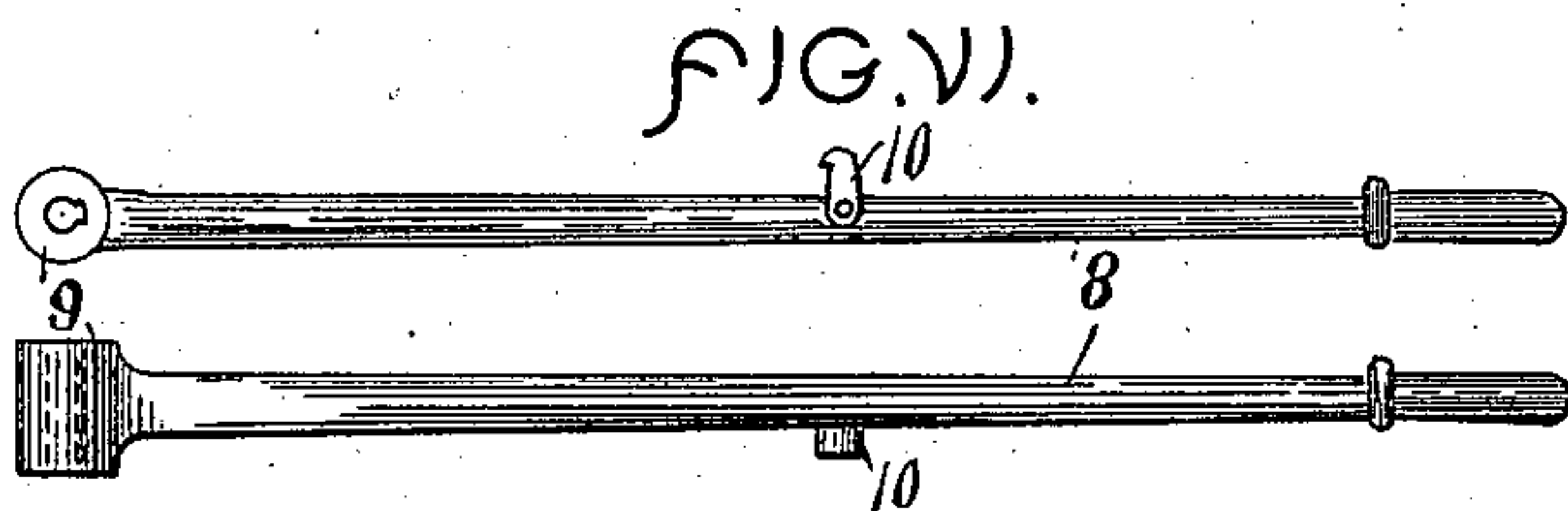
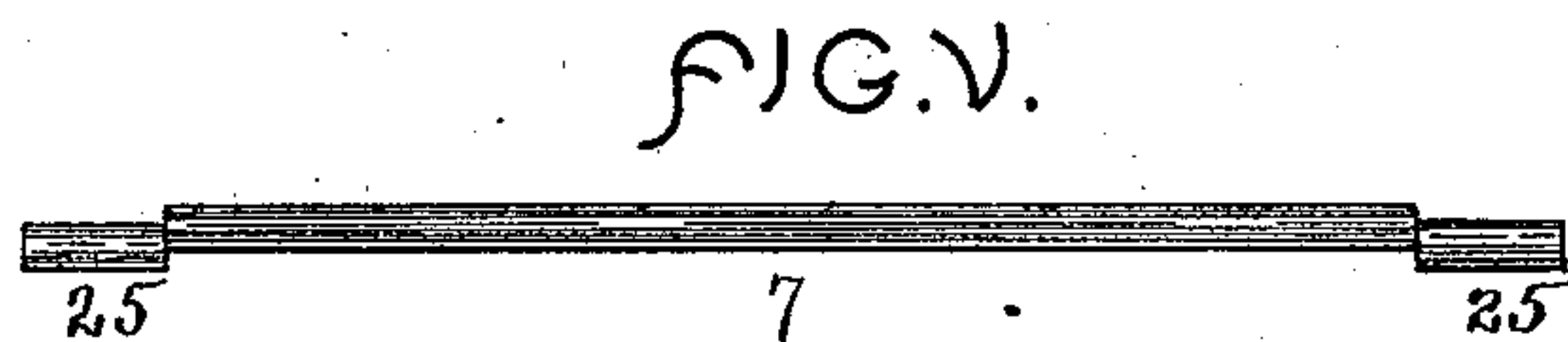
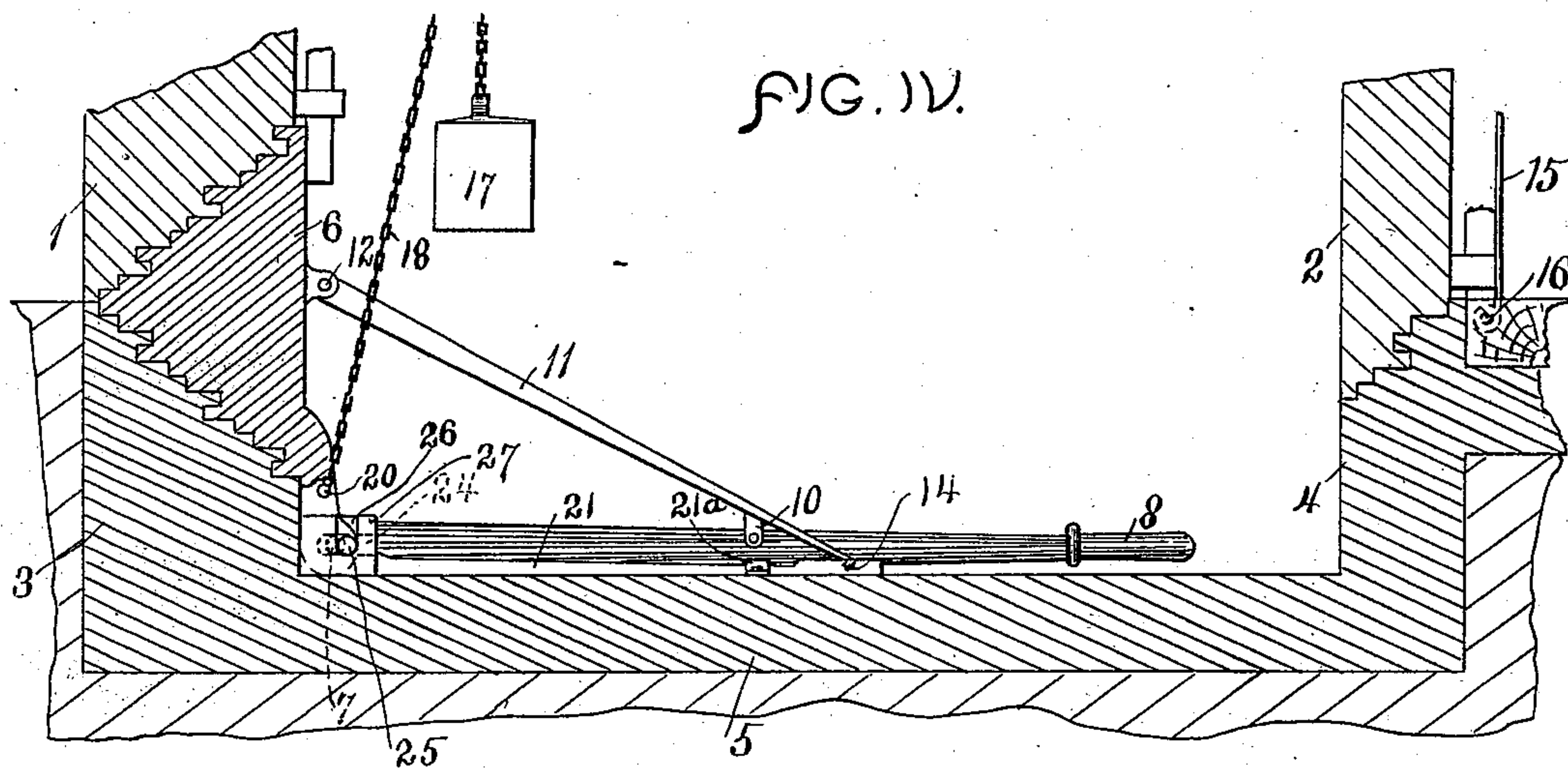
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# UNITED STATES PATENT OFFICE.

FREDERICK S. HOLMES, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
GEORGE S. CLARK, OF SAME PLACE.

## REMOVABLE SILL FOR VAULTS OR SAFES.

SPECIFICATION forming part of Letters Patent No. 557,389, dated March 31, 1896.

Application filed December 10, 1892. Serial No. 454,777. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK S. HOLMES, a citizen of the United States, and a resident of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Removable Sills for Vaults or Safes, of which the following is a specification.

My invention relates to sills for vaults or safes which are made removable or knock-down in order to avoid the obstruction and inconvenience offered by deep stationary sills. In movable sills it is desirable to have the sill mounted on a shaft or pivot or otherwise made removable, so that it can be moved in and out of place and held in position for locking until it can be engaged by the bottom row of locking-bolts on the door. One difficulty which is encountered in mounting the sill on a simple pivot is that deep stepping with right lines—that is to say, stepwork having the faces of the tongues and grooves in parallel planes—cannot be used. Another difficulty encountered, especially if the sill is to be so far removed as to open the doorway of the vault down to the level of the floor outside, is that the sill is very bulky and inconvenient for manipulation. My invention overcomes these difficulties by providing in connection with the sill means for first moving it a distance equal at least to the depth of the stepwork and in a straight line normal to the planes of the faces of the tongues and grooves forming the same—such, for instance, as by mounting the knockdown sill on a bearing and providing such bearing with means for giving it an independent horizontal movement sufficient to disengage the stepwork before the commencement of the swinging movement of the sill, also bracing the sill against swinging movement while it is being moved horizontally and when the sill is in a locking position retaining said bracing to make a more effective closure, and also by counterbalancing the sill by means which will permit the swinging movement up or down to be accomplished with ease.

My invention will be fully understood upon reference to the accompanying drawings, in which—

Figure I is a vertical section of the lower part of a vault just behind the outer door-sill

to which my invention is applied. Fig. II is a vertical sectional view illustrating the relations of the parts when the sill is vertical and braced in position and the stepwork is disengaged. Fig. III represents the relations of the parts after the sill is in lowered position. Fig. IV is a view illustrating the relations of the parts when the door is locked. Figs. V, VI, VII, and VIII are views which illustrate, respectively, the construction of the cam-shaft, the hand-lever, the retracting-bar, and the locking-bar, to be hereinafter described.

1 is the outer door; 2, the inner door; 3, the outer door-frame at bottom; 4, the inner door-frame at bottom; 5, the bottom of vestibule.

6 is a movable or knockdown sill pivoted on a shaft 7 and adapted to be moved to a horizontal from a vertical position by hand-lever 8, fulcrumed at 9 and adapted to engage the sill by a hook 10.

A locking-bar or bracing-lever 11 is pivoted to the back of the sill at 12 and falls by gravity as the sill is raised until its free end 13 drops into a recess 14 in the well of vestibule 5 or in another part of the operating apparatus. In unlocking the reverse operation is followed. Lever 8 being raised to vertical position, is made to engage the sill by the hook 10, and the sill 6 is then lowered on said lever 8 to horizontal position, as shown in Fig. 3. The vestibule is provided with a well sufficiently deep to receive the sill out of the way. To allow of passage over the lowered sill and through the vestibule, a movable floor 15, pivoted at 16 within the inner door, is swung into position over the sill, securing the desired end—namely, a level passage from floor of building into the vault.

17 represents counterbalance-weights, which are connected by cords 18, which pass over pulleys 19 in the sides of the vestibule, and are attached at 20 to the sides of the sill in order to counterbalance its weight and ease its up and down movements.

The foregoing presents a simple outline of the lowering and raising of the sill; but several objections are found to exist in this method of operating the sill, because it simply gives a vertical oscillating motion to the



sill in an arc and does not allow of the use of long tongues, grooves, and stepping to be made with parallel right lines, nor does it give the amount of pressure requisite to force the  
 5 tongues firmly upon the packing, which is placed in the grooves in order to provide absolutely air-tight joints. These objections are readily overcome by mechanism used in connection with the foregoing parts, and which is  
 10 as follows:

21 is a retracting-bar pivoted at 22 to the shaft 7, sliding in and held down by a bearing 21<sup>a</sup> and having at or near its outer end the depression or recess 14, into which the  
 15 claw 13 on the end of the bracing or locking lever 11 drops, as hereinbefore referred to, so as to brace the sill both ways and retain it in vertical position. The shaft 7 is fitted in lugs or bearings 23, having laterally-opening  
 20 slots 24, in which the shaft has a limited horizontal movement, while on the ends of said shaft 7 are formed cams or eccentrics 25, which enter vertically-opening slots 26 in lugs 27, so that the cam ends 25 have a limited vertical  
 25 movement in said lugs 27. The hand-lever 8 is keyed or otherwise fixed to the shaft 7, so that said shaft turns with the movement of the lever; but the shaft, while fixed against vertical movement, is allowed horizontal move-  
 30 ment by its bearings in the lugs 23, and the cam ends 25 are prevented from horizontal movement by their bearings in the lugs 27. It therefore results that as the shaft 7 is turned by the hand-lever 8 the movement of its cam  
 35 ends 25 in lugs 27 will cause said shaft to move in a horizontal direction with all the parts mounted upon it. The hand-lever 8 is attached to the shaft 7 in such relation to the cam ends that the shaft 7 moves inward or  
 40 away from the bottom 3 of the door-frame as the hand-lever moves downward, and vice versa.

It has been stated that the bracing or locking lever 11 drops into a notch 14 in the end  
 45 of the retracting-bar. This takes place as the handle moves up and the shaft 7 consequently moves outward or backward. The sill thus reaches a vertical braced position before the stepwork of the two parts comes  
 50 together. If, now, after the sill is thus braced in vertical position the hook 10 on the hand-lever is disengaged from the sill and said lever is returned to horizontal position, the sill will move horizontally toward the lower part  
 55 of the door-frame, the ridges on one part entering the grooves on the other. The arrangement for horizontal movement to be effected after the sill is in vertical position renders it immaterial what the depth of the stepwork is,  
 60 and the cam ends and long hand-lever cause the sill parts to come together with great pressure for securing air-tight joints.

The operation is as follows: In closing and  
 65 locking, the sill 6 is raised into vertical position by the hand-lever 8, which is pivoted on cam-rod 7. While in this position the free end 13 of the locking-bar 11 falls into the recess

14 of the retracting-bar 21, after which lever 8 is returned to the horizontal position and by its movement, through cam-rod 7 moving  
 70 horizontally in its bearings, the entire sill is carried forward to its seat in the frame 3 and forcibly secured in place by the position of the eccentrics. In unlocking, the lever 8 is brought to vertical position, which reverses  
 75 the motion of the eccentrics and carries the sill in a directly horizontal line away from the door-frame 3. The hook 10, which is pivoted on lever 8, is engaged with the upper edge of sill 6, when, by returning lever 7 to  
 80 horizontal position, sill 6 is carried along with it, being eased down by the counterbalances. The locking-bar 11, having been previously lifted out of engagement with the notch 14, slides to horizontal position along the floor  
 85 of vestibule. After the parts are brought to these positions the movable floor or foot-plate 15 is brought to its proper position.

While it is desirable to render the operation easy by counterbalancing the sill 6 in  
 90 some manner, such as by the weights attached to cords passing over the pulleys and connected to lugs formed on the sills 6, it is obvious that the remaining features of my invention are operative either without counter-  
 95 balancing or in connection with some other suitable counterbalancing.

The main feature of my invention is that portion of the construction which renders it possible to use deep right-line stepwork—that  
 100 is to say, that feature of the invention which permits the sill to be moved in a straight line, without any deviation or drop, until the stepwork is disengaged, and which will return the  
 105 sill in the same way, so as to bring into engagement, without dragging or abrasion, the accurately-fitting tongues and grooves.

My invention therefore consists, broadly, in providing the sill with means for moving it in a straight line normal to the parallel faces  
 110 of the tongues and grooves, and a distance equal, at least, to the depth of the stepwork.

My invention further consists in the broad idea of counterbalancing the removable or knockdown portion for the purpose of ren-  
 115 dering it more readily manipulated.

Having thus described my invention, what I claim is—

1. In a vault or safe, the combination of the door-frame, the movable or knockdown sill  
 120 pivoted in proper relation to said door-frame on a horizontal bearing, the lever for raising the sill, and the bracing or locking lever, pivoted to the back of the sill and having a bearing for its other end at some point fixed rela-  
 125 tively to the pivot of the sill, all substantially as set forth.

2. In a vault or safe, the combination of the door-frame, the movable or knockdown sill  
 130 pivoted on the horizontal cam-shaft movable transversely, a lever for turning the cam-shaft, a locking or bracing lever connected with the sill for holding it in vertical position, and connection between the end of said brac-



ing-lever and the cam-shaft, whereby the sill is moved horizontally by the cam-shaft after it has assumed a vertical position, all substantially as herein set forth.

5 3. In a vault or safe, the combination of the door-frame, the sill pivoted to the door-frame, and the pivoted lever having means for engaging the sill, for moving it up and down, and detachable from the sill so that the lever  
10 may be laid down out of the way after the sill is elevated as explained.

4. In a vault or safe, the combination of the door-frame, having the stepped inner face, the sill stepped correspondingly to meet said  
15 door-frame, the horizontal cam-shaft upon which the sill is pivoted, the horizontally-elongated bearing for said cam-shaft the bearing for the cam of said shaft, and a lever for rotating said cam-shaft, all substantially as  
20 and for the purpose set forth.

5. The combination of the door-frame of a vault or closure and the removable portion, having interlocking stepwork of the character specified; said removable portion having

means for moving it a distance equal at least 25 to the depth of the stepwork and in a straight line normal to the parallel faces of the stepwork, substantially as and for the purpose set forth.

6. In combination; the door-frame of a 30 vault or closure and the removable or knock-down sill therefor, provided with interlocking stepwork, a shaft upon which the sill is mounted, bearings constructed to permit said shaft to move in a straight line therein and 35 means for imparting such straight-line movement to the shaft in its bearing, substantially as and for the purpose set forth.

7. In combination with the doorway of a vault or closure, the herein-described remov- 40 able portion and the counterbalance for rendering said removable portion easily controlled, as explained.

FREDERICK S. HOLMES.

Witnesses:

HERVEY S. KNIGHT,  
WM. E. KNIGHT.