

(No Model.)

2 Sheets—Sheet 1.

T. J. MORGAN.  
SAFETY GATE FOR RAILWAY CARS.

No. 516,505.

Patented Mar. 13, 1894.

Fig. 1.

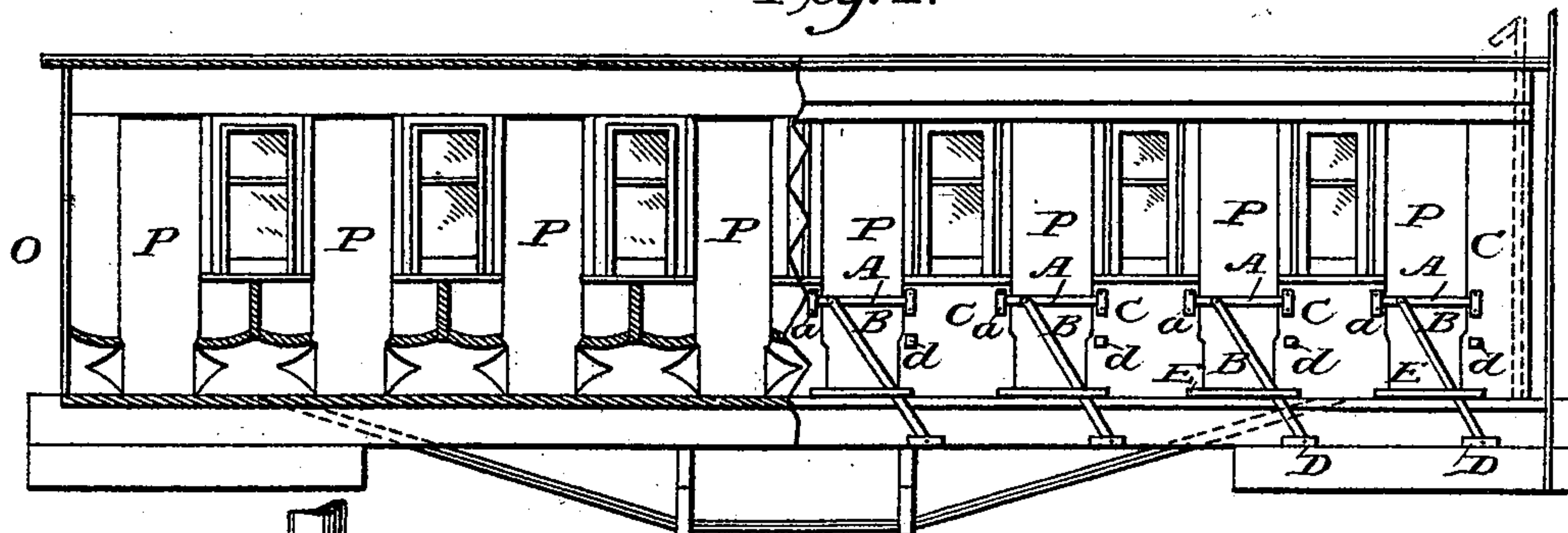


Fig. 2.

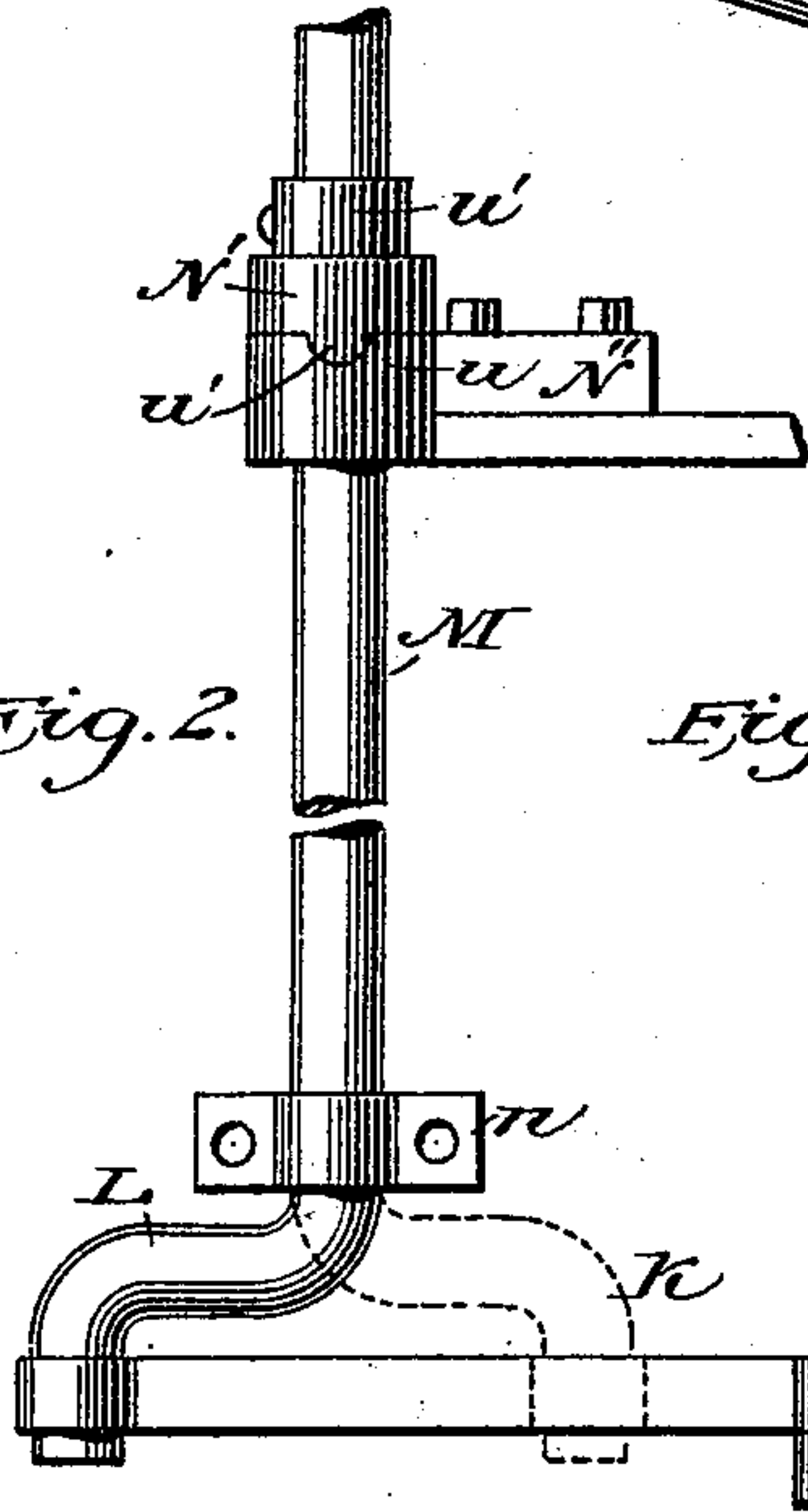


Fig. 3.

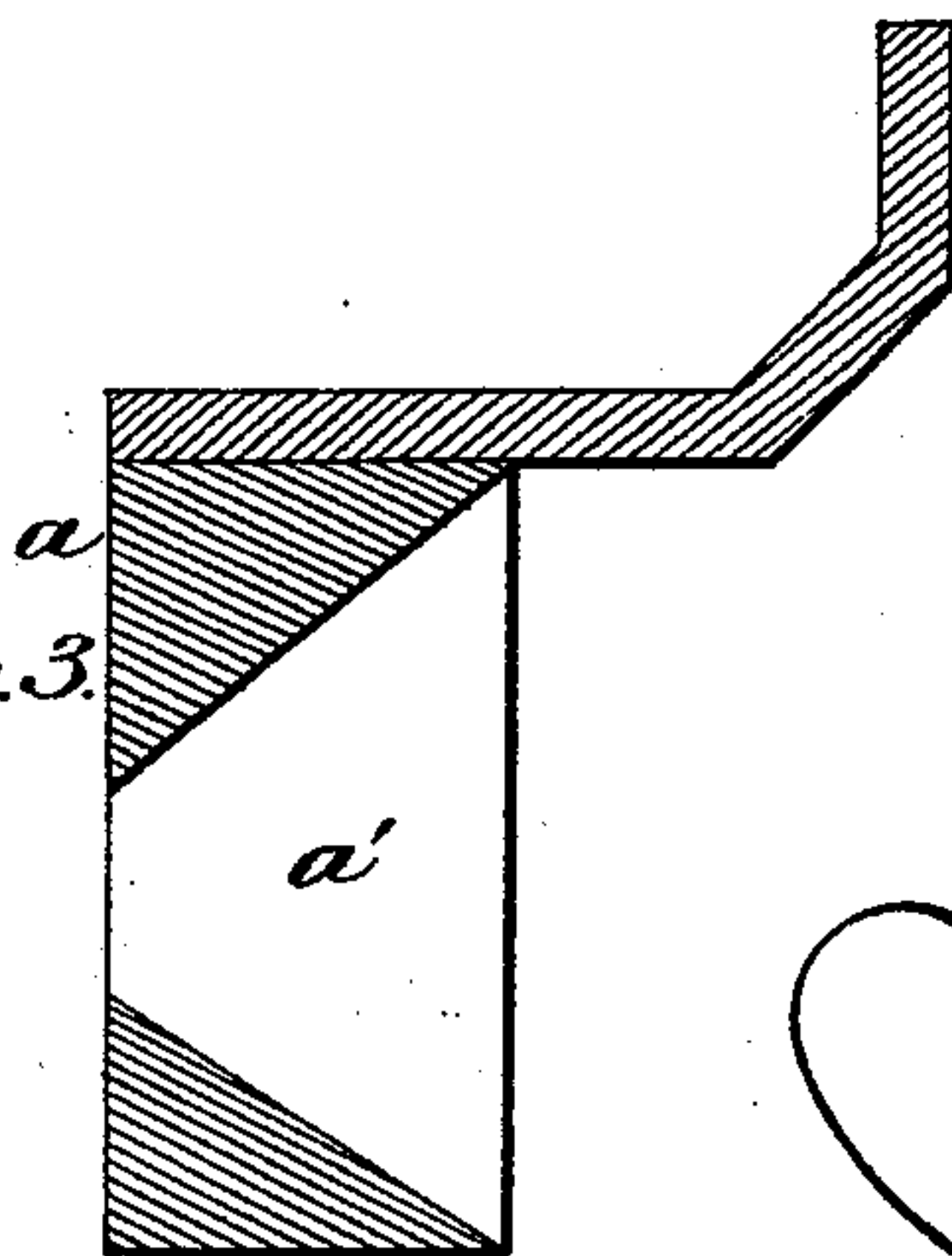


Fig. 4.

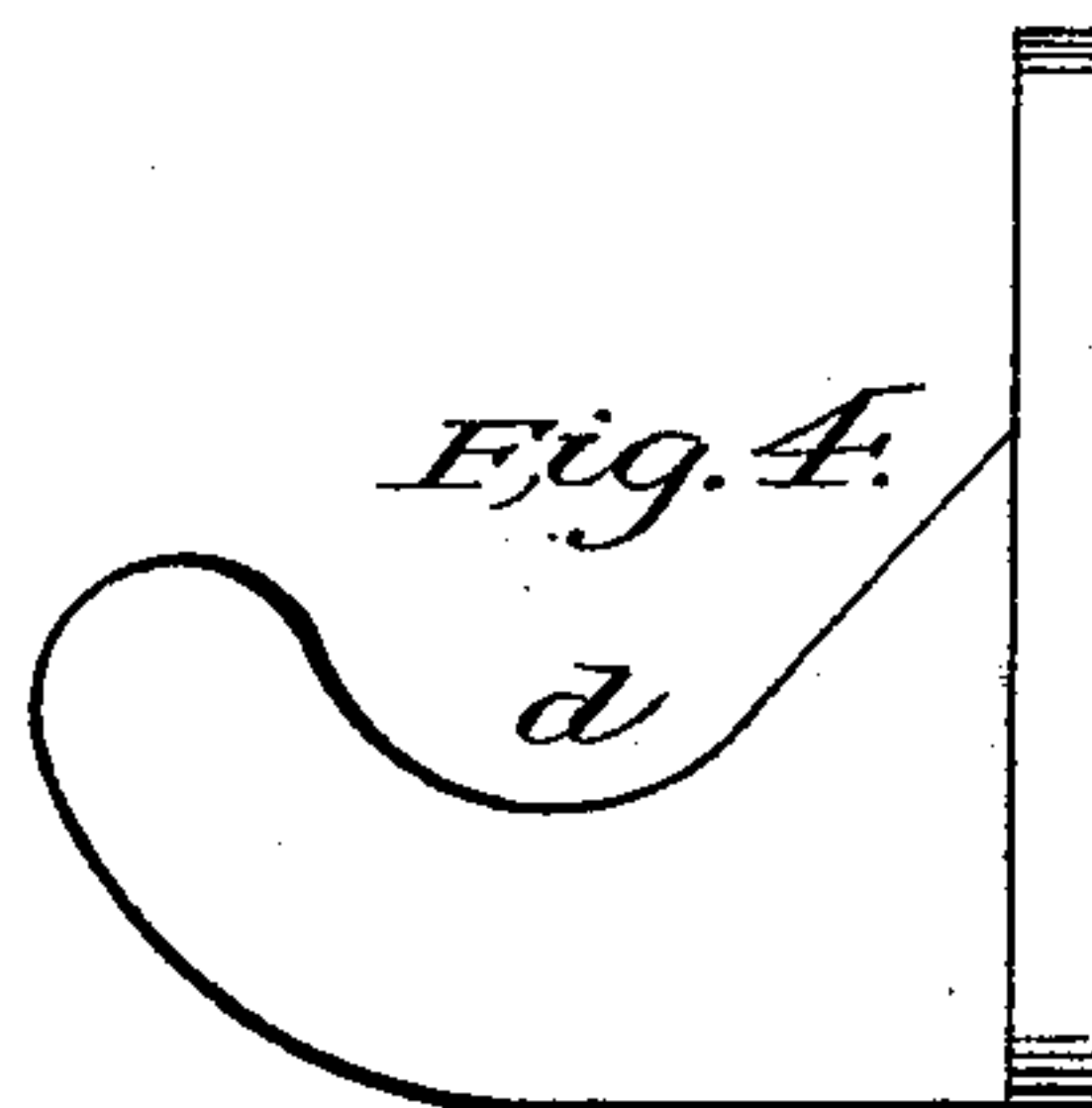


Fig. 12.

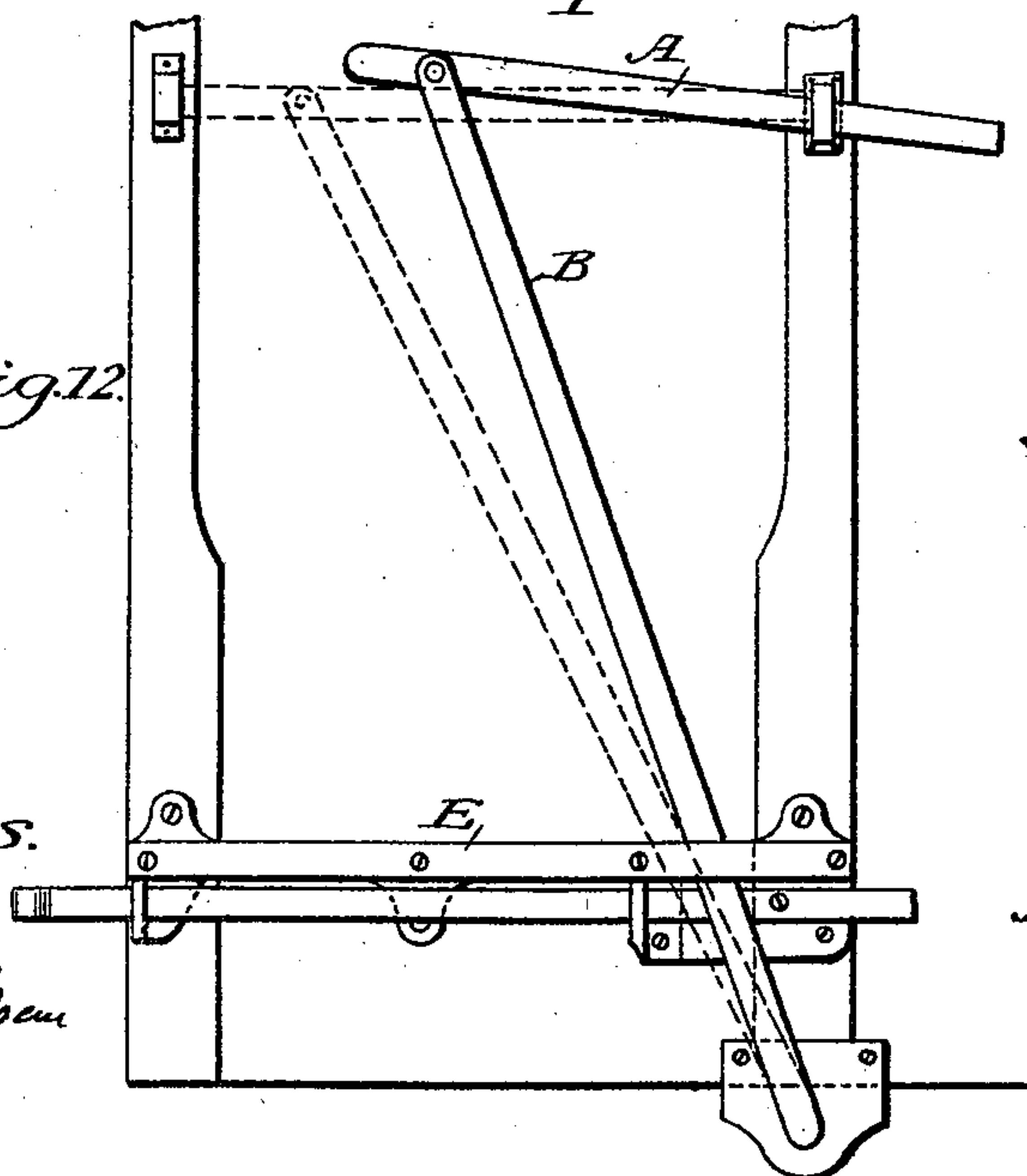


Fig. 11.



Witnesses.

Albert Hamilton  
Amos W. Jackson

Inventor.  
Thomas J. Morgan

(No Model.)

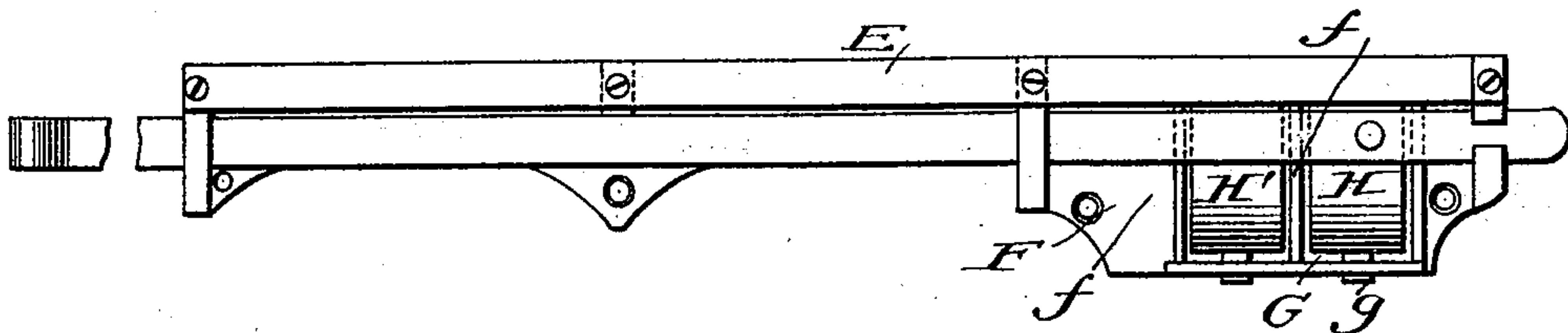
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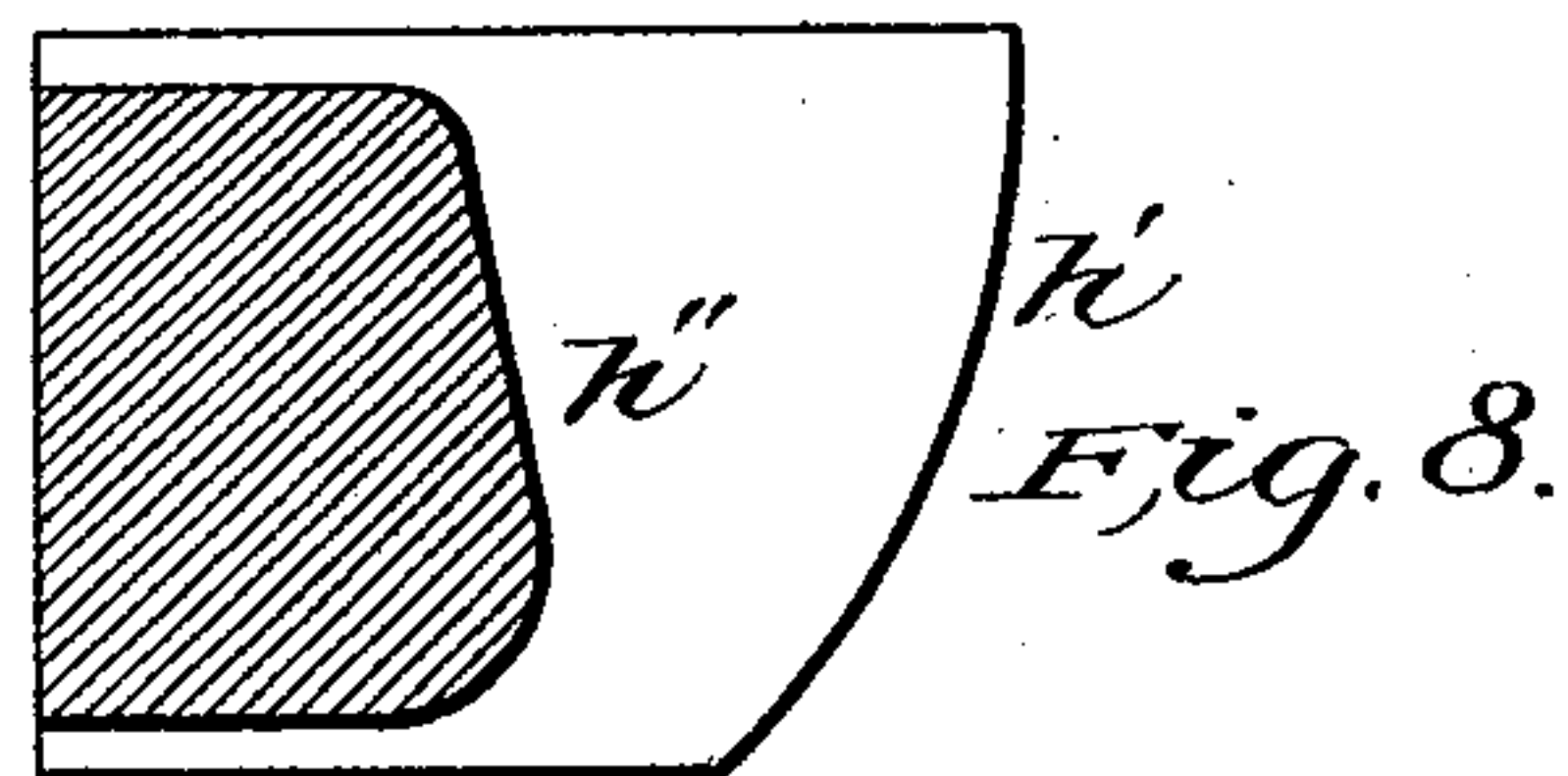
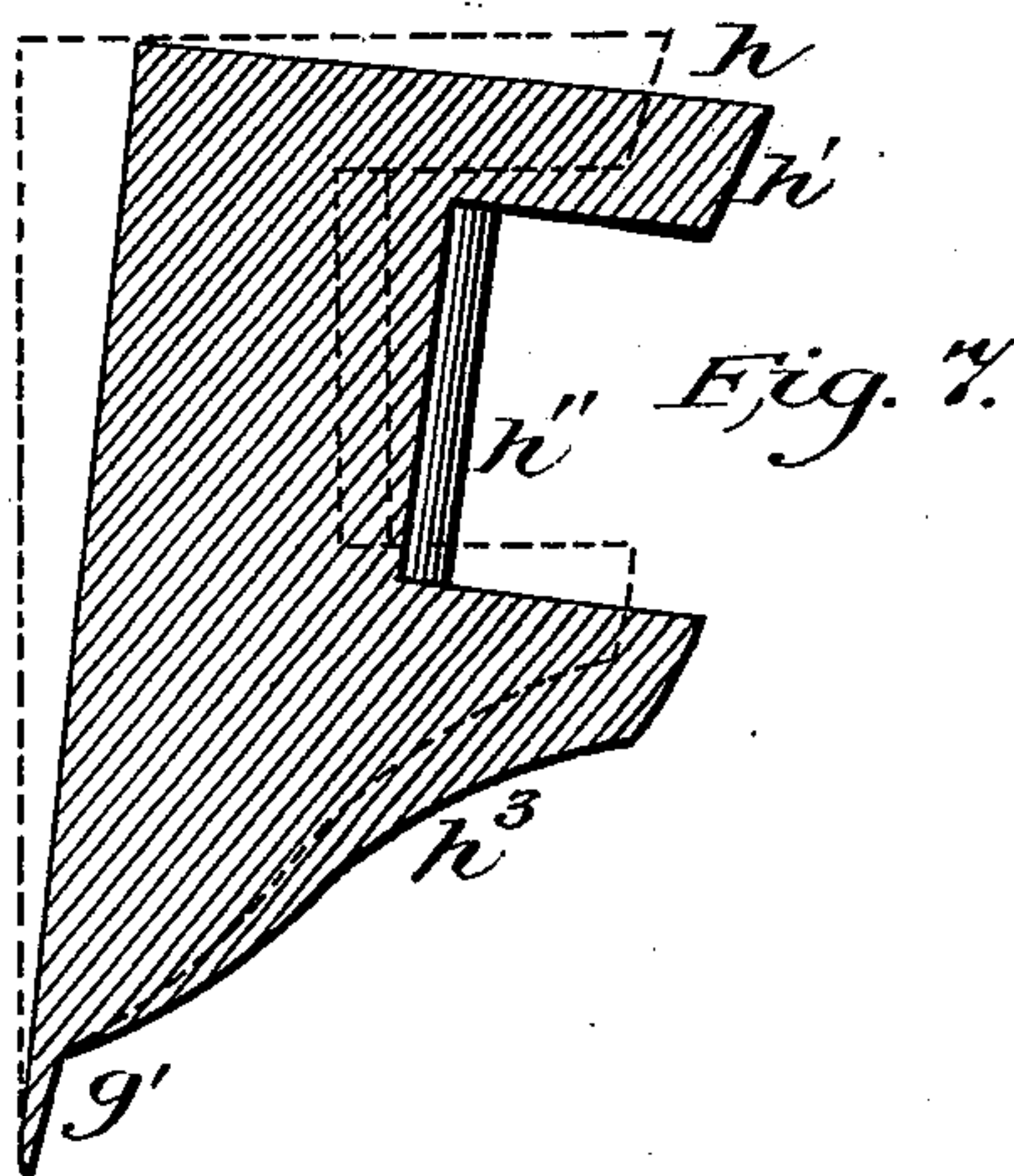
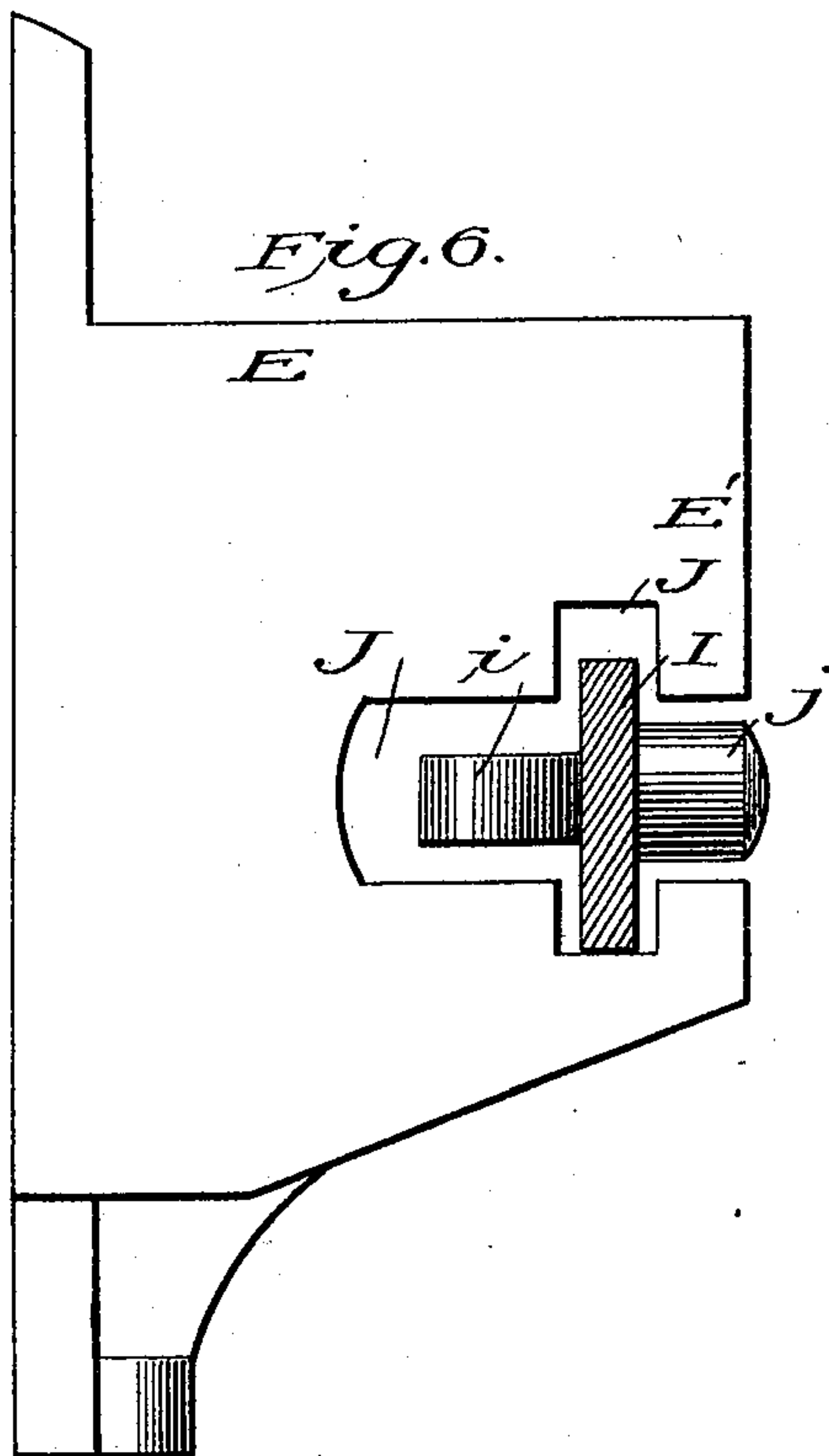
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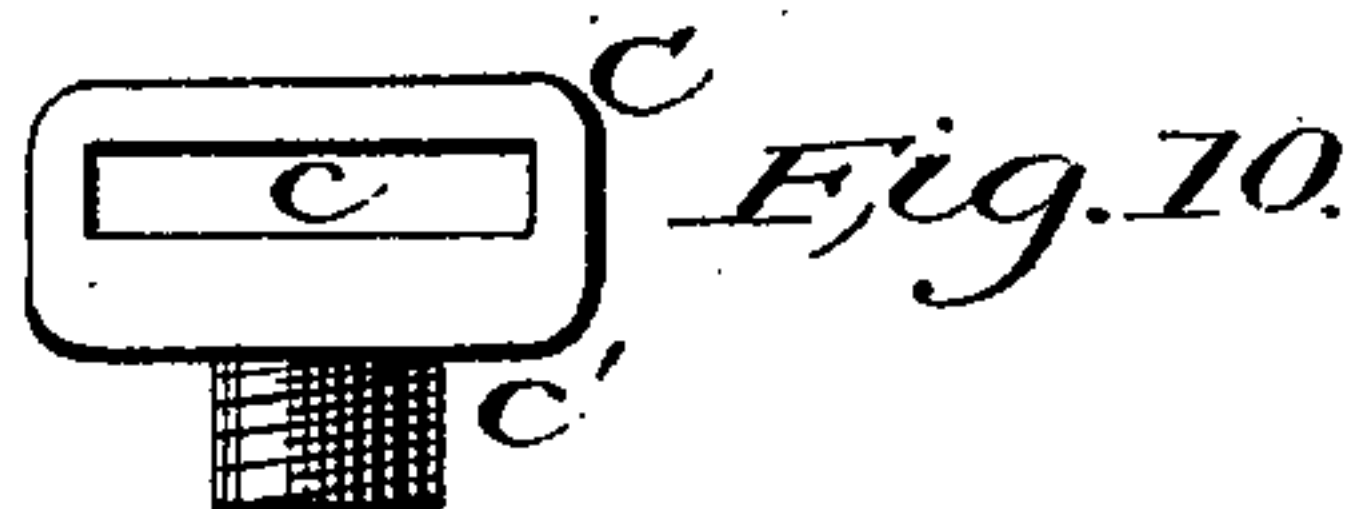
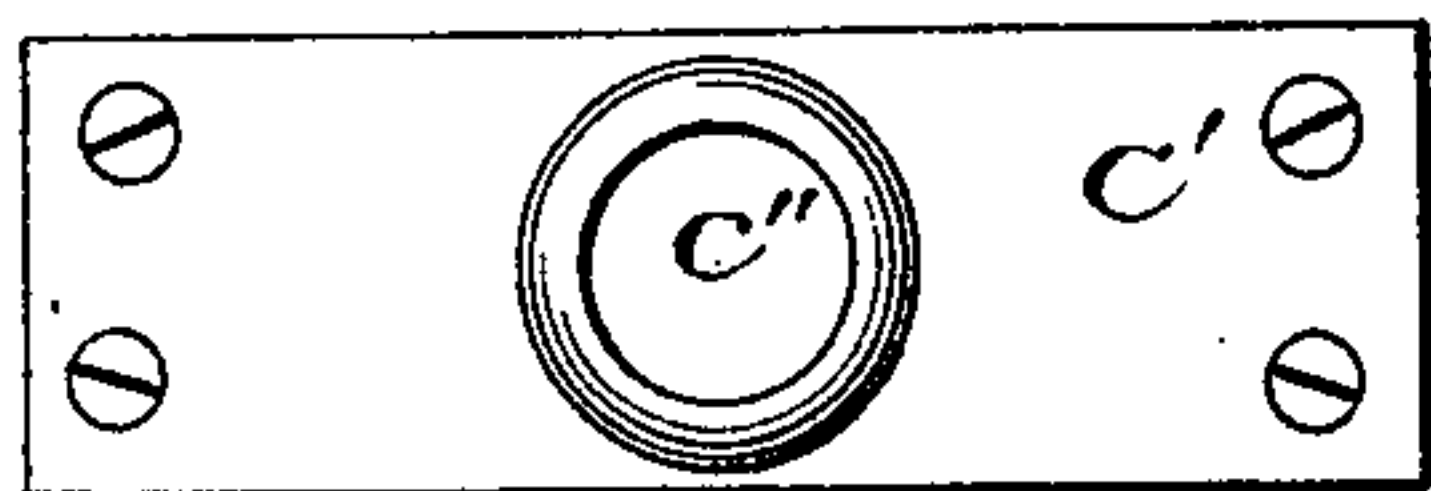
*Fig. 5.*



*Fig. 6.*



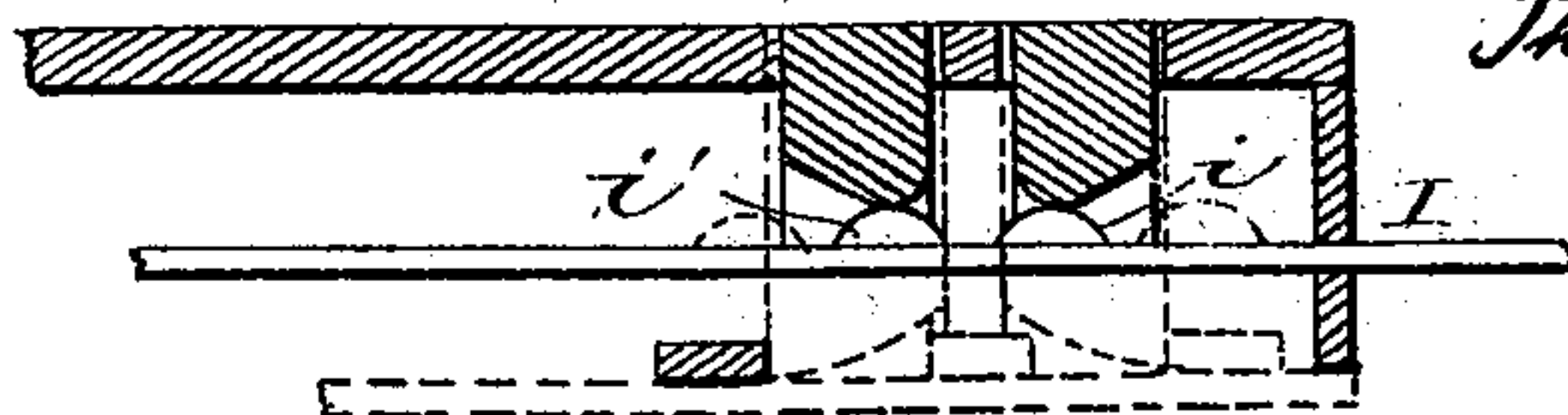
*Fig. 9.*



*Witnesses.*

*Adelbert Hamilton*  
*Amos W. Jackson*

*Fig. 13.*



*Inventor.*  
*Thomas J. Morgan.*



# UNITED STATES PATENT OFFICE.

THOMAS J. MORGAN, OF CHICAGO, ILLINOIS.

## SAFETY-GATE FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 516,505, dated March 13, 1894.

Application filed January 13, 1893. Serial No. 458,584. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS J. MORGAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Safety-Gates for Railway-Cars; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, forming a part hereof, in which—

Figure 1 is a side elevation of the body of a car, showing one end in section, and showing the safety gates closed; Fig. 2, a detail of the handle rod for operating the sliding bar by which the gate locks are operated; Fig. 3, a detail in section of the socket receiving the free end of the horizontal or cross bar of the gate; Fig. 4, a detail, being a side elevation of the stop for retaining the horizontal or cross bar of the gate against displacement when the gate is open; Fig. 5, a detail showing the sliding bar for operating the locks of the gate, and one set of locks; Fig. 6, an end elevation of the threshold or guard plate for the doorway, showing the sliding bar for operating the locks in section; Fig. 7, a sectional elevation of one of the locks; Fig. 8, a cross section of one of the locks; Fig. 9, a side elevation of the plate for the gate swivel; Fig. 10, a top or plan view of the gate swivel; Fig. 11, a detail, being an edge view of the sliding bar showing one set of cams for operating one set of locks or tumblers. Fig. 12 is a detail showing the movements of the bars of the gate. Fig. 13 is a detail showing the operation of the cams for the locks or tumblers.

This invention is designed more especially for use with railway cars in which the seats extend across the car from side to side, with a passage way between the seats, and a door or opening at the side of the car for the entrance and exit of passengers, which cars are termed "open" cars, but the invention can be applied to and used with other styles of cars, where a safety gate is desired or necessary.

The objects of the invention are to construct a safety gate for the door or passage

of a car, which can be operated by an employé, without liability of injuring the passengers in closing the gate, and which, when closed, can not be released except by an employé releasing the lock by which the gates are held closed; to improve the construction and form of the safety gate, and have the movement of one part of the gate operate the companion or other part; to improve the means for locking and holding the safety gate in both its opened and closed position; to enable several gates of a car to be operated simultaneously and from one point; to give the sliding bar which operates the gate locks absolute accuracy of throw under all conditions; to prevent any movement of the parts when the handle rod and its connection with the sliding bar are at a dead center, and positively hold the parts in position against the jar of the car; to have the support for the gate locks and the sliding bar which operates such locks also form the threshold or guard for the door or passage to the seats, and to improve generally the construction and operation of the safety gate and its operating mechanism as a whole; and its nature consists in the several parts and combinations of parts hereinafter described and pointed out in the claims as new.

In the drawings, A represents the horizontal or cross bar of the safety gate.

B is the diagonal bar of the gate, pivoted to the bar A by a suitable pin or pivot, b, located at the proper distance from the free or detachable end of the bar A, for the movement of the two bars in closing and opening the gate formed by the two bars, and the free or detachable end of the bar A enters a socket or clasp, a, secured to the post of a door or passage way or to the body of the car adjacent to the door or passage way, and this clasp or socket a has an opening or recess, a', with inclined walls or faces to permit the end of the bar A to swing or travel as required in entering into and withdrawing from the clasp or socket.

C is a head, having a passage or opening, c, for the bar A, and having a pivot or trunnion, c', which enters a hole or opening, c'', therefor in a thimble on the plate C', which plate C' is attached to the body of the car, as



shown in Fig. 1, and the trunnion or journal  $c'$  can be screw threaded on its exterior, or it can be a plain face on its exterior, and when screw threaded, the hole  $c'$  in the thimble  
 5 will have a corresponding screw thread, and when the head C is connected with the plate  $C'$ , it forms a swivel support or connection for the bar A.

D is a plate or support attached to the lower  
 10 sill or body of the car and to which the lower end of the bar B is attached by a suitable pin or pivot and at a point on the body of the car below the swivel head C, is a stop,  $d$ , which can be formed as shown in Fig. 4, which stop  
 15 is engaged by the end of the bar A when the gate is opened, and holds such bar against displacement or being accidentally caught and pulled out of place by a passenger or other person.

20 E, Fig. 5 is a support cast or otherwise formed into shape to have a top and end portions, which support is secured to the door sill or body of the car for the top of the supports to form or furnish a threshold or guard  
 25 for the door or passage to the seats.

F is a plate or wall depending from the top plate or portion of the support E, in the construction shown, but which could be a separate piece secured in any suitable manner to  
 30 the top of the support E.

G are pockets or receptacles on the wall or plate F, formed by end walls,  $f$ , and an intermediate wall,  $f'$ , and a bottom plate or wall  $g$ .

35 H and H' are the locks or tumblers for the bar B, each lock or tumbler having an upper plate or wing,  $h$ , with an inclined edge  $h'$ , which, as shown, is on the arc of a circle, and each tumbler also has a center or web portion with an inclined face,  $h''$ , and as shown  
 40 the lower face,  $h^3$ , of each tumbler is cut away, so as to allow the tumbler or lock to drop forward by gravity. Each tumbler, at its lower edge or end, has a tongue or projection,  $g'$ , which enters a recess, in the plate  $g$ , and forms a stop against displacement of the lock or tumbler in dropping into a locking position or being moved into the unlocking or releasing position.

50 I, Figs. 2 and 6, is a sliding bar extending the full length of the car, or nearly so, and this bar has on its inner face, in the arrangement shown, a series of cams,  $i$ ,  $i'$ , and one,  $i$ , for each lock or tumbler H, and one  $i'$  for  
 55 each lock or tumbler H', which cams are located in such relation to the locks or tumblers as that with the throw of the bar I in one direction, the cams  $i$  will engage the inclined face  $h''$  of the locks or tumblers H, and throw such tumblers back, and with the movement of the bar I in the opposite direction, the cams  $i'$  will engage the inclined face  $h''$  of the locks or tumblers H', and throw such locks or tumblers back. The outer face  
 60 of the sliding bar I has secured thereto a series of heads or pins,  $j$ , which, with the throw of the sliding bar I in the direction to close

the gates, will strike the edges of the bars B and carry such bars from a vertical to a diagonal position for closing the gates. 70

J is a slot in each end of each support E, which slot is formed in one end, so as to receive the bar I, and allow the cams  $i$  to move forward and back with the throw of the bar, and the slot in the other end of the support  
 75 E is formed to allow the passage of the cam  $i'$  and pin  $j$  forward and back with the throw of the bar I. The bar I is supported in the slots J of the several supports E, and has, by this arrangement, a support its entire length, 80 and the bar is held in position by the slots J.

K is a link or strap, the inner end of which is attached by a suitable pin or pivot to the end of a sliding bar I.

L is a crank, to which the outer end of the  
 85 link or strap K is connected.

M is a rod on the lower end of which is formed the crank L, and a rod M, crank L, and link or strap K are provided for each end  
 90 of the car on opposite sides. The rod M extends up to the top of the car, and is secured to the body of the car by suitable straps,  $m$ , so that the rod is free to turn, and at the same time is held against dropping down.

N is a head, having a wing or extension  $N''$ ,  
 95 which can be bolted or otherwise secured to the roof of the car, and this head N has a depression or recess,  $n$ .

N' is a head attached to the rod M by a band or flange,  $n''$ , and a suitable set screw  
 100 or otherwise, and this head N' has a projection or tooth,  $n'$ , which enters the depression or recess  $n$  in the head N, and locks the two heads N and N' together.

O is a drop handle attached in any suitable  
 105 manner to the rod M, at a point on such rod to be within reach of the brakeman or operator standing on the station or depot platform, and by means of this handle O the rod M can be turned in either direction, as required to throw the sliding bar I into position for locking the gates in an open or closed position. A handle similar to O, or a hand wheel can be secured to the upper end of the  
 110 rod M, so that the brakeman or operator can mount the car and operate the sliding bar through the rod M, from the top of the car. 115

The car shown is one having the seats set back to back, and extending across the car from side to side, and having a doorway or  
 120 passage P between the seats, as shown in Fig. 1. The body of the car can be constructed in the usual manner for cars of this description, and the car is to be provided with the usual trucks and other appliances, which can be of the ordinary construction and are therefore not described. 125

A support E is provided for each door or passage P, and each support is to be attached in any suitable manner so as to form a  
 130 threshold or guard for the door or passage. The locks or tumblers H and H' are placed in their respective pockets G, for each support E, so that the inclined face,  $h'$ , of the



two locks or tumblers H and H' will stand in opposite relations to each other, with the apex of the inclined face adjacent to the center walls  $f'$ , by which arrangement, with the movement of the bar B into a vertical position to open the gate, the edge of the bar will strike the inclined face  $h'$  of the lock H, and throw such lock back, and with the dropping of the bar into a diagonal position to close the gate, the edge of the bar B will strike the incline  $h'$  of the lock or tumbler H', and throw such lock or tumbler back. The tumblers, when in the pockets G, rest at their lower ends on the wall or bottom  $g$ , and are held against being thrown beyond a center backward by the engagement of the upper face of each tumbler with the under face of the top of the support E, and after the tumblers or locks H and H' are placed in their pockets or receptacles G, they are held in position by a bar E', fastened to the front side or edge of the support E, and between this bar E' and the edge or front of the support E, is an opening or slot extending the length of the wall F, or nearly so, through which slot the bar B passes.

The supports E, with the tumblers H and H' for each support, located and held in the pockets G, are attached one at each doorway or passage; the sliding bar I, with the cams  $i$ , is entered endwise through the several supports E, and the pins or heads  $j$  are attached to the bar I at the proper point to perform the work required of them in engaging a bar B; the diagonal bar B, for each doorway or passage, is entered through the slot therefor in the support E, and is pivoted at its lower end to the plate or support D for such lower end; the plate C', with the swivel head C is attached adjacent to the doorway or passage on the body of the car, and the bar A for each doorway or passage is slipped endwise into the opening  $c$  of the swivel head C, and is connected to the upper end of the bar B by a pin or pivot  $b$ , and the clasp or socket  $a$  is placed in position adjacent to the doorway on the opposite side to the swivel head C, so as to receive the free or detachable end of the bar A; the link K is attached at one end to the bar I, and at its other end is connected with the crank L of the rod M, which rod is mounted at the end of the car with the head N, attached at the top of the car, and the head N' on the rod M, and the drop handles for operating the rod are placed in position on the rod M, one to be reached from the station or depot platform, and the other from the top of the car, completing the attachment of the safety gates and their operating mechanism, ready for use.

In use, to release the bar B so that such bar can be thrown up into a vertical position, carrying with it the bar A, the brakeman or operator, through the rod handle, turns the rod M, so as to swing the crank L into the position shown by the dotted lines in Fig. 2, which moves the sliding bar I, through the

connecting link or strap K, in the direction of the throw of the crank, and this movement of the sliding bar I brings the cam  $i'$ , which operates the tumbler H' into contact with the inclined face  $h''$ , throwing such lock or tumbler back, and carrying the engaging wing  $h$  on such lock or tumbler out of engagement with the edge of the bar B, leaving such bar perfectly free, so that a passenger or other party can take hold of such bar and move or throw it into a vertical position at the side of the doorway or passage, and with such movement of the bar B, the bar A is carried out of the way by its connection with the upper end of the bar B, such carrying out of the way of the bar A being permitted by the turning of the swivel C, through which the body of the bar A passes, for the bar to hang vertical, or nearly so, back of the bar B at the side of the doorway or passage P, leaving such doorway or passage free or open for the entrance or exit of the passengers.

The gate is closed by the brakeman or operator grasping the handle of the rod M, and turning such rod for the crank L to be in the position shown by the full lines in Fig. 2, and this turning of the crank L, through the connecting strap or link K, draws the sliding bar I in the direction the crank is turned, and with such movement of the bar I, the cam  $i$ , which co-acts with the tumbler or lock H, is brought into engagement with the inclined face  $h''$  of such lock or tumbler, and forces the lock or tumbler back for its wing  $h$  to be carried out of engagement with the edge of the bar B, releasing such bar from the lock or tumbler, and with the continued movement of the sliding bar I, the pin  $j$  comes into engagement with the edge of the vertical standing bar B, and carries such bar over to its diagonal or closed position, but not to the full closing of the gate, and with the movement of the bar B to its diagonal or inclined position, the bar A is drawn into a horizontal position, by its connection with the bar B, such movement being permitted by the swivel C, which turns with the withdrawal of the bar A, to a horizontal position.

The movements in opening and closing the gates are controlled by the sliding bar I, operated from the rod M, so that the brakeman or operator can, by one and the same throw of the crank L, move the sliding bar to release all of the gates, or move such bar to lock all the gates, and in locking the gates the pins  $j$  for the respective bars B, do not force such bars to the limit of the diagonal or inclined position, as the throw of the crank L is one that will not carry the pins  $j$  to the full limit of the drop of the bars B, by which arrangement, in case a passenger is not wholly within the car, but is partially in the door or passage P, no injury will be done to such passenger, as the gates do not close so as to catch and injure the passenger, and with the removal of the obstruction, the gates will self-close by the action of gravity, as the bar B



has passed its center, and will drop of its own weight into a closed position, carrying with it the bar A, for the end of such bar to enter the clasp or socket  $a$ , and when the diagonal bar is fully down, it is locked and held in that position by the forward drop of the lock or tumbler  $H'$ , which drop is had in the arrangement shown, by gravity, and when the lock or tumbler  $H'$  drops outward or forward, the edge of the wing  $h$  passes the edge of the bar B, so that the edge of the bar and the edge of the wing are engaged, locking and holding the bar B, in its diagonal position, and such bar cannot be raised until the engagement of the wing  $h$  therewith is released, and such engagement can only be released by the operator turning the rod M and carrying the crank L into the position shown by the dotted lines in Fig. 2. The bar B, when in its vertical position to open the gate, is locked and held in such position by the forward drop of the tumbler H, which, in the construction shown, is had by gravity, and with such forward drop of the tumbler H, the edge of the wing  $h$  passes the edge of the bar, and engages therewith, so as to hold the bar B in its vertical or raised position, and the bar B will stand in its raised or vertical position until the engagement of the wing  $h$ , with its edge, is released, and such release can only be had by the operator turning the rod M to carry the crank L into the position shown by the full lines in Fig. 2. It will thus be seen that the bar B is positively locked in both the position for closing the gate and the position for opening the gate, through the locks or tumblers H and  $H'$ , and that these tumblers are actuated, in the construction shown, to self-lock when released by the movement of the sliding bar, and cannot be unlocked except through the movement of the sliding bar from the end of the car, by which means any tampering with the gates by a passenger is prevented, as when closed, the gate cannot be opened until it is released by the sliding bar, the result being a perfect control of the gate by the brakeman or operator, and no possibility of actuating the gates by a passenger.

The horizontal or cross bar A, when the gate is opened, is held in place by its engagement with the stop  $d$ , which stop should be one that will prevent the bar from being thrown or carried out of place on the entrance or exit of the passengers, by being caught by a passenger, and when the gates are closed and locked, in order to prevent any movement of the sliding bar from the jar of the car or other concussion that might disengage the cam  $i'$  from the lock or tumbler  $H'$ , and release such tumbler, the crank L and the connecting link or strap K are set in such relation with each other and with the sliding bar I, as to have the crank on a center and hold the sliding bar firmly in position, and to prevent the crank from turning accidentally the tooth or projection  $n'$  engages the recess or opening  $n$ , and locks the heads N and  $N'$  one

to the other, and such locking is had with the crank L at its center, so that unless the engagement of the head  $N'$  with the head N is broken, the crank L must be held in its center or locked position, for the sliding bar I, but at the same time the form of the projection or tooth  $n'$  should be one to permit the release of the engagement between the heads N and  $N'$  without any inconvenience, when the operator, through the handle, turns the rod M.

The release of the locks or tumblers, through the movement of the sliding bar I, in the construction shown, allows the locks or tumblers to drop into a locking position by gravity, but instead of having the locks or tumblers thrown into locking position by gravity, springs can be placed back of the locks or tumblers, to act and throw the locks or tumblers forward into a locking position, and in releasing the locks or tumblers, the resistance of the springs will be overcome by the action of the cams on the sliding bar.

The trunnion or journal  $c'$  of the swivel head C, when screw threaded, cannot become detached in use, as the head will only make a quarter turn in the movements of the bar A, and when the trunnion or journal  $c'$  has a plain face on its exterior, it can be riveted or otherwise secured in the thimble of the plate  $C'$ , so as to form a pivot for the head C.

The diagonal bar B, when partially closed by the action of the sliding bar I and the head J, cannot be thrown back to a vertical position by a passenger, as the engagement of the pin or head J with the edge of the bar B locks such bar against the return to a vertical position until the sliding bar I is returned to the position shown by the dotted lines of the crank in Fig. 2, and when the bar B is closed or in its diagonal or inclined position, such bar cannot be thrown up or back to a vertical position by any one inserting a knife blade or other thin strip of metal or other device into the slot in the support E and throwing the tumbler or lock  $H'$  out of engagement, as with the tumbler or lock thus released, an attempt to raise the bar B will be stopped by the engagement of the edge of the bar with the pin or head  $j$ , so that its head or pin not only serves as a means for carrying the bar B to its diagonal or inclined position, but also forms a lock against the raising of such bar when once carried to its diagonal position, until the pin or head  $j$  is moved out of the way.

The cars are unprovided with platforms and steps at the end and the passengers enter and depart from the cars through the several doorways or passages P, and the station or depot platforms are to be on a level, or nearly so, with the threshold or guard of the doorway or passages, and by having the handle O on the rod M at a point to be grasped by the brakeman or operator standing on the station or depot platform, and a handle on the upper end of the rod M, to be grasped by the brakeman or operator on top of the car,



the safety gates can be operated either from the station platform or from the top of the car, and can only be operated by a brakeman or operator. The doorways or passages P are on both sides of the car, and safety gates are provided for each doorway or passage on both sides of the car, the safety gates for the doorways or passages on each side of the car operated each by its own sliding bar and connections, and in use the safety gates on the side of the car adjacent to the station or depot platform are the ones operated, the safety gates on the opposite side of the car being kept closed.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a safety gate, of a horizontal or cross bar, a diagonal bar pivoted at its upper end to the horizontal bar, and having a stationary pivot for its lower end, and a swivel head carrying the horizontal bar, substantially as and for the purposes specified.

2. The combination, in a safety gate, of a swivel head carrying the cross bar of the gate, substantially as and for the purpose specified.

3. The combination, in a safety gate, of a bar swinging on a stationary pivot, and a lock or tumbler engaging said bar and locking the bar against movement when the gate is closed, substantially as and for the purposes specified.

4. The combination, in a safety gate, of a bar having a stationary pivot and a lock or tumbler engaging said bar and locking the bar against movement when the gate is opened, substantially as and for the purposes specified.

5. The combination, in a safety gate, of a bar having a stationary pivot, a tumbler or lock engaging the bar and locking the bar against movement when the gate is closed, and a tumbler engaging the bar and locking the bar against movement when the gate is opened, substantially as and for the purposes specified.

6. The combination, in a safety gate, of a bar having a stationary pivot, a locking tumbler for said bar, and a sliding bar throwing the tumbler out of engagement, substantially as and for the purposes specified.

7. The combination, in a safety gate, of a bar having a stationary pivot, locking tumblers for said bar, holding the bar against movement in either direction when locked, a sliding bar and cams on the the sliding bar for releasing the tumblers, substantially as and for the purposes specified.

8. The combination, in a safety gate, of a bar having a stationary pivot, a sliding bar

and a head or pin on the sliding bar for moving the pivoted bar from a vertical to a diagonal position, substantially as and for the purposes specified.

9. The combination, in a safety gate, of a cross bar, a diagonal bar having a stationary pivot at one end and pivoted to the cross bar, a swivel head carrying the cross bar, locking tumblers engaging the diagonal bar, a sliding bar, and cams on the sliding bar releasing the locking tumblers, substantially as and for the purposes specified.

10. The combination, in a safety gate, of a cross bar, a diagonal bar having a stationary pivot at one end and pivoted to the cross bar at its other end, a swivel head carrying the cross bar locking tumblers engaging the diagonal bar, a sliding bar, cams on the sliding bar releasing the locking tumblers, and a pin on the sliding bar for carrying the diagonal bar from a vertical to a diagonal position, substantially as and for the purposes specified.

11. The combination, in a safety gate, of a sliding bar having cams operating locking tumblers, and a crank operating the sliding bar, and having a dead center locking the sliding bar against movement, substantially as and for the purposes specified.

12. The combination, in a safety gate, of a sliding bar having cams operating locking tumblers, a crank moving the sliding bar, a rod actuating the crank, and an operating handle for the rod, substantially as and for the purposes specified.

13. The combination, in a safety gate, of a sliding bar having cams operating locking tumblers, a crank moving the sliding bar, a rod actuating the crank, and a lock for the rod holding the crank on its center, substantially as and for the purposes specified.

14. The combination, with the doorway or passage of a car, of a support forming a threshold for the doorway or passage, and carrying the actuating devices for a safety gate, substantially as and for the purposes specified.

15. The combination, in a safety gate, of locking tumblers and a sliding bar operating the tumblers, substantially as and for the purposes specified.

16. The combination, in a safety gate, of a bar having a stationary pivot, a sliding bar, and an intermediate stop on the sliding bar holding the pivoted bar against being raised, substantially as and for the purposes specified.

THOMAS J. MORGAN.

Witnesses:

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FRANK W. ROBINSON.