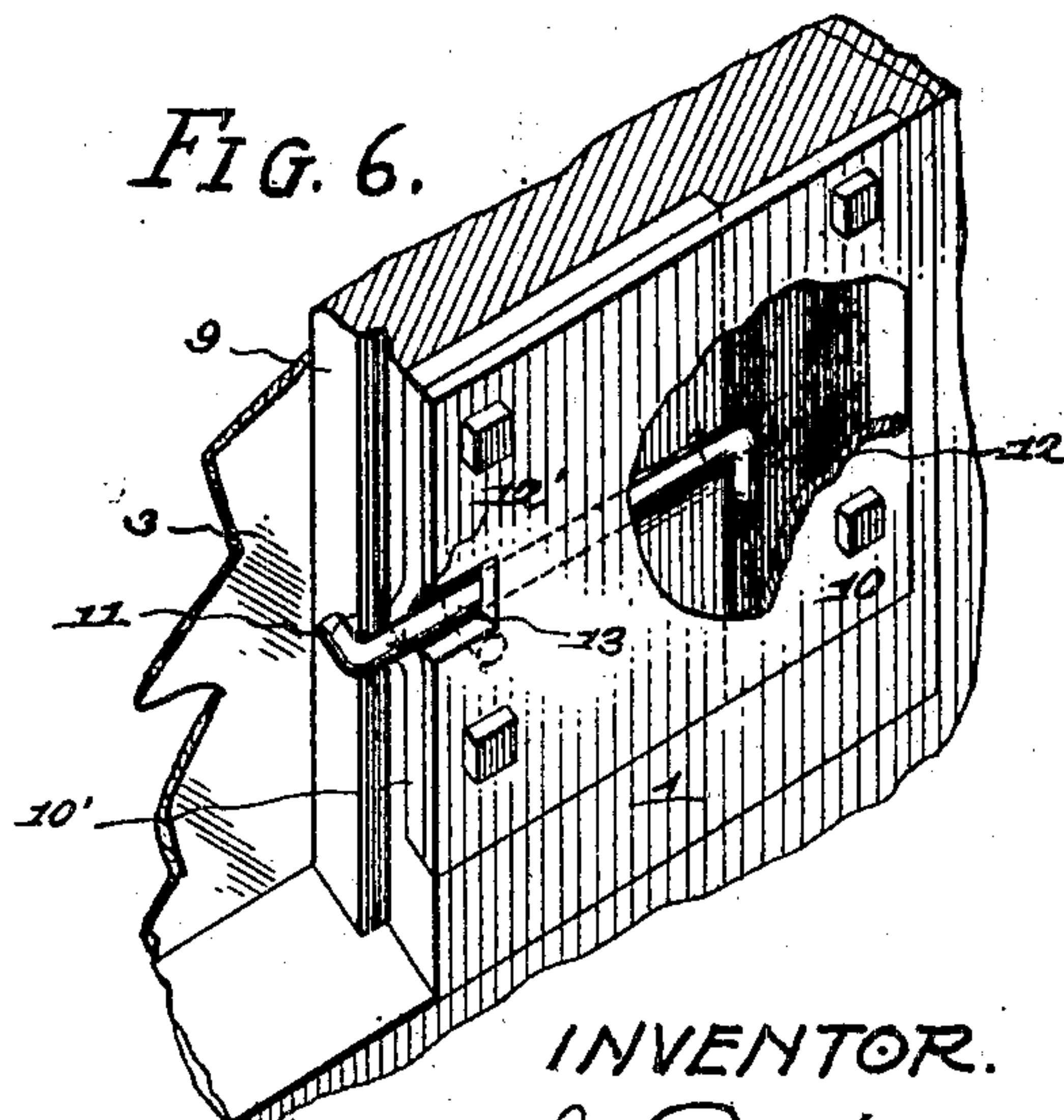
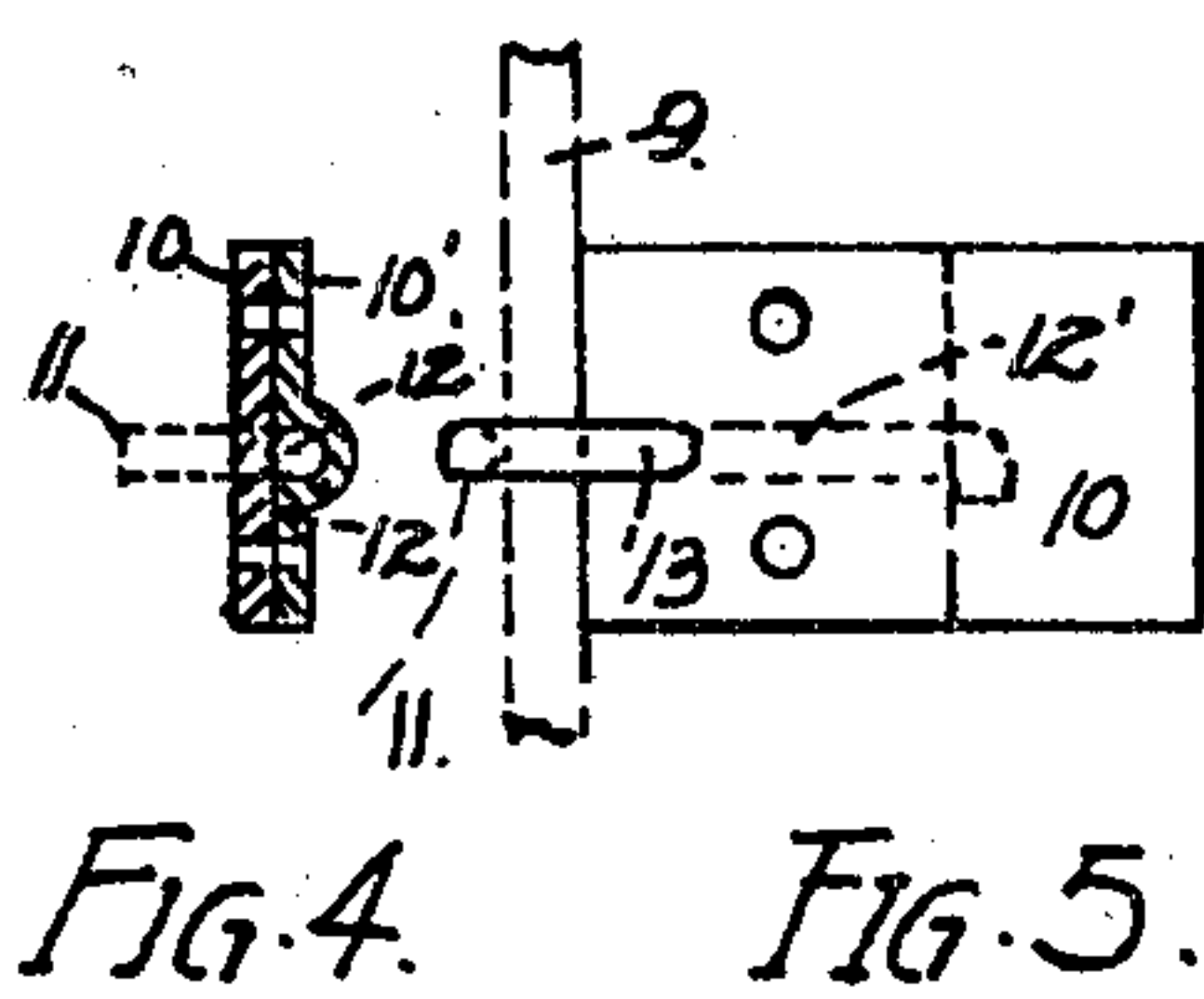
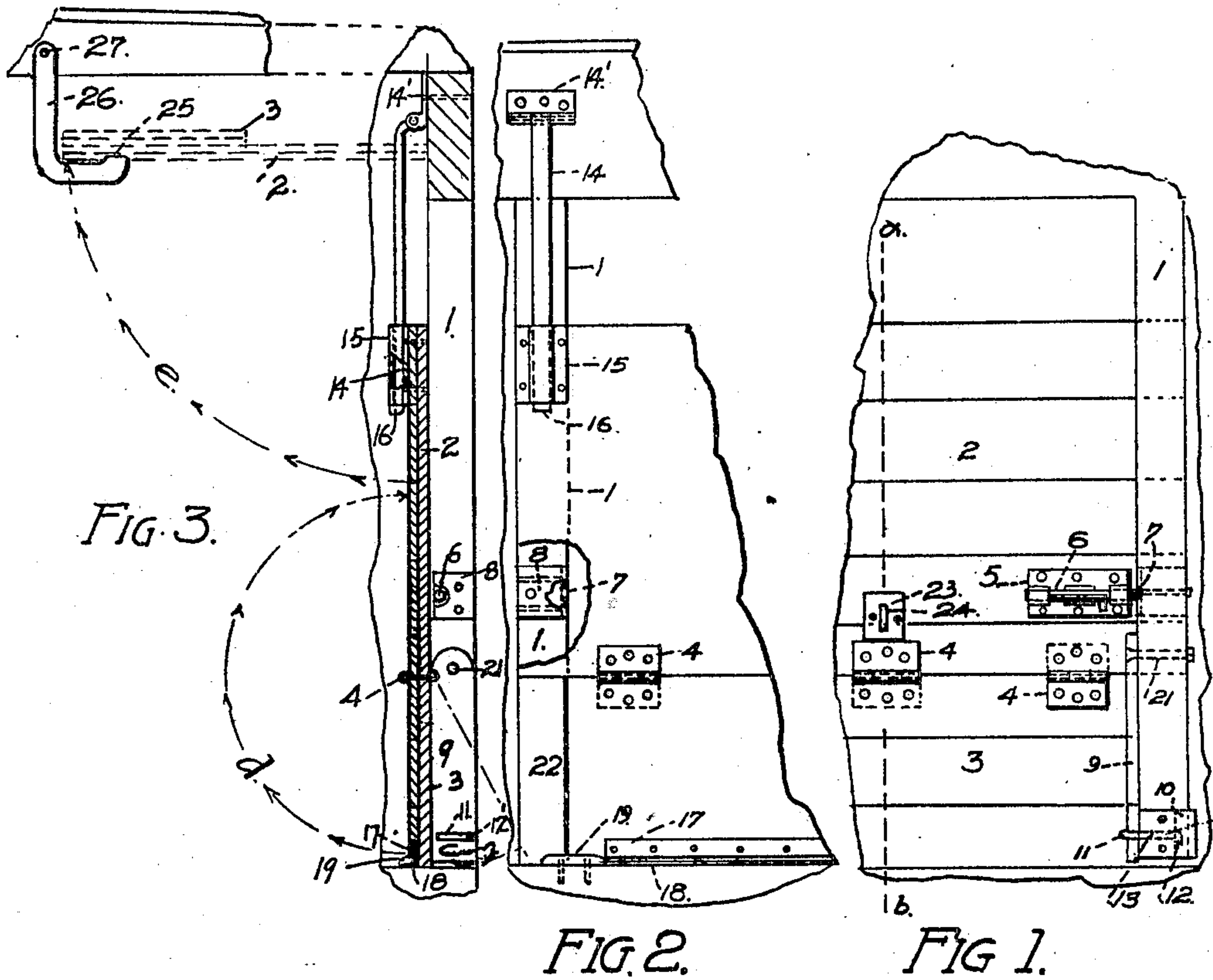


No. 837,553.

PATENTED DEC. 4, 1906.

H. J. FORST.  
GRAIN DOOR FOR BOX CARS.  
APPLICATION FILED NOV. 2, 1905.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

HENRY JOHN FORST, OF LOUISVILLE, KENTUCKY.

## GRAIN-DOOR FOR BOX-CARS.

No. 837,553.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed November 2, 1906. Serial No. 285,583.

*To all whom it may concern:*

Be it known that I, HENRY JOHN FORST, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented a new and useful Grain-Door for Box-Cars, of which the following is a specification.

This invention relates to doors for box-cars that may be brought into use when the cars are used for grain and may be folded up and swung out of the way when the cars are to be used for other purposes; and the objects of my improvement are comparative inexpensiveness of manufacture, facility in use, simplicity of construction, to provide a door of this class that may be easily opened and will not stick by reason of the grain working between the joints, that will not leak grain, that is perfectly secure against bursting out, and durability. These objects I attain by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an outside elevation of a portion of the door and one of the door-posts with its appurtenances; Fig. 2, an inside elevation of a portion of the door and one of the door-posts with its appurtenances; Fig. 3, a sectional elevation; Fig. 4, a sectional detail view of the lower locking-bolt; Fig. 5, an elevation of the lower locking-bolt, and Fig. 6 a detail perspective view of the lower locking-bolt as applied.

Similar reference characters refer to similar parts throughout the several views of the drawings.

The body of the invention comprises two parts 2 and 3 of the door, which extends a suitable height for the purpose of holding grain in a car in the usual way, but does not close the entire opening. The upper part 2 is made of sufficient length to extend across the opening and lie against the inner face of the door-posts 1. The lower part 3 is of such a length as to pass freely between the adjacent faces of the door-posts 1, leaving the inner face 22 of the posts exposed. The entire door is adapted to swing inward, being hung on hinges 14. The stationary leaf 14' of the hinges is secured near the ceiling of the car, above the portal and on a line with door-posts 1. The free leaf 14 of the hinges is made of considerable length and adapted to pass slidably through a clip-plate 15. The lower end of leaf 14 is bent outward at a right angle at 16 to limit the downward motion of clip 15. Parts 2 and 3 of the door are

joined together at their edges by means of reversible hinges 4. This arrangement adapts part 3 for swinging both outward and inward for the purpose hereinafter described.

Part 2 is provided on the outside, at its lower end, with a locking-bolt which is adapted to slide into the socket 7, provided in plate 8, which is fastened to door-posts 1 for the purpose of preventing part 2 from swinging inward when in use and allowing grain to enter between the door-posts and the door.

To prevent part 3 from swinging outward when in use, cleats 9 are provided to bear against its entire width and pivoted at their upper ends on bolt 21, so that the lower ends of the cleats may be free to swing outward. Bolt 21 is disposed just above hinge 4 in order that part 3 may swing out freely when cleats 9 are released and free to swing out. A second or lower bolt 13 is placed near the lower end of door-posts 1 and let into the surface of the posts so that it is flush with the outside of the car and will not interfere with the passage of the outer car-door. Bolt 13 is provided at its free end with a right-angular hook portion 11 and at its opposite end with a similar right-angular hook portion 12. The two right-angular hook portions of the bolts extend at ninety degrees relative to each other. Bolts 13 are secured by means of double plates consisting of an outer plate 10, which is flat, and an inner plate 10', having a groove 12' formed in it to accommodate the bolt. The inner plate 10' is shorter than the outer plate 10, but is brought out flush with the outer edge of plate 10. The inner hook portion 12 of bolt 13 strikes against the rear edge of plate 10' when the bolt is shot out into operative position. When hook portion 11 is bent inward into contact with cleat 9, the portion 12 extends downward and presses against the inner side of outer plate 10, so that its rotary motion is limited when part 11 extends across cleat 9 at right angles thereto. When the bolt is drawn back to release cleat 9, part 11 is turned over through one hundred and eighty degrees so that it extends outward. Part 12 will now be turned upward and rest against the inner side of plate 10, and the further rotary motion of the bolt will be stopped. The bolt may now be drawn back so that part 11 recedes into the recess provided therefor in plate 10. It will be understood that bolt 13 must be shot to the closing position, Fig. 6, before the outer door of the car can be closed. Bolts 13 are for the pur-



pose of locking cleats 9 in a vertical position against the adjacent faces of door-posts 1. A short cleat or stop 19 is secured to the floor of the car at each end of the door for the purpose of stopping the inward motion of part 3 and retaining it in a vertical position.

A hook 26 is swung from the ceiling of the car for the purpose of holding the door near the ceiling when not in use.

The operation of my new grain-door will now be understood. To use the door, it is swung down across the portal, as shown in Figs. 1, 2, and 3, so that part 2 lies against the inner face of door-posts 1 and is locked in that position by means of bolts 6. Part 3 is swung in till it rests firmly against stop 19, and cleats 9 pressed in against the ends of part 3 and locked in that position by means of bolts 13. When bolts 13 are open, the right-angular portions 11 extend outward and are pushed back so that they rest in the slots provided therefor in the outer plate 10, thus being flush with the adjacent edges or faces of door-posts 1. In order to lock the door, bolts 13 are pushed across cleats 9 and portion 11 turned inward so as to point toward the door. It will be understood that in this position the bolts not only hold cleats 9 firmly against part 3, but the part 11 at the same time holds cleats 9 firmly against the adjacent faces of door-posts 1, so that any leakage of grain between cleats 9 and the door-posts is prevented. The hook portion 12 of the bolts prevents them pulling out of their sockets or turning more than a half-revolution. A strip of leather or other flexible material 17 is provided on the bottom edge of part 3 to prevent leakage of grain at this place. The door is now in a position for loading the car with grain. It will be understood that as the car is filled the grain will press against part 3, so as to press it firmly against cleats 9, so that no grain can work in between part 3 and cleats 9. Part 2 is also firmly pressed against the inner face of posts 1, so that the grain cannot get between these parts. Thus with strip 17 closing the joint between part 3 and the threshold any leakage at any point is prevented, making a strong perfectly secure door. When the car is to be unloaded, it is simply necessary to turn bolts 13 a half-revolution, so that portion 11 extends outward, then push bolts 13 back till parts 11 enter their recess in plate 10, so as to release cleats 9. If bolts 13 work hard, they may be driven back by striking part 11 with a stone or any available implement. As soon as cleats 9 are released from bolts 13 part 3 is free to swing outward and will immediately do so on account of the pressure of the grain against it. The grain will now flow out from the entire length of the door until all the pressure from the inside is relieved and the door is perfectly free.

Bolts 6 are now drawn back so as to release part 2. The operator then enters the car, swinging the door inward until part 3 passes over cleats 19. He then folds part 3 upward against the inner face of part 2, lifts both parts of the door in this position, causing them to slide upward on leaves 14 of the hinges until they strike the top, swings the entire door up against the ceiling of the car, and secures it with hook 26. The free end 25 of hook 26 enters slot 24 of plate 23, provided on the inner face of part 2 therefor. The door is now out of the way, and the remaining grain in the car may be easily unloaded and the car may be used for any other purpose desired, leaving the door ready for use when required. It will be seen that it is not necessary to use any nails to secure the door, as is usual, and thus the car is not injured and is therefore rendered more durable. It will be understood that when bolts 13 are shot into the position shown in Fig. 1 they are flush with the outside surface of the car and the regular door may be closed without interference.

Having thus described my invention so that any one skilled in the art pertaining thereto may make and use it, I claim—

1. The combination with a grain-car provided with portals, door-posts, and a door, of a lower door-section adapted to swing outward between said door-posts, cleats pivoted at their upper end on the adjacent faces of said door-posts so that their lower ends may swing outward and disposed in the path of said lower door-section, and bolts secured on the outer faces of said door-posts adapted to be shot across the path of the lower end of said cleats, substantially as specified.

2. In a grain-car having door-posts and a grain-door adapted to swing outward between said door-posts, cleats for holding said door pivoted at their upper end to said door-posts adapting them to swing vertically, and bolts on said door-posts adapted to be shot into the path of said cleats to prevent said cleats swinging out, substantially as specified.

3. In a grain-car having door-posts and a grain-door adapted to swing outward between said door-posts, cleats for holding said door pivoted at their upper end to said door-posts adapting them to swing vertically, and bolts on said door-posts adapted to be shot into the path of said cleats to prevent said cleats swinging out, said bolts being slidably mounted between inner and outer plates and having a portion at each end bent at right angles and said right-angular portions disposed at ninety degrees relative to each other.

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Witnesses:

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