T. B. RANKIN.

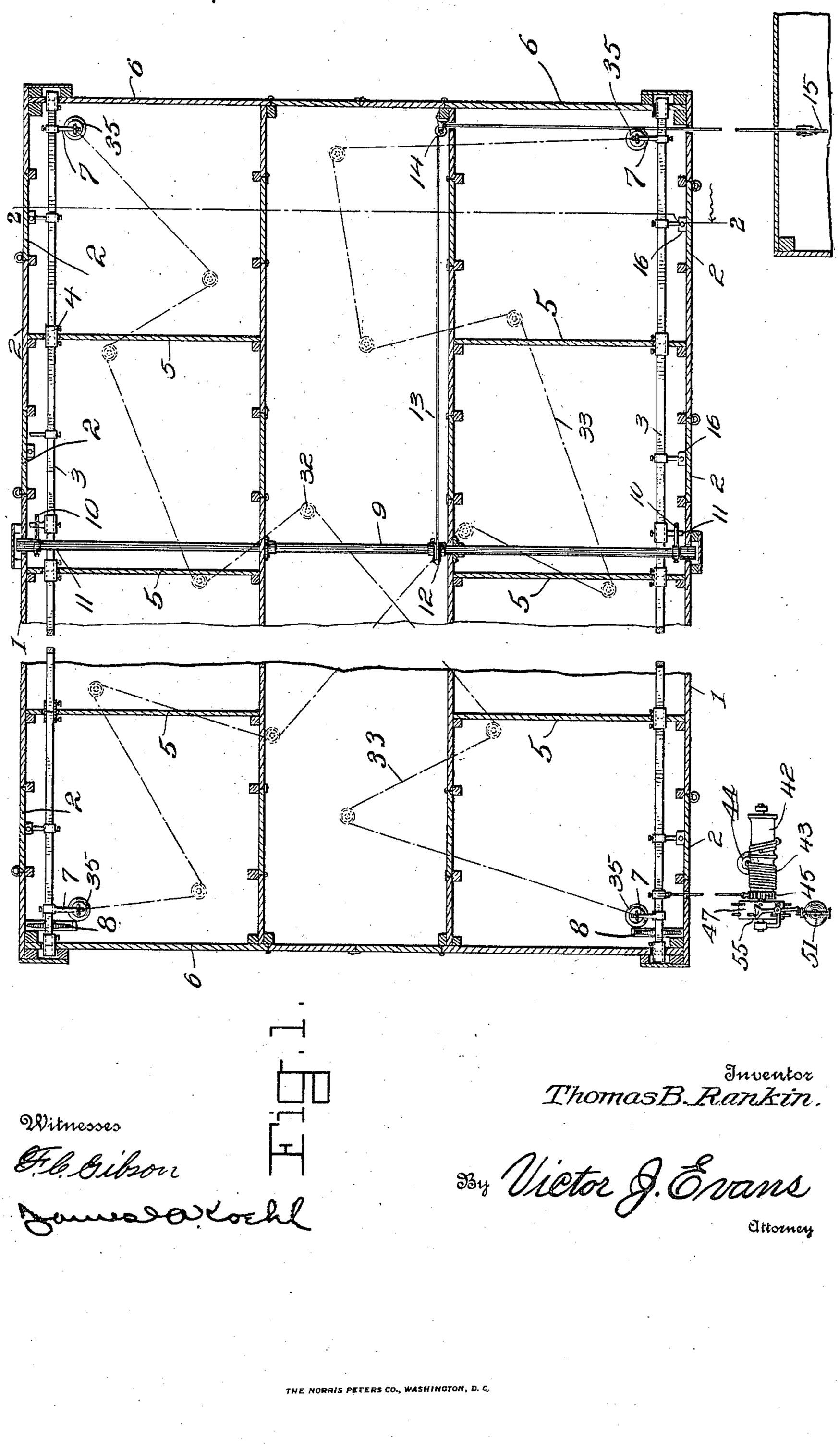
DOOR RELEASING MECHANISM.

APPLICATION FILED DEC. 28, 1909.

966,241.

Patented Aug. 2, 1910.

4 SHEETS—SHEET 1.



Witnesses

F. L. Gibson

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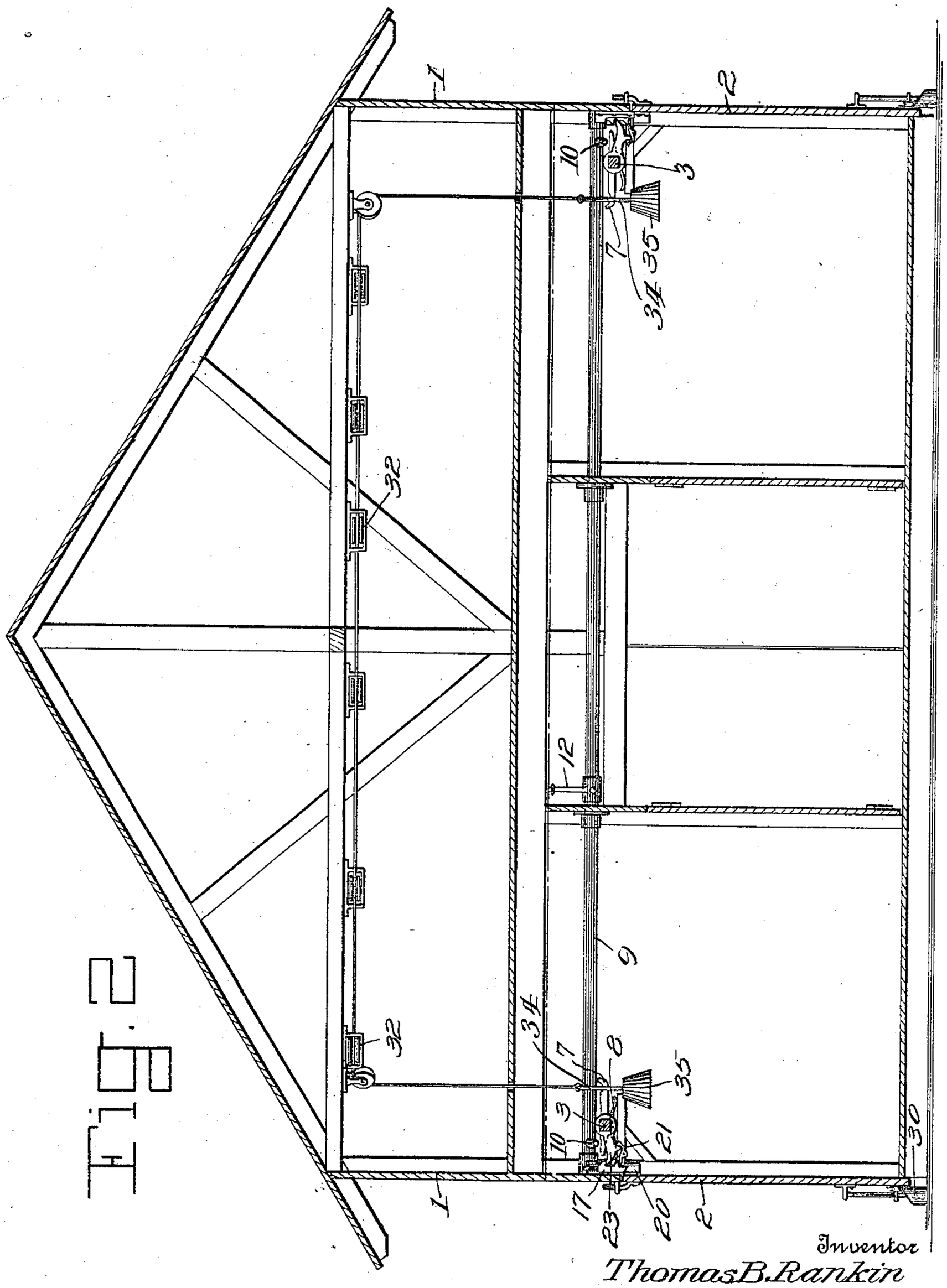

Fig. 2.

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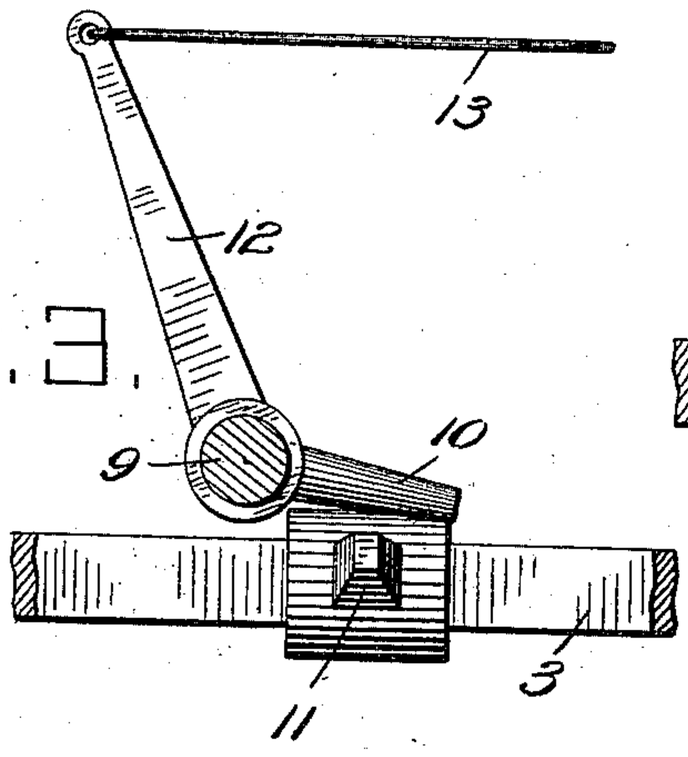
4 SHEETS—SHEET 3.

Fig. 3.



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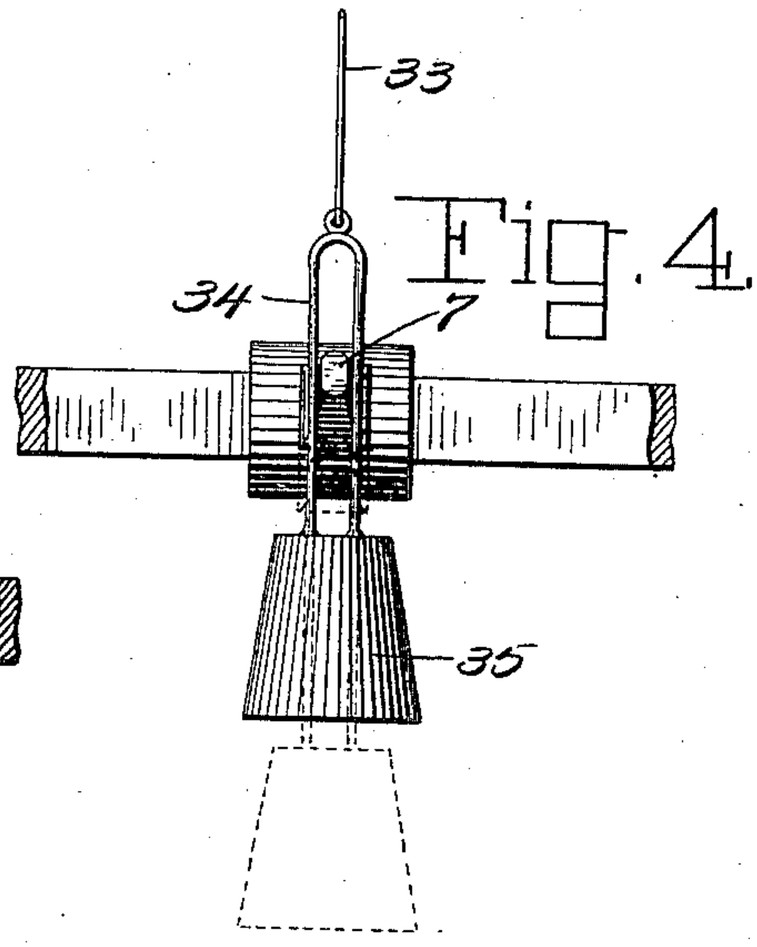


Fig. 5.

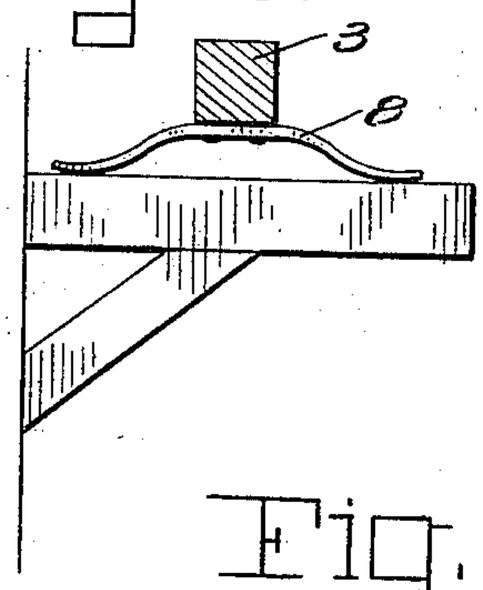


Fig. 6.

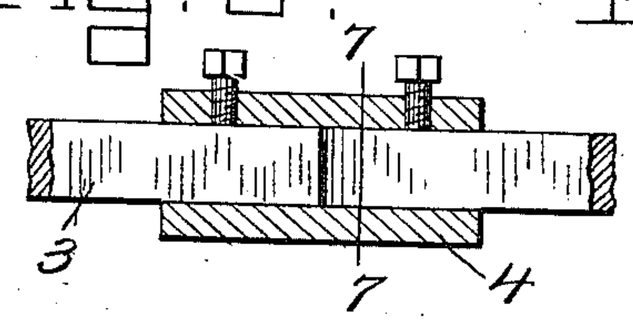


Fig. 7

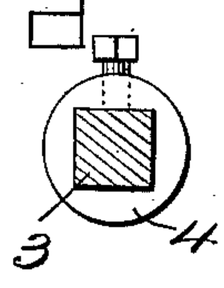


Fig. 8.

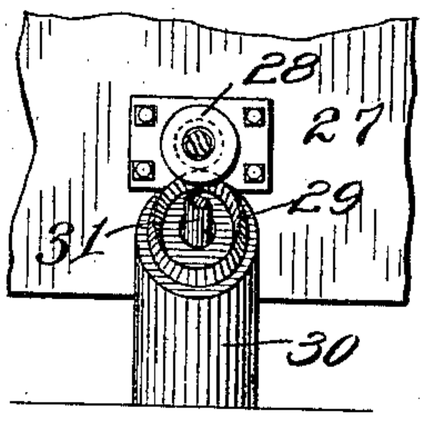
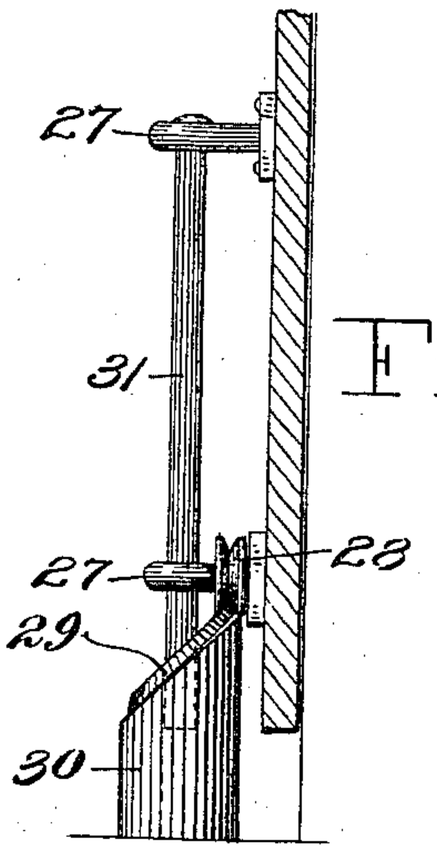


Fig. 9.



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4 SHEETS—SHEET 4.

Fig. 10.

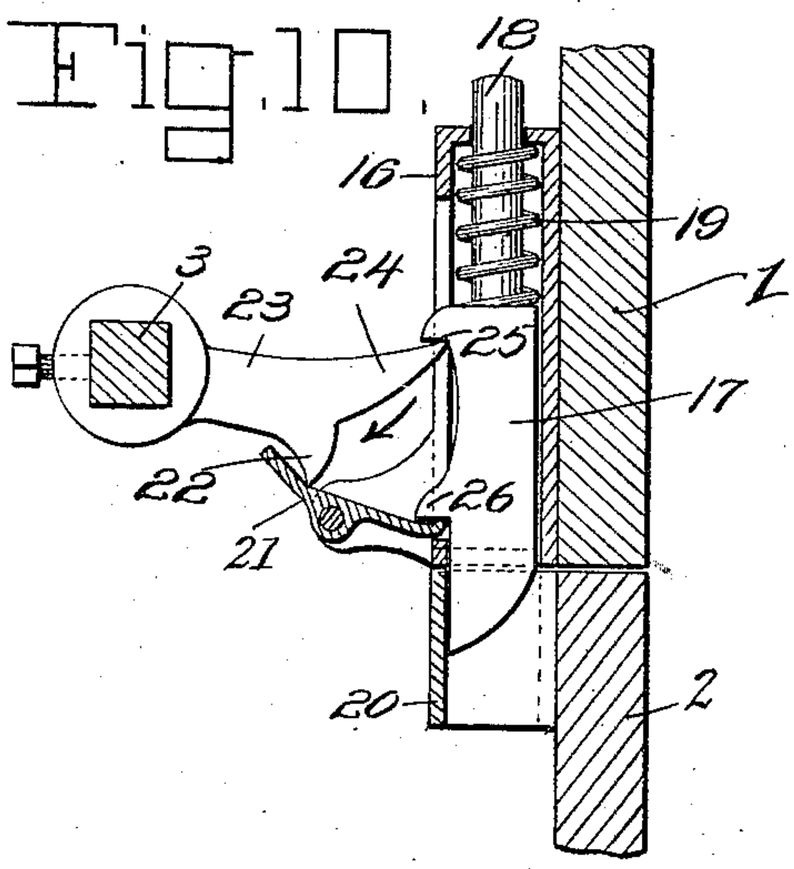


Fig. 12.

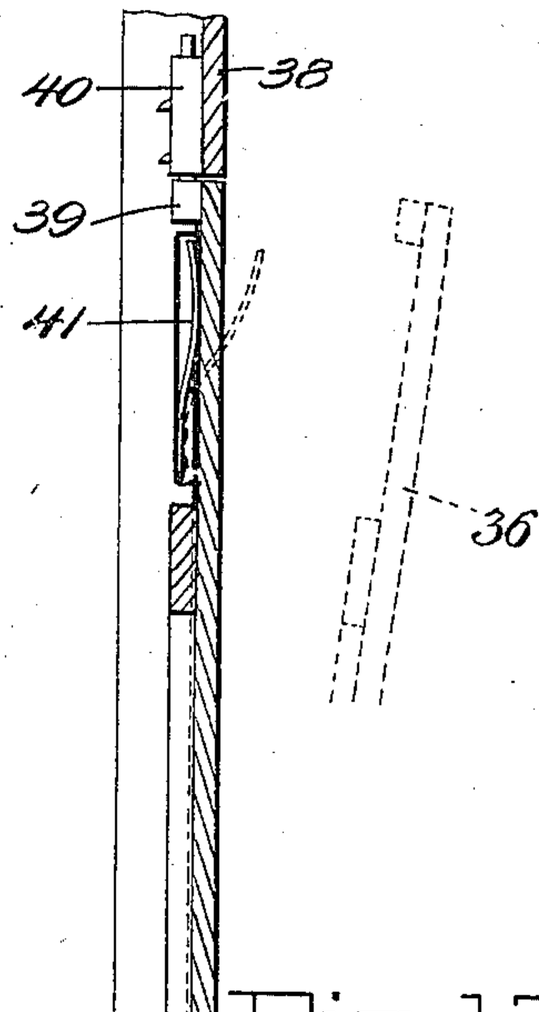


Fig. 11.

Fig. 13.

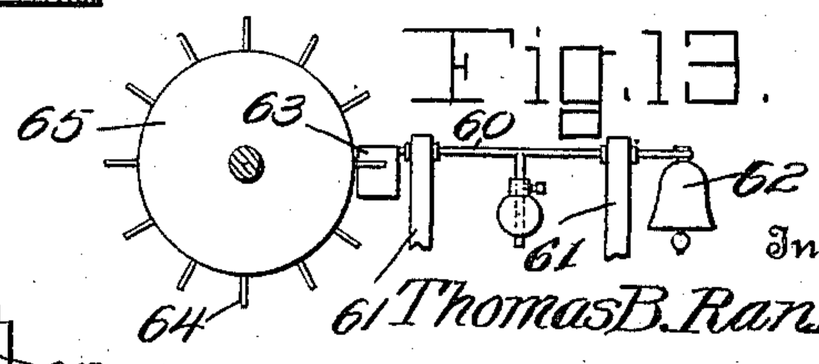
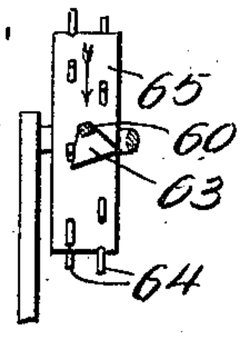


Fig. 14.



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UNITED STATES PATENT OFFICE.

THOMAS BRAXTON RANKIN, OF ITAWAMBA COUNTY, MISSISSIPPI.

DOOR-RELEASING MECHANISM.

966,241. Specification of Letters Patent. Patented Aug. 2, 1910.

Application filed December 28, 1909. Serial No. 535,375.

To all whom it may concern:

Be it known that I, THOMAS BRAXTON RANKIN, a native citizen of the United States, residing on Nettleton Rural Route, in the county of Itawamba and State of Mississippi, have invented new and useful Improvements in Door-Releasing Mechanism, of which the following is a specification.

This invention relates to door openers, and particularly to one adapted for use upon the doors of a barn or the like, means being employed whereby the doors of the barn can be automatically thrown open at the time of a fire to permit the escape of live stock.

Another object of the invention is to provide a novel form of alarm operable automatically upon opening of the doors.

The above mentioned and other objects are attained by the construction, combinations and arrangements of parts, as disclosed on the drawings, set forth in this specification, and particularly pointed out in the appended claims.

In the drawings, forming a portion of this specification and in which like numerals of reference indicate similar parts in the several views:—Figure 1 is a sectional elevation of my improved door opener showing it applied to a barn or similar structure whose walls are provided with swinging doors or closures. Fig. 2 is a section taken vertically on the line 2—2 of Fig. 1. Fig. 3 is a sectional elevation of the trip shaft. Fig. 4 is a sectional elevation of one of the latch releasing shafts. Fig. 5 is a sectional elevation of the said trip shaft taken at right angles to Fig. 4 and showing one of the yieldable supports for the shaft. Fig. 6 is a sectional elevation showing the manner in which the sections of the shaft are coupled to each other. Fig. 7 is a section taken on the line 7—7 of Fig. 6. Fig. 8 is a sectional elevation of a portion of one of the door hinges. Fig. 9 is a sectional elevation of the said hinge taken at right angles to that shown in Fig. 8. Fig. 10 is a sectional elevation of one of the latch members. Fig. 11 is a sectional elevation of the alarm. Fig. 12 is a sectional elevation of a slightly modified form of door. Fig. 13 is a diagrammatic view of a slightly modified form of alarm. Fig. 14 is a diagrammatic view of the bell actuating member of the alarm.

In Figs. 1 and 2 of the drawings, I show a barn, stable or similar inclosure, the side walls 1 each being provided with a plurality of hinged or swinging doors 2, the hinges being disposed vertically so that the doors can open from the sides of the walls. The doors can be arranged at any suitable points in the walls but are preferably located at points adjoining the stalls in which the live stock is stationed. Longitudinally extending squared shafts 3 are mounted within the inclosure at points slightly above the door openings. These shafts are arranged in parallel relation with the side walls 1 and each of such shafts is formed from a plurality of short sections whose meeting ends are joined by coupling members 4, such screws being carried by the coupling members to engage the said shaft sections to hold them operatively positioned in the coupling members. These shafts have their bearing members revolubly mounted in the partitions 5 and in the end walls 6 of the inclosure. Each shaft is provided with a plurality of horizontally extending fingers 7, each being positioned adjacent to one of the end walls. The shafts are engaged by flat leaf springs or similar equivalent elastic elements 8 which exert their tension to hold the fingers 7 normally in their horizontal positions.

A trip shaft 9 is journaled in the walls of the inclosure and is provided with trip fingers 10 which are disposed immediately above co-engaging fingers 11 upon the shafts 3. When the shaft 9 is revolved in one direction the trip fingers 10 will be engaged with the fingers 11 to revolve the shafts 3 against the tension of the springs 8. The shaft 9 has extending therefrom a crank arm 12 to which is secured one end of a flexible connection 13 or equivalent operating cord or the like. This cord or connection is engaged with an antifriction roller 14 and the outer end is attached suitably to an operating lever 15. This lever may be located at any suitable point but it is preferably stationed in a house near to the barn or inclosure. Should the occupant of the house detect the odor of smoke or should he discover that the barn is on fire he could conveniently operate the lever 15 to actuate the shaft 9 for a purpose to be hereinafter more fully disclosed.

The side walls 1 of the inclosure or barn carry casings 16 which are arranged immediately above the door opening. Each

casing is provided with a vertically sliding bolt 17 upon which is formed a reduced stem 18. Each casing is provided with an expansion spring 19 which surrounds the stem 18 and exerts its tension against the bolt to normally hold it engaged with its keeper 20 upon the door. The casings 16 just described are provided with pivoted lips 21 whose outer ends are positioned immediately beneath lugs or projections 22 upon dogs 23. These dogs are suitably mounted upon the shafts 3 to rotate therewith and the outer ends of the said dogs are formed into wings 24 which are normally positioned beneath shoulders 25 of the bolts 17. The outer ends of the lips 21 are disposed beneath shoulders 26 upon the said bolts. When the shafts 3 are rotated in the direction of the arrow shown in Fig. 10 the lugs 22 will be moved into such engagement with the lips 21 to impart thereto rocking movement which movement will be imparted to the sliding bolts to move them out of engagement with their keepers 20.

Each hinged door is provided with a plurality of eye members 27 which are arranged in superimposed relation as shown, the lowermost member being provided with a revoluble roller 28 which is slidable upon an angularly disposed track 29 upon the upper inclined surface of a post 30. Each post is formed with a standard 31 with which the eye members 27 are engaged. The construction just described is such that when the latch members of the doors are moved into their released positions the said doors will be free for movement into their open positions.

A suitable number of revoluble pulleys 32 are mounted adjacent to the top of the inclosure or stable, the said pulleys being arranged preferably, in a zig-zag manner at the sides of the center of the said stable. Inflammable flexible cords 33 are passed over the pulleys and their terminal ends are secured to the elongated bails 34 of weights 35. The arms of the bails straddle the fingers 7 upon the shafts 3, the said fingers being normally disposed intermediate the ends of the said arms. In case the inflammable cords should take fire it will obviously appear that the weights 35 will be free to fall, their weight against the fingers 7 being sufficient to revolve the shafts 3.

In lieu of the post 30 and rollers 28 described in the preferred form of my invention the doors may be hinged at their bottoms to the side walls of the inclosure. For example the door 36 shown in Fig. 12, has its lower end hinged as shown at 37, the upper end of the said door being free for swinging movement outwardly of the side wall 38. The door is provided with a keeper 39 which is adapted to be engaged normally by a latch 40. A spring 41 is located adjacent to the door and is engaged therewith so that when the latch member is released from its engaging keeper the door can be automatically thrown open.

An alarm is used in connection with the element of the apparatus herein disclosed and preferably embodies a revoluble drum 42 around which is wound a cable 43. This cable has one end secured to the drum and its other end carries a weight 44. The drum is provided at one end with a ratchet wheel 45 which is engaged by a pivoted dog 46 to normally hold the drum against rotation. Adjacent to the ratchet wheel, the drum is provided with an actuating element 47 which is preferably in the form of a disk whose peripheral edge portion is provided with a plurality of outwardly extending pins 48 which are arranged in staggered relation to each other. A bracket 49 is located adjacent to the drum and supports a pivoted shaft 50 from which is suspended a bell 51. The shaft 50 has one of its ends extended outwardly and upwardly from the bracket to form a crank 52 which is engaged with one end of a member 53. This element is mounted for horizontal pivotal movement upon the arm 54 of the bracket 49. One end of the member is provided with a triangular head 55 which is located immediately above the peripheral portion of the actuating element 47, its inclined side faces being disposed in the path of movement of the pins 48. The dog 46 is pivoted upon a support 56 upon which is mounted a spring 57 for holding the dog normally engaged with the ratchet wheel 45. The said dog 46 is in the form of an angle lever and one arm thereof is connected to one end of a connection 58, the other end of the said connection being operatively connected with one of the shafts 3. In this manner when the shaft is revolved the dog 46 will be actuated and moved out of engagement with the ratchet wheel 45 allowing the weight to descend, thus causing the drum 42 to revolve to impart to the actuating element 47 the desired rotary movement. Rotation of the said actuating element causes its pins 48 to engage the head 55 of the element 53 to impart to the latter rocking movement thereby oscillating the arm 52 and rocking the shaft 50. The hammer 59 of the bell is of the usual type and upon movement of the shaft 50 the said hammer will be effectively moved against the bell to sound the same.

In the form of the alarm shown in Fig. 13, a horizontal shaft 60 is mounted to rock in brackets 61. The shaft is provided at one end with a bell 62 and at the other end with a triangular head 63. The head 63 is similar to the head 55 in the preferred form of my invention excepting that it is arranged vertically and its inclined faces extend downwardly and outwardly from the shaft and

are disposed in the path of movement of the pins 64 of an actuating element 65.

I claim:—

1. In an apparatus of the class described, an inclosure having a plurality of swinging doors, keepers carried by the said doors, latch members located adjacent to the doors and adapted to be normally engaged with the said keepers to hold the doors in their closed positions, a rock shaft located within the inclosure, a trip shaft, means upon the said trip shaft adapted to actuate the said rock shaft, and means for actuating the latch members to move them out of engagement with the keepers upon the said doors.

2. In an apparatus of the class described, an inclosure having a swinging door, a latch member for normally holding the door in its closed position, a rock shaft, connections between the said rock shaft and the latch member, a trip finger extending from the said rock shaft, a trip shaft, and a trip finger extending from the said trip shaft and adapted for engagement with the trip finger upon the said rock shaft.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS BRAXTON RANKIN.

Witnesses:
W. L. Conwill,
J. W. Raines.