Jan. 26, 1926. 1,570,927

E. E. SPOTTSWOOD

SAFETY DOOR STRUCTURE

Filed May 27, 1925

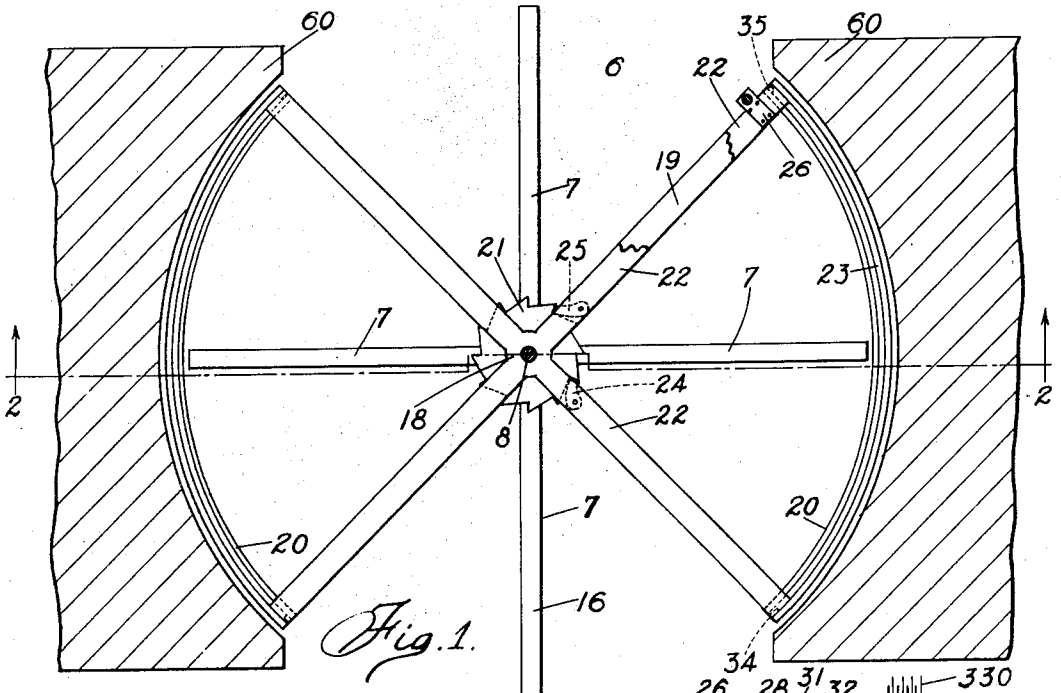


Fig. 1.

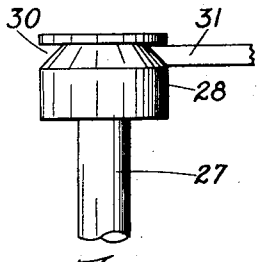


Fig. 3.

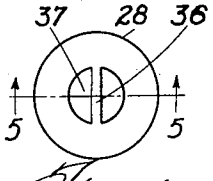


Fig. 4.

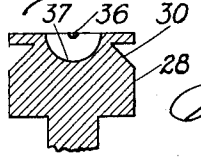


Fig 5.

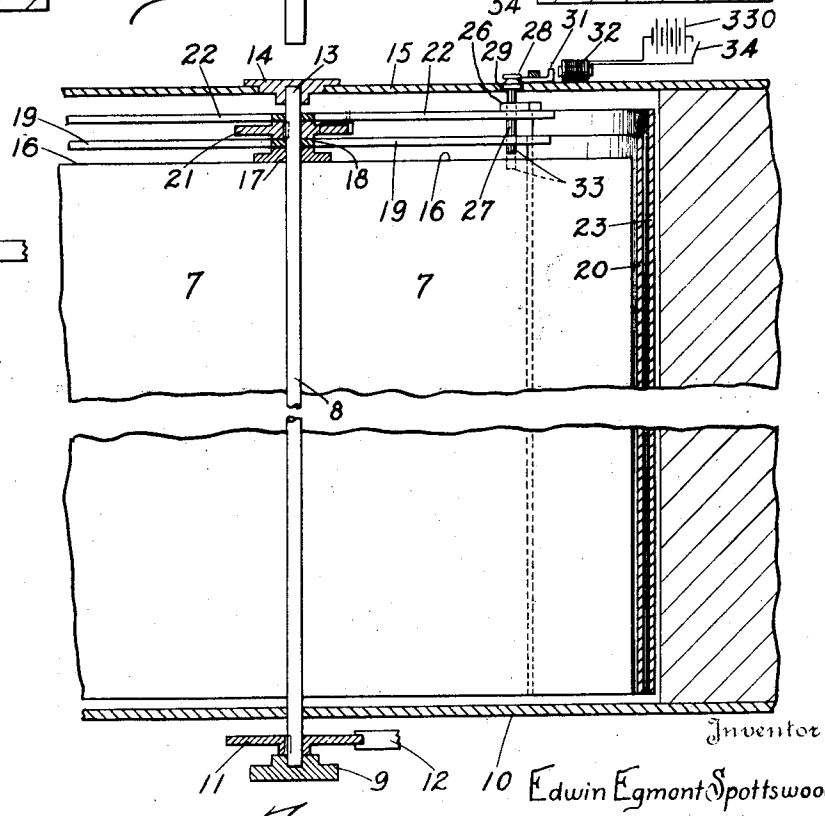


Fig. 2.

Inventor

Edwin Egmont Spottswood

By Murray and Zugelter

Attorneys

Patented Jan. 26, 1926. 1,570,927

UNITED STATES PATENT OFFICE.

EDWIN EGMONT SPOTTSWOOD, OF CINCINNATI, OHIO.

SAFETY DOOR STRUCTURE.

Application filed May 27, 1925. Serial No. 33,308.

To all whom it may concern:

Be it known that I, EDWIN EGMONT SPOTTSWOOD, a citizen of the United States of America, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in a Safety Door Structure, of which the following is a specification.

This invention relates to safety door structures for banks and similar institutions and has for an object the provision of a structure which normally serves as a revolving door.

Another object is to provide a device of this kind which is adapted to be converted into a trap by means of a suitable release mechanism which may be operated from a remote point.

Another object is to provide a device for the purpose stated which is simple and positive in operation.

These and other objects are attained by the means described herein and disclosed in the accompanying drawings, in which:

Fig. 1 is a plan view of the safety door mechanism of my invention.

Fig. 2 is a view taken on line 2—2 of Fig. 1.

Fig. 3 is a fragmental side view of a locking bolt mechanism forming a detail of my invention.

Fig. 4 is a top plan view of the bolt shown in Fig. 3.

Fig. 5 is a cross sectional view taken on line 5—5 of Fig. 4.

The device of my invention is adapted to be mounted within an entrance 6 of a bank or other building and for its normal purposes comprises a revolving door structure. The revolving door structure consists of the usual four vanes or doors 7 spaced at right angles to one another in the usual manner. The doors 7 are rigidly secured to a central cylindrical rod or post 8 which is revolubly mounted in a suitable bearing member 9 positioned beneath the surface of the floor 10 of a building or banking room. A ratchet wheel 11 is keyed to the rod 8 or otherwise rigidly secured thereto and a suitable pawl 12, cooperating with a ratchet 11 insures one way rotation of the revolving doors. The upper end 13 of the rod 8 is revoluble in a socket member 14 secured in any suitable manner to a ceiling structure 15 which forms a closure for the entire top of the entrance way 6. Secured to the top edges 16 of the doors 8, is a bearing flange 17, which serves as an additional means to secure the doors 7 in their relative positions and also serves, together with the rod 8, as an abutment bearing for receiving the perforate central portion 18 of a pair of cross arms or cross bars 19 which extend radially from the rod 8 and serve as a mounting from which arcuate metal doors 20 are suspended. The arcuate doors 20 embrace substantially a quarter circle and are positioned diametrically opposite one another on the ends of the cross arms 19. A second ratchet wheel 21 is keyed to the rod 8 and is positioned immediately above the central perforate portion 18 of the cross arm member 19. The ratchet wheel 21 supports a second cross arm structure 22 which is also freely revoluble on the rod 8 and is independent of the ratchet 21. The free ends of the second pair of cross arms 22 carry a second pair of arcuate doors 23 which are positioned exteriorly of and concentric with the doors 20. One of the cross arms 22 is provided with a pawl 24 engaging the ratchet 21 and one of the cross arms 19 is provided with a pawl 25 which also engages the ratchet 21. In this way the revolving door 7 and rod 8 may be turned in one direction while the pawls 24 and 25 on the cross arms 22 and 19 respectively, permit the teeth of the ratchet wheel 21 to push them aside as the rod 8 and ratchet wheel 21 are rotated. A perforate plate 26 is carried by one of the cross arms 22 and serves to retain a headed locking pin 27 having a shouldered head 28 which normally extends into the perforation 29 in the ceiling member 15. The head 28 is provided with a peripheral groove 30 which receives a reciprocating latch member 31 for holding the pin 27 with the upper portion of the head 28 in position engaging the walls of the perforations 29 in the ceiling member 15. The latch member 31 is mounted for horizontal reciprocation into and out of the groove 30. The latch 31 is adapted to be manually or otherwise projected over the perforation 29 in order to engage the shouldered groove 30 in the head 28 and said latch is adapted to be withdrawn by any suitable means either mechanical or electromechanical, as shown. An electromagnet 32 connected with a suitable source of electrical energy such as a battery 330 and adapted to be energized thereby on closing of a suitable switching

means such as 34, serves as a convenient mechanism by means of which the latch 31 may be withdrawn from its engagement upon the head 28 for the purpose of releasing the bolt 27 and causing it to drop with the head 28 clear of the ceiling 15. When the bolt 27 is released and drops with the lower side of the head 28 engaging upon the plate 26, the lower end 33 will descend to project below the top 16 of one of the doors 7 so that when the revolving door 7 is moved forwardly it will engage the pin 27 and push said pin, the plate 26 and arm 22 ahead of it so that the outer arcuate doors 23 are moved about their pivotal mounting upon the rod 8 thus forming a closed cell between a given pair of doors 7 and one of the arcuate doors 23. During the movement just described the cross arms 19 have been free of any force and therefore will tend to remain stationary so that the arcuate doors 20 will remain in position. One extreme end of the arcuate door 23 carries a lug 34 projecting toward the adjacent side of arcuate door 20 while the opposite edge of the door 20 carries a lug 35 projecting toward the adjacent side of the door 23. Upon continued movement of the revolving door 7, the pin 27 in engagement with the door 7, carries the door 23 forward until the lug 34 engages the lug 35 on door 20 whereupon this door will also be carried along by further movement of the revolving doors 7. As will be noted from the disclosure in Fig. 1 the pawls 24 and 25 preclude movement of the doors 20 and 23 independently of the revolving doors 7 so that force applied directly to either of these doors in the direction of the normal one-way rotation of the revolving door 7, will cause the pawls 24 and 25 to lock upon the ratchet 21 so that the revolving door 7 will be moved at the same time. The movement of these doors 20 and 23 in the opposite direction is blocked by the pin 27 engaging the door 7 which is retained against the movement in such opposite direction by the ratchet and pawl 11 and 12. From the foregoing it will be apparent that when it is desired to detain a person who may be leaving a banking or similar room, a switch such as 34 may be operated from some remote position whereupon the pin 27 will drop with the head 28 clear of the ceiling 15. The person to be detained may then prepare to depart by pushing one of the revolving doors 7 before him. As such door comes into alignment with the cross bar 22 carrying the pin, the door 23 is substantially locked in position and forms a closure for the open side between adjacent doors 7 and the person finds himself locked therein. The second door 20 operates in the manner just described to form a closure for the space between the next adjacent doors 7. Inasmuch as the doors 20 and 23 are secured to the opposite ends of the cross arms 19 and 22, it will be readily apparent that said doors operate in unison. A person trapped in either of the spaces between doors 7 may continue to push one of said doors 7 before him and to pull the arcuate doors 20 and 23 about with him. However, there can be no relative movement between any of the doors until the pin 27 is again raised. It should be noted that the device of my invention forms four substantially sealed chambers disposed within a closed cylinder, and if the person detained be a bandit or a desperado, he may be rendered submissive by introducing tear gas or any similar incapacitating agent most conveniently through the ceiling structure 15. The latch 31 and actuating mechanism 32 are preferably positioned upon the floor above and may be conveniently protected by a locked floor plate (not shown). When it is desired to release the doors from their locked position, the doors are revolved until the head 28 of the pin 27 is brought into registry with the perforation 29 in the ceiling 15 whereupon a hooked instrument, for example a piece of bent wire may be passed through the perforation 29 and passed about a cross lug 36 which extends across a depression 37 in the top of the head 28. While the release structure is shown in crude mechanical form, it will be readily apparent to those skilled in the art that a powerful electromagnet may be positioned above the perforation 29 so that the head 28 of the pin 27 may be attracted thereby in order to withdraw the pin 27 from its position before the doors 7.

It will also be readily apparent to those skilled in the art that the inner or second arcuate doors 20 together with the cross bars 19 may be dispensed with so that only two of the spaces between door 7 are closed by the arcuate doors 23. In this embodiment, such doors 23 may be caused to lock by any suitable means such as snap latches, when they reach a position blocking the entry ways 6. In this embodiment the normal side walls 60 form a closure for the remaining spaces between the doors 7. Various modifications of the herein described structures will suggest themselves to those skilled in the art.

What I claim is:

1. In a safety door structure the combination with revolving doors mounted for one-way rotation in an entry way, of oppositely spaced arcuate doors mounted for movement in a circle about the revolving doors, and means for locking the revolving doors and arcuate doors whereby said doors may be moved in one direction only with the arcuate doors forming closures for the spaces between the revolving doors.

2. In a device of the class described the combination with an entry way, of a re-

volving door mounted within the entry way and controlling entrance and exit therefrom, cross arms mounted for independent rotation within the entry way, oppositely spaced arcuate doors carried by the cross arms, means for precluding independent movement of the cross arms in one direction, and means carried by one of the cross arms for normally locking the cross arms against movement, and releasing means operable by remote control for releasing the locking means and permitting it to enter the path of the revolving doors whereby the revolving doors and arcuate doors are locked one upon the other for forming closed chambers within the entry way.

3. In a device of the class described the combination with a revolving door comprising a revolubly mounted support rod and vanes rigidly mounted thereon at right angles to one another, ratchet means carried by the support rod for permitting one way rotation of the revolving doors, cross arms mounted on the support rod and movable independently thereof, means carried by the support rod and cross arms for precluding independent movement of the cross arms in the direction of rotation of the revolving doors, arcuate doors carried by the cross arms and locking means operable by remote control for normally holding the cross arms and arcuate doors against movement and releasable for permitting movement of said cross arms and arcuate doors and to assume a position for locking the revolving doors and arcuate doors one upon the other upon movement of the revolving doors.

4. In a device of the class described the combination with a revolving door comprising vanes having spaces therebetween, of means permitting one-way rotation of the revolving doors, a pair of arcuate oppositely spaced doors revolubly supported by the revolving door structure and adapted to be moved through a circular path about the revolving doors, a second pair of similarly supported arcuate doors mounted concentrically of the first mentioned pair of arcuate doors, means precluding independent movement of the arcuate doors in the direction of rotation of the revolving door, locking means adapted to assume an inoperative position whereby the arcuate doors are held against movement and to assume a position in the path of the revolving doors whereby movement of the revolving doors will cause movement of the second mentioned arcuate doors about their mounting, and means carried by the arcuate doors for locking said doors one upon the other after the second mentioned arcuate door has been moved through a quarter circumference about its mounting on the revolving door.

5. In a device of the class described the combination with a revolving door having vanes, the outer ends of which are adapted to move through a circumference, of a pair of opposite spaced arcuate doors disposed concentric with the circumference described by the vanes of the revolving door, and means adapted to assume an inoperative position for precluding movement of the arcuate doors and to assume an operative position in the path of the revolving doors for locking said arcuate doors to form closed chambers between adjacent vanes of the revolving door and precluding relative movement of said revolving door and arcuate doors.

6. In a device of the class described the combination with a revolving door having spaced vanes, of a closing member mounted for movement adjacent the vanes of the revolving door, and locking means adapted to normally preclude movement of the closing member and releasable to assume a position in the path of the revolving door for locking the closing means upon the vanes of the revolving door for forming a closed chamber between adjacent vanes.

7. In a device of the class described the combination with a revolving door having spaced vanes, of a closing member movable to form a closure for a space between said vanes and locking means adapted to assume a position in the path of said vanes for locking the closing member upon one of said vanes whereby a closed and locked chamber is formed.

In testimony whereof, I have hereunto subscribed my name this 20th day of May, 1925.

EDWIN EGMONT SPOTTSWOOD.