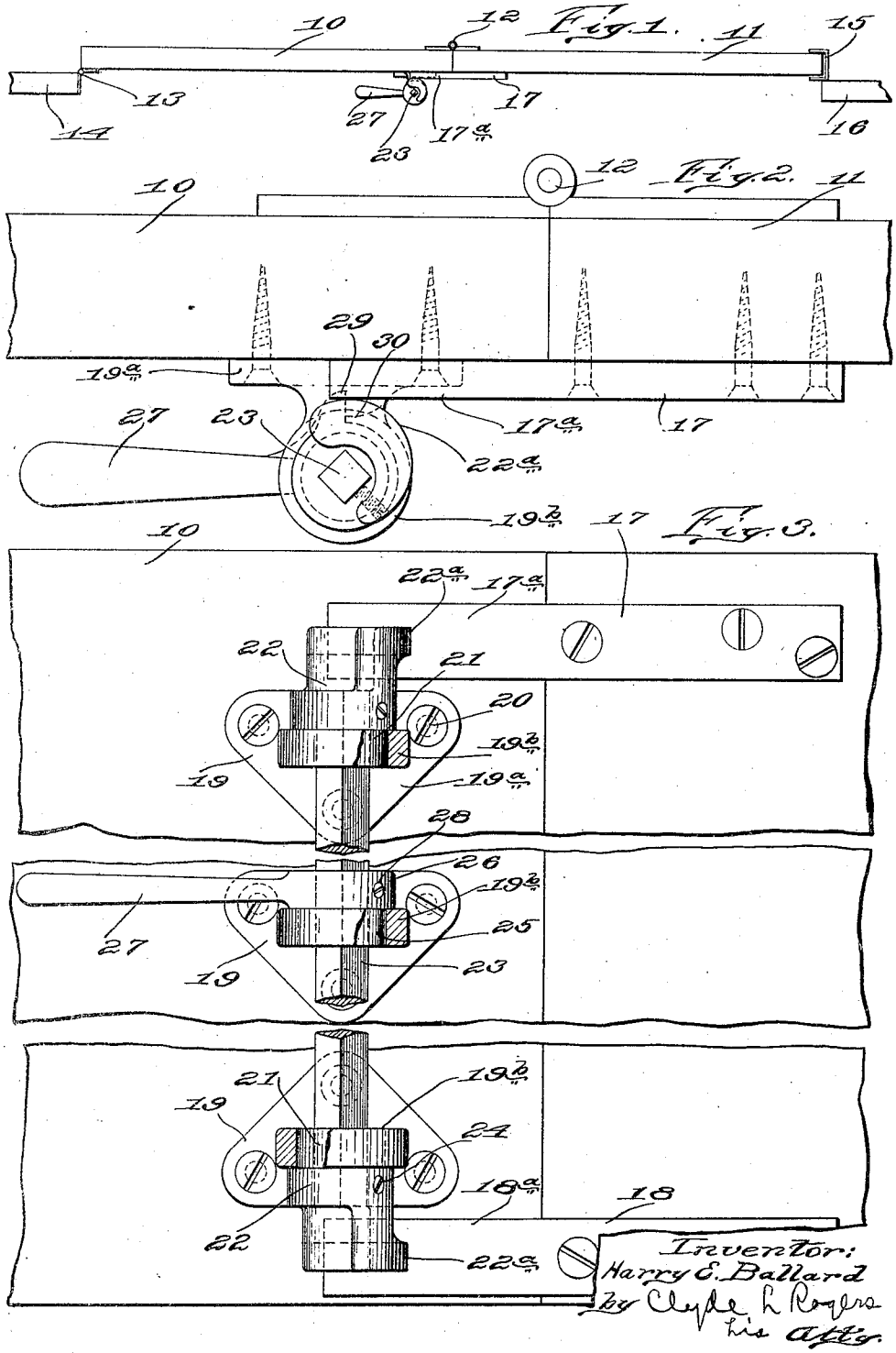
Dec. 26, 1922. 1,439,859

H. E. BALLARD.
BINDER FOR FOLDING DOORS.
FILED SEPT. 14, 1920.

2 SHEETS-SHEET 1



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2 SHEETS-SHEET 2

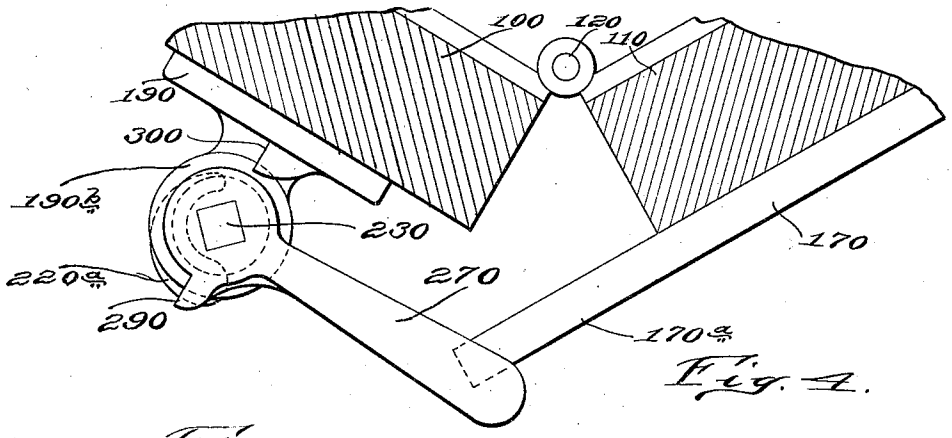



Fig. 4.

Fig. 5.

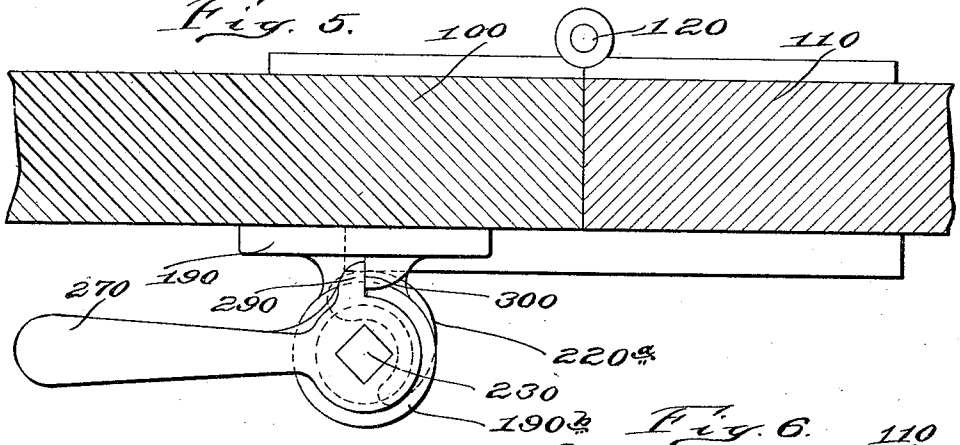
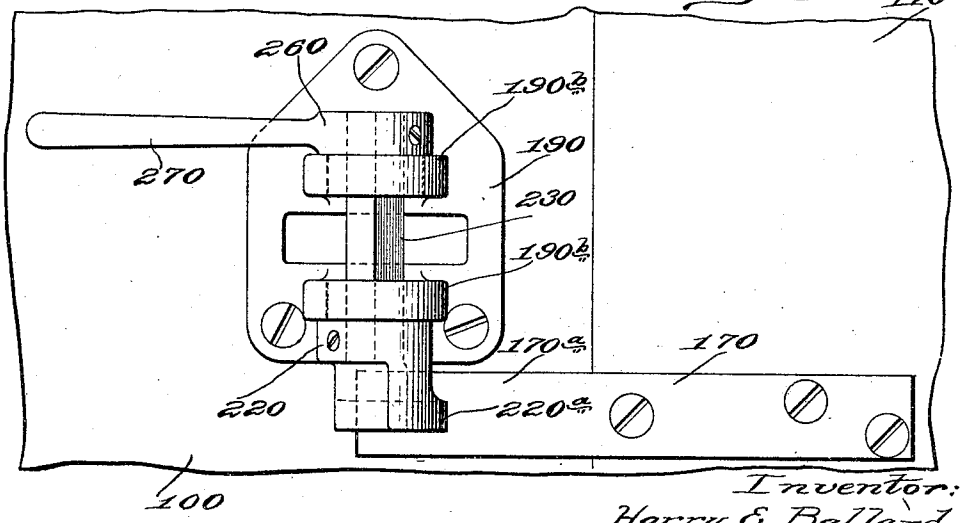



Fig. 6.




Inventor:
Harry E. Ballard.
by Clyde L. Rogers
his Atty

Patented Dec. 26, 1922. 1,439,859

# UNITED STATES PATENT OFFICE.

HARRY E. BALLARD, OF HOLYOKE, MASSACHUSETTS, ASSIGNOR TO THE COBURN TROLLEY TRACK MANUFACTURING COMPANY, OF CHICOPEE FALLS, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## BINDER FOR FOLDING DOORS.

Application filed September 14, 1920. Serial No. 410,284.

*To all whom it may concern:*

Be it known that I, HARRY E. BALLARD, a citizen of the United States, and resident of Holyoke, county of Hampden, Commonwealth of Massachusetts, have invented an Improvement in Binders for Folding Doors, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts in each of the several views.

This invention relates to folding doors and more particularly to a binder and operating device therefor adapted to hold the same closed securely but being instantly and easily releasable, with an actuating device that may also constitute the instrumentality for moving the door to open position. The foregoing and other objects and advantages of the invention will more fully appear from the following detailed description, and the distinctive features of novelty will be pointed out in the appended claims.

Referring to the drawings:

Fig. 1 is a plan view showing my improved binder applied to a folding door.

Fig. 2 is a plan view on a relatively enlarged scale of the binder device with the portions of the door adjacent the central hinge.

Fig. 3 is a partial front elevation with intermediate portions broken away showing the binder device applied to a door.

Fig. 4 is a plan view of a slightly modified form of the binder device applied to a door, portions of the door being shown in horizontal section, and with the door in partially open position.

Fig. 5 is a view similar to Fig. 4 but showing the position of the parts with the door closed; and

Fig. 6 is a partial front view of the binder device of Figs. 4 and 5 applied to the door.

10, 11 indicate two portions of a folding door hinged together by hinges 12. The door portion 10 has its outer side hinged at 13 to a relatively stationary wall or support 14, while the portion 11 may have its outer side engaged with a hanger 15 suitably guided in an overhead support (not shown). These two door portions when in door closing position, close the opening between the wall 14 and a wall 16. One of the door portions, shown as the portion 11 is equipped at top and bottom with stout bars 17, 18 fixed thereto by screws or otherwise at the side of the door opposite the hinges 12 and projecting some distance horizontally over the other door portion 10 as indicated at $17^a$, $18^a$. The door portion 10 has fixed thereto adjacent its inner edge, a plurality of brackets 19 in vertical alignment, there being three of these brackets shown, adjacent the top and bottom of the door, and at an intermediate point respectively. All of these brackets may be alike, comprising as shown a plate $19^a$ secured to the door by screws 20, and having formed therewith a bearing collar or ring $19^b$ projecting outward therefrom. The lower one of the brackets 19 is shown as applied to the door in inverted position in respect to the others for a purpose that will appear. The upper and lower bearing collars $19^b$ have fitted to turn therein, hollow tubes 21 borne by cam heads 22, the one of these cam heads associated with the upper collar $19^b$ extending upward therefrom and the one associated with the lower collar extending downward therefrom as shown, these heads having bearing engagement with the collars $19^b$. These hubs and cam heads are formed with squared sockets in which are fitted the ends of a squared shaft or bar 23, the cam heads being secured to this shaft by suitable means shown as clamp screws 24. The cam heads 22 are formed with cam faces $22^a$ which, as the shaft 23 is turned in one direction, i. e. to the right or in a clockwise direction as seen in Fig. 2, are adapted to bind against the projecting end portions $17^a$ of the bars to lock them strongly and securely against the surface of the door portion 10, to thus hold the doors against folding movement; while upon turning of the shaft to the left the cam faces first release the bar ends $17^a$, and then move out from behind the same altogether to permit said ends to swing outward as the doors fold, this occurring when the shaft has been turned approximately a one-half rotation from the position shown in Fig. 2. The intermediate bearing collar $19^b$ has fitted to turn therein a hub 25, borne by a head 26 from which a handle 27 projects, this head

being likewise secured to the squared shaft by a clamp screw 28. The position of the handle 27 with respect to the cams $22^a$ is such that it extends alongside the doors to the left thereof as seen in Fig. 2 when the cams are in position to lock the door closed, whereby it may be swung to the necessary extent for releasing the cams from the bar projections $17^a$ to release the doors for folding. To prevent the handle 27 from swinging too far inward on this binding movement, so that it will be difficult to get hold of, I prefer to provide this head 26 with a stop shoulder 29 which is adapted to engage with a fixed stop shoulder 30 formed on the bracket 19. In cases where by reason of smaller dimension of the doors or for other reasons it is not necessary or desirable to have cam locking devices as described at both top and bottom of the door, it is practicable to employ a simplified and more compact form of the device with the binder and operating handle at an intermediate point in the height of the door. Such a form is shown in Figs. 4 to 6 wherein two door portions 100, 110 are hinged at 120. The door portion 110 has at an intermediate point in the height thereof a stout bar 170 fixed thereto with a projecting portion $170^a$ which is adapted to be pressed against the portion 100 similarly as the bars 17 already described. In this case a single bracket 190 is secured to the door portion 100 and this is equipped with bearing collars $190^b$ vertically spaced apart. The lower one of these bearing collars has fitted therein a reduced hub of a cam head 220, while the upper collar has fitted therein a hub extending from a head 260 which bears a handle 270. The cam head 220 is equipped with a cam face $220^a$ adapted to cooperate with the bar projection $170^a$ for binding action similar as in the described form. The heads 220, 260 have squared socket passages therethrough in which is fitted a squared shaft or bar 230, to which said heads are secured. The handle head 260 bears a shoulder 290 adapted to engage a stop shoulder 300 on the bracket plate 190 to limit the handle movement as already described. I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination with two door portions hinged together for folding, of a binder therefor composed of a bar secured to one of said door portions and projecting to overlap the other portion, and a cam equipped with an operating member and mounted for oscillation upon the other of said door portions on an axis substantially parallel with the hinges of said door portions adapted to engage and bind the projecting portion of said bar against said door portion upon actuation thereof in one direction.

2. The combination with two door portions hinged together for folding, of a binder for holding said portions against folding, composed of a bar secured to one of said portions and projecting to overlap the other portion, a rock shaft journalled to the other door portion bearing a cam adapted in one position to engage said bar projection with a binding action and in another position to release the bar, and a handle for operating said rock shaft.

3. The combination with two door portions hinged together for folding, of binding means for holding said portions against folding, composed of bars secured to one of the door portions adjacent the top and bottom thereof and projecting to overlap the other door portion, and a rock shaft journalled to turn in brackets secured to the other door portion with cam heads at its extremities bearing cam faces adapted eo engage said bar projections, and a handle fixed to said rock shaft at an intermediate point and journalled in a bracket secured to the second door portion.

4. The combination with two door portions hinged together for folding, of binding means for holding said portions against folding at will, composed of a bar secured to one of said portions and projecting to overlap the other portion, a bracket secured to said other door portions, a cam head having a hub fitted in a bearing collar of said bracket and bearing a cam face adapted to engage said bar projection to bind it against the door portion, a rock shaft in said cam head, and a handle fixed to said rock shaft and having a head equipped with a hub journalled in a bearing collar fixed with respect to said bracket.

In testimony whereof, I have signed my name to this specification.

HARRY E. BALLARD.