

Nov. 8, 1932.

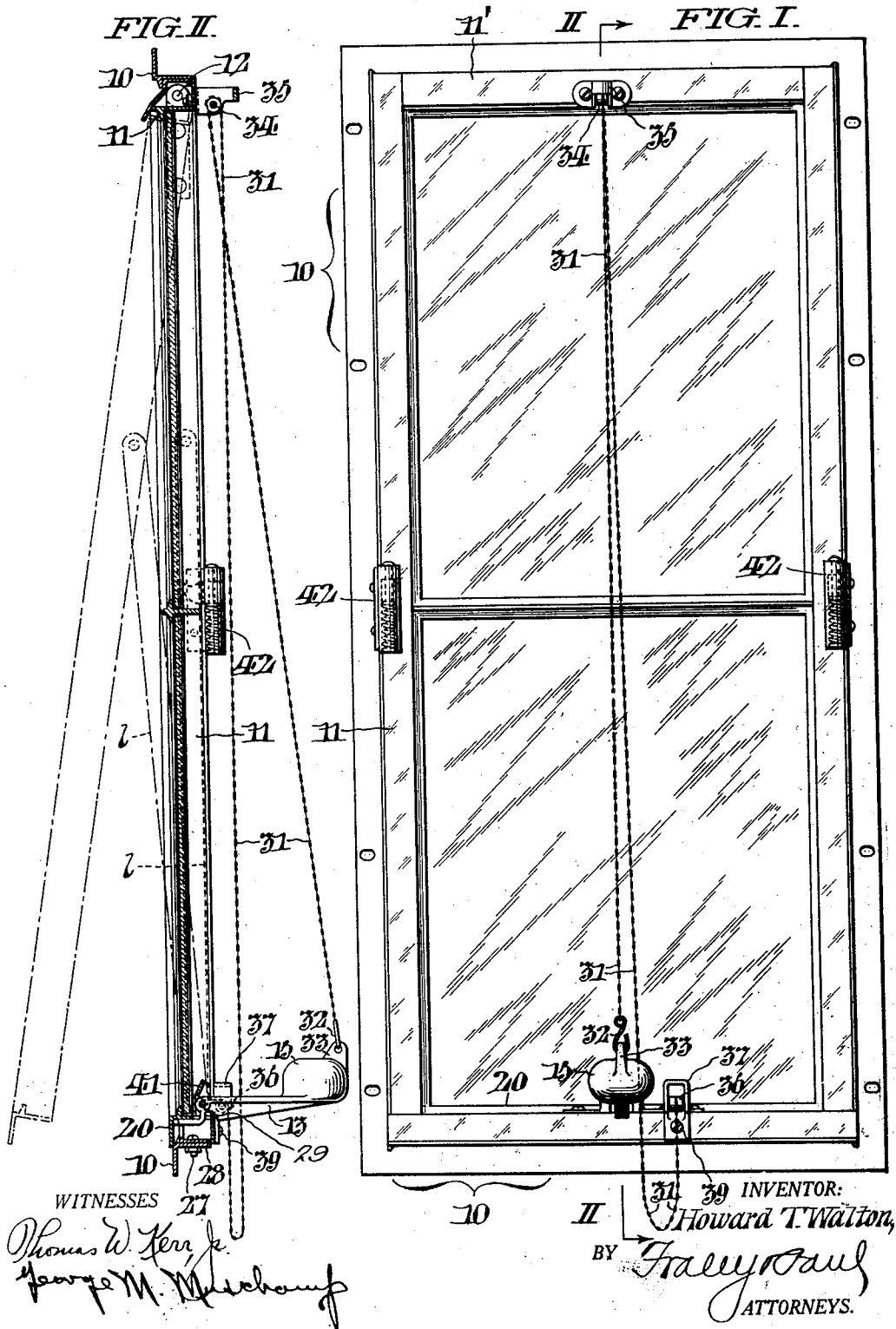
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1,887,484

EXPLOSION RELEASE MECHANISM FOR WINDOWS

Filed Sept. 21, 1929

4 Sheets-Sheet 1



Nov. 8, 1932.

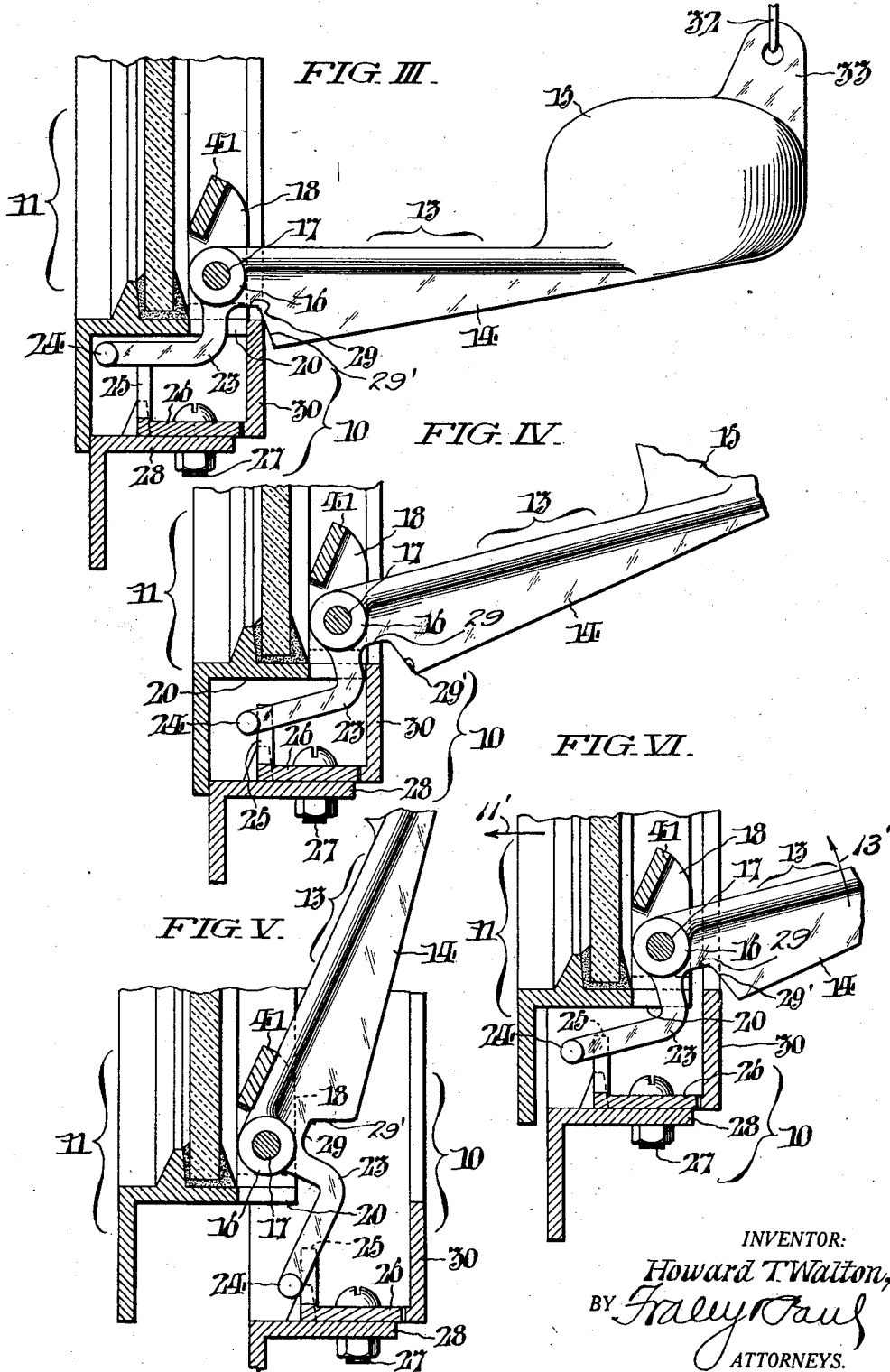
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EXPLOSION RELEASE MECHANISM FOR WINDOWS

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FIG. VII.

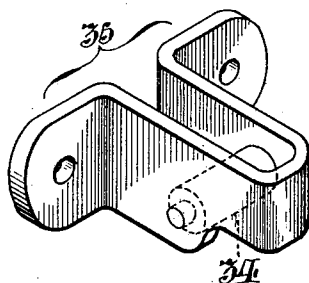


FIG. VIII.

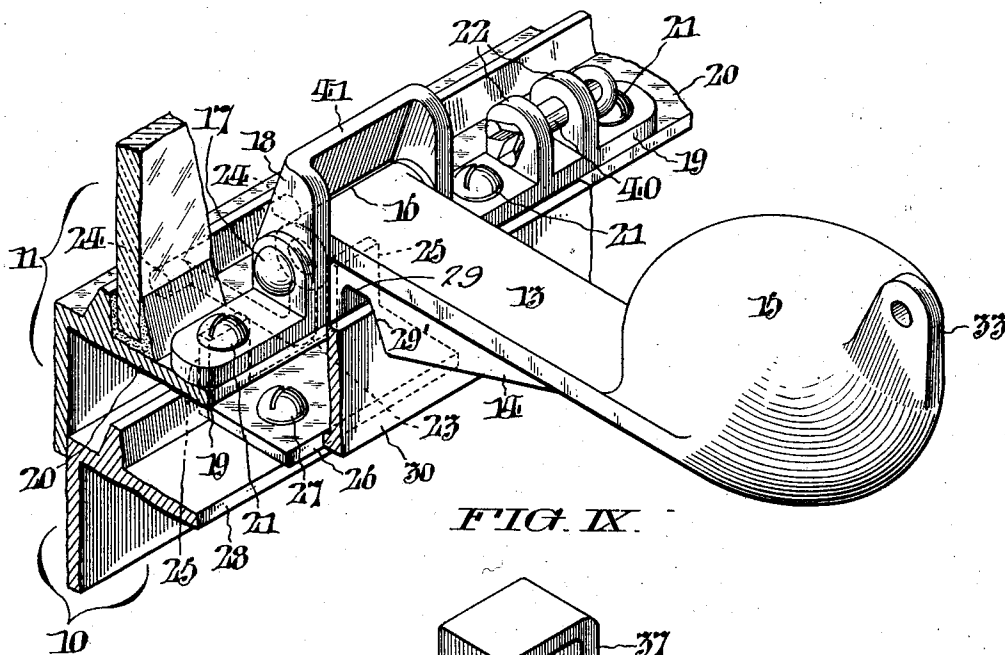
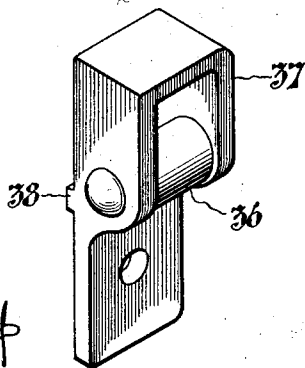


FIG. IX.



WITNESSES

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EXPLOSION RELEASE MECHANISM FOR WINDOWS

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4 Sheets-Sheet 4

FIG. X.

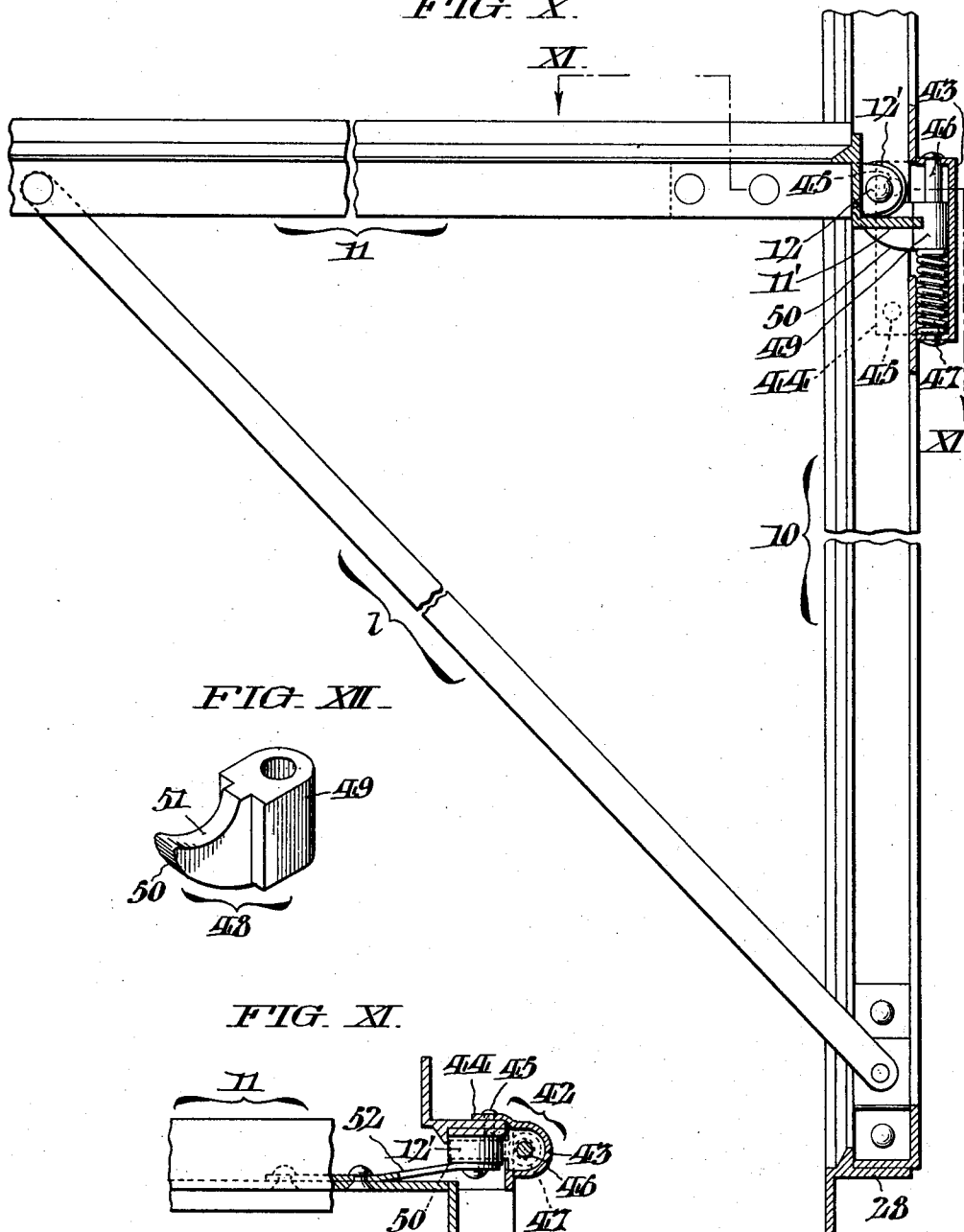


FIG. XII.

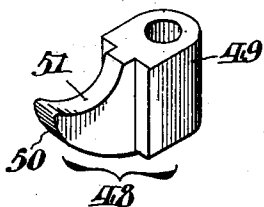
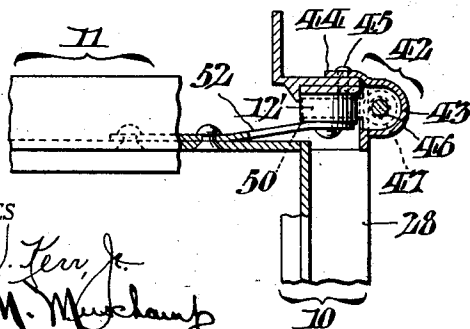


FIG. XI.



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## UNITED STATES PATENT OFFICE

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## EXPLOSION-RELEASE MECHANISM FOR WINDOWS

Application filed September 21, 1929. Serial No. 394,338.

This invention relates to fireproof windows and has reference, more particularly, to means whereby such windows may be automatically projected or opened under the impact of an explosion.

The primary object of my improvements is to provide a novel means whereby pivoted sash may be automatically released and projected, when an explosion takes place within the building into which said sash afford light and ventilation.

Another object of this invention is the provision, in window sash of the kind referred to, of means effective to absorb the impacts, conductive to breakage of the sash lights or glass, set up incident to careless opening of such sash or when automatically thrown fully open due to an explosion within the building.

A further object of this invention is the provision of a release mechanism, of the type referred to, which also embodies means whereby the sash may be manually operated for purposes of opening and closing.

Another object is to provide a window light and ventilator sash which is difficult to open from the outside, or for illicit purposes.

A still further object is to provide a simple equipment for the noted purposes which can be readily applied to standard types of fireproof windows, or it may be formed as a part thereof under original construction.

Other objects of this invention will appear from the following descriptive matter, at the end of which the novel features are claimed; and, in connection with such descriptive matter, reference is made to the accompanying drawings forming a part hereof.

In the drawings:—

Fig. I is an inside elevation of a window structure fitted with my improved locking and explosion-release mechanism.

Fig. II is a sectional view, taken as indicated by the arrows II—II in the preceding illustration.

Fig. III is a detail view, on a larger scale, illustrating the sash locking-release mechanism in the closed position.

Fig. IV is a similar view illustrative of the parts under initial manual operation.

Fig. V is a like illustration showing the position assumed by the sash under impetus imparted by the locking-release device.

Fig. VI is a corresponding view illustrative of the position assumed when influenced by an explosion.

Fig. VII is a perspective view of a chain roller guide for attachment to the upper rail of the window sash.

Fig. VIII is a fragmentary perspective view of the locking-release mechanism with associated window structure to which said mechanism is attached.

Fig. IX is a perspective view of a chain roller guide for fixture to a stationary rail of the window frame.

Fig. X is an enlarged fragmentary detail view illustrative of a shock absorbing means, hereinafter fully explained.

Fig. XI is a sectional plan, taken approximately on the plane designated XI—XI in the preceding view; and,

Fig. XII is a perspective view of an impact element or shoe, later on again referred to.

In all the views corresponding parts are designated by like reference characters.

Referring in detail to the drawings, and more particularly to Figs. I and II thereof, a standard type of fireproof window-frame or casement is comprehensively designated by the numeral 10, the same being fitted with a ventilator sash 11, adapted to swing outwardly on vertically movable friction pivots 12 at the upper region thereof and strut links 1—Fig. I, which determine lateral projection of said sash when the latter is opened under downward pull thereon manually or otherwise effected; or by explosive impetus automatically through the medium or aid of my novel locking-release mechanism.

This locking-release mechanism, as best appreciated from Figs. III to VI, and VIII, consists of a latch member 13, conveniently—although not essentially—including a T-section body portion 14 with a weight enlargement 15 at one end, and a journal embossment 16 at the other end, whereby said latch member is fulcrumed, by a pin or rivet 17, to what

may be conveniently termed a "stirrup" bearing 18. This stirrup bearing 18, as best seen in Fig. VIII, embodies a base flange 19 whereby it is secured to the lower cross rail 20 of the ventilator sash 11, by means of screws 21—for example; as well as including upstanding apertured ears 22, for a purpose later on explained. It is also to be remarked that the latch member 13 is also formed with an angled extension 23, remote from the weight-enlargement 15, which projects outwardly beyond and below the fulcrum 17, and that said extension is provided with lateral rounded offsets 24, for coaction with the spaced components 25 of an abutment member 26, conveniently secured by screws 27, on the bottom rail 28 of the window frame or casement 10.

Adjacent to and below the fulcrum axis 17, the latch member 13 is formed with a notch 29 which normally engages over the upstanding flange 30, of a component of the window frame or casement 10, thereby to hold the sash 11 in closed position as best shown in Fig. III.

To effect operation of the sash 11 normally, a drop chain—for example—31, Figs. I and II, is provided, the same being connected or hooked at 32 to an upstanding apertured projection 33, on the weight enlargement 15, of the latch member 13. This chain 31 passes over a guide roller 34, freely journaled in a stirrup bearing 35—Fig. VII—suitably secured to the upper rail 11' of the sash 11, thence downwardly, and over a second guide roller 36, journaled in a box-like bearing 37—Fig. IX, said bearing having a projecting rib 38 adapted to seat on the upstanding flange 30 aforesaid, of the window casement 10, and to which it is appropriately secured, as by a screw 39. After passage over the guide roller 36, the free end of the drop chain 31 is anchored, as by a cotter or split pin 40—Fig. VIII, between the apertured ears 22 on the stirrup bearing 19 hereinbefore referred to, as secured to the lower cross rail 20, of the sash 11. Thus it will be readily understood that by pulling downward on that portion of the drop chain 31 not directly connected to the weight enlargement 15, of the latch member 13, or the left-hand length as viewed in Fig. I, said latch member will be upwardly rocked on the pin or pivot 17. As a result of such movement, swinging of the sash 11 outward, on its pivots 12, will be brought about, through coaction of the angled extension offsets 24 with the spaced components 25, of the abutment member 26, as best understandable from Figs. IV and V. It will be noted in the just explained connection, and more particularly from a study of Fig. IV, that the action described, does not take place until the notch 29 clears the upstanding casement flange 30, so that the sash 11 is actually opened by the impetus of the swinging weighted latch

member 13, whereby the effort necessary to manual operation is greatly eased; while the inclined stop portion 41, of the stirrup bearing 18, limits the upward swing of said weighted latch member.

To effectively prevent impact shocks incident to careless or the sudden explosive opening of the sash 11, I preferably attach at each side of the casement 10 a shock absorber 42. These shock absorbers 42 are right-and-left counterparts and, as best understood from Figs. X and XI, comprise a trough-like case 43, one longitudinal side whereof is somewhat extended to provide an attaching-offset flange 44, whereby the device is conveniently secured, as by rivets 45, to the side components of the casement 10. Longitudinally of the trough-like case 43, there is rigidly fixed a guide pin 46 encircled for a portion of its length by a buffer spring 47, on which seats the impact shoe 48. This impact shoe 48, as best understood from Fig. XII, embodies an apertured portion 49 freely accommodated in the case 43, with capacity for sliding movement longitudinally of the guide pin 46, and a laterally outstanding impact projection 50 that is rounded out at 51 for co-action with the sash pivot rollers 12', said pivot rollers being sustained by bearing elements 52 attached to the upper side portions of the sash 11, in the known way. The use and advantage of these shock absorbers 43 is so obvious as not to necessitate detail explanation herein, other than to mention the fact they serve to reduce sash light breakages to a minimum.

In the event of an explosion within the building, the influence of such explosive pressure in the direction of the arrow 11' against the sash 11 as a whole, causes the same to be outwardly forced or swung on the friction pivots 12, the resistance of the weight 15 being overcome through enforced upward swinging movement of the latch member 13 in the direction of the arrow 13', as shown in Fig. VI, induced by co-action between the notch 29 and flange 30, such coaction being assisted by slightly bevelling one edge 29' (Figs. III—VI and VIII) of said notch for example; or, the exceedingly short-leverage relation of said parts compared to that of the sash movement with respect to its pivots 12. Obviously the weighting of the latch member 13 may be varied, in accordance with the size of the sash 11 to be operated, as well as to permit ready yielding at any predetermined pressure.

From the foregoing it is thought the aims and advantages of my explosion-release mechanism will be clearly appreciated, and while I have described the invention in a form which is believed to be best suited to commercial practice, it is to be understood that the several features may be modified without departure from the general nature of said invention; and, therefore, I do not confine my-

self to the disclosed details, as they can be varied within the scope of the claims without involving departure from the spirit of my improvements.

5 Having thus described my invention, what I claim is:—

1. A window with a laterally projectible sash suspended by pivots above the transverse median thereof, and a weighted latch member afforded pivotal bearing on the sash lower rail adapted to engage a stationary contiguous projection with capacity to yield under explosive-pressure imposed on said sash from the inside.

15 2. A window with a sash supported above center by vertically movable pivots and strut links determining lateral projection of such sash as the latter is opened by downward pull thereon, and a weighted latch member afforded pivotal bearing on the sash lower rail, said member being adapted to engage a projection on a contiguous stationary part of the window frame with capacity to yield under explosive-pressure imposed on said sash from the inside.

20 3. A window with a sash supported above center by vertically movable pivots and strut links determining lateral projection of such sash as the latter is opened by downward pull thereon, a weighted latch member afforded pivotal bearing on the sash lower rail and having a notch co-operative with a projection on a contiguous horizontal rail or the sill of the window frame with capacity to yield under explosive-pressure imposed on said sash from the inside, and means whereby the sash may be manually operated.

4. A window with a sash supported above center by vertically movable pivots and strut links determining lateral projection of such sash as the latter is opened by downward pull thereon, a weighted latch member afforded pivotal bearing on the sash lower rail and having a notch co-operative with a projection on a contiguous horizontal rail or the sill of the window frame with capacity to yield under explosive-pressure imposed on said sash from the inside, means whereby the sash may be manually operated, and means effective to absorb shocks incident to careless or sudden opening whereby fracture of the sash light is prevented.

5. A window with a sash supported above center by vertically movable pivots and strut links determining lateral projection of such sash as the latter is opened by downward pull thereon, a weighted latch member afforded pivotal bearing on the sash lower rail with a notch normally engaging a contiguous stationary element and an angled extension co-operative with a fixed abutment to initiate outward projection of the sash when released, said latch member also having capacity to yield under explosive-pressure imposed on

the sash from the inside, and means whereby the sash may be manually operated.

6. A window with a sash supported above center by vertically movable pivots and strut links determining lateral projection of such sash as the latter is opened by downward pull thereon, a weighted latch member afforded pivotal bearing on the sash lower rail, said latch member having a notch normally engaging a contiguous stationary element and an angled extension co-operative with a fixed abutment to initiate outward projection of the sash when released, said latch member also having capacity to yield upon exertion of explosive-pressure imposed on the sash from the inside, means whereby the sash may be manually operated, and stop means limiting swinging movement of the latch member.

7. A window with a sash supported above center by vertically movable pivots and strut links determining lateral projection of such sash as the latter is opened by downward pull thereon, a weighted latch member afforded pivotal bearing on the sash lower rail, said latch member having a notch co-operative with a stationary projection of the window frame and an angled extension embodying offsets adapted to engage fixed abutments to initiate outward projection of the sash when released, said latch member also having capacity to yield upon exertion of explosive pressure against the sash from the inside, stop means integral with the pivotal bearing aforesaid to limit upward movement of the latch member, and means whereby the sash may be manually operated.

8. A window with a sash supported above center by vertically movable pivots and strut links determining lateral projection of such sash as the latter is opened by downward pull thereon, a weighted latch member afforded pivotal bearing on the sash lower rail, said latch member having a notch co-operative with a stationary projection of the window frame and an angled extension embodying offsets adapted to engage fixed abutments to initiate outward projection of the sash when released, said latch member also having capacity to yield upon exertion of explosive pressure against the sash from the inside, stop means integral with the pivotal bearing aforesaid to limit upward movement of the latch member, and a drop chain with associated guide means connected to the weighted latch member and the sash lower rail whereby said sash may be manually operated.

9. A window with a sash supported above center by vertically movable pivots and strut links determining lateral projection of such sash as the latter is opened by downward pull thereon, a weighted latch member afforded pivotal bearing on the sash lower rail, said latch member having a notch co-operative with a stationary projection of the window frame and an angled extension embodying

offsets adapted to engage fixed abutments to initiate outward projection of the sash when released, said latch member also having capacity to yield upon exertion of explosive pressure against the sash from the inside, stop means integral with the pivotal bearing aforesaid to limit upward movement of the latch member, a drop chain with associated guide means connected to the weighted latch member and the sash lower rail whereby said sash may be manually operated, and shock absorbers at each side of the window casement co-operative with the sash movable pivots in preventing fracture of the sash light due to careless or sudden opening thereof.

10. A window with a sash supported above center by vertically movable pivots and strut links determining lateral projection of such sash as the latter is opened by downward pull thereon, a weighted latch member afforded pivotal bearing on the sash lower rail, said latch member having a notch co-operative with a stationary projection of the window frame and an angled extension embodying offsets adapted to engage fixed abutments to initiate outward projection of the sash when released, said latch member also having capacity to yield upon exertion of explosive pressure against the sash from the inside, stop means integral with the pivotal bearing aforesaid to limit upward movement of the latch member, a drop chain with associated guide means connected to the weighted latch member and the sash lower rail whereby said sash may be manually operated, and shock absorbers at each side of the window casement, each said shock absorber comprising a trough like case housing, a cushioned shoe engageable by the aligned movable pivot aforesaid in preventing impacts tending to fracture the sash light.

11. A window with a sash supported above center by vertically movable pivots and strut links determining lateral projection of such sash as the latter is opened by downward pull thereon, a weighted latch member afforded pivotal bearing on the sash lower rail, said latch member having a notch co-operative with a stationary projection of the window frame and an angled extension embodying offsets adapted to engage fixed abutments to initiate outward projection of the sash when released, said latch member also having capacity to yield upon exertion of explosive pressure against the sash from the inside, stop means integral with the pivotal bearing aforesaid to limit upward movement of the latch member, a drop chain with associated guide means connected to the weighted latch member and the sash lower rail whereby said sash may be manually operated, and shock absorbers at each side of the window casement, each said shock absorber comprising a trough like case housing a spring influenced shoe having a lateral projection hollowed out

on the upper edge for co-action with the aligned movable pivot aforesaid in absorbing impacts due to careless or other sudden opening of the sash, for the purpose specified.

12. An explosion-release mechanism for windows of the type described comprising a stirrup bearing for attachment to the window sash lower rail, and a weighted latch member fulcrumed in said bearing adapted to engage a contiguous stationary projection with capacity to yield under explosive pressure imposed on the window sash.

13. An explosion-release mechanism for windows of the type described comprising a stirrup bearing for attachment to the window sash lower rail, a weighted latch member fulcrumed in said bearing having a notch adapted to engage a contiguous stationary projection with capacity to yield under explosive pressure imposed on the window sash, and apertured ears on the aforesaid bearing affording anchorage connection for appropriate manual sash operating means.

14. As a new article of manufacture an attachment member, for windows of the type described, comprising a body portion with a weight enlargement at one end and fulcrum bearing means at the other end having an angled extension projecting therebeyond with flanking offsets, for the purposes set forth.

15. As a new article of manufacture an attachment member, for windows of the type described, comprising a T-section body portion with a weight enlargement at one end, a fulcrum bearing portion at the other end with a subjacent notch, and an angled extension having lateral offsets below and beyond said bearing portion, for the purposes set forth.

16. As a new article of manufacture an attachment member, for windows of the type described, comprising a T-section body portion with a weight enlargement at one end, a fulcrum bearing portion at the other end with a subjacent notch in the leg of the T portion and an angled extension including lateral rounded offsets below and beyond said bearing portion, for the purposes set forth.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this 17th day of September, 1929.

HOWARD T. WALTON.