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H. C. SMITH.
AUTOMATIC WINDOW CLOSER.
APPLICATION FILED JULY 30, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

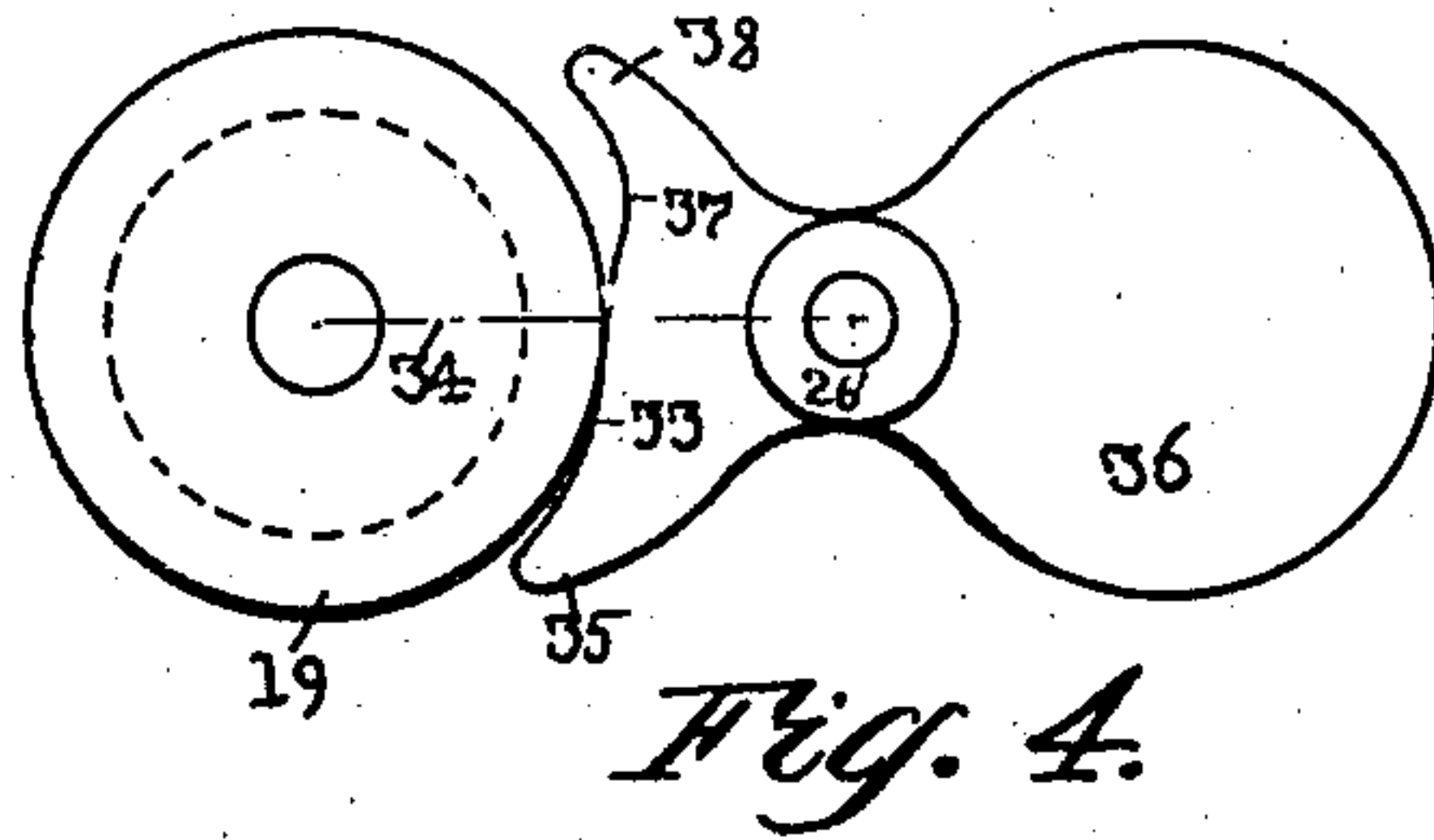
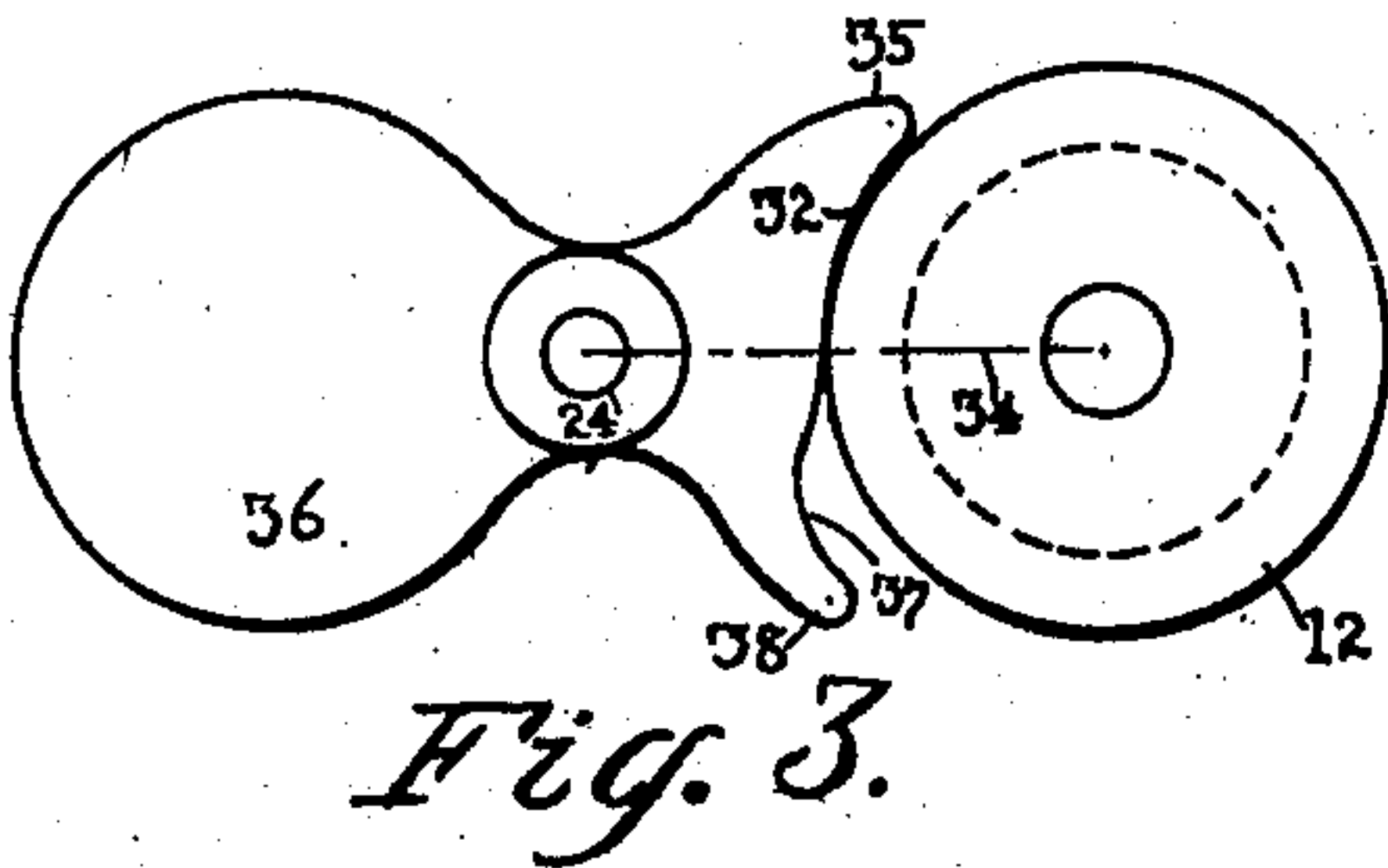
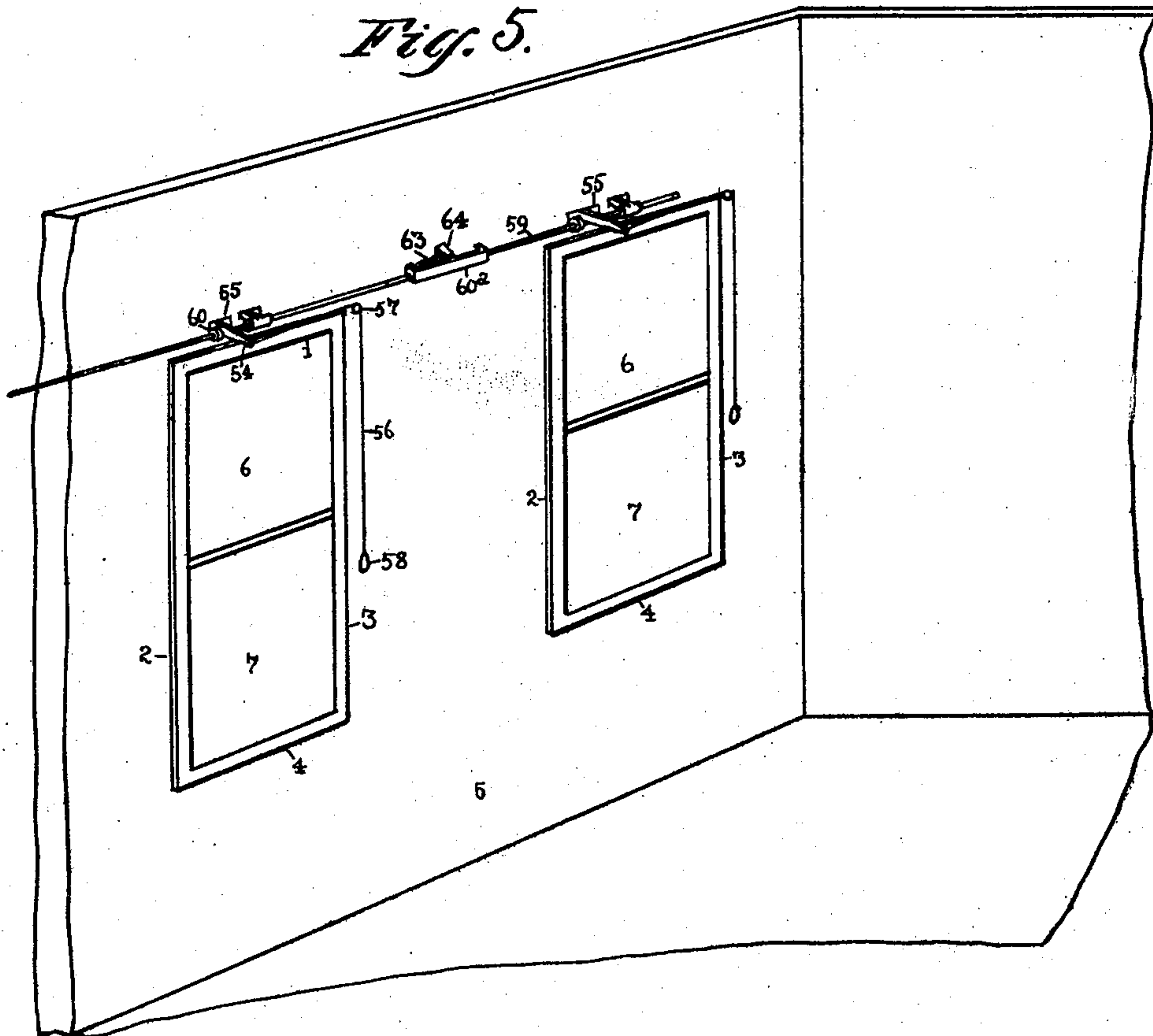


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY COLLIER SMITH, OF NEW YORK, N. Y.

AUTOMATIC WINDOW-CLOSER.

SPECIFICATION forming part of Letters Patent No. 775,547, dated November 22, 1904.

Application filed July 30, 1903. Serial No. 167,551. (No model.)

To all whom it may concern:

Be it known that I, HENRY COLLIER SMITH, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Automatic Window-Closers, of which the following is a specification.

This invention relates mainly to fireproof windows provided with means for causing them to close automatically in case of fire; and its objects are to improve and simplify the construction and operation of the window-closing mechanism, to facilitate the opening and closing of the windows manually, and to provide improved means for causing a plurality of windows to be closed by the melting of a single fuse.

Other objects and advantages will herein-
after appear.

In the drawings forming part of this specification, Figure 1 is a sectional plan of the head of a fireproof window-frame, illustrating one form of sash-controlling mechanism. Fig. 2 is an elevation of the window-sashes and appurtenances, the head of the window being shown, partly in section, on the line *xx* of Fig. 1. Fig. 3 shows a pulley and brake employed for the upper-sash, and Fig. 4 shows pulley and brake for the lower sash. Fig. 5 is a perspective of a fragment of a room or building, showing a plurality of windows and my present improvements applied thereto.

In the several views like parts are identified by like signs.

The head of the window-frame is designated as 1, its stiles as 2 3, its sill as 4, and the wall of the building containing the frame as 5. An upper sash 6 and a lower sash 7 are mounted to slide up and down in the frame. The upper sash 6 is provided with overweighted counterbalances 8 and 9, connected to the sash by cables 10 and 11, which run over pulleys 12 and 13. The lower sash 7 is provided with underweighted counterbalances 14 and 15, connected to the sash by cables 16 and 17 running over pulleys 18 and 19. The disproportion between the weights of the sashes and those of the counterbalances is such as to enable the sashes to close automatically when not opposed by braking means. The pulleys

12 and 18 form a set at one side of the window, and 13 and 19 form a set at the other side of the window.

The braking means preferably consist of shoes 20, 21, 22, and 23, applied to the pulleys 12, 13, 18, and 19, respectively. The brake-shoes 20 and 22 are pivotally mounted at 24 upon a horizontal beam, bar, or connection 25, and the brake-shoes 21 and 23 are pivoted at 26 upon the ends of a similar bar 27. Said bars are formed between the shoes with yokes 28 and 29, in which are caught the outer ends of rods or links 30 and 31, respectively, whereby the brake-shoes are drawn with moderate pressure against the pulleys. The shoes are intended to be effective only during the closing movements of the sashes, their only functions being to prevent the sashes from closing automatically by reason of their disproportionate counterbalances, and to this end the shoes are provided with treads 32 and 33, Figs. 3 and 4, which terminate at one end near a line 34, joining the pulley-axis to that of the shoe and curving thence in contact with the tread of the pulley for a short distance, so that the rotation of the pulley in window-closing direction carries the shoe-tread toward the line 34, thereby effecting a binding action between the shoe and the pulley, each being forced back by the other, with the result that sufficient frictional opposition to the rotation of the pulley is effected by the shoe to prevent the sash from closing because of its unbalanced condition. The shoes are lengthened to form horns 35 to act as guards to contact with the pulley-treads and limit the cramping movements of the shoes, so that it is impossible for the shoes to lock the pulleys against movement, although permitting the shoes to offer considerable frictional opposition to the movement of the pulleys. At Fig. 3 the tread of the shoe is above the line 34, and at Fig. 4 the shoe is below said line, one pulley and shoe being fitted for one side of the upper sash and the other for the opposite side of the lower sash, said pulleys being caused to turn in directions opposite one to the other during the opening movements of their respective sashes. Each shoe may have a counterweight 36 preferably sufficient to offset the weight of the shoe, and each

shoe may also, if desired, be formed with an opposite tread 37 and horn 38, so that the shoes may be made duplicates and any shoe used in connection with any pulley.

5 The connections 30 and 31, which keep the brakes in contact with the pulleys, are at their inner ends pivoted at 39 and 40, respectively, to a cross-lever 41, which is pivotally supported at 42 between said levers, the pivot
10 projecting up from the floor 43 of the window-frame head. The single lever 41 controls all the brakes, so that by a movement of the lever in one direction all of the brakes may be set, while by a reverse movement
15 thereof all may be released.

I provide a spring 44 for setting the brakes, said spring being caught at its inner end upon an offset arm 45, formed upon the lever 41, and at its outer end upon a stem 46, which
20 projects through the window-frame head, and at its projecting end is threaded to receive a nut 47, whereby the spring may be drawn to the desired degree of tension. Said nut is made of fusible metal—that is, of metal which
25 melts at a moderate degree of heat, say one hundred and forty degrees, more or less. The spring being normally tensioned, the brakes are always set, but by the presence of undue heat the nut 47 may be weakened or destroyed,
30 thereby relieving the spring of tension, and hence releasing all the brakes. The nut 47 is by preference placed upon the outer side of the window, so as to be attacked by heat or fire from without. It will be understood that
35 by reason of the lever, link, and yoke-bar construction the tension of the spring 44 is divided evenly among all of the four brakes, which is a desideratum, since it causes the window-sashes to work evenly and smoothly.

40 It will be observed that the mechanism hereinbefore described is complete and operative, and hence may be used, if desired, without any of the following-described devices.

A stem 48 is projected through the inner
45 wall of the window-frame head and is provided at its inner end with a head 49, a compression-spring 50 being coiled about the stem and confined between said head and said wall. The outer end of the stem is threaded to re-
50 ceive a nut 51, whereby the stem may be drawn out and the spring compressed and held under restraint. The nut 51 is made of fusible metal, and the heat of a fire within the room causes the nut to collapse, thus liberat-
55 ing the spring, which consequently drives the head 49 against a spur 52, formed upon the lever 41, vibrating the same against the tension of the weaker spring 44 and releasing all the brakes, thereby enabling the sashes to
60 close by reason of their disproportionately counterbalanced condition. It will be seen that the devices 48, 49, 50, and 51 are not connected to the lever 41 and its appurtenances, said lever being operable wholly in-
65 dependently of said devices, the latter being

dormant and effective when released by heat to actuate the lever.

I prolong the lever 41 at 54 to extend outside of the window-frame, a slot 55 being formed in the latter to permit play of the lever, and to the projecting end I attach a releasing-cord 56, carried over or through an eye or projection 57 and provided with a handle 58, so that upon pulling down the cord the lever may be vibrated, distending the spring
70 44 and releasing all the brakes, the parts returning to normal position under the influence of the spring 44 upon the release of the cord. It will thus be seen that in neither opening nor closing the window is the oppo-
80 sition of the brakes encountered, since the brakes are ineffective during the opening operation, while by pulling on the cord the brakes are released and the sashes close automatically. This feature of improvement, it
85 will be perceived, is valuable, whether or not thermal means are provided for releasing the brakes.

I prefer to connect mechanically the automatic closing mechanisms of a plurality of
90 windows, and for this purpose I string a rod 59 along the wall above the windows and fix thereon collars or tappets 60 in position to actuate the arms 54 of the brake-controlling levers, so that by an endwise movement of the
95 rod all of the levers may be vibrated. The rod passes through a bracket 60^a, and between the arms 61 of the bracket the rod is provided with a fixed collar 62, between which and one of the bracket-arms is confined under com-
100 pression a powerful spring 63, the rod being restrained from movement under the tension of said spring by means of a stop 64, against which the collar 62 bears. Said stop may be
105 fixed to either the window-frame or the wall and may consist of fusible metal, so that in case of fire within the room the heat causes the stop to give way, whereupon the spring
110 63 drives the rod along and by means of the collars 60 vibrates all of the levers and causes all the windows to close, said spring 63 being sufficiently powerful to overcome the tension of all the springs 44.

Variations in construction, arrangement, and operation may be resorted to within the
115 scope of my invention, and portions of my improvements may be used without others.

Having thus described my invention, I claim—

1. The combination of a disproportionately-
120 counterbalanced sash, a brake therefor, a spring normally rendering said brake effective, and thermally-operative means for releasing said brake in opposition to the tension of said spring.

2. The combination of a disproportionately-
125 counterbalanced sash, a brake therefor, a spring for said brake, a second spring for releasing said brake in opposition to the tension of said brake-spring, and a member fusible at
130

low temperature and holding said second spring in restraint.

3. The combination of a disproportionately-counterbalanced sash, a brake therefor, means normally rendering said brake effective, a spring disconnected from said brake but capable of releasing the same, means, inclusive of a thermotic device, for holding said spring in restraint, and means for releasing said brake independently of said spring.

4. The combination of a disproportionately-counterbalanced sash, a brake therefor, a spring normally rendering said brake effective, a member fusible at low temperature and holding said spring under tension, a second spring wholly disconnected from the first spring and from said brake, but capable when released of overcoming the first spring and releasing the brake, and a second member fusible at low temperature and holding said second spring under restraint.

5. The combination with a window-frame of a disproportionately-counterbalanced sliding sash mounted therein, a brake for said sash, means for setting the brake, said setting means including a member fusible at low temperature, a spring wholly disconnected from said brake and from said brake-setting means but capable when released of releasing the brake, and a second member fusible at low temperature and holding said spring under restraint; one of said fusible members being mounted within and the other without the window.

6. The combination with a window-frame of a sliding sash mounted therein, means for causing said sash to close automatically, brakes and connections inclusive of a fusible part, for rendering said closing means ineffective, means for releasing said brakes, and a fusible part holding said brake-releasing means under restraint; one of said fusible devices being mounted at the inner side and the other at the outer side of the window.

7. The combination with a window-frame of a sash mounted therein, disproportionate counterbalances for said sash, means, including a fusible part, for rendering said counterbalances ineffective to close the window, a spring for releasing said counterbalances, and a fusible part holding said spring under restraint; one of said fusible parts being mounted upon the inner side and the other upon the outer side of the window.

8. The combination with a window-frame, of a pair of sliding sashes mounted therein, disproportionate counterweighting means for the sashes, means common to the sashes for rendering the counterweighting means ineffective, and means, including a spring and a thermally-releasable device holding said spring under restraint, for releasing said counterweighting means.

9. The combination of a sliding sash, counterbalances therefor, cables connecting the sash to the counterbalances, pulleys over which

the cables run, brakes for said pulleys, a spring common to said brakes for rendering them effective, a fusible device whereby said spring is held under tension, means for overcoming the tension of said spring and releasing said brakes, and a fusible device holding said releasing means under restraint.

10. The combination of a window-frame, a pair of sliding sashes mounted therein, disproportionate counterbalances for the sashes, cables connecting the sashes to the counterbalances, pulleys over which the cables run, a brake for each pulley, means directly connecting the brakes at adjoining pulleys, a spring connected to said connecting means for rendering all the brakes effective, a fusible device whereby said spring is held under tension, means, including a second spring, for overcoming the tension of the first spring and releasing all the brakes, and a fusible device holding said second spring under restraint; one of said fusible devices being mounted at the inner side of the window, and the other at the outer side thereof.

11. The combination of a movable window-sash, a brake at each side thereof, a lever disposed between said brakes, connections from said lever to said brakes, and a pivotal support for said lever between said connections.

12. The combination with a window-frame, of a sliding sash mounted therein, disproportionate counterbalances for said sash, cables connecting said sash to said counterbalances, pulleys over which said cables run, a brake for each pulley, a lever disposed between said brakes, connections from said lever to said brakes, a pivotal support for said lever between said connections, a spring connected to said lever for setting the brakes, and a fusible device holding said spring under tension.

13. The combination with a window-frame, of a pair of sliding sashes mounted therein, disproportionate counterbalancing means for said sashes, cables connecting said sashes to said counterbalancing means, pulleys over which said cables run, a brake for each pulley, means directly connecting the brakes at adjoining pulleys, a lever, connections from said lever to said connecting means, and a support for said lever between said connections.

14. The combination with a window-frame, of a pair of sliding sashes mounted therein, disproportionate counterbalancing means for said sashes, cables connecting said sashes to said counterbalancing means, pulleys over which said cables run, a brake for each pulley, means directly connecting the brakes at adjoining pulleys, a lever, connections from said lever to said connecting means, a support for said lever between said connections, a spring for causing said lever to set the brakes, and a spring-holding fusible device.

15. The combination with a window-frame, of a pair of sliding sashes mounted therein, a brake at each side of each sash, means directly

connecting adjoining brakes, a lever, connections extending from said lever to said connecting means, a pivotal support for said lever, a spring connected to said lever for setting the brakes, and a fusible device holding said spring under tension.

16. The combination with a sliding sash, of a brake at each side thereof, a lever connected to said brakes, and fuse-controlled means for controlling said lever.

17. The combination with a sliding sash, of disproportionate counterbalancing means therefor, a brake at each side of the sash, a lever connected to said brakes, a spring connected to said lever, and a fusible device connected to said spring.

18. The combination with a window-frame, of a window-sash movable therein, a brake at each side of the sash, a lever disposed between said brakes, connections from said lever to said brakes, a pivotal support for said lever between said connections, fusible devices one at the inner side of the window and another at the outer side of the window, and means connected to said lever and adapted to be rendered ineffective by the destruction of either fusible device, for setting the brakes.

19. The combination with a window-frame, of a sash movable therein, counterbalancing means in disproportion to said sash, a brake for each side of the sash, a lever disposed between said brakes, connections from said lever to said brakes, a spring connected to said lever and normally rendering said brakes effective, and thermally-operative means for causing said lever and connections to release the brakes in opposition to the tension of said spring.

20. The combination with a window-frame, of a sliding sash mounted therein, disproportionate counterbalances for said sash, pulleys and cables running thereover for connecting said sash to said counterbalancing means, a brake for each pulley, a lever between the brakes, connections extending from the lever to the brakes, a pivotal support for the lever between said connections, a spring connected to said lever for setting the brakes, a second spring for releasing said brakes in opposition to the tension of said brake-setting spring, and a fusible device holding said second spring under restraint.

21. The combination with a window-frame, of a sliding sash mounted therein, disproportionate counterbalances for said sash, cables connecting said sash to said counterbalances, pulleys over which said cables run, a brake for each pulley, a lever between the brakes, connections extending from the lever to the brakes, a pivotal support for the lever between said connections, a spring connected to the lever and normally rendering the brakes effective, a fusible device holding said spring under tension, a second spring wholly disconnected from the first spring and from said lever, but capable when released of overcoming the first

spring and releasing the brakes, and a fusible device holding said second spring under restraint.

22. The combination with a window-frame, of a pair of sliding sashes mounted therein, disproportionate counterbalances for said sashes, cables connecting said sashes to said counterbalances, pulleys over which said cables run, a brake for each pulley, means directly connecting the brakes at adjoining pulleys, a lever, connections from said lever to said connecting means, a support for said lever between said connections, a spring connected to said lever for setting the brakes, a fusible device holding said spring under tension, a second spring capable of moving the lever and releasing the brakes in opposition to the tension of the first spring, and a fusible device holding said second spring under restraint; one of said fusible devices being mounted at the inner side and the other at the outer side of the window.

23. The combination with a window-frame and a sliding sash mounted therein, of a lever, rods extending in opposite directions from said lever to the sides of the window, a pivotal support for said lever between said rods, a spring connected to said lever, a fusible device connected to said spring, and sash-closing means controlled by said rods.

24. The combination with a window-frame and a sliding sash mounted therein, of a lever, rods extending in opposite directions from said lever to the sides of the window, a pivotal support for said lever between said rods, a fusible device connected to said lever, and means cooperating with said fusible device, lever and rods to control the movement of the sash.

25. The combination with a window-frame and a sliding sash mounted therein, of a lever, rods extending in opposite directions from said lever, a pivotal support for said lever between said rods, a fusible device connected to said lever, means cooperating with said fusible device, lever and rods to control the movement of the sash, a second fusible device, and means held under restraint thereby for effecting the release of the sash; one of said fusible devices being at the inner side and the other at the outer side of the window.

26. The combination with a window-frame of a pair of sliding sashes mounted therein, a lever, a pair of rods extending in opposite directions from said lever, a pivotal support for said lever between said rods, a fusible device connected to said lever, and means cooperating with said fusible device, lever and rods to control the movements of both sashes.

27. The combination with a window-frame of a pair of sliding sashes mounted therein, a lever, a pair of rods extending in opposite directions from said lever, a pivotal support for said lever between said rods, a fusible device, a spring cooperating with said fusible device,

lever and rods, means controlled by said rods for controlling the movements of the sashes, and means, including a second spring and a fusible device holding the same under restraint, for permitting the sashes to close automatically by the action of undue heat; one of said fusible devices being located at the inner side and the other at the outer side of the window.

28. The combination of a disproportionately-counterbalanced sash, a brake therefor, a spring normally rendering said brake effective, and both thermally-operative means and manually-operable means for releasing said brake in opposition to the tension of said spring.

29. The combination of a disproportionately-counterbalanced sash, a brake therefor, a spring for said brake, manually-operable means for releasing said brake in opposition to the tension of said spring, a second spring capable of releasing said brake in opposition to the tension of said spring, and a fusible device holding said second spring under restraint.

30. The combination of a disproportionately-counterbalanced sash, a brake therefor, a spring normally rendering said brake effective, a fusible device cooperating with said spring, a second spring capable when released of overcoming the first spring and releasing the brake, a fusible device holding said second spring under restraint, and manually-operable means for releasing the brake in opposition to the tension of the first-mentioned spring.

31. The combination with a window-frame, of a pair of sliding sashes mounted therein, disproportionate counterbalancing means for said sashes, cables connecting said sashes to said counterbalancing means, pulleys over which said cables run, a brake for each pulley, means directly connecting the brakes at adjoining pulleys, a lever, connections from said lever to said connecting means, a support for said lever between said connections, a fusible device, a spring cooperating with said fusible device and lever to set the brakes, and a brake-releasing cord attached to said lever.

32. The combination with a window-frame, of a sliding sash mounted therein, a disproportionate counterbalance for said sash, braking means effective to prevent the closing of the sash because of the disproportion of its counterbalances, but possessing little or no efficiency to oppose the opening movement of the sash, and means for preventing the braking means from locking the sash.

33. The combination with a window-frame, of a sliding sash mounted therein, a counterbalance for said sash sufficiently under weight to permit the sash to close by gravity, and braking means rendered effective by the downward pressure or movement of the sash, but relieved or rendered inefficient by the upward

movement or pressure of the sash, said braking means being incapable of preventing the downward movement of the sash by the application of manual force to said sash.

34. The combination with a window-frame, of a sliding sash mounted therein, a counterbalance for said sash sufficiently over weight to raise the sash, a brake rendered effective by the upward pressure or movement of the sash, but relieved or rendered inefficient by the downward movement or pressure of the sash, and means for preventing the brake from locking the sash.

35. The combination with a window-frame, of a pair of disproportionately-counterbalanced sliding sashes mounted therein, and braking means for both sashes; said braking means including a pair of brakes for each sash, and being rendered effective by the closing movements of the sashes or by pressure applied to the sashes to close them, but being relieved by pressure applied to the sashes to open them, and being incapable of preventing the closing of the sashes by the application of manual force to said sashes.

36. The combination of a sliding sash, a disproportionate counterbalance, a cable connecting said sash to said counterbalance, a pulley over which said cable runs, and a brake mounted at said pulley and constructed to oppose the rotation thereof in one direction but to be automatically relieved by rotation of the pulley to any extent in the other direction.

37. The combination of a sliding sash, a pair of disproportionate counterbalances therefor, cables connecting said sash to said counterbalances, pulleys over which said cables run, and brakes mounted at said pulleys and connected to each other; said brakes being constructed to oppose the rotation of the pulleys during the sash-closing movement but to be relieved during the opening movement of the sash.

38. The combination of a sliding sash, disproportionate counterbalancing means therefor, including a cable and a pulley over which the cable runs, and a pivoted brake-shoe for said pulley, so mounted that rotation of the pulley in one direction causes the shoe to bite the pulley, while rotation of the pulley to any extent in the other direction relieves the pressure of the shoe upon the pulley.

39. The combination with a window-frame, of a pair of sliding sashes mounted therein, a pair of counterbalances for each sash, cables connecting the sashes to the counterbalances, pulleys over which said cables run, brakes for said pulleys, means connecting the brakes at adjoining pulleys at each side of the window, and connections extending from one connecting means to the other; said braking mechanism being constructed to oppose the rotation of the pulleys during the closing movements of the sashes, but to be released during the sash-opening movements.

40. The combination of a pair of sliding sashes, counterbalances therefor, cables connecting the counterbalances to the sashes, adjoining pulleys for the cables, brake-shoes for said pulleys, a bar whereon said shoes are pivoted, and a spring connected to said bar between said shoes; each shoe being so pivoted upon said bar that the rotation of the pulley causes the shoe either to bite or release the pulley, according to the direction of its rotation.

41. The combination of a pair of sliding sashes, a pair of disproportionate counterbalances for each thereof, cables connecting the counterbalances to the sashes, cable-pulleys disposed in two sets, brake-shoes for the pulleys, bars whereon said brake-shoes are pivoted, one bar for each set of shoes, and a yielding connection extending from one bar between its shoes to the other bar between its shoes; each shoe being so pivoted upon its bar that the rotation of its pulley during the opening of the sash causes the shoe to bite the pulley, but during the closing of the sash causes the shoe to release the pulley.

42. The combination with a window-frame, of a pair of independently-movable disproportionately-counterbalanced sliding sashes mounted therein, braking means for both sashes, and a single manually-operable member for releasing all of said braking means simultaneously; said braking means being rendered effective by the closing movements of the sashes, but being relieved by the opening movements thereof.

43. The combination of a sliding sash, disproportionate counterbalancing means therefor, including a cable and a pulley over which the cable runs, a pivoted brake-shoe for said pulley, so mounted that rotation of the pulley in one direction or the other causes the shoe either to bite the pulley or to release the same, and manually-operable means for releasing the brake.

44. The combination of a disproportionately-counterbalanced sash, a brake therefor, a spring normally rendering said brake effective, and both thermally-operative means and manually-operable means for releasing said brake in opposition to the tension of said spring.

45. The combination with a window-frame, of a pair of sliding sashes mounted therein, disproportionate counterweighting means for the sashes, means common to the sashes for rendering the counterweighted means ineffective, and means, including a spring and a thermally-releasable device holding said spring under restraint, for releasing said counterweighting means.

46. The combination with a window-frame, of a pair of sliding sashes mounted therein, a brake at each side of each sash, means directly connecting adjoining brakes, a lever, connections extending from said lever to said

connecting means, a pivotal support for said lever, a spring and fuse connected to said lever, and a manually-operable brake-releasing member also connected to said lever.

47. The combination with a window-frame, of a sash mounted therein, disproportionate counterweighting means for the sash, means, inclusive of a member projecting from the window-frame, for rendering said counterweighting means normally ineffective, a fuse at a point remote from said projecting member, a spring held under restraint by said fuse, and a rod connected to said spring and extending to said projecting member, said rod being effective when actuated by said spring, to move said projecting member in a manner to release said counterweighting means to close the sash.

48. The combination of a plurality of window-frames, a movable sash in each frame, disproportionate counterweighting means for each sash, means at each window for rendering said counterweighting means normally ineffective, a rod extending from one window to another and provided with means for releasing the counterweighting means at each window, and a fusible device restraining said rod from movement.

49. The combination of a plurality of window-frames, a movable sash in each frame, disproportionate counterweighting means for each sash, means for rendering said counterweighting means normally ineffective, and fuse-controlled mechanism, inclusive of a mechanical connection from one window to another, for releasing said counterweighting means, whereby the fusing of one fusible device causes all the windows to close.

50. The combination of a plurality of window-frames, a disproportionately-counterbalanced sash in each frame, a brake for each sash, a rod extending from window to window and provided with means for releasing the brake at each window, a spring connected to said rod, and a fuse preventing movement of said rod by said spring.

51. The combination of a plurality of window-frames, movable sashes in the frames, and a train of sash-closing mechanism including a fusible device and extending from one window to another; said train being effective upon the fusing of a fusible device, to close the sashes in all the windows.

52. The combination of a plurality of window-frames, movable sashes in the frames, and a train of sash-closing mechanism including a fusible device within the room and extending from one room to another; said train being effective upon the fusing of said fusible device, to close the sashes in all the windows, and also including an individual fusible device upon the outside of each window, the fusing whereof is effective to close the one window.

53. The combination of a plurality of win-

dow-frames, movable sashes in the frames, brakes for the sashes, a train of sash-closing devices including a fusible device and extending from window to window, said train being
 5 effective upon the fusing of a fusible device, to close the sashes in all the windows, and individual sash-releasing means at each window and inclusive of a manually-operable member.

54. The combination with a plurality of win-
 10 dows, each provided with a sash, and each sash being adjustable to any desired extent independently of the other sashes, of a train of sash-closing mechanism extending from window to window for closing all of the
 15 sashes simultaneously, and including means for closing the sashes from different positions to which they may have been opened, and individual means at each window for closing the sash from any position to which it may
 20 have been opened, independently of the sashes in the other windows.

55. The combination with a plurality of windows, each provided with a sash, and each sash being adjustable to any desired extent
 25 independently of the other sashes, of a train of window-closing mechanism including a

thermotic device and extending from window to window for closing all of the sashes simultaneously, said train including means for closing the sashes from different positions to which
 30 the several sashes may have been opened, and individual means at each window for closing the sash from any position to which it may have been opened, independently of the sashes in the other windows.

56. The combination with a window-frame, of a sliding sash mounted therein, means for causing said sash to close, means inclusive of a fusible device, for rendering said closing means ineffective to close the sash, means
 40 whereby said closing means may be rendered effective, and a fusible device holding the last-mentioned means under restraint; so that at the fusing of either of said fusible devices, the sash is caused to close; one of said fusible de-
 45 vices being mounted at the inner side and the other at the outer side of the window.

HENRY COLLIER SMITH.

Witnesses:

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 CHARLES H. HAIG.