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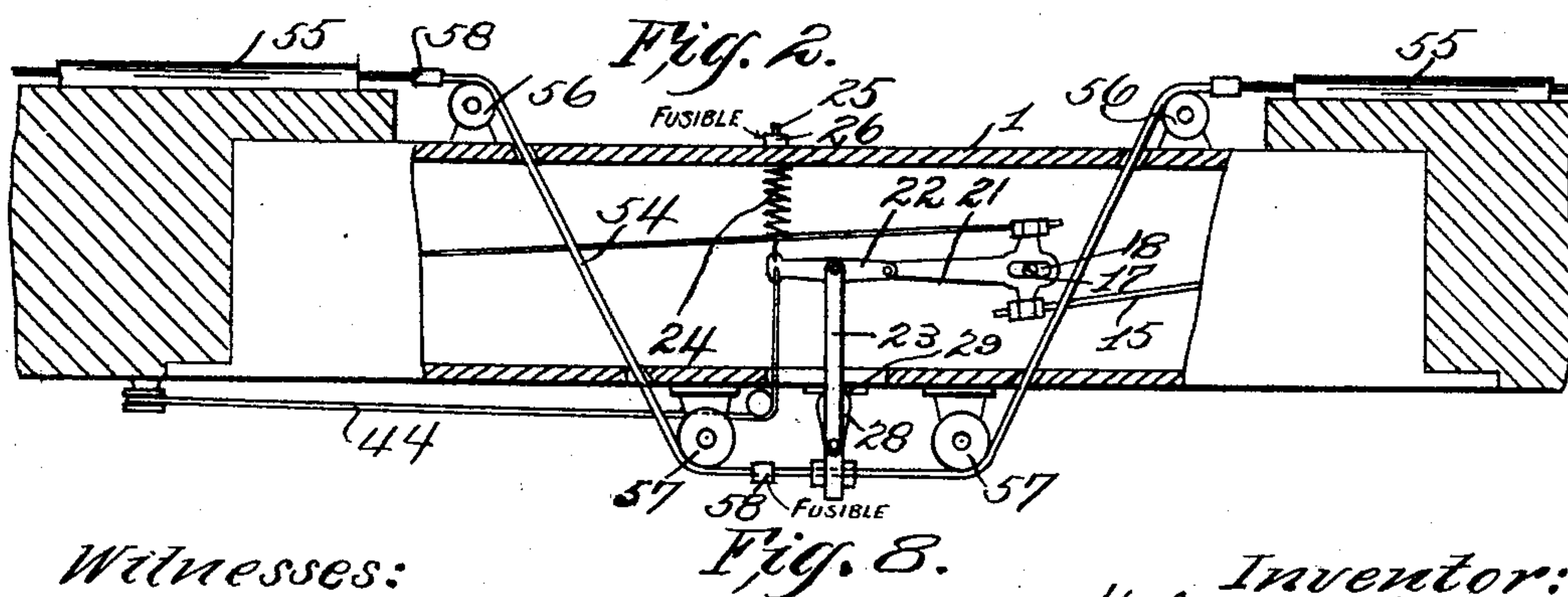
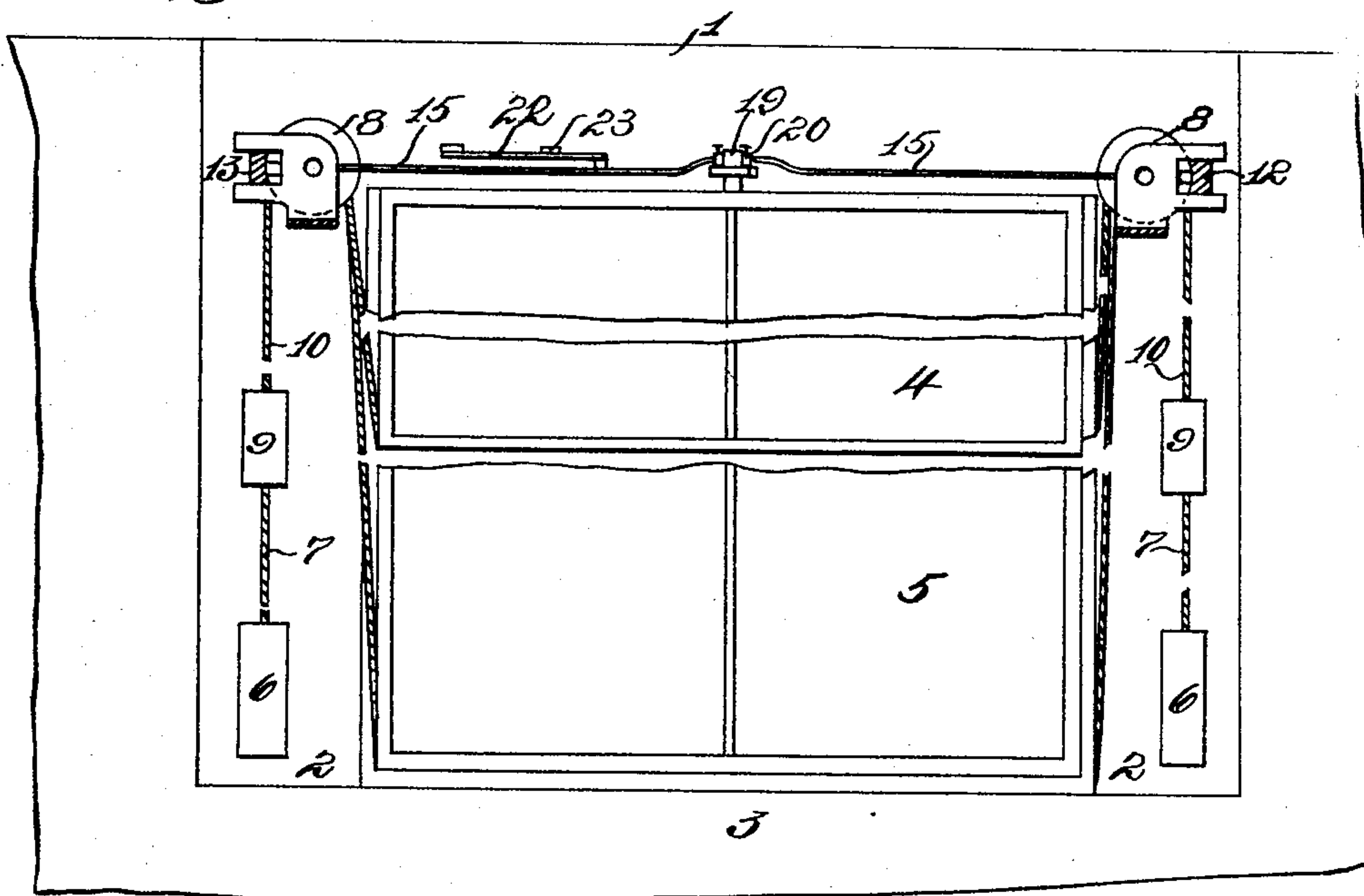
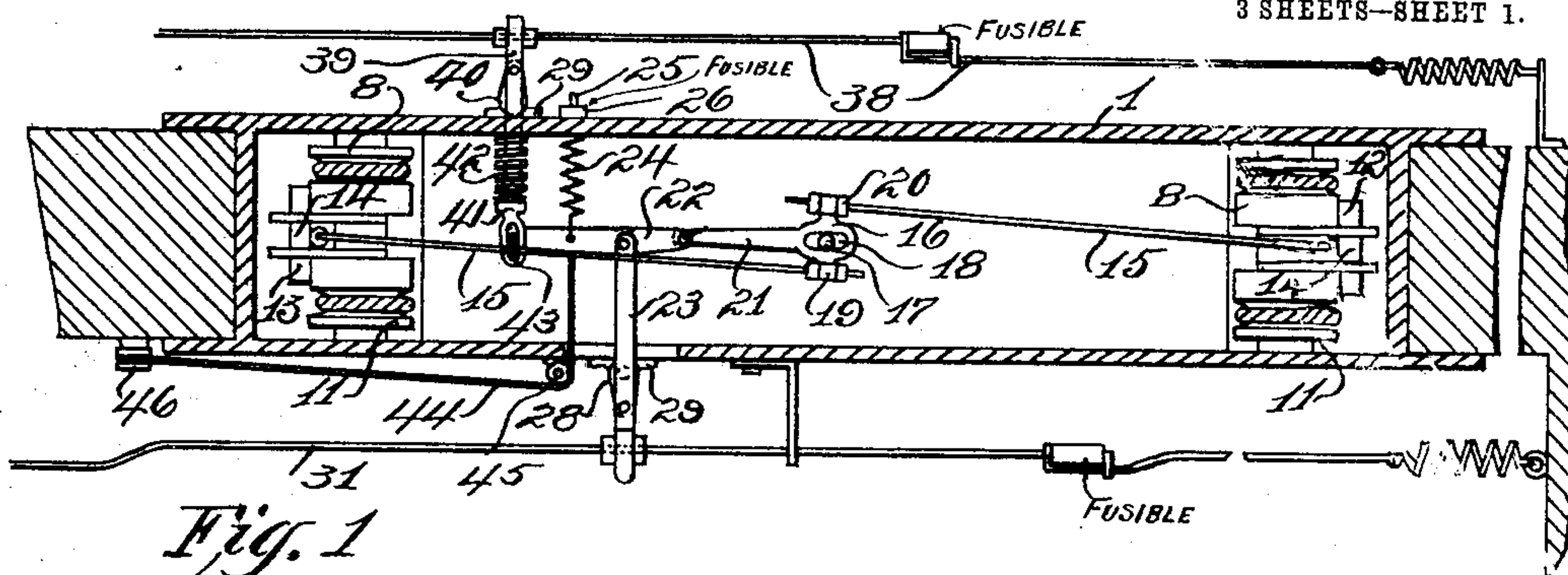
PATENTED NOV. 15, 1904.

H. C. SMITH.
WINDOW CLOSER.

APPLICATION FILED AUG. 18, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:
Charles H. Haig
Frank Silles

Inventor:
H. Collier Smith
By his Attorney,
O. B. Stierney

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3 SHEETS—SHEET 2.

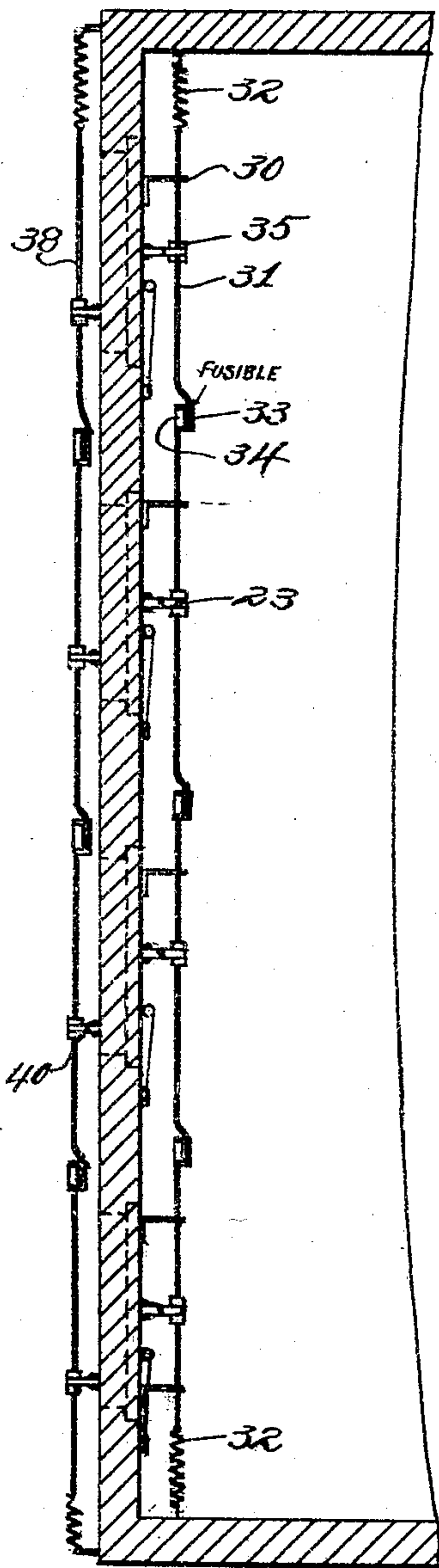


Fig. 3.

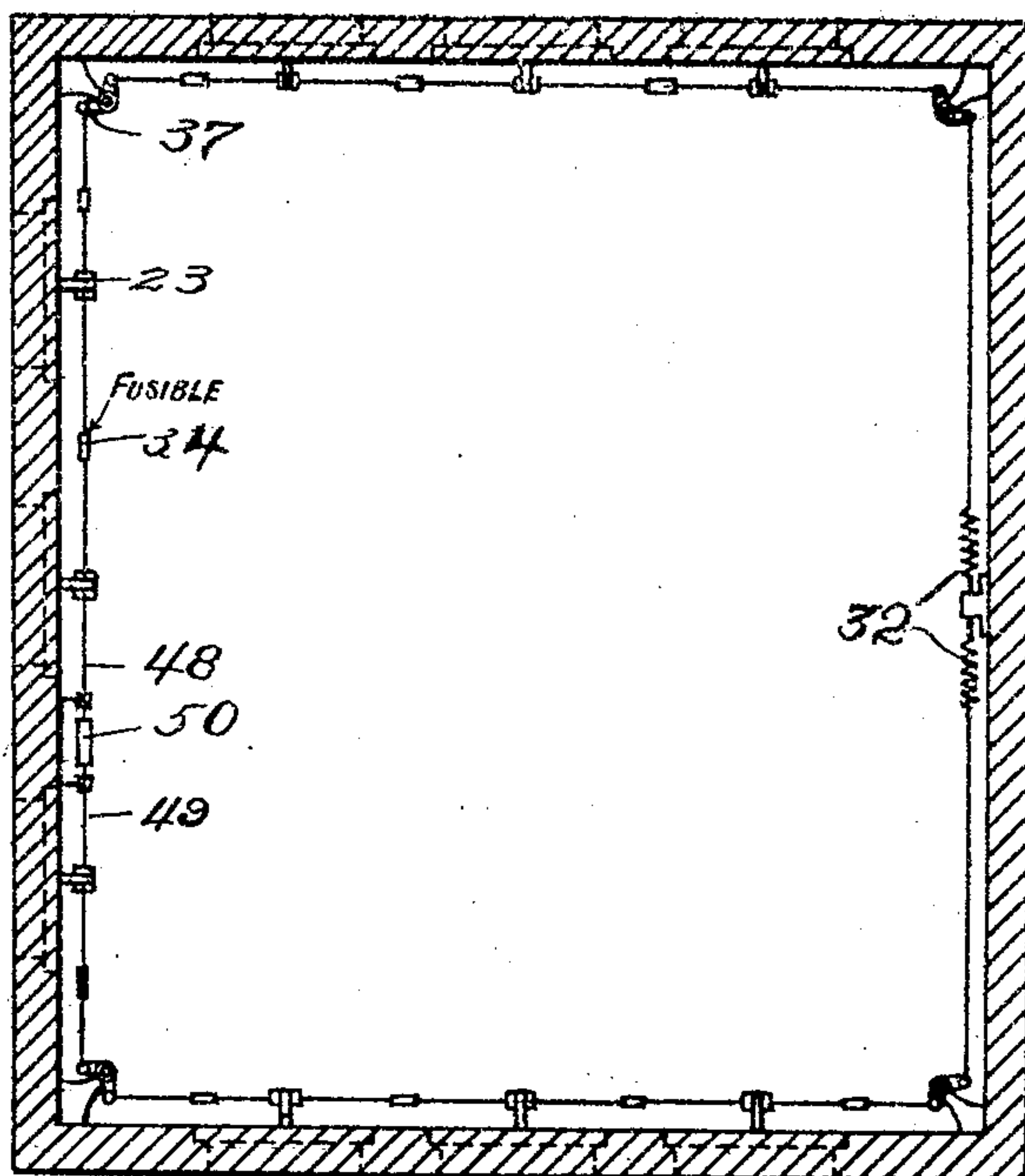


Fig. 4.

Witnesses:
Charles H. Fair
Frank Sells

Inventor:
H. Collier Smith
By his Attorney,
B. B. Stierney

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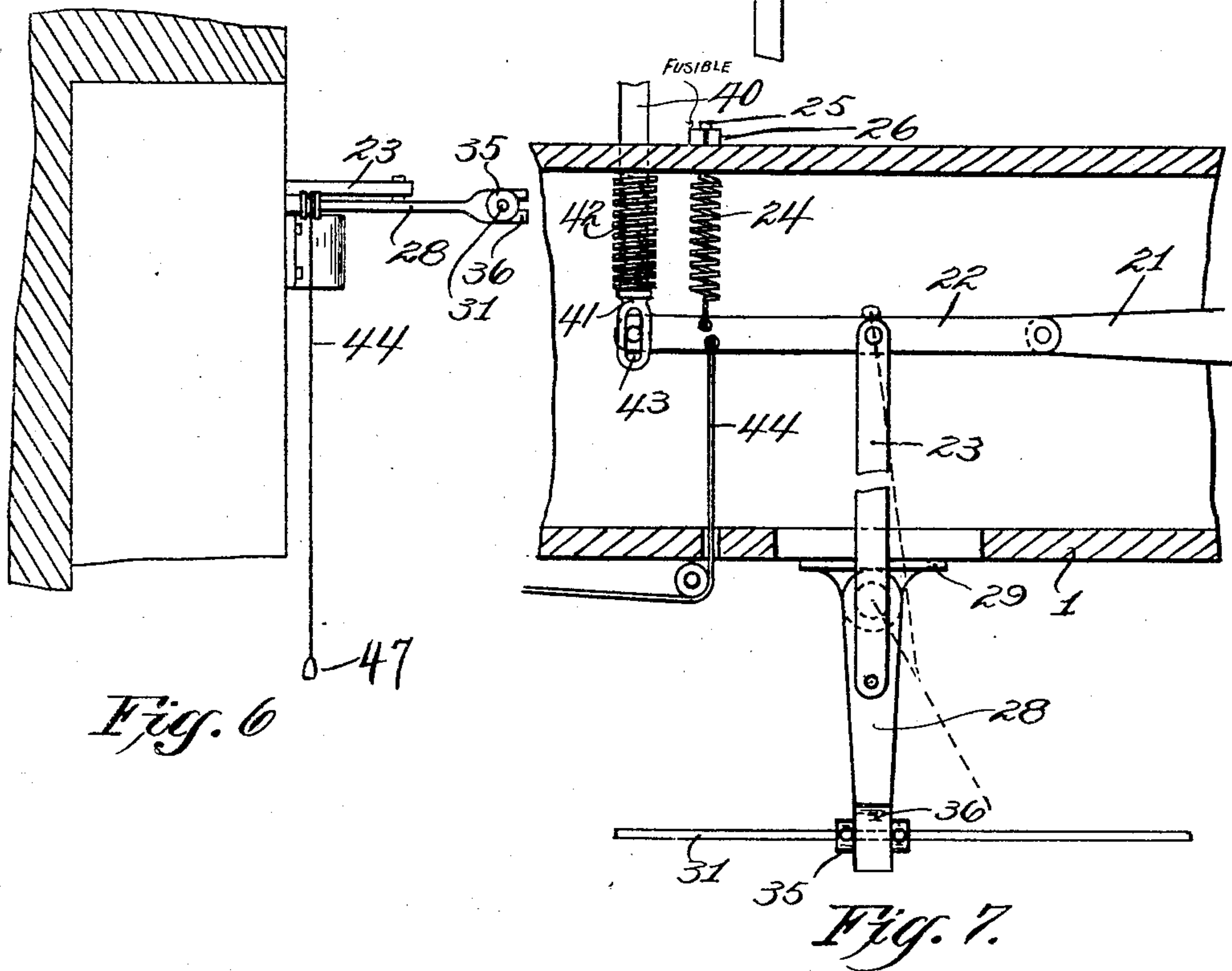
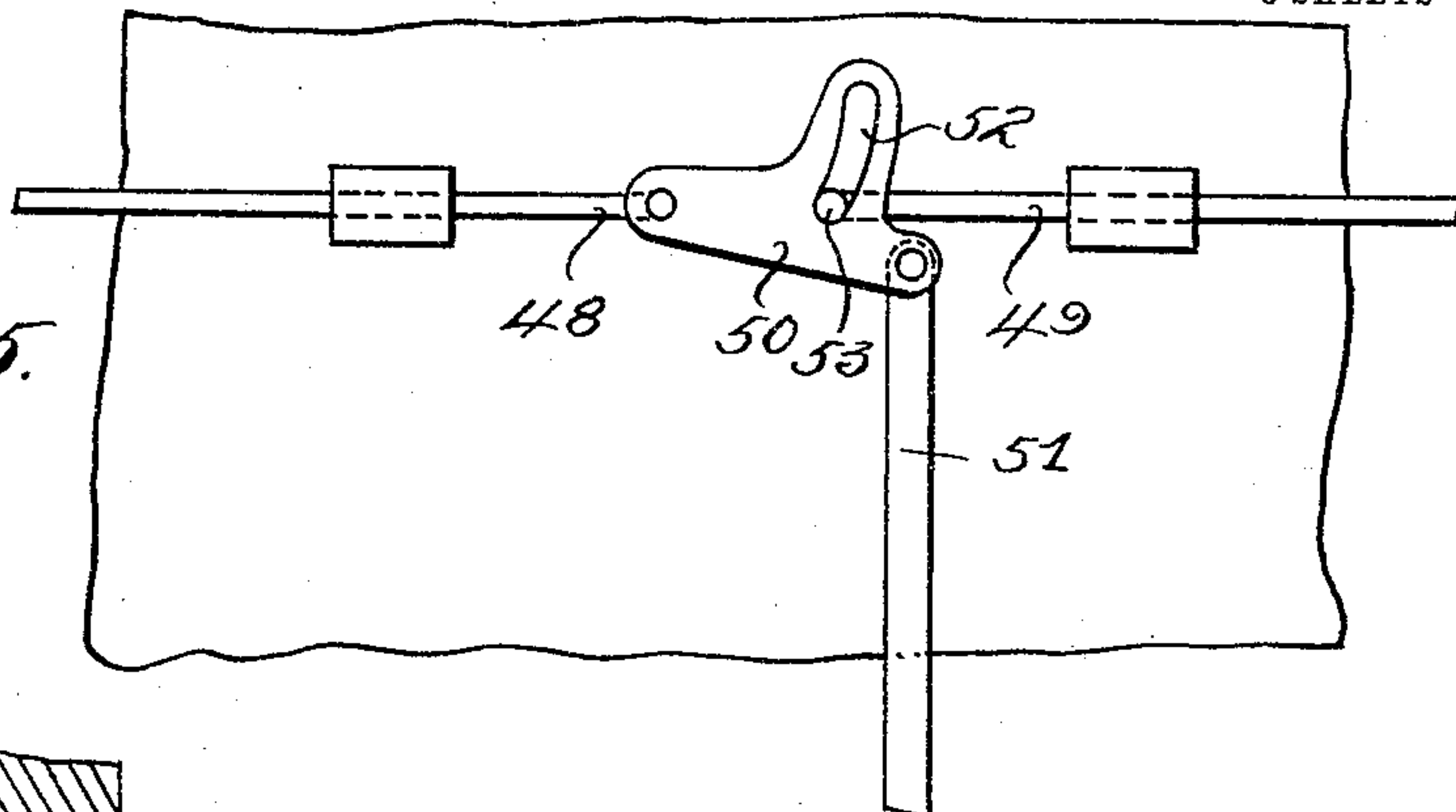
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NO MODEL.

3 SHEETS—SHEET 3.

Fig. 5.



Witnesses:

Charles H. H. H.
Frank L. L.

Inventor.
H. C. Smith
By his Attorney,
B. B. Stickney

UNITED STATES PATENT OFFICE.

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

WINDOW-CLOSER.

SPECIFICATION forming part of Letters Patent No. 775,046, dated November 15, 1904.

Application filed August 18, 1903. Serial No. 169,951. (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 Window-Closers, of which the following is a specification.

This invention relates principally to means for connecting the windows of a building by such a train of window-closing mechanism that fire either within or without the building will cause all the windows to close.

It also relates to improvements in the specific construction of the sash-controlling means at each window and also to means for closing at will either one or all of the windows.

In the drawings forming part of this specification, Figure 1 is a sectional plan of the head of a fireproof metallic window-frame, illustrating the preferred form of sash-controlling mechanism thereat, as well as adjacent portions of window-closing means which extend from one window to another. Fig. 2 is an elevation of a window, showing the mechanism within the window-frame. Fig. 3 shows my improved window-closing trains applied to a series of windows upon both the inner and outer sides thereof. Fig. 4 shows a window-closing train extending around the four walls of a room for closing the windows in all the walls. Fig. 5 is a detail of manual means for closing a series of windows. Fig. 6 is a side elevation showing the portion of the sash-controlling mechanism which projects from the window, and Fig. 7 is an enlarged plan of a portion of the sash-controlling means provided at each window. Fig. 8 is a view of one form of the invention in which the window-closing train is partly within and partly without the building.

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, its sill as 3, and its upper sliding sash as 4, and its lower sliding sash as 5. The upper sash is provided with over-weighted counterbalances 6, connected to the sash at the sides thereof by cables 7, which run over pulleys 8. The lower sash is provided with partial counterbalances 9, connect-

ed to the sash at each side by cables 10, running over pulleys 11. The disproportion between the weights of the sashes and the weights of their respective counterbalances is such as to enable the sashes to close automatically when not opposed by braking means. Said braking means preferably consist of shoes 12 and 13 at each side of the window for bearing upon the adjoining pulleys 8 and 11, respectively. The adjoining shoes are preferably connected by an equalizing-bar 14, formed integral therewith. In said bars, at points between the adjoining pulleys, are caught the outer ends of rods or links 15, which at their inner ends are pivoted to a cross-lever or brake-lever 16, which is pivotally supported upon a pin 17, which stands up from the floor of the window-head. The lever acts through the rods to cause the brakes to bear upon the pulleys with sufficient power to prevent the window-sashes from closing because of their disproportionately - counterbalanced condition. By a movement of the lever in one direction all four brake-shoes may be set against the pulleys, while by a reverse movement thereof all the brakes may be released. The lever preferably engages the fulcrum or pivot-pin 17 by means of a slot 18, extending in the direction of the connections 15, so that when the lever is turned it must bear with equal pressure against the rods, or, in other words, the lever fulcrums upon each rod for the purpose of thrusting or drawing the other rod, the lever being bodily movable in a direction longitudinal of the rods and the pin 17 serving as a guide between the rods. The lever thus adjusts itself equally to the four brake-shoes. The rods 15 are adjustably connected to the lever, being for this purpose passed through eyepieces 19, swiveled in the lever, jam-nuts 20 being threaded upon the rods at each side of each eyepiece. By turning the nuts the length of each rod may be adjusted, so that a slight movement of the lever may release or set the brakes. To an arm 21, formed upon said lever and extending along the window-head, I pivot one end of an auxiliary lever 22, which between its ends is pivoted to a fulcrum-link 23 and at its outer end is connected to a draw-spring 24, which hooks

to a stem 25, projecting through the wall of the window-head to the outside of the building, and is provided with a nut 26 for adjusting the tension of the spring, said nut being preferably of metal fusible at relatively low temperature—say one hundred and forty degrees. By means of the spring and auxiliary lever the brake-lever 16 is caused to set the brakes, while upon the fusing of the nut the spring, levers, and brakes are released.

The fulcrum-link 23 projects through a slot 27, formed in the inner wall of the window-head, and at its outer end is pivoted to an arm 28, pivoted vertically upon a bracket 29. The arm coöperates with the link to form a toggle, which is normally at dead-center and is hence able to sustain the stress of the spring 24 without moving; but by moving the toggle to either side until it is off from the dead-center (see dotted lines, Fig. 7) it becomes no longer able to sustain the spring-pressure, and the latter being relieved of much or all of the resistance contracts or becomes inert or relaxed, whereby the pressure of the brakes upon the pulleys is relieved and the sashes may close automatically. The movement of the toggle out of normal position thus disables the lever and spring; but by returning the toggle to normal position the parts are restored to their effective positions.

Referring now to Fig. 3, it will be seen that I string through or upon brackets 30 a series of rods 31, which are connected to form a chain, said chain at its ends being tensioned by means of oppositely-acting draw-springs 32, attached to the end walls of the building. Each rod is formed at the end with a hook 33, adapted to coöperate with the hook upon the adjoining rod to form the chain or train, and between each pair of hooks is caught a fuse 34, these fuses hence being disposed at intervals in the chain, and it will be perceived that by the action of heat upon any fuse its resistance to the action of the springs 32 is lost and one of the springs is enabled to draw one or more rods in one direction, while the remaining spring draws the remaining rods in the opposite direction. Each of said rods is connected, by means of adjustable collars and set-screws 35, with an extension formed upon the projecting end of the toggle-link 28, said extension preferably forking the rod, as at 36, so that when by the action of moderate heat any fuse is destroyed a movement of each rod in either one direction or the other is effected by the springs 32, whereby all the toggles are moved off from dead-center and for reasons heretofore explained the brakes are relieved and the windows caused to close, thus shutting off the supply of air to the flames and preventing rapid spread thereof.

At Fig. 4 is illustrated a manner of connecting the windows in several walls of a room by means of a single thermotic train, bell-cranks 37 being mounted at the corners

of the room for connecting adjoining chains into a single chain, the latter being provided with springs 32. As in the construction illustrated at Fig. 3, the effect of fusing any fuse at any point in the room is to cause window-closing movement of the chain, extending to all the windows in the room.

At Figs. 1 and 3 is illustrated a window-closing train running along by the windows upon the outside of the building, the rods 38 of the chain being connected in the same manner as the rods 31 and similarly operable by springs. At each window the chain is connected to a toggle-link 39, pivoted to a toggle-arm 40, similar to the arm 23. At its inner end each link is provided with a head 41, between which and the outer wall of the window-frame head is confined a compression-spring 42, which is normally held under tension or restrain by the toggle, whose operation is similar to that of the toggle 23 28. The head 41 of the link has a pin-and-slot connection at 43 to the outer end of the auxiliary lever 22, so as not to interfere with the movements of the latter already described, while the link 39 is capable of moving the auxiliary lever to release the brakes, in opposition to the power of spring 24, owing to the superior power of the link-driving spring 42. This releasing movement occurs, as will be understood, whenever any of the fuses upon the outside chain is destroyed by fire exterior to the building. At each window is provided manual means for releasing the brakes to close the sashes, consisting of a cord 44, attached at one end to the lever 22 and running thence to the exterior of the window-frame within the room and over pulleys 45 and 46, from the latter of which it hangs, carrying a bob 47. For closing all of the windows in the system at will any rod in the chain may be divided, as at 48 and 49, Fig. 5, and its ends connected by a plate 50, the latter being pivoted to the end of one rod and provided with a handle 51. The plate is provided with an eccentric slot 52, engaging a pin 53, provided upon the other rod, so that by swinging the plate up or down the chain may be either shortened or lengthened, or, in other words, longitudinal movements of the chain rods may be effected for closing the windows or resetting the brakes at will.

It will be observed that I have combined with a movable sash a pivoted member, such as 28, movable in opposite directions from a normal central position, means for enabling said sash to be closed by a movement of said pivoted member in either direction from normal central position, means urging said pivoted member in opposite directions, and fusible devices connected to said pivoted member at opposite parts thereof and effective when fused to release said pivoted member, so that it may close the sash.

Referring now to Fig. 8, the window-clos-

ing train comprises a cable 54, running through conduits 55, affixed to the outside of the building or built directly into the walls. At each window the cable runs from the ends of the conduits over pulleys 56 and through the window-head to the interior of the building, where it runs over pulleys 57, between which it is connected by adjustable collars to the toggle-link 28. The cable 54 consists of a series of lengths suitably connected by fusible links or splices 58 at points both interior and exterior of the building, where they will be readily attacked by flame or heat. Upon the fusing of any connection the cable parts and in the manner heretofore described causes the windows to close. Manual closing means for the individual window are also seen at Fig. 8, and it will be understood that the device shown at Fig. 5 for closing all the windows at will may be applied at any point in the length of the cable, whose ends are provided with springs 32.

Variations may be resorted to within the scope of my invention, and portions of my improvements may be used without others.

Having thus described my invention, I claim—

1. The combination with a window-frame, of a sash movable therein, a pair of brakes for said sash, a brake-lever disposed between said brakes, connections from said brakes to said brake-lever, means for turning said brake-lever so as to set the brakes, and a support for said brake-lever between said connections; said brake-lever being loosely mounted upon said support, in a manner to permit play of the brake-lever longitudinally of said connections, whereby the power transmitted by the brake-lever is evenly divided between the brakes.

2. The combination with a window-frame, of a sash mounted for sliding movement therein, a pair of brakes for the opposite sides of said sash, a brake-lever disposed between said brakes, connections from said brakes to said brake-lever, means for effecting length adjustment of one of said connections, a spring for turning said brake-lever so as to set the brakes, and a support for said brake-lever between said connections; said brake-lever being movable bodily upon said support in directions longitudinally of said connections.

3. The combination with a window-frame, of a sash mounted for sliding movement therein, a pair of brakes for the opposite sides of said sash, a brake-lever disposed between said brakes, connections from said brakes to said brake-lever, means for effecting length adjustment of each of said connections independently of the other, a pin-and-slot bearing for said brake-lever between said connections, said slot extending longitudinally of said connections, and means for turning said brake-lever to cause said brakes to operate.

4. The combination with a window-frame, of a pair of sliding sashes mounted therein, disproportionate counterbalances for said sashes, cables connecting said counterbalances to said sashes, pulleys over which said cables run, a pair of brakes for said pulleys, each brake being adapted to operate upon adjoining pulleys, a brake-lever between said brakes, a connection extending from said brake-lever to each brake and attached to the latter at a point between its pulleys, a support for said brake-lever between said connections, said brake-lever being movable bodily upon said support in a direction longitudinally of said connections, and means for turning said brake-lever to set the brakes.

5. The combination with a window-frame, of a pair of sliding sashes mounted therein, disproportionate counterbalances for said sashes, cables connecting said counterbalances to said sashes, pulleys over which said cables run, brake-shoes for said pulleys, means connecting the shoes at adjoining pulleys, a brake-lever, a pair of connections attached to said connecting means and also to said brake-lever, a pin-and-slot bearing for said brake-lever between said connections, said slot extending in a direction longitudinal of said connections, and means for turning said brake-lever to set the brakes; said connections being attached to said brake-lever by means of eyepieces swiveled upon the brake-lever and through which the connections extend, and nuts threaded upon the connections and binding one at each side of each eyepiece.

6. The combination with a window-frame, of a pair of sliding sashes mounted therein, a pair of brake-shoes for each sash, connecting means between adjoining brake-shoes, a brake-lever, a spring for said lever, and means for causing the power of said brake-lever to adjust itself equally to all of said brake-shoes.

7. The combination with a window-frame, of a pair of sliding sashes mounted therein, disproportionate counterbalancing means for said sashes, four cables connecting said counterbalancing means to said sashes, four pulleys for said cables, two pulleys at each side of the window-frame, a brake-shoe for each pulley, a brake-lever, a spring for said brake-lever, and means for causing the power of said brake-lever to adjust itself equally to all of said brake-shoes.

8. The combination with a sash disproportionately counterbalanced so that it constantly tends to close, a brake for preventing closing of the sash, and a lever, of a spring connected to said lever for setting the brake and holding the window open, and thermotic means for disabling the lever and spring.

9. The combination with a disproportionately-counterbalanced sash, a brake, and a lever, of means connecting said lever to said brake, a spring connected to said lever for set-

ting the brake, a movable fulcrum for said lever, and releasable means for holding said fulcrum in effective position.

10. The combination with a disproportionately-counterbalanced sash, a pair of brakes therefor, a lever, and means for enabling said lever to control said brakes, of a spring connected to said lever for setting the brakes, a thermotic device holding said spring under tension, a movable fulcrum for said lever, and releasable means for holding said fulcrum in effective position.

11. The combination with a disproportionately-counterbalanced sash, a brake, a lever, and means for enabling said lever to control said brake, of a spring connected to said lever for setting the brake, a thermotic device holding said spring in a tense condition, and thermotic means for disabling said lever and spring.

12. The combination with a disproportionately-counterbalanced sash, a brake, a lever, and means connecting said lever to said brake, of a spring connected to said lever for setting the brake, a movable fulcrum for said lever, and thermally-releasable means for holding said fulcrum in effective position.

13. The combination with a disproportionately-counterbalanced sash, a pair of brakes therefor, a lever, and means for enabling said lever to control said brakes, of a spring connected to said lever for setting the brakes, a movable fulcrum for said lever, thermally-releasable means for holding said fulcrum in effective position, and a thermotic device holding said spring in a tense condition.

14. The combination with a disproportionately-counterbalanced sash, a brake, a lever, and means for enabling said lever to control said brake, of a spring connected to said lever for setting the brake, a fulcrum-link for said lever, and releasable means for holding said link in effective position.

15. The combination with a disproportionately-counterbalanced sash, a brake, a lever, and means for enabling said lever to control said brake, of a spring connected to said lever for setting the brake, a fulcrum-link for said lever, an arm cooperating with said link to form a toggle, and means for controlling said toggle.

16. The combination with a disproportionately-counterbalanced sash, of a pair of brakes for said sash, a brake-lever, connections from said brakes to said brake-lever, a support for said brake-lever between said connections, an auxiliary lever connected to said brake-lever, a spring connected to said auxiliary lever for setting the brakes, a movable fulcrum for said auxiliary lever, and releasable means for holding said fulcrum in effective position.

17. The combination with a window-frame, of a sash movable therein, a pair of brakes for said sash, a brake-lever disposed between said brakes, connections from said brakes to said

brake-lever, a support between said connections whereon said brake-lever may move bodily longitudinally of the connections, an auxiliary lever connected to said brake-lever, a spring connected to said auxiliary brake-lever for setting the brakes, a movable fulcrum for said auxiliary lever, and thermally-releasable means for holding said fulcrum in effective position.

18. The combination with a window-frame, of a pair of sliding sashes mounted therein, disproportionate counterbalances for said sashes, cables connecting said counterbalances to said sashes, pulleys over which said cables run, a brake-shoe for each pulley, means connecting the shoes at adjoining pulleys, a brake-lever, a pair of connections attached to said connecting means and also to said brake-lever, an auxiliary lever connected to said brake-lever, a spring connected to said auxiliary lever for setting the brakes, a thermotic device holding said spring under tension, a movable fulcrum for said auxiliary lever, and thermally-releasable means for holding said fulcrum in effective position.

19. The combination with a window-frame of a sash, a member movable in opposite directions from a normal central position, means controlled by said movable member and rendered effective by the movement thereof in either direction, for closing said sash, and means for controlling said movable member.

20. The combination with a window-frame of a sash, a member movable in opposite directions from a normal central position, means controlled by said movable member and rendered effective by the movement thereof in either direction, for closing said sash, a thermotic device upon one side of said movable member, for moving it in one direction, and a thermotic device upon the opposite side of said movable member, for moving it in the opposite direction.

21. The combination with a window-frame, of a pair of sliding sashes mounted therein, a pair of brake-shoes for each sash, connecting means between adjoining brake-shoes, a brake-lever, a spring for operating said lever, means for causing the power exerted by said brake-lever to adjust itself equally among all of said brake-shoes, and thermotic means for relieving said brakes.

22. The combination with a disproportionately-counterbalanced sash, of a pair of brakes, one for each side of the sash, a brake-setting lever between said brakes, means constantly holding said lever in brake-setting position, adjustable means connecting the brake-lever to the brakes, and means for causing the brake-lever to adjust itself equally to the brakes while setting the same.

23. The combination with a disproportionately-counterbalanced sash, of a pair of brakes, one for each side of the sash, a brake-lever between said brakes, a spring connected to

said brake-lever for operating the same, a thermotic device holding said spring under tension, and means for causing the brake-lever to adjust itself equally to the brakes.

24. The combination with a disproportionately-counterbalanced sash, a brake, and a lever, of a spring connected to said lever for setting the brake, and thermotic means for disabling said lever and spring.

25. The combination with a disproportionately-counterbalanced sash, a brake, a lever, and means for enabling said lever to control said brake, of a spring connected to said lever for setting the brake, a fulcrum-link for said lever, and thermally-releasable means for holding said link in effective position.

26. The combination with a disproportionately-counterbalanced sash, a brake, a lever, and means for enabling said lever to control said brake, of a spring connected to said lever for setting the brake, a fulcrum-link for said lever, an arm coöperating with said link to form a toggle, and thermotic means for controlling said toggle.

27. The combination with a plurality of windows, each having a sash, each sash being adjustable at will independently of the other sashes to any desired height, of a train of sash-closing mechanism extending from window to window and including a series of thermotic devices, the heating of any one whereof causes said train of mechanism to operate to close all the sashes from any positions to which they may have been opened.

28. The combination with a plurality of windows, each having a sash, each sash being adjustable at will independently of the other sashes to any desired height, of a train of sash-closing mechanism extending from window to window and including a series of fusible devices connected in the train at intervals, and the fusing of any one whereof causes said train of mechanism to operate to close all the sashes from any positions to which they may have been opened.

29. The combination with a plurality of windows each provided with a sash and a counterbalance therefor, each sash being adjustable at will independently of the others to any desired height, of a train of mechanism extending from window to window and including means for controlling said counterbalances, and also including at intervals a series of fusible devices, the fusing of any of which is effective to cause a movement of said train of mechanism to close all the sashes from any positions to which they may have been opened.

30. The combination with a plurality of windows each having a plurality of sashes, each of which is adjustable at will to any desired height, of a train of mechanism extending from window to window and including means for effecting the closing of all the sashes from any positions to which they may be opened, and also including a series of thermotic de-

vices, the heating of any whereof is effective to cause the closing of all of the sashes.

31. The combination with a plurality of windows, each provided with a pair of sliding sashes and closing means therefor, of a lever at each window, means for enabling each lever to control all the sash-closing means at its window, and means for mechanically connecting said levers; said connecting means including a plurality of separated fusible devices, and also including means rendered effective by the fusing of any fusible device, for operating said levers to close the sashes.

32. The combination with a plurality of windows, each having a disproportionately-counterbalanced window-sash, of a brake for each sash, and a common releasing member extending from window to window for releasing all of the brakes in all of the windows; said releasing member being normally ineffective, and including a series of separated thermotic devices, the heating of any whereof causes said releasing member to operate.

33. The combination with a plurality of windows, each having a sash, each sash being adjustable at will to any desired extent independently of the other sashes, of a series of thermotic devices located at intervals, means mechanically connecting said thermotic devices, and means operable by said connecting means for closing all of the sashes upon the heating of any of said thermotic devices, from any positions to which said sashes may have been opened.

34. The combination with a window-frame and a pair of sliding sashes therein, each sash being adjustable at will to any desired extent independently of the other sashes, of a series of thermotic devices located at intervals, means mechanically connecting said thermotic devices, and means operable by said connecting means for closing said sashes upon the heating of any of said thermotic devices, from any positions to which said sashes may have been opened.

35. The combination with a plurality of windows, each having a pair of disproportionately-counterbalanced sashes mounted for sliding movement, of a brake for each sash, and a common member for releasing all of said brakes and including a series of separated fusible devices, the fusing of any whereof causes said common releasing member to operate.

36. The combination with a plurality of windows, each having a sliding sash provided with disproportionate counterbalancing means including weights, cables and pulleys, of brakes for said pulleys, a device at each window for operating its brakes, and a common releasing member mechanically connected to all of said brake-operating devices; said releasing member including a series of mechanically-connected thermotic devices, the heating of any whereof causes the brakes to be released.

37. The combination with a plurality of win-

dows, of a set of rods forming a chain, a thermotic device connecting each rod to the next, and means rendered effective by the heating of any thermotic device, for enabling said rods
5 to close all of said windows.

38. The combination with a plurality of windows, of a set of rods forming a chain, a fusible device connecting each rod to the next, means releasable by the fusing of any fusible
10 device, for causing endwise movements of the rods, and window-closing means operable by the rods during such movements.

39. The combination with a plurality of windows, of a set of rods forming a chain, a fusible device connecting each rod to the next, tensioned opposing springs connected to the
15 ends of the chain, and window-closing means operable by longitudinal movement of the rods.

40. The combination with a plurality of windows, of a set of rods forming a chain, means, including a set of fusible devices, for connecting
20 said rods, means releasable by the fusing of any fusible device for keeping the chain taut, and window-closing means operable by longitudinal movement of the rods in either
25 direction.

41. The combination with a plurality of windows, of rods connected by fusible connections, means tending to pull said rods apart, and
30 window-closing means operable by the rods.

42. The combination with a plurality of windows, of a set of rods forming a chain, a hook upon each end of each rod adapted to cooperate with the hook on the adjoining end of the
35 next rod, fusible devices caught between adjoining hooks, springs tensioning the chain, and means at each window connected to the chain and operable by movement thereof in either direction, for closing the window.
40

43. The combination with a plurality of windows, of a window-closing chain including a series of thermotic devices mounted at intervals, means for tensioning the chain, and a
45 window-closing mechanism at each window adjustably connected to said chain.

44. The combination with a plurality of windows, of a window-closing chain including a series of fusible devices mounted at intervals, means at the ends of the chain for tensioning
50 the same, and a window-closing mechanism at each window adjustably connected to said chain and operable by movement of the latter in either direction.

45. The combination with a plurality of windows, of a set of rods connected to make a chain, fusible devices connected at intervals in the chain, window-closing mechanism at
55 each window and adjustably connected to said chain and operable by movement of the chain in either direction, and normally dormant means releasable by the fusing of any fusible device, for effecting movement of the chain.
60

46. The combination with a plurality of windows, each having a disproportionately-coun-

terbalanced sash, a brake, a lever, and a spring connected to said lever for setting the brake, of common means extending from window to window for disabling all of said levers and
70 springs.

47. The combination with a plurality of windows, each having a disproportionately-counterbalanced sash, a brake, and means for setting the brake, of a rod or chain extending
75 from window to window, and means at each window operable by a movement of said rod or chain in either direction, for releasing the brake.

48. The combination with a plurality of windows, each having a pair of disproportionately-counterbalanced window-sashes, and a brake
80 for each of said sashes, of a set of rods, means for connecting said rods to form a chain extending from window to window, brake-releasing means at each window connected to
85 said chain, means for tensioning said chain, and thermotic devices connected at intervals in said chain and adapted when heated to release the same.

49. The combination with a plurality of windows, each having a pair of disproportionately-counterbalanced sliding sashes, a pair of brakes for each of said sashes, and a spring for setting
90 said brakes, of a chain including a series of fusible devices mounted at intervals, connecting means at each window from the chain to the brakes and operable to release the brakes by a movement of the chain in either direction, and means at the ends of the chain for
95 tensioning the same.

50. The combination with a plurality of windows, each provided with a movable sash, of a set of rods connected to make a chain, fusible devices connected at intervals in the chain, sash-closing mechanism at each window
100 adjustably connected to said chain and operable by movement of the chain in either direction, and normally dormant means releasable by the fusing of any fusible device, for effecting movement of the chain; said sash-closing
105 mechanism comprising at each window a disproportionate counterbalance at each side of the sash, cables connecting the sash to the counterbalances, and pulleys for the cables, and brakes normally acting upon the pulleys
110 but releasable by said chain.

51. The combination with a plurality of windows, each having a disproportionately-counterbalanced sash, a brake, a lever, means for enabling said lever to control said brake, a
120 spring connected to said lever for setting the brake, a movable fulcrum for said lever, and releasable means for holding said fulcrum in effective position, of means extending from window to window and inclusive of a series of
125 thermotic devices, for controlling said fulcrum-holding means; the latter being normally in effective position, but operable by a movement of said controlling means in either direction.
130

52. The combination with a plurality of windows, each having a disproportionately-counterbalanced sash, a brake, a lever, means for enabling said lever to control said brake, a spring connected to said lever for setting the brake, a fulcrum-link for said lever, and an arm coöperating with said link to form a toggle, of a series of rods and fusible devices connected together to form a chain to which said toggles are connected, and means at the ends of the chain for maintaining the same under tension.

53. The combination with a plurality of windows, each having a disproportionately-counterbalanced sash, a pair of brakes for said sash, a brake-lever, connections from said brakes to said brake-lever, an auxiliary lever connected to said brake-lever, a spring connected to said auxiliary lever for setting the brakes, a fulcrum-link for said auxiliary lever, and an arm coöperating with said link to form a toggle, of a chain extending from window to window and including a series of fusible devices connected to said toggles so that the latter may be operated to release the brakes by means of a movement of the chain in either direction, and means at the ends of said chain pulling the latter in opposite directions.

54. The combination with a plurality of windows set in different walls of a building and each window having a movable sash, each sash being adjustable at will independently of the other sashes to any desired height, of a train of sash-closing mechanism extending around the different walls from window to window and including a series of thermotic devices connected in the train at intervals, the heating of any of which effects a movement of the train to close all the sashes from any positions to which they may have been opened.

55. The combination with a plurality of windows each having a movable sash, of sash-closing mechanism common to all the windows and mounted partly within and partly without the windows, and including both within and without the windows a number of separated fusible devices, the fusing of any one whereof effects the closing of all the sashes.

56. The combination with a plurality of windows each having a movable sash, of two sash-closing mechanical trains, one upon the inside of the windows and one upon the outside, both extending to all the windows, and each including thermotic devices the heating of any one whereof effects a sash-closing movement of its train.

57. The combination with a plurality of windows each provided with a movable sash, sash-closing means, normally effective means for rendering said closing means ineffective, a spring for rendering said sash-closing means effective, and means for holding said spring under restraint, of means common to the win-

dows, and inclusive of a series of thermotic devices, for releasing all of said springs.

58. The combination with a plurality of windows each provided with a movable sash, a brake, means for setting the brake, a spring capable of releasing the brake, and means for holding said releasing-spring under restraint, of means extending from window to window for releasing all of said springs.

59. The combination with a plurality of windows each provided with a movable sash, a pair of brakes therefor, means for setting the brakes, a spring capable of releasing the brakes, and a toggle holding said releasing-spring under restraint, of a chain comprising a series of rods and fusible devices extending from window to window and connected to said toggles so that the latter may be operated by a movement of the chain in either direction, and means at the ends of the chain tending to disrupt the same.

60. The combination with a plurality of windows, each having a sash, each sash being adjustable at will independently of the other sashes, of a train of sash-closing mechanism extending from window to window and including a series of thermotic devices, the heating of any one whereof causes said train of mechanism to operate to close all of the sashes from any positions to which they may have been adjusted, and thermotic means at each window for closing the same independently of said train.

61. The combination with a plurality of windows, each having a sash and sash-closing means inclusive of a fuse upon the outer side of the window, of a train of sash-closing mechanism extending from window to window upon the inner side thereof and including a series of fusible devices, the fusing of any whereof causes said train of mechanism to operate.

62. The combination with a plurality of windows, each having a disproportionately-counterbalanced sash, a brake, and brake-releasing means, of a series of rods and fusible devices forming a chain which is connected to said releasing means, means for tensioning said chain, and manually-operable means at each window for releasing its brake.

63. The combination with a plurality of windows, each having a disproportionately-counterbalanced sash, a brake, and brake-releasing means, of means extending from window to window and inclusive of a series of separated thermotic devices, for releasing all the brakes upon the heating of any one of said thermotic devices, independent thermotic brake-releasing means at each window, and manually-operable means at each window for releasing its brake.

64. The combination with a plurality of windows, each having a sash, each sash being adjustable independently of the other sashes, of a train of sash-closing mechanism extending

from window to window and including a series of thermotic devices, and capable of closing all of the sashes from any positions to which they may have been adjusted, the heating of
 5 any one whereof causes said train of mechanism to operate, and manual means for operating said train.

65. The combination with a plurality of windows, of a series of rods and a series of fusible devices connected to form a chain extending from window to window, means at the ends of said chain for tensioning the same, window-closing means operable by movement of the chain, and means for effecting movement of
 10 said chain at will to close the windows.

66. The combination with a plurality of windows, of a set of rods forming a chain, means, including a set of fusible devices, for connecting the rods, means releasable by the fusing
 20 of any fusible device for keeping the chain tensioned, window-closing means operable by longitudinal movement of the rods in either direction, and means included in the chain for lengthening and shortening the same at will,
 25 to effect window-closing movements thereof.

67. The combination of a train of mechanism including a series of fusible devices, means at the ends of the train tending to urge the train in opposite directions, a window-sash,
 30 and sash-closing means operable by a movement of said train in either direction.

68. The combination with a movable sash, of a pivoted member movable in opposite directions from a normal central position, means
 35 for enabling said sash to be closed by a movement of said pivoted member in either direction from normal central position, means urg-

ing said pivoted member in opposite directions, and fusible devices connected to said pivoted member at opposite parts thereof and
 40 each effective when fused to release the pivoted member so that it may close the sash.

69. The combination with a movable sash, of a pivoted member movable in opposite directions from a normal central position, means
 45 for enabling said sash to be closed by a movement of said pivoted member in either direction from normal central position, thermotic devices, and oppositely-acting springs connected by said thermotic devices to said piv-
 50 oted member.

70. The combination with a disproportionately-counterbalanced sash and a brake therefor, of a pivoted member movable in opposite directions from a normal central position,
 55 means for enabling said pivoted member by a movement in either direction from such normal position to release said brake, thermotic devices, and means connected to said thermotic devices and to said pivoted member for
 60 urging the latter in opposite directions.

71. The combination with a disproportionately-counterbalanced window-sash, of a brake for maintaining the sash in any position to which it may be adjusted, and a device mov-
 65 able in opposite directions from normal position and capable, when moved in either direction, of releasing said brake and closing the sash.

HENRY COLLIER SMITH.

Witnesses:

B. C. STICKNEY,
 CHARLES H. HAIG.