

No. 776,559.

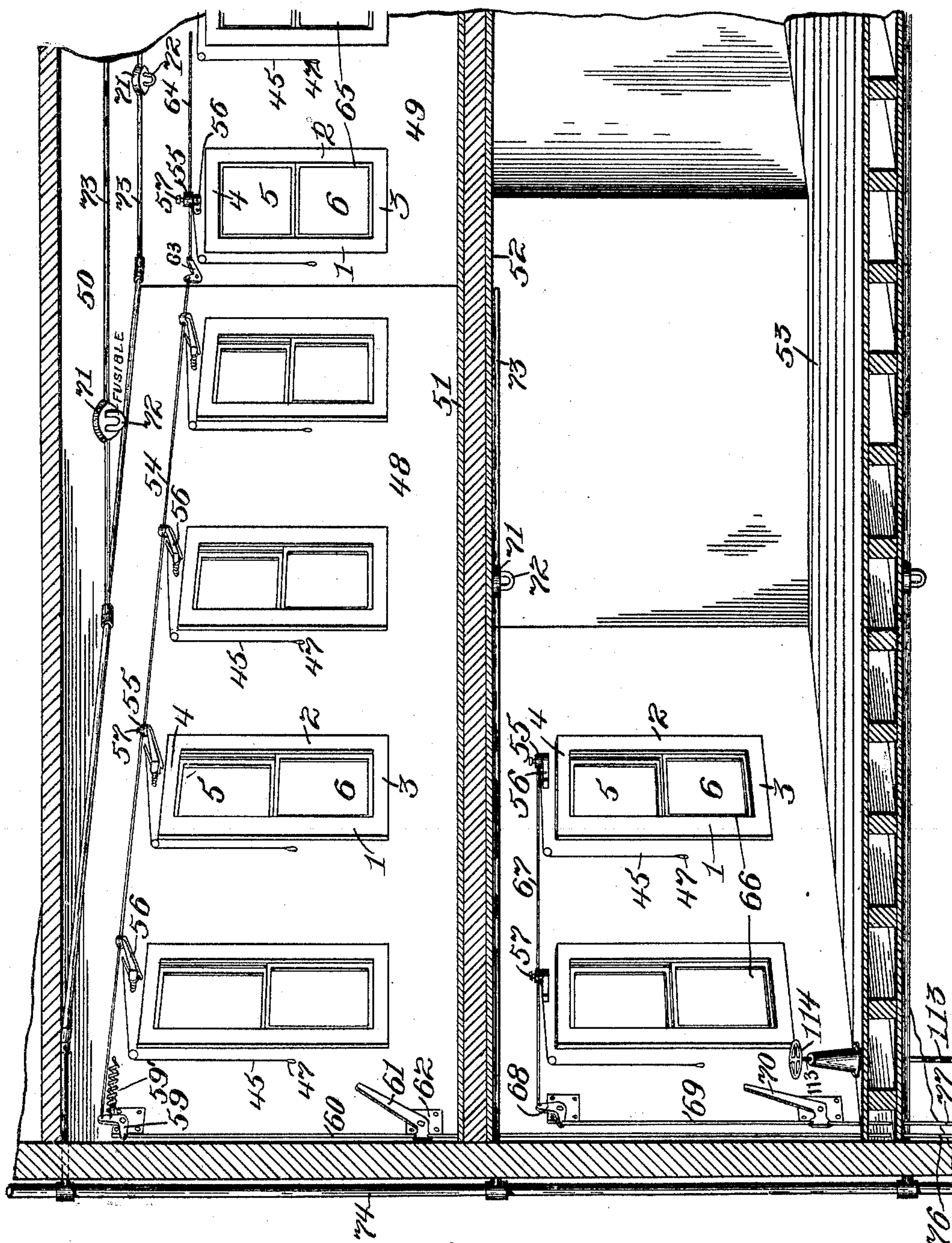
PATENTED DEC. 6, 1904.

H. C. SMITH.  
AUTOMATIC WINDOW CLOSER.

APPLICATION FILED JULY 17, 1903.

NO MODEL.

3 SHEETS--SHEET 1.



Witnesses:  
C. A. Jarvis.  
B. B. Stierney,

Fig. 1.

Inventor:  
H. Collier Smith.  
By his Attorney,  
F. A. Richards.



No. 776,559.

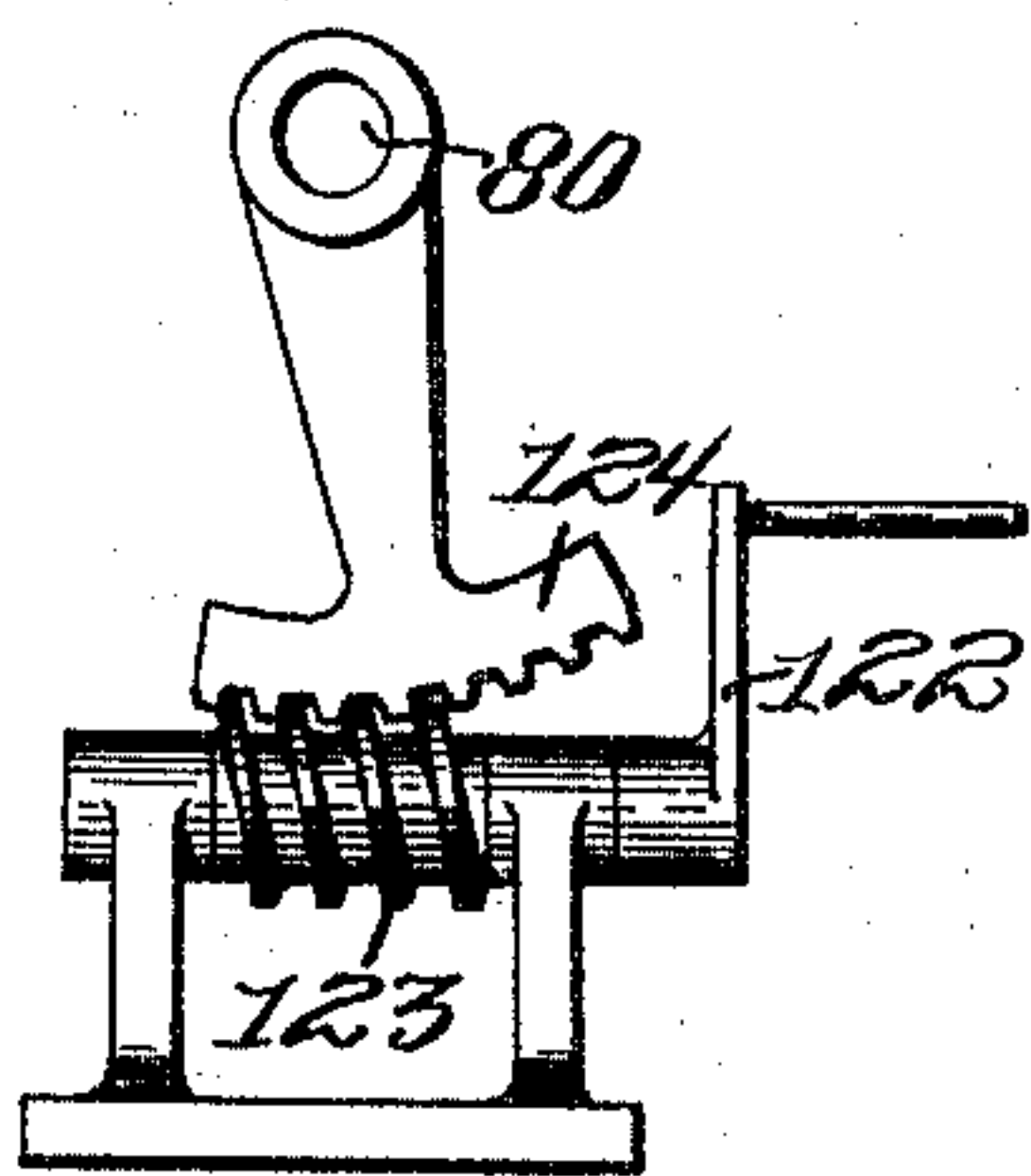
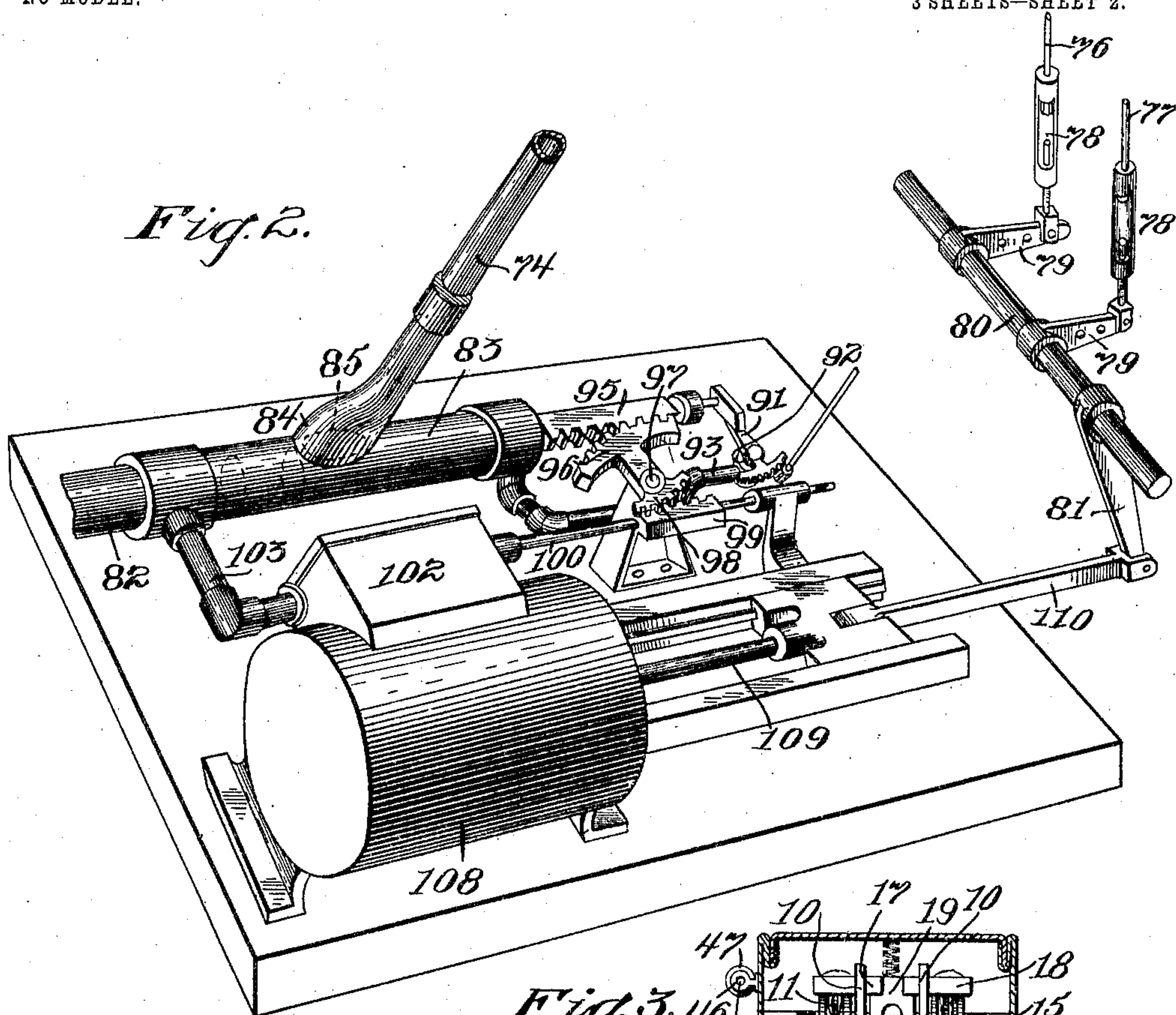
PATENTED DEC. 6, 1904.

H. C. SMITH.  
AUTOMATIC WINDOW CLOSER.

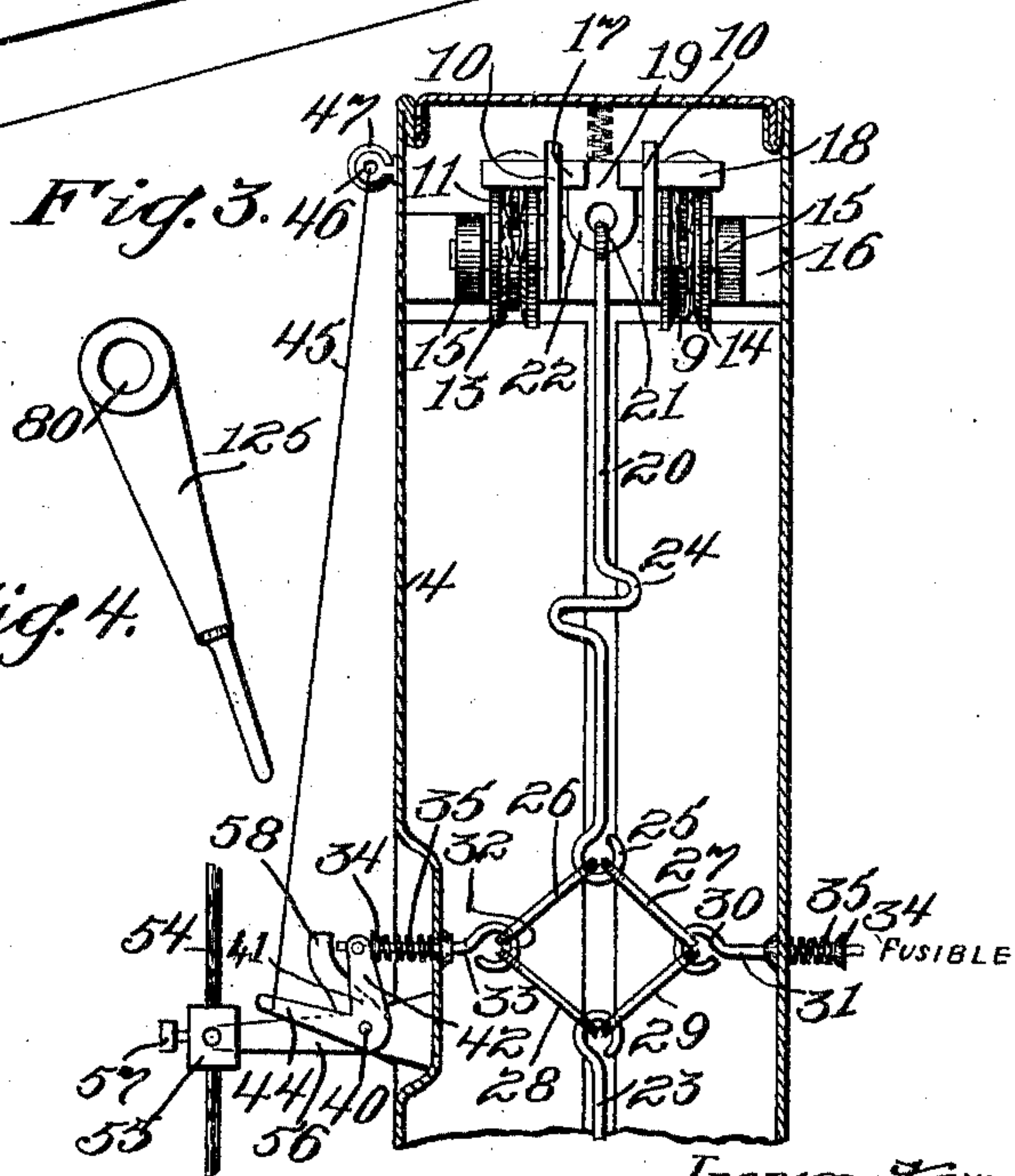
APPLICATION FILED JULY 17, 1903.

NO MODEL.

3 SHEETS—SHEET 2.



*Fig. 4.*



Witnesses:  
C. A. Jarvis.  
G. F. Fuss.

Inventor:  
H. Collier Smith.  
By his Attorney,  
F. H. Richards.



No. 776,559.

PATENTED DEC. 6, 1904.

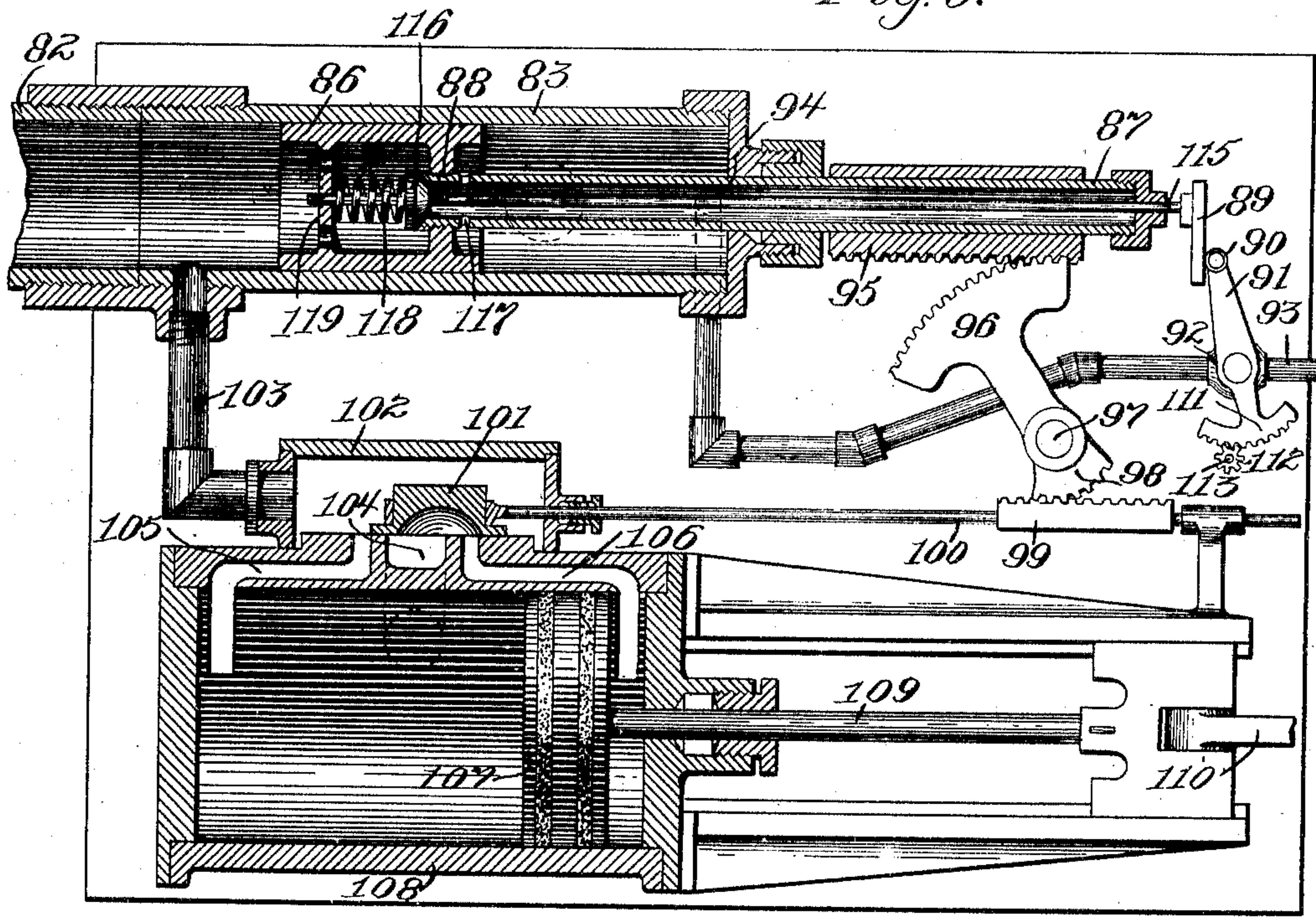
H. C. SMITH.  
AUTOMATIC WINDOW CLOSER.

APPLICATION FILED JULY 17, 1903.

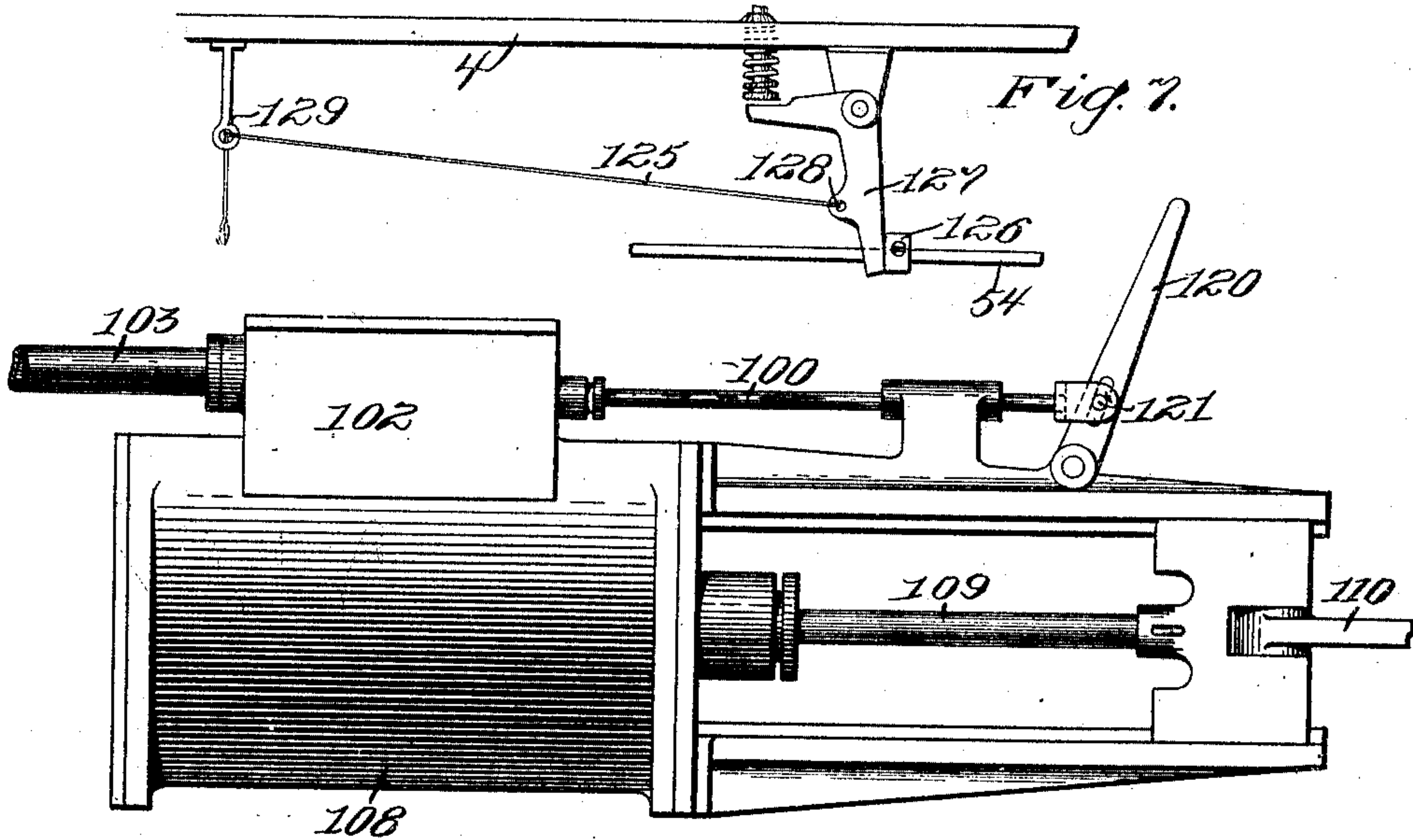
NO MODEL.

3 SHEETS—SHEET 3.

*Fig. 6.*



*Fig. 7.*



*Fig. 8.*

Witnesses:

G. G. Fuss.

B. C. Sticker.

Inventor:

H. Collier Smith.

By his attorney,

F. H. Richard.



# UNITED STATES PATENT OFFICE.

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

## AUTOMATIC WINDOW-CLOSER.

SPECIFICATION forming part of Letters Patent No. 776,559, dated December 6, 1904.

Application filed July 17, 1903. Serial No. 165,914. (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 to means for closing windows; and particularly to means for closing them automatically in case of fire either within or close to a building; and its objects are principally to facilitate the handling of the windows and to provide improved fire protection. I enable the closing devices of a plurality of windows to be operated all at once whenever desired, while the closing devices at each window may also be operated independently of those at other windows. I also enable the presence of undue heat either outside or inside of a window to effect the closing thereof independently of other windows. I also provide means for enabling the windows upon a floor to be manually released all together from the control of devices which hold them open. I make provision whereby all of the window-closing devices upon the several stories of a building are under the control of a single lever or equivalent device. I further provide for automatically closing all of the windows in a building at the same time that either an automatic sprinkler system or any stand-pipe for fire protection begins to operate to quench a fire.

Other objects, improvements, and advantages will hereinafter appear.

In the drawings forming part of this specification Figure 1 is a sectional perspective view of several stories in a building provided with my present improvements in one form. Fig. 2 is a perspective showing the lower end of an automatic sprinkler stand-pipe connected to a water-main and also operatively connected to a hydraulic engine, which in turn is adapted to control all of the window-closing devices in the building. Fig. 3 is a partial plan of the upper portion or head of a window-frame, showing automatic window-closing devices of the kind made the subject-matter of my pending application filed June 23,

1903, Serial No. 162,729. Fig. 4 is a view of a handle which may be used, if desired, for manually closing a small number of windows in several stories. Fig. 5 is a view of a winch and worm mechanism operated thereby which may be used, if desired, for closing a large number of windows in several stories. Fig. 6 is a sectional plan of the hydraulic engine seen at Fig. 2. Fig. 7 is a fragmentary plan of the preferred form of manually-operable individual window-brake releaser. Fig. 8 shows a manually-controlled hydraulic engine for closing the windows.

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

Each of the windows, which are preferably of hollow metallic fireproof construction, may consist of jambs or stiles 1 and 2, a sill 3, and a head 4. Within the latter may be located many of the parts for controlling the movements of the sashes. The upper sash is designated as 5 and the lower as 6, and each preferably slides vertically and is provided with suitable disproportionate counterbalancing means consisting of underbalancing weights for the lower sash and overbalancing weights for the upper sash, substantially as shown in Patent No. 772,260, granted to me October 11, 1904. The former are connected by cables 9 to the top of the upper sash and the latter by cables 11 to the top of the lower sash, said cables running over pulleys 14 and 13 and the general structure at both ends of the window-head being the same. The pulleys are journaled in standards 15, formed upon a bracket 16. Brake-shoes 17 and 18, preferably formed integral on a bar 19, are adapted to bear upon the peripheries of adjoining pulleys. Said bar is supported and guided upon said bracket 16 between the pulleys, and the brakes are operated or set by means of a wire connection 20, which hooks at 21 into an eye-piece 22 cast upon the brake-bar between the pulleys, whereby a longitudinal draft upon said connection produces uniform pressure of the brake-shoes upon the pulleys, the bar 19 acting as a pressure-equalizer. The braking means at the opposite end of the window-head are similar to those already described, and the rod extending therefrom toward the



center of the window-frame head is designated as 23. Each connecting-rod may have an S-bend 24 to provide for length adjustment and to render the rod yielding. At the outer end the rod is hooked at 25 to the central pivot of toggle-bars 26 and 27, while the rod 23 is similarly caught upon toggle members 28 and 29. Both toggles at one end are pivoted to an eye 30, formed upon the inner end of a screw-stem 31 and at the opposite end to an eye 32, formed upon the inner end of a screw-stem 33, so that by drawing the stems away from each other the rods 20 and 23 are drawn toward each other thereby to set the brakes. The ends of the stems 31 and 33 project outside and inside of the window-frame and each is provided upon or near its tip with a nut 34, a compression-spring 35 being interposed between the nut and the window-frame and the nut serving to regulate the tension of the spring as well as to adjust the stems 31 and 33. The springs press the rods outwardly, and their function acting through the described linkage is to hold the brakes yieldingly against the pulleys. Said nuts 34 are made of metal fusible at relatively low temperature—say  $140^{\circ}$ , more or less—and by reason of their situation are quickly attacked and melted by heat either inside or outside of the window, whereby the springs 35 are relieved of restraint, and hence all the brake-shoes are released, whereupon the upper sash is raised by its overbalancing-weights and the lower sash drops by its own weight.

Referring to Fig. 3, I pivot at 40 upon the window-head 4 a bell-crank 41, one arm 42 whereof has a bearing against the inner fusible nut 34. The other arm 44 of the bell-crank extends away from the window-frame and is provided with a cord 45, which passes through an eye 46 and carries a hand-grip 47. By pulling on the cord the bell-crank is vibrated, the stem 33 is pressed in, and the toggles relaxed sufficiently to release the brakes, so that either one or both sashes if open are enabled to close automatically.

At Fig. 1 the side wall in the upper story is designated as 48, its front wall as 49, the ceiling as 50, the floor as 51, and the ceiling of the lower story is designated as 52 and its floor as 53. Along the side wall 48 above the windows in each story extends a horizontal releasing-rod 54, which at each window is provided with a swivel-collar 55, swiveled upon a lever 56, the collar being secured to the rod by a set-screw 57, whereby the collar may be set along the rod to the point required and there secured. Said levers 56 are simultaneously operable by the rod and are adapted to release the brake-releasing means at all of the windows, each lever being provided for this purpose with an arm 58, which is adapted to bear upon the end of the stem 33, as seen best at Fig. 3. At Fig. 1 the left-hand end of said rod 54 is shown connected by a bell-crank 59

and vertical rod 60 with a lever 61, pivoted upon a bracket 62, secured to the side wall 48, so that by vibrating said lever all of the brakes in the windows may be released and the sashes closed accordingly. At its opposite end said rod 54 is connected by a suitably-disposed bell-crank 63 with a similar rod 64, having similar means for closing the windows 65 upon the front wall 49 of the building, and it will be understood that the window-closing mechanism may be continued in like manner around the remaining two walls of the room. The cord 45 may be pulled to release the sashes in any window, while by operating the handle 61 all of the windows upon the floor may be closed simultaneously. Upon releasing the handle 61 the springs 35 acting in unison operate to turn the members 36 and the rods 54 and 60 together with the lever to normal position, although, if desired, an additional draw-spring 59' may be attached to the bell-crank 59 to insure the proper return action of all the parts and enable the brakes to regain control of the pulleys and sashes.

Upon the lower story, at Fig. 1, are illustrated two windows 66, provided with a common releasing rod or member 67, which is connected by a bell-crank 68 and rod 69 to a handle 70 similar to the handle 61. It will be understood that each floor of the building may be provided with an apparatus of the kind described.

Attached to the ceiling in each story are automatic sprinkler-heads 71 of the usual type, provided with fusible members 72, which when heated to a moderate degree—say  $140^{\circ}$ , more or less—release the water, the latter flowing in through a horizontal pipe 73 and a connected stand-pipe 74, as seen at the left in Fig. 1. For causing the flow of water through the automatic sprinkler system to effect the closing of all the windows in the building I connect a hydraulic engine with the stand-pipe 74 and also prolong the vertical window-closing rods 60 and 69, as at 76 and 77, and attach the same by means of lost-motion turnbuckles 78 to arms 79, the latter being fixed upon a rock-shaft 80, having an operating-arm 81, to which is jointed the connecting-rod of the hydraulic engine, so that by the action or stroke of the engine the vertical rods may be pulled down and the brakes released in all of the windows, while by the return movement or stroke of the engine the rods may be thrust up and the brakes reset.

At Figs. 2 and 6 the water-main 82 is shown provided with a tubular head 83, to which the lower end of the stand-pipe 74 is jointed, said stand-pipe being broadened at its lower end, as at 84, and a long opening 85 being provided in the head 83, whereby the latter communicates with the stand-pipe. Between the stand-pipe and the main is an automatic sliding tubular valve 86, adapted to be driven toward the right by the water-pressure when water



flows through the stand-pipe, said valve being effective to cause the operation of the hydraulic engine. A stem 87, which at its left-hand or inner end is threaded at 88 into the head of the valve, projects to the right from the water-main head 83 and carries at its outer end a lug 89, which by engaging a roller 90, carried upon an operating-arm 91, fixed to a valve 92, is enabled to open the latter, thereby allowing the water which is confined within the head in advance of the automatic valve 86 to escape through a vent or waste-pipe 93, the latter communicating at 94 with the right-hand end of the water-main head 83, where it is in position to be closed by the automatic valve 86 at the completion of its window-closing movement. The vent-valve is opened at the initial part of the movement of the automatic valve 86, which latter, it will be understood, temporarily closes the stand-pipe 74 at the early part of its movement. The connection between the automatic valve 86 and the hydraulic engine comprises a rack 95, fixed upon the valve-stem 87, a sector 96 in mesh with the rack and pivoted at 97, a sector 98 rigid with sector 96, and a rack 99 in mesh with sector 98 and carried upon a stem 100, which operates a slide-valve 101 in the hydraulic engine. The latter may be of a construction analogous to that of a standard steam-engine and provided with a water-chest 102, containing the valve 101, and communicating by a pipe 103 with the water-main 82. The engine may also be provided with an exhaust 104 and opposite inlet-ports 105 and 106, the latter of which is opened by the movement of the automatic valve 86, admitting water behind a piston 107, contained in the cylinder 108 of the engine, so that through a piston-rod 109 a connecting-rod 110 is pulled to vibrate the arm 81 and rock-shaft 80 and operate the window-closing connections hereinbefore described. Thus the flow of water through the stand-pipe, whether the latter be connected to an automatic sprinkler or be provided at different stories with fire-hose, or both, serves to close all the windows in the building, and thereby to shut off the supply of air from the flames and materially check the spread thereof. The engine, which it will be understood is double acting, may be caused to restore the described mechanism to normal position, this movement of the engine being effective through the instrumentality of a sector 111, formed upon an extension of the valve-arm 91 and connected by a pinion 112 and shaft 113 to a hand-wheel 114, the latter placed in any desired part of the building, so that by turning said hand-wheel the shaft and pinion may be rotated and the arm 91 forced back to normal position, thereby closing the vent-valve 92 and forcing the automatic valve 86 back to normal position. During this operation the rack 95 and sector 96 restore the

slide-valve 101 to normal position, thereby opening the port 105 to the water-main and the port 106 to the exhaust 104, whereupon the piston will move to the position seen at Fig. 6, thereby resetting the brakes. In order to facilitate the return movement of the automatic valve 86, the lug 89 is preferably provided upon the end of a rod 115, projecting from the stem 87, which is made hollow, and said rod 115 carries at its inner end a conical valve 116, normally closing the inner end of the tube 87, but caused to open by the pressure of the arm 91 upon the lug 89, whereby water is admitted from the main into said stem 87, and through perforations 117 in the latter flows into the right-hand portion of the main head, thereby easing the return movement of the valve 86. A compression-spring 118 is provided between the valve 116 and a grating 119, formed within the valve, so as normally to hold the valve 116 closed.

It will be seen that the hand-wheel 114 may be operated at any time to permit the vent of the water confined within the head in advance of the automatic valve 86, so as to cause the said valve to operate, and, through the hydraulic engine, to close all the windows. This, it will be understood, may be done at the close of the day by the attendant in charge of the building, and the engine may remain in the brake-releasing position over night, so that the windows are rendered unable to stay open in the night, while in the morning, by reversing the handle 114, the brakes may be reset for the day.

At Fig. 8 a hydraulic engine is shown as manually controlled by means of a lever 120, connected by a pin and slot 121 with the valve-rod 100 of the engine, this apparatus being useful in buildings unprovided with a stand-pipe, but having numerous windows, whose closing means may be hard to operate.

At Fig. 5 is shown a winch 122 and a worm 123, the latter in mesh with a sector-gear 124, provided upon the rock-shaft 80, and this gearing may be used for manually closing the windows in buildings where water-pressure is unavailable or where there are not sufficient windows to warrant the installation of a hydraulic engine.

At Fig. 4 is shown a handle 125, which may be fixed directly upon the rock-shaft 80 to operate the same at any time, this device being sufficient to operate a small number of windows throughout a building.

At Fig. 7 the window-closing rod 54 is shown as provided with an adjustable collar 126, adapted to bear against a window-closing lever 127, which may be used in place of the two levers 41 and 44. (Seen at Fig. 3.) Each of the levers 127 is provided with an eye 128, to which is connected a cord 125, whereby the lever 127 may be operated independently of the collar 126 upon the rod 54. The latter



is passed loosely through an eye formed in the end of the lever, so as to be supported thereby, but not to interfere with the movement thereof.

5 Other 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—

10 1. The combination with a plurality of windows each having a disproportionately-counterbalanced sash, of brakes for said sashes, and a common releasing member for all of said brakes.

15 2. The combination with a plurality of windows each having a plurality of disproportionate counterbalanced sashes, of brakes for said sashes, a member at each window common to said brakes for controlling the same, 20 and a device for operating all of said controlling members so as to release all of the brakes in all of the windows simultaneously.

25 3. The combination with a plurality of windows each having an upper and lower disproportionately-counterbalanced sliding sash, of a brake for each of said sashes, and a common releasing member for all of said brakes.

30 4. In a building having rows of windows in its different side walls, each window having a disproportionately-counterbalanced sash, the combination of brakes for said sashes, a common releasing member for a row of windows in one side wall, and a second common releasing member for a row of windows in another 35 side wall; said releasing members being connected.

40 5. In a building having a plurality of stories, and a plurality of windows in each story, each window having a disproportionately-counterbalanced sash, the combination with a brake for each sash, of means common to all of the windows for releasing the brakes.

45 6. In a building having a plurality of stories and a plurality of windows in different walls in each story, each window having a disproportionately-counterbalanced sash, the combination with a brake for each sash, of a single releaser operatively connected to all of said brakes.

50 7. In a building having windows in its different side walls, each window having a disproportionately-counterbalanced sash, the combination of brakes for said sashes, a common releasing member for the windows in one wall, a second common releasing member for the windows in another wall and hydraulic 55 means for operating said releasing members automatically.

60 8. The combination with a sprinkler system, of window-closing means operatively connected thereto, and thermotic means for putting into operation both the window-closing means and the sprinkler system.

9. The combination with an automatic

65 sprinkler system, of a disproportionately-counterbalanced window-sash, a brake therefor, and means operatively connected to said sprinkler system for releasing the brake.

70 10. In a building having a plurality of windows, the combination with an automatic sprinkler system, of disproportionately-counterbalanced sashes mounted in said windows, brakes for said sashes, and means operatively connected to said sprinkler system for releasing all of said brakes. 75

80 11. In a building having several floors and provided with a plurality of windows upon each floor, the combination with an automatic sprinkler system, of means operatively connected thereto for closing the windows upon the several floors.

85 12. In a building having several stories and having its walls in each story provided with apertures, the combination with an automatic sprinkler system, of means operatively connected thereto for closing all of said apertures.

90 13. The combination with a plurality of windows each having a disproportionately-counterbalanced sash, of brakes for said sashes, a common releasing member for all of said brakes, a sprinkler system, and means connected to said sprinkler system for operating said releasing member.

95 14. The combination with a plurality of windows each having a plurality of disproportionately-counterbalanced sashes, of brakes for said sashes, a common releasing member for all of said brakes and a sprinkler system to which said releasing member is operatively connected. 100

105 15. The combination with a plurality of windows each having an upper and lower disproportionately-counterbalanced sliding sash, of brakes for said sashes, a common releasing member for all of said brakes, and a sprinkler system to which said releasing member is operatively connected.

110 16. In a building having windows in its different side walls, each window having a disproportionately-counterbalanced sash, the combination of brakes for said sashes, a common releasing member for the windows in one wall, a second common releasing member for the windows in another wall, and a sprinkler 115 system to which said releasing members are operatively connected.

120 17. In a building having a plurality of stories, and a plurality of windows in each story, each window having a disproportionately-counterbalanced sash, the combination with a brake for each sash, of means common to all of the windows for releasing the brakes, and a sprinkler system to which said releasing means are operatively connected.

125 18. In a building having a plurality of stories and a plurality of windows in different walls in each story, each window having a disproportionately-counterbalanced sash, the



combination with a brake for each sash, of a sprinkler system operatively connected to all of said brakes.

19. The combination with a plurality of windows each having a disproportionately-counterbalanced sash, of brakes for said sashes, a common releasing member for all of said brakes, and means at each window for releasing its sashes independently of the other windows.

20. The combination with a plurality of windows each having a plurality of disproportionate counterbalanced sashes, of brakes for said sashes, a common releasing member for all of said brakes, and means at each window for releasing its sashes independently of the other windows.

21. The combination with a plurality of windows each having an upper and lower disproportionately-counterbalanced sliding sash, of a brake for each of said sashes, a common releasing member for all of said brakes, and means for releasing the sashes in each window independently of the other windows.

22. In a building having windows in its different side walls, each window having a disproportionately-counterbalanced sash, the combination of brakes for said sashes, a common releasing member for the windows in one side wall, and a second common releasing member for the windows in another side wall; said releasing member being connected, and means at each window for releasing its sash independently of the other windows.

23. In a building having a plurality of stories, and a plurality of windows in each story, each window having a disproportionately-counterbalanced sash, the combination with a brake for each sash, of means common to all of the windows for releasing the brakes; and means for releasing each sash independently of the other sashes.

24. In a building having a plurality of stories and a plurality of windows in different walls in each story, each window having a disproportionately-counterbalanced sash, the combination with a brake for each sash, of a single releaser operatively connected to all of said brakes, and means for releasing each sash independently of the other sashes.

25. The combination with a plurality of windows each having a disproportionately-counterbalanced sash, of brakes for said sashes, a common releasing member for all of said brakes, a sprinkler system, means connected to said sprinkler system for operating said releasing member, and means for releasing each sash independently of the other sashes.

26. The combination with a plurality of windows each having a plurality of disproportionately-counterbalanced sliding sashes, of brakes for said sashes, a common releasing member for all of said brakes, an automatic sprinkler system to which said releasing member is operatively connected, and means at each win-

dow for releasing the sashes independently of the other windows.

27. The combination with a plurality of windows each having an upper and lower disproportionately-counterbalanced sliding sash, of brakes for said sashes, a common releasing member for all of said brakes, an automatic sprinkler system to which said releasing member is operatively connected, and means at each window for releasing its sashes independently of the other windows.

28. In a building having windows in its different side walls, each window having a disproportionately-counterbalanced sash, the combination of brakes for said sashes, a common releasing member for the windows in one wall, a second common releasing member for the windows in another wall, hydraulic means for operating said releasing members automatically, and means at each window for releasing its sashes independently of the other windows.

29. In a building having a plurality of stories, and a plurality of windows in each story, each window having a disproportionately-counterbalanced sash, the combination with a brake for each sash, of means common to all of the windows for releasing the brakes, a sprinkler system to which said releasing means are operatively connected and means at each window for releasing the sashes independently of the other windows.

30. In a building having a plurality of stories and a plurality of windows in different walls in each story, each window having a disproportionately-counterbalanced sash, the combination with a brake for each sash, of a sprinkler system operatively connected to all of said brakes, and means at each window for releasing the sashes independently of the other windows.

31. The combination with a plurality of windows each having a disproportionately-counterbalanced sash, each sash being adjustable at will independently of the other sashes to any desired extent, of brakes for said sashes, a manually-operable common releasing member for all of said brakes, a water-supply system, and means connected to said system for operating said releasing member; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

32. The combination with a plurality of windows, each having a disproportionately-counterbalanced sash, each sash being adjustable at will independently of the other sashes to any desired extent, of brakes for said sashes, a manually-operable common releasing member for all of said brakes, a water-supply system, and means connected to said system for operating said releasing member, and means for releasing each sash independently of the other sashes; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.



33. The combination with a plurality of windows each having a plurality of disproportionately-counterbalanced sashes, of brakes for said sashes, a manually-operable common releasing member for all of said brakes, and an automatic sprinkler system to which said releasing member is also operatively connected.

34. The combination with a plurality of windows each having a plurality of disproportionately-counterbalanced sashes, of brakes for said sashes, a manually-operable common releasing member for all of said brakes, and an automatic sprinkler system to which said releasing member is also operatively connected, and means at each window for releasing the sashes independently of the other windows.

35. The combination with a plurality of windows each having an upper and lower disproportionately-counterbalanced sliding sash, of brakes for said sashes, a manually-operable common releasing member for all of said brakes, and a sprinkler system to which said releasing member is also operatively connected for automatic operation.

36. The combination with a plurality of windows each having an upper and lower disproportionately-counterbalanced sliding sash, of brakes for said sashes, a manually-operable common releasing member for all of said brakes, and a sprinkler system to which said releasing member is also operatively connected for automatic operation, and means at each window for releasing its sashes independently of the other windows.

37. In a building having windows in its different side walls, each window having a disproportionately-counterbalanced sash, the combination of brakes for said sashes, a common releasing member for the windows in one wall, a second common releasing member for the windows in another wall, said releasing members being manually operable, and a sprinkler system connected to said releasing members for automatic operation.

38. In a building having a plurality of stories, and a plurality of windows in each story, each window having a disproportionately-counterbalanced sash, the combination with a brake for each sash, of manually-operable means in each story common to all of the windows in the story for releasing the brakes, and a sprinkler system to which the brake-releasing means are operatively connected.

39. In a building having a plurality of stories and a plurality of windows in different walls in each story, each window having a disproportionately-counterbalanced sash, the combination with a brake for each sash, of a sprinkler system operatively connected to all of said brakes, means for releasing all the brakes in one story independently of those in another story, and means at each window for releasing the sashes independently of the other windows.

40. The combination with a plurality of win-

dows each having a sash, each sash being adjustable at will independently of the other sashes to any desired extent, of normally ineffective closing means for said sashes, and a common member for releasing the closing means of all of said sashes; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

41. The combination with a plurality of windows each having a plurality of sashes, each sash being adjustable at will independently of the other sashes to any desired extent, of normally ineffective closing means for said sashes, and a common member for releasing the closing means of all of said sashes; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

42. The combination with a plurality of windows each having an upper and lower sliding sash, each sash being adjustable at will independently of the other sashes to any desired extent, of normally ineffective closing means for each of said sashes, and a common member for releasing the closing means of all of said sashes; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

43. In a building having a plurality of stories, and a plurality of windows in each story, each window having a movable sash, each sash being adjustable at will independently of the other sashes to any desired extent, of means common to all of the sashes for closing the same; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

44. In a building having a plurality of stories and a plurality of windows in different walls in each story, each window having a sash, each sash being adjustable at will independently of the other sashes to any desired extent, the combination with automatically-operable closing means for each sash, of a single controller operatively connected to the closing means for all of the sashes; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

45. The combination with a plurality of windows each having a disproportionately-counterbalanced sash, of brakes for said sashes, a common releasing member for all of said brakes, and thermally-controlled means for automatically operating said releasing member.

46. The combination with a plurality of windows each having a plurality of disproportionately-counterbalanced sashes, of brakes for said sashes, a common releasing member for all of said brakes, and thermally-controlled means to which said releasing member is connected for automatic operation.

47. The combination with a plurality of windows each having an upper and lower dispro-



portionately-counterbalanced sliding sash, of  
brakes for said sashes, a common releasing  
member for all of said brakes, thermally-con-  
trolled means to which said releasing member  
5 is connected for automatic operation, and  
means at each window for releasing its sashes  
independently of the other windows.

48. In a building having apertures in its  
different walls, each aperture having a dis-  
10 proportionately-counterbalanced closure, the  
combination of brakes for said closures, a  
common releasing member for the closures in  
one wall, a second common releasing member  
for the closures in another wall, and thermally-  
15 controlled means for operating said releasing  
members automatically.

49. In a building having a plurality of sto-  
ries, and a plurality of windows in each story,  
each window having a disproportionately-  
20 counterbalanced sash, the combination with a  
brake for each sash, of means common to all  
of the windows for releasing the brakes, and  
a thermally-controlled device to which said  
releasing means are connected for automatic  
25 operation.

50. In a building having a plurality of sto-  
ries and a plurality of windows in different  
walls in each story, each window having a dis-  
proportionately-counterbalanced sash, the  
30 combination with a brake for each sash, of  
thermally-controlled means connected to all  
of said brakes for automatically operating  
them, and means at each window for releasing  
the sashes independently of the other win-  
35 dows.

51. The combination with a plurality of win-  
dows, each having a sash, each sash being ad-  
justable at will independently of the other  
sashes to any desired extent, of a common  
40 controlling member for all of said sashes, and  
thermotie means for operating said control-  
ling member; each sash being provided with  
means normally effective to hold it in any po-  
sition to which it may be adjusted.

52. The combination with a plurality of win-  
dows, each having a plurality of sashes, each  
sash being adjustable at will independently of  
the other sashes to any desired extent, of a  
common controlling member for all of said  
50 sashes, and thermotie means for operating  
said controlling member; each sash being pro-  
vided with means normally effective to hold  
it in any position to which it may be adjusted.

53. The combination with a plurality of win-  
55 dows, each having an upper and lower sliding  
sash, each sash being adjustable at will inde-  
pendently of the other sashes to any desired  
extent, of a common controlling member for  
all of said sashes, and thermotie actuating  
60 means to which said controlling member is op-  
eratively connected, said actuating means in-  
cluding a plurality of independent fusible de-  
vices; and each sash being provided with  
means normally effective to hold it in any po-  
65 sition to which it may be adjusted.

54. In a building having windows in its dif-  
ferent walls, each window having normally in-  
effective sash-closing means, the combination  
of a common releasing member for the sashes  
in one wall, a second common releasing mem- 70  
ber for the sashes in another wall, and a ther-  
motie actuator to which said releasing mem-  
bers are operatively connected.

55. In a building having a plurality of sto-  
ries, and a plurality of windows in each story, 75  
each window having a sash, each sash being  
adjustable at will independently of the other  
sashes to any desired extent, the combination  
with normally ineffective closing means for  
each sash, of means common to all of the win- 80  
dows for releasing the closing means, and a  
thermotie-operative device by which said re-  
leasing means are controlled; each sash being  
provided with means normally effective to  
hold it in any position to which it may be ad- 85  
justed.

56. In a building having a plurality of sto-  
ries and a plurality of windows in different  
walls in each story, each window having a sash,  
each sash being adjustable at will independ- 90  
ently of the other sashes to any desired ex-  
tent, the combination with automatic closing  
means for each sash, of a thermotie-operative  
device operatively connected to all of said  
closing means; each sash being provided with 95  
means normally effective to hold it in any po-  
sition to which it may be adjusted.

57. The combination with a plurality of win-  
dows each having a disproportionately-coun-  
terbalanced sash, of brakes for said sashes, a 100  
thermotie releasing device for all of said  
brakes, and means at each window for re-  
leasing its sashes independently of the other  
windows.

58. The combination with a plurality of win- 105  
dows each having a plurality of disproportion-  
ately-counterbalanced sashes, of brakes for  
said sashes, a thermotie releasing device for  
all of said brakes, and means at each window  
for releasing its sashes independently of the 110  
other windows.

59. The combination with a plurality of win-  
dows each having an upper and lower dispro-  
portionately-counterbalanced sliding sash, of  
a brake for each of said sashes, a thermotie 115  
releasing device for all of said brakes, and  
means for releasing the sashes in each window  
independently of the other windows.

60. In a building having windows in its dif-  
ferent walls, each window having a dispropor- 120  
tionately-counterbalanced sash, the combina-  
tion of brakes for said sashes, a common re-  
leasing member for the windows in one wall,  
a second common releasing member for the  
windows in another side wall; a thermotie ac- 125  
tuator for said releasing members, and means  
at each window for releasing its sash independ-  
ently of the other windows.

61. In a building having a plurality of sto-  
ries, and a plurality of windows in each story, 130



each window having a disproportionately-counterbalanced sash, the combination with a brake for each sash, of thermotic means common to all of the windows for releasing the  
5 brakes; and means for releasing each sash independently of the other sashes.

62. In a building having a plurality of stories and a plurality of windows in different walls in each story, each window having a dis-  
10 proportionately - counterbalanced sash, the combination with a brake for each sash, of a single thermotic releaser operatively connected to all of said brakes, and means for releasing each sash independently of the other  
15 sashes.

63. 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 extent, of a common  
20 thermotic closing member for all of said sashes; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

64. The combination with a plurality of win-  
25 dows each having a sash, each sash being adjustable at will independently of the other sashes to any desired extent, and a common thermotic closing member for all of said sashes, of means for releasing the closing  
30 means of each sash independently of the other sashes; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

65. The combination with a plurality of win-  
35 dows each having a plurality of sliding sashes, each sash being adjustable at will independently of the other sashes to any desired extent, of a common thermotic closing member for all of said sashes; each sash being pro-  
40 vided with means normally effective to hold it in any position to which it may be adjusted.

66. The combination with a plurality of win-  
45 dows each having a plurality of sliding sashes, each sash being adjustable at will independently of the other sashes to any desired extent, of a common thermotic closing member for all of said sashes, and means at each win-  
50 dows for releasing the closing means independently of the other windows; each sash being provided with means normally effective to hold it in any position to which it may be ad-  
justed.

67. The combination with a plurality of win-  
55 dows each having an upper and lower sliding sash, each sash being adjustable at will independently of the other sashes to any desired extent, of a common thermotic closing mem-  
60 ber for all of said sashes; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

68. The combination with a plurality of win-  
65 dows each having an upper and lower sliding sash, each sash being adjustable at will independently of the other sashes to any desired extent, of a common thermotic closing mem-

ber for all of said sashes, and a single device at each window for releasing both its sashes independently of the other windows; each sash being provided with means normally effective to hold it in any position to which it  
70 may be adjusted.

69. In a building having windows in its different side walls, each window having a disproportionately-counterbalanced sash, the combination of brakes for said sashes, a common re-  
75 leasing member for the windows in one wall, a second common releasing member for the windows in another wall, thermotic means for operating said releasing members automatically, and means at each window for releasing  
80 its sashes independently of the other windows.

70. In a building having a plurality of stories, and a plurality of windows in each story, each window having a disproportionately-counterbalanced sash, the combination  
85 with a brake for each sash, of thermotic means common to all of the windows for releasing the brakes, a sprinkler system to which said releasing means are operatively connected, means at each window for releasing the sashes independ-  
90 ently of the other windows, and means upon each story for releasing all the brakes in that story.

71. In a building having a plurality of stories and a plurality of windows in different  
95 walls in each story, each window having a disproportionately - counterbalanced sash, the combination with a brake for each sash, of a thermotic actuating device operatively connected to all of said brakes, and means at each  
100 window for releasing the sashes independently of the other windows.

72. In a building having a plurality of stories and a plurality of windows in different  
105 walls in each story, each window having a disproportionately - counterbalanced sash, the combination with a brake for each sash, of a manually-operable single releaser operatively connected to all of the brakes upon each story, each releaser operable independently of the  
110 other releasers, and a thermotic device also operatively connected to said releasers for causing their automatic operation.

73. The combination with a plurality of win-  
115 dows each having a disproportionately-counterbalanced sash, of brakes for said sashes, a manually-operable common releasing member for all of said brakes, and thermotic means for operating said releasing member.

74. The combination with a plurality of win-  
120 dows each having a disproportionately-counterbalanced sash, of brakes for said sashes, a manually-operable common releasing member for all of said brakes, thermotic means for operating said releasing member, and means for  
125 releasing each sash independently of the other sashes.

75. The combination with a plurality of win-  
130 dows each having a plurality of sashes, each sash being adjustable at will independently of



the other sashes to any desired extent, of a manually-operable common member for closing all of said sashes, and a thermotic device to which said releasing member is also operatively connected; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

76. The combination with a plurality of windows each having a plurality of sashes, each sash being adjustable at will independently of the other sashes to any desired extent, of a manually-operable common member for closing all of said sashes, and a thermotic device to which said releasing member is also operatively connected, and means at each window for releasing the closing means independently of the other windows; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

77. The combination with a plurality of windows each having an upper and lower disproportionately-counterbalanced sliding sash, of brakes for said sashes, a manually-operable common releasing member for all of said brakes, and a thermotic device to which said releasing member is also operatively connected for automatic operation.

78. The combination with a plurality of windows each having an upper and lower sliding sash, each sash being adjustable at will independently of the other sashes to any desired extent, of a manually-operable common closing member for all of said sashes, and a thermotic device to which said closing member is also operatively connected for automatic operation; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

79. In a building having windows in its different side walls, each window having a disproportionately-counterbalanced sash, the combination of brakes for said sashes, a common releasing member for the windows in one wall, a second common releasing member for the windows in another wall, said releasing members being manually operable, and a sprinkler system connected to said releasing members for automatic operation.

80. In a building having a plurality of stories, and a plurality of windows in each story, each window having a sash, each sash being adjustable at will independently of the other sashes to any desired extent, the combination of manually-operable closing means in each story common to all of the windows in that story, and a thermotic device to which the sash-closing means are operatively connected; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

81. In a building having a plurality of stories and a plurality of windows in different walls in each story, each window having a sash, each sash being adjustable at will independ-

ently of the other sashes to any desired extent, the combination with means for automatically closing each sash, of a thermotic device operatively connected to all of said closing means, means for closing all the sashes in one story independently of those in another story, and means at each window for releasing the sash-closing devices independently of the other windows; each sash being provided with means normally effective to hold it in any position to which it may be adjusted.

82. The combination with an automatic sprinkler system, of a device operable by the flow of water in said system, a hydraulic engine provided with a valve which is operated by said device, and means operatively connected to said engine for closing a plurality of windows.

83. The combination with an automatic sprinkler system, of a valve between the main and the sprinkler system, and hydraulic window-closing means operatively connected to said valve.

84. The combination with a plurality of windows and a closing device common to said windows, of a hydraulic engine operatively connected to said closing device, and a sprinkler system.

85. The combination with a plurality of windows, of a window-closing device common to said windows, a hydraulic engine operatively connected to said window-closing devices, a plurality of fusible parts, and means for enabling the collapse of any fusible part to start said engine.

86. The combination with a set of windows of a closing member common to said windows, and a double-acting hydraulic engine connected to said closing member for actuating the same.

87. The combination with a set of windows of a manually-operable closing member common to said windows, and a double-acting hydraulic engine provided with means for operating said closing member.

88. The combination with an automatic sprinkler system, of a device operable by the flow of water in said system, a hydraulic engine provided with a valve which is operated by said device, and means operatively connected to said engine for closing a plurality of windows, said engine being provided with manually-controlled means for reversing its piston.

89. The combination with an automatic sprinkler system, of a valve between the main and the sprinkler system, and hydraulic window-closing means operatively connected to said valve; said closing means including a hydraulic device which is also manually operable.

90. The combination with a plurality of windows and a closing device common to said windows, of a hydraulic engine operatively con-



connected to said closing device, a sprinkler system, and thermally-operable means for controlling the sprinkler system and the hydraulic engine.

5 91. The combination with a plurality of windows, of a closing device common to said windows, a hydraulic engine operatively connected to said window-closing device, a plurality of fusible parts, means for enabling  
10 the collapse of any fusible part to bring said engine into operation, and a manually-operable device for starting said engine independently of the fuses.

15 92. The combination with a stand-pipe of a valve between the stand-pipe and the main, and operable by the flow of water in the stand-pipe, a hydraulic engine connected to the main and having an operating-valve, a connection between said valves, and a set of win-  
20 dow-closing devices operable by said engine; said engine-valve and engine being double-acting, and means being provided for manually effecting the return stroke of the valve.

25 93. The combination with a set of windows of a closing member common to said windows, a double-acting hydraulic engine connected to said closing member for actuating the same,

and an automatic sprinkler apparatus operatively connected to said hydraulic engine.

94. The combination with a set of windows 30 of a closing member common to said windows, a double-acting hydraulic engine connected to said closing member for actuating the same, and an automatic sprinkler apparatus operatively connected to said hydraulic engine, 35 and manually-operable means for causing the engine to return the window-closing member to normal position.

95. The combination with a set of windows of a manually-operable closing member com- 40 mon to said windows, a double-acting hydraulic engine provided with means for operating said closing member, and an automatic sprinkler system provided with means for operating said hydraulic engine to move said 45 closing member both from and to normal position.

Signed at Nos. 9 to 15 Murray street, New York, N. Y., this 16th day of July, 1903.

HENRY COLLIER SMITH.

Witnesses:

B. C. STICKNEY,  
FRED. J. DOLE.