P. G. WIEGERT.

WINDOW FRAME AND SASH.

APPLICATION FILED JAN. 2, 1908.

911,351.

Patented Feb. 2, 1909.

2 SHEETS—SHEET 1.

Fig. 2.

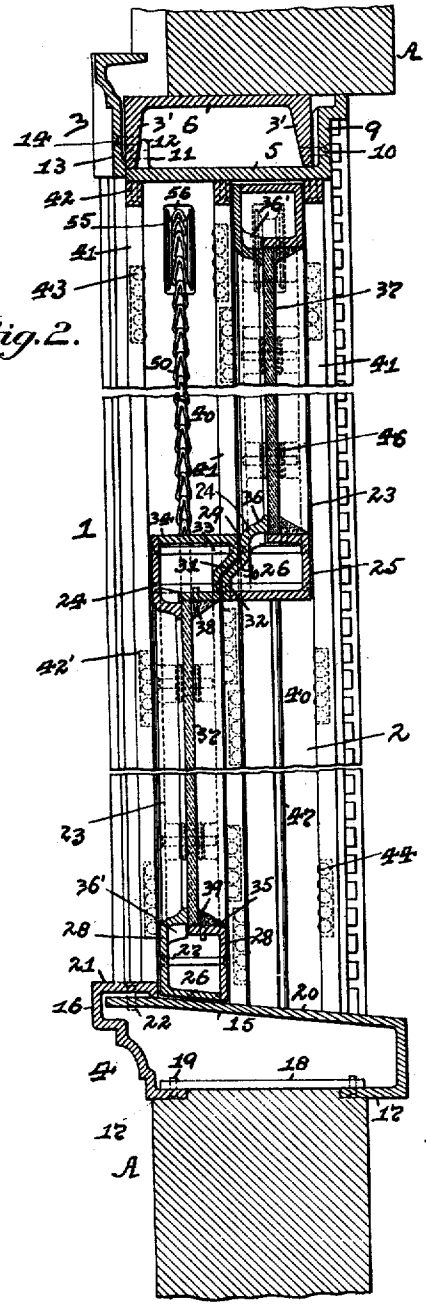


Fig. 3.

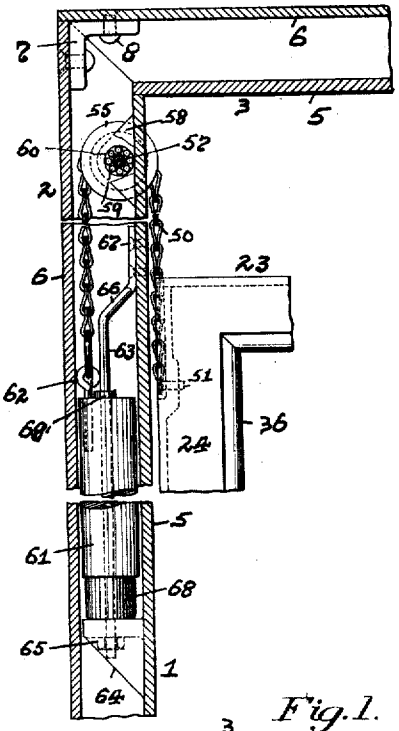
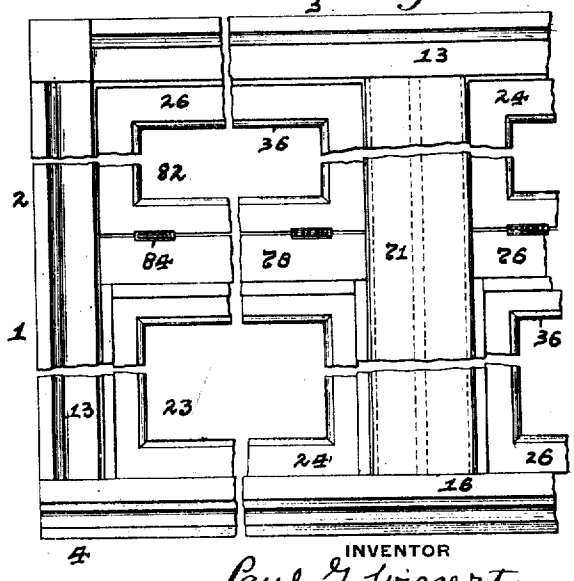


Fig. 1.



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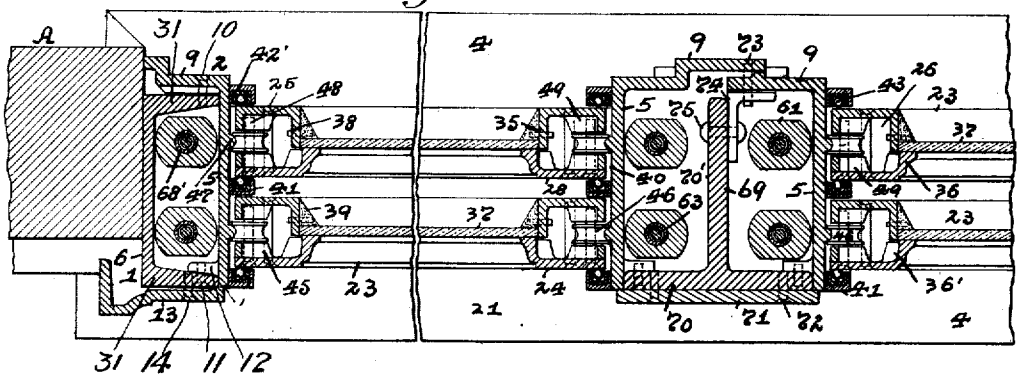
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2 SHEETS—SHEET 2.

Fig. 4.



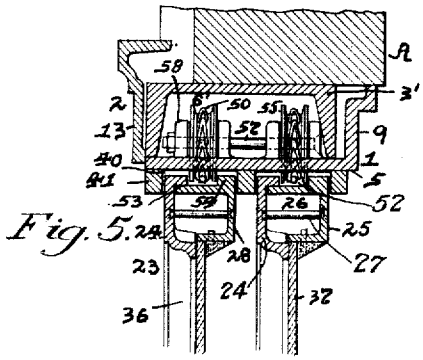


Fig. 5.

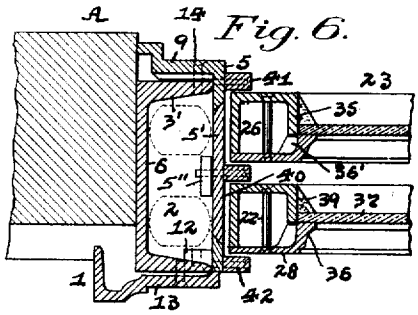
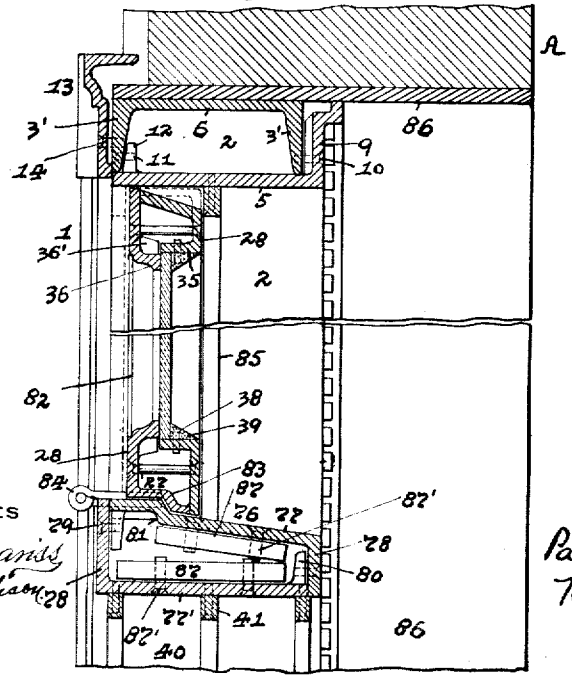


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

PAUL G. WIEGERT, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO THE STANDARD COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF OHIO.

WINDOW FRAME AND SASH.

No. 911,351. Specification of Letters Patent. Patented Feb. 2, 1909.

Application filed January 2, 1908. Serial No. 408,866.

To all whom it may concern:

Be it known that I, PAUL G. WIEGERT, a resident of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Window Frames and Sashes; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to window frames and sashes and has special reference to metallic frames and sashes.

The object of my invention is to form a cheap, simple and efficient window frame and sash which will be entirely fire-proof in its construction and with a frame or casing which will require less space in the thickness of the building wall than in the ordinary approved forms by reason of its compactness, as well as one which will dispense with the lintels ordinarily used, and so provide a frame or casing which will be of sufficient strength and weight to furnish support for the masonry equivalent to the lintels that are used for that purpose.

A still further object of my invention is to provide for a construction of sash which will allow for the clear play to avoid binding of the same in the frame, will be substantial and compact, and will have an equal bearing distributed along the same.

My invention consists, generally stated, in the novel arrangement, construction and combination of parts, as hereinafter more specifically set forth and described and particularly pointed out in the claims.

To enable others skilled in the art to which my invention appertains to construct and use my improved window frame and sash, I will describe the same more fully, referring to the accompanying drawings, in which:—

Figure 1 is a side elevation showing a portion of my improved window frame and sash. Fig. 2 is a vertical central section showing one side of the same. Fig. 3 is a side elevation of the counter-balance for the sash and showing the frame in section. Fig. 4 is a cross-section of one side of the frame and sash when used with a center mullion. Fig. 5 is a cross section of one side of the frame taken above the pulleys for the sash chain. Fig. 6 is a like view taken below the pulleys. Fig. 7 is a vertical central section of the frame showing a transom applied thereto.

Like symbols of reference herein indicate like parts in each of the figures of the drawings.

As illustrated in said drawings 1 represents the window frame or casing which is formed of metal such as iron or steel and comprises the side portions or jambs 2, the head 3 and the sill 4. The side portions or jambs 2 and head 3 are formed hollow and are each provided with the inner and outer sections 5 and 6, engaging with the masonry or brick work A, said section 5 being of L-shaped form, and said outer section 6 being in the form of a channel bar, preferably of rolled steel. These sections 5 and 6 are connected to each other at their upper adjoining and angular cut ends through the brackets 7 and rivets 8. The inner sections 5 of the jambs 2 and head 3 fit over and against the end edges of the channel flanges 3′ and are provided with a Z-shaped flange 9 thereon for forming the outer face of the frame 1 and extending to the masonry or brick-work A, and said sections and the outer sections 6 are connected together by the screws 10 engaging said flange and the outer flange 3′ of the channel forming said outer sections and by the screws 11 engaging the inner flange 3′ on said channel and a lug 12 on the inner sections 5. An inner face plate 13 fits over the inner flange 3′ on the sections 6 and over the edge of the inner section 5 and is secured to said flange by the screws 14. The sill 4 is also formed hollow and comprises the two sections 15 and 16 which rest upon the masonry or brick-work A by their flanges 17 and are connected together at their lower portions through said flanges by the bar 18 extending between the same and secured thereto by the screws 19. The section 15 is provided with the upper face 20, which is downwardly inclined in the ordinary manner towards the outer end of said section extending beyond the masonry or brick-work A, and the section 16 which forms the inner face of the sill 4 has a flange 21 extending over said upper face 20 and connected thereto by the screws 22.

Within the frame 1 are the upper and lower sashes 23 which are formed of metal such as iron or steel, and are each composed of the outer and inner L-shaped sections 24 and 25 for forming the hollow inclosed frames 26 thereof. The sections 24 and 25 for said frames 26 are connected together by

means of the bolts or rivets 27 engaging the sides 28 of said sections and the opposing sides of each of said sections at the meeting rails of the frames 26 are provided with vertical portions 29 and the projecting portions 30 having the inclined portions 31 and the vertical portions 32. The inclined portions 31 fit over and under each other to form an overlapping joint when the sashes 23 are in their closed positions, to thereby enable a substantially air tight connection to be formed at this point, and braces 33 connect the two sides of the sashes 23 for strengthening the same.

The inner section 24 on the sashes 23 is provided with the projecting portion 36 thereon which extends inwardly from the side 28 of said section and somewhat beyond the inner edge 35 on the section 25 on said sashes for forming a stop for the glass plate or light 37 and said stop is braced by a rib 36′ under the same and which abuts with said side 28. The plate or light 37 in these fireproof constructions is generally formed of wired glass and it is held in place against said stop 36 by the pins 38 inserted within said edge 35, so that the putty 39 can be afterwards placed against said light and edge to form the usual air tight connection.

The sashes 23 are adapted to move within grooves 40 formed by the outer sections 5 on the jambs 2 and head 3 and by the inner, outer and parting beads 41, preferably of rolled steel, which are placed in their usual positions and are secured to said sections by the screws 42. Mounted loosely within the channel guiding boxes 42′ set within the beads 41 on the jambs 2 are the balls 43 which extend slightly beyond the said boxes and beads and are adapted to bear against the two side faces of the sashes 23 formed by the sections 24 and 25 thereof to form the ball bearings 44. These ball bearings 44 are placed at intervals and staggered along said faces, and are so arranged to revolve within the guiding boxes 42 as to allow sufficient play for the same and will distribute an equal bearing along the two side faces of the sashes 23.

The outer side of the sashes 23 formed by the outer sections 24 of the same and facing the sections 5 of the jambs 2 are provided with the roller bearings 45 which are formed by the grooved rollers 46 arranged at intervals within and through said sections 24 and adapted to bear on a curved bead 47 formed on the said sections 6 of said jambs, so that said sashes will travel freely in the grooves 40 of the jambs 2 through said bearings. These rollers 46 are mounted on shafts 48 formed in screw-shape, and they pass through the inner sections 24 of the sashes 23 and are journaled in bearings 49 formed on said sections and the sections 25 of said sashes.

The sashes 23 are counterbalanced in the movements within the grooves 40 in the jambs 2 through the chains 50 at each side of said jambs and each connected to each outer face of said sashes by one of their ends through the screw pins 51, which are secured to the outer faces of the sections 25 of said sashes and within grooves 52 formed by a lip 53 on the sections 24 of said sashes and a shoulder 54 formed on said sections 25, so that said chains and the grooved pulleys 55 hereinafter described can be seated within said grooves in the movements of said sashes along the grooves 40. Each of the chains 50 pass over one of the pulleys 55 which are mounted within the hollow jambs 2 so as to extend through an opening 56 in the outer section 6 of said jambs and into the grooves 40, and the two pulleys on one side of each of said jambs are loosely journaled on a shaft 57 made in the form of a screw-bolt and mounted within bearings 58 formed on the inner face of said outer sections 6. The pulleys 55 have a series of balls 59 within a seat 60 formed in each of the same, which holes are adapted to engage with the shaft 57 to form a ball-bearing connection therewith for the easy movement of said pulleys and sashes 23 connected to one end of the chains 50 passing over said pulleys. The opposite ends of the chains 50 are each connected to one side of weight 61 through an eye 62, such weight being adapted to travel vertically within the hollow portion of the jambs 2 by being guided centrally on a rod 63, and the inner sections 5 of said jambs are provided with a removable section 5′ within the lower portions of the same, which is held in place by one of the screws in the parting bead engaging with lugs 5″ on said section 5 and extending over the top and bottom of said section 5′ for access to the weights and their constructions in each of said jambs. This rod 63 is located centrally of said hollow portion, and is supported at its lower end in a bracket 64 formed on the inner face of the inner jamb section 6 through a nut 65 engaging with the threaded lower end of said rod, while its upper end is bent toward said section, as at 66, and is secured to said section by the screws 67.

Between the lower end of the weight 61 and the brackets 64 and fitting around the rod 63 through an opening through the same is the bumper 68 which is formed of suitable flexible material, preferably rubber and is supported on the bracket 64. The weight 61 is formed of cast metal such as iron, and during the casting of the same a short section of a metal pipe 68′ is cast centrally within and through the same, so that said pipe will form the bearing surface for the weight guiding rod 63 passing through the same. This construction of the weight and the centrally located guiding rod for the same will enable a permanently fixed rod to be employed and it will guide the weight always

true and centrally within a narrow and hollow jamb.

When the center mullion is used within the frame or casing 1, as shown in Fig. 4, a center supporting plate or bar 69 of T-shape and preferably formed of rolled steel, is placed between the two sections 5 forming said mullion, and it is secured to said sections through its side flanges 70 in the manner hereinbefore described for the channel sections 6, while a plate 71, preferably of steel, for forming the inner facing of said mullion is placed against said bar and is secured to said flanges by the screws 72. The inner sections 5 have their flanges 9 overlapping each other and are secured together by the screws 73, which screws also extend into a bracket 74 fitting against the inner one of said flanges for securing the same and such bracket also fits against the center flange 70′ on the bar 69 for being secured thereto by the rivets 75, while such center flange will also act as a dividing wall for forming the hollow portions on each side of the same for the weights and their operating devices, as hereinbefore described.

When it is desired to use a transom in the frame or casing 1, such as is shown in Fig. 7, a hollow sill construction 76 is used between the sashes 23 and the head 3, which is formed of the top and bottom sections 77 and 77′ of substantially L-shape and secured together through their flanges 78 by screws 79 passing into lugs 80 on the main portions or bodies of said sections. The body of the top section 77 is provided with a shoulder 81 thereon around which a shoulder 83 on the bottom face of the inner section on the frame for the transom 82 engages, and with this exception and the upper face of the said frame being inclined, the two sections comprising said frame are substantially like the sections 24 and 25 for the sashes 23. The transom 82, as shown, is a tilting one and tilts on the hinge 84 connecting the same and the upper face of the sill 76 and the shape of the upper and lower faces of said transom enables it to tilt and be set against the single outer bead 85, although a stationary transom can be used, and in such case an inner bead can be used, such as is shown in dotted lines in said Fig. 7.

The head for the transom 82 is substantially like the head 3, and a plate 86 is used above and against the channel section 6 of said head, as well as like side plates against the like section of the jambs 2, so that such plates will then be between said sections and the masonry or brick-work A in this construction, and can extend outwardly beyond said head and jambs to support said wall and be varied in width according to the thickness of said wall. The side plates 86 are preferably formed of steel and are provided with flanges 87 thereon with which screws 87′ passing through the bodies of the sill sections 77 and 77′ are adapted to engage for the holding of these parts together.

It will thus be seen that as my improved window frame and sash has its main parts formed of cast metal and rolled steel, it will occupy such a small space in the thickness of the building walls that the thickness of the masonry or brick-work throughout such walls will be reduced to considerably less thickness than in the ordinary window constructions, while the frame or casing is so constructed, that with the progress of such masonry or brick-work on a building, the frame or casing will be built in as such work proceeds, and the weight and strength in this construction of frame or casing provides the necessary support for the mason work across the window spans or openings.

It will also be seen that the main members of the center mullion being formed of cast metal and rolled steel it will provide a stiffening support in the center of the window opening, as well as forming a part of the window frame or casing, while the construction of the sash will enable the same to travel freely through its two forms of bearings, by reason of said bearings engaging with three sides of the sash and within the pulleys, and the bearing within the hollow portion of the sash being concealed will not be exposed to the elements. The sash at all its points bears against the balls or rollers and not against the guides, thereby allowing clear play and avoiding binding. The form of the sash employed is more substantial and more compact than the ordinary constructions by reason of their main members being formed of cast metal, and in itself is of such section as to form stops for the glass lights, thereby doing away with separate pieces to be attached to the sash for such stops, as in such ordinary constructions.

Various other forms of sashes can be used with such frames and other forms of frames can be used with such sashes, while various modifications and changes in the design and construction of both my improved window frame and sash may be resorted to without departing from the spirit of the invention, or sacrificing any of its advantages.

What I claim as my invention, and desire to secure by Letters Patent, is:—

1. In a window structure, a hollow metallic frame or casing fitting in the window opening and composed of an outer channel section and an inner L-shaped section, said L-shaped section fitting over and against the flanges of the outer section and connected to said section.

2. In a window structure, a hollow metallic frame or casing fitting in the window opening and composed of an outer channel section and an inner L-shaped section, said L-shaped section fitting over and against the

flanges of the outer section and connected to said section through said flanges.

3. In a window structure, a hollow metallic frame or casing fitting in the window opening and composed of an outer channel section and an inner L-shaped section having lugs thereon, said L-shaped section fitting over and against the flanges of the outer section and connected to said section through said flanges and lugs.

4. In a window structure, a hollow metallic frame or casing fitting in the window opening, and a hollow metallic mullion within said frame formed of a center supporting flanged plate and sections connected together.

5. In a window structure, a hollow metallic frame or casing fitting in the window opening and a hollow metallic mullion in said frame and formed of a center supporting flanged plate and flanged sections connected together.

6. In a window structure, a hollow inclosed metallic frame or casing fitting in the window opening, and a hollow metallic mullion in said frame and formed of a T-bar and flanged sections connected together.

7. In a window structure, a hollow inclosed metallic frame or casing fitting in the window opening, and a hollow metallic mullion in said frame and formed of a T-bar and flanged sections connected together with the flanges of said sections overlapping each other.

8. In a window structure, a frame or casing fitting in the window opening, and a hollow metallic sash fitting in said frame and formed of two L-shaped flanged sections connected together one of which has a rib forming an abutment for the other.

9. In a window structure, a frame or casing fitting in the window opening, and a hollow metallic sash fitting in said frame and formed of two L-shaped flanged sections connected together, one of which has a rib forming an abutment for the other and with the flange on one section extending beyond the other to form stops for the glass plate or light.

10. In a window structure, a frame or casing fitting in the window opening, a sash fitting between guiding strips or beads on said frame, and ball-bearings in said beads and staggered on each side of the sash for engaging the sides of said sash.

11. In a window structure, the combination of the frame or casing, a sash, a pulley connected to said sash through a cord or chain, a guide-rod within said frame, a weight fitting around said rod and connected to said chain, and a flexible bumper within said frame for engaging with the lower end of said weight.

12. In a window structure, the combination of the frame or casing, a sash, a pulley connected to said sash through a cord or chain, a guide-rod within said frame, a weight fitting around said rod and connected to said chain, and a flexible bumper within said frame and fitting around said rod for engaging with the lower end of said weight.

13. In a window structure, the combination of the frame or casing, a sash, a pulley connected to said sash through a cord or chain, a guide-rod within said frame and supported thereby, a weight fitting around said rod and connected to said chain, and a flexible bumper within said frame and fitting around said rod, said bumper resting on said rod support and engaging with the lower end of said weight.

In testimony whereof I, the said PAUL G. WIEGERT, have hereunto set my hand.

PAUL G. WIEGERT.

Witnesses:
F. W. STRAUS,
R. A. KNOWLES.