

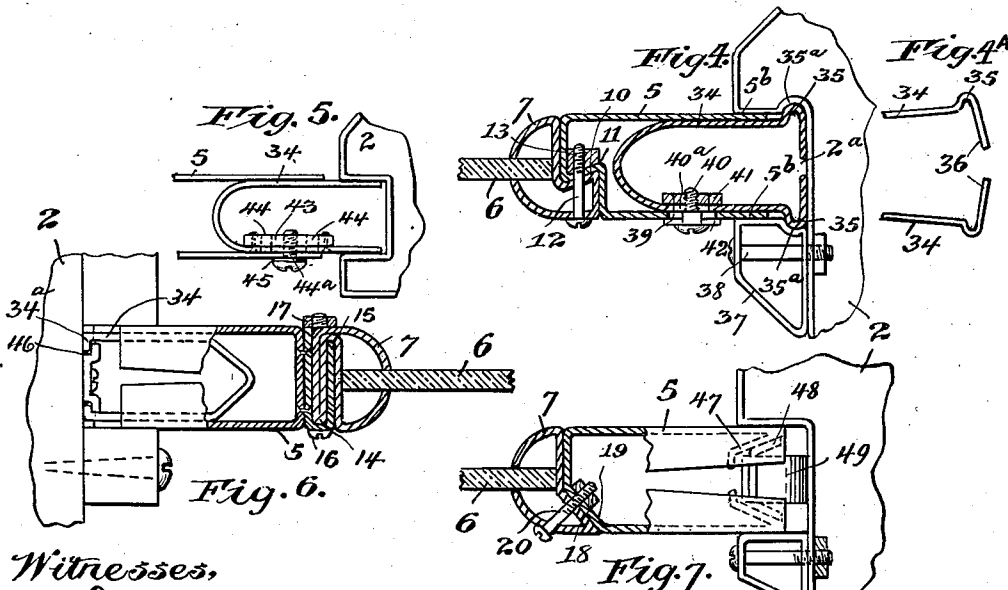
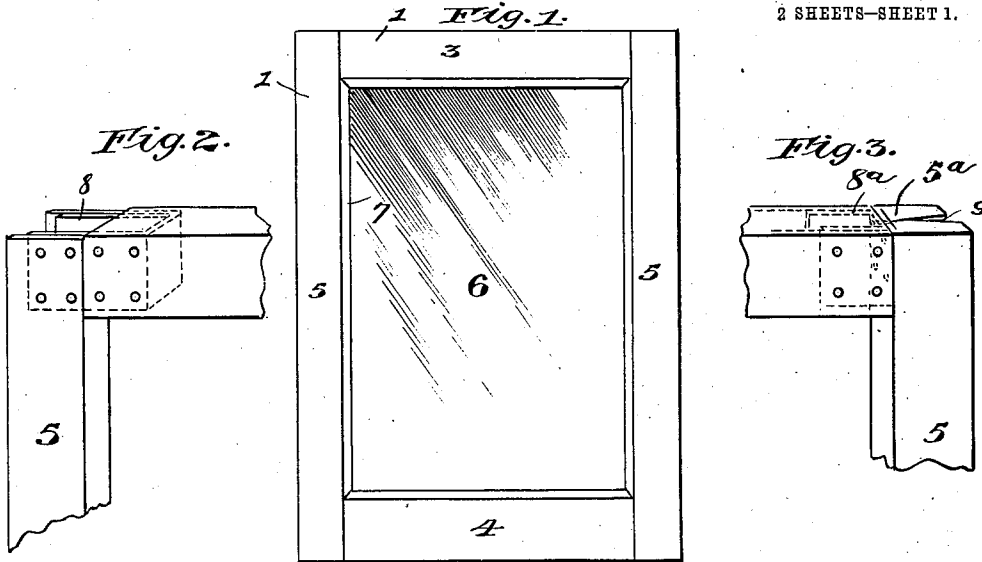
G. H. FORSYTH.
METAL SASH.

APPLICATION FILED FEB. 6, 1905.

980,937.

Patented Jan. 10, 1911.

2 SHEETS—SHEET 1.



Witnesses,
J. M. Mann,
J. N. Ford.

Inventor,
George H. Forsyth
By Affield, Fowler & Lathrop
Attys.

G. H. FORSYTH.

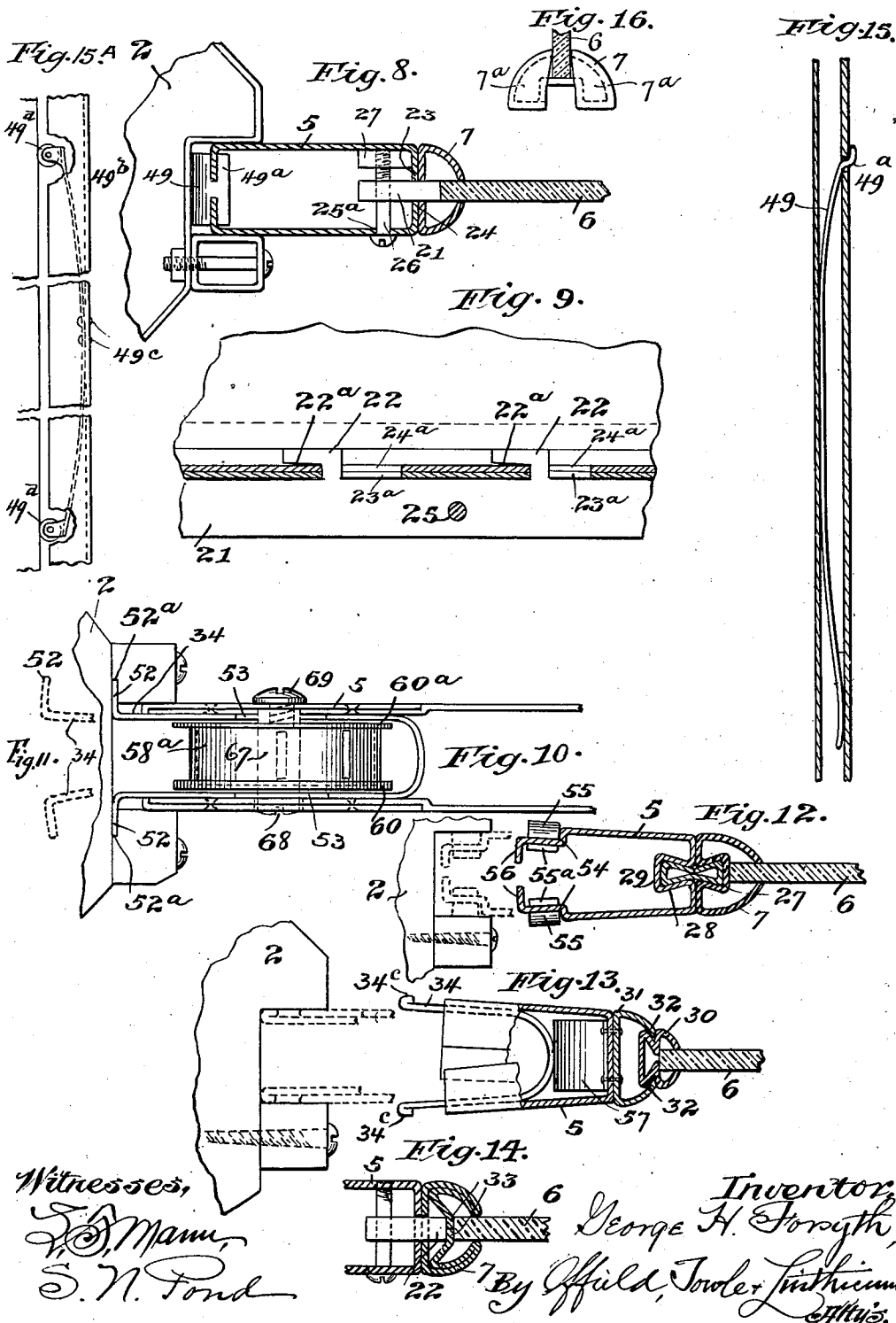
METAL SASH.

APPLICATION FILED FEB. 6, 1905.

980,937.

Patented Jan. 10, 1911.

2 SHEETS-SHEET 2.



Witnesses,
J. S. Mann,
S. N. Ford

Inventor,
George H. Forsyth,
By Alfred Fowler Smith
Attys.

UNITED STATES PATENT OFFICE.

GEORGE H. FORSYTH, OF CHICAGO, ILLINOIS.

METAL SASH.

980,937.

Specification of Letters Patent.

Patented Jan. 10, 1911.

Application filed February 6, 1905. Serial No. 244,406.

To all whom it may concern:

Be it known that I, GEORGE H. FORSYTH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Metal Sash, of which the following is a specification.

This invention has to do with metal sash, and concerns itself chiefly with that type wherein the stiles are transversely yieldable, thereby producing a snugly fitting sash that will exclude the dust and prevent rattle of the sash without binding the latter, under various conditions of weather.

In my invention, I show among other improvements novel means for adjusting the sash to varying widths of window casing and for holding the glass securely within the sash and preferably under spring tension. I also show an efficient sash balance whereby the sash may be easily raised to any desired position.

Certain matter which has been disclosed but not claimed in this application is claimed in my co-pending applications filed December 12, 1910 and given Serial No. 596,924, and Serial No. 596,925.

Referring to the drawings,—Figure 1 is a front elevational view of the sash; Figs. 2 and 3 are fragmentary views showing two possible ways of forming the joints of the sash members; Figs. 4, 4^a, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 15^a show various constructions for holding the glass within the sash, and for adjusting the latter to varying widths of window opening; Fig. 16 is an end view showing a lipping over of the beveled end of one of the glass-engaging strips.

1 designates the sash as a whole, and 2 the window casing; 3 and 4 the cross members of the sash and 5 the vertical members or stiles.

6 is the glass, and 7 the glass-engaging strips retaining the glass within the sash.

In Fig. 2, 8 is a reinforcing shell, whose sides are respectively riveted to the walls of the cross members 3 and 4 and stiles 5 of the sash. In Fig. 3 the reinforcing shell 8^a is riveted to the rear wall of the stiles 5 and to the side walls of the cross members 3 and 4. With the latter construction, I have shown the ends of the stiles as lipped over at 5^a, leaving, however, an open space 9,

which permits the sash to have transverse yielding movement at this point.

In Fig. 4 the glass-engaging strip 7 is formed at its base with an incline 10 to engage a corresponding incline 11 of the sash member. The screw 12 when passed through the registering holes of the respective inclines and screwed into the strip 13, tends to draw the strip 7 into close engagement with the member 5. In this construction and various others which I have shown, the glass-engaging strips grip and hold the glass under spring tension, and are of such a construction that, together with the glass, they can be inserted frontwise into the sash opening.

In Fig. 6 the glass-engaging strip 7 is formed with an interlocking lip 14, which engages a cooperating lip 15, which is fastened to the back wall of the sash member 5. The interlocking lips 14 and 15 are inclined toward their outer margins thereby engaging each other under tension; after which the screw 16 and its nut 17 combine to securely hold them together.

In Fig. 7 the glass-engaging strip is provided with a bevel 18, which is held against the corresponding bevel 19 of the sash member 5 by the screw 20.

In Fig. 8 the glass-engaging strip 7 is held in position against the sash member 5 by means of the key 21, shown most clearly in Fig. 9. The heads 22 pass through elongated slots 23^a in the transverse wall 23 of the sash member and registering openings 24^a in the base 24 of the strip 7. After the heads 22 have been inserted through the slots above mentioned, the key 21 is thrust forward causing the heads 22 to engage the base 24 and retain the strip 7 in position. The inner strip engaging edges 22^a of the key-heads 22, as shown in Fig. 9 are slightly inclined, thus holding the strip 7 against the sash member under constant tension. After the key 21 has been thrust forward until the holes 25 register with the holes 25^a in the side of the sash member, the screw 26 is inserted and screwed into the block 27.

In Fig. 12, the glass-engaging strip 7 is provided at its base with the reëntrant inclined guide-way 27. The sash member is also provided with a corresponding guide-way 28. After the glass and its engaging

strip 7 have been inserted within the sash opening, the locking strip 29 is also inserted endwise within the guide-ways 27 and 28 preferably under tension, thereby securely holding the glass-engaging strip 7 and the sash member together.

In Fig. 13 I employ a secondary strip 30, directly engaging the glass; which strip can be snapped into position and holding engagement with the strip 31 by its edges 32 by reason of the resiliency of the latter.

In Fig. 14 I show a slightly modified form of key engagement already described in Figs. 8 and 9; the difference being that in this latter form the glass bears against the inverted and upturned supporting base of the strip 7, instead of directly resting against the key-heads 22.

In Fig. 4, the transversely yielding adjusting strip 34 is formed along its outer edges with the ribs 35 adapted to engage corresponding depressions 35^a in the window casing guide. The strip 34 when not engaging the groove 2^a in the window casing flares outwardly, as shown in Fig. 4^a. The end portions 36 also incline outwardly. When the strip 34 is, therefore, introduced within the groove 2^a, it not only engages the recesses 35^a and the bottom of the groove 2^a under tension, but also tends to bear against and hold the outer margins of the sash members at 5^b in spring engagement with the sides of the grooves 2^a. As the sides of the sash member 5 also flare outwardly, before engaging the groove, there will be a double tendency to exclude dust and prevent rattling of the window sash. The side of the sash member is provided with a slot 39 through which a screw 40, shouldered at 40^a, is passed into a block 41, thus permitting the strip 34 to have sidewise slidable movement relatively to the sash member 5, whereby to accommodate the sash to varying distances between the bottoms of the oppositely disposed casing grooves 2^a. The washer 42 underneath the head of the screw 40 is supposed to slightly overlap the slot 39, concealing the latter from view. After the sash has been inserted within the window casing and the stop or strip 37 has been placed in position and held there by the screw 38, the sash cannot be displaced from the window casing, the slot 39 being of limited length, whereby the outer margins 5^b of the side walls of the sash member 5 cannot be withdrawn from engagement with the sides of the casing groove by sidewise displacement of the sash relative thereto.

In Fig. 5 the side walls of the sash member 5 do not enter within the groove in which the strip 34 operates. The block 43, which is riveted to the interior of the side wall of the strip 34, is provided with a plurality of threaded holes 44, into one of which the

screw 44^a, which is provided with a washer 45, is screwed. The strip may thus readily be adjusted to varying distances between the bottoms of the window casing grooves. By withdrawing the screw 44^a, the adjusting strip 34 may be retracted and withdrawn from engagement with the window casing groove, permitting the sash to be readily removed frontwise of the window casing. By this construction the guide of the casing may be integral therewith instead of being detachable as a whole or in part therefrom.

In Fig. 6 the strip 34 is formed along its outer edges with inwardly turned lipped portions 34^a which engage correspondingly lipped portions of the detachable strip 46, the latter being screwed to the window casing.

In Fig. 7 I show the groove engaging side walls of the sash member 5 bent backwardly and inwardly at an incline. The adjusting strip 48 is also provided with corresponding inclines, whereby the elongated bow spring 49 not only adapts the sash to varying distances between the bottoms of the casing grooves, but also has the effect of forcing the adjacent portions of the side walls of the sash members into spring engagement with the sides of the grooves. In Fig. 8 I also provide an elongated bow spring 49 also carried by the sash by means of a slot in the inwardly bent tongues 49^a.

In Fig. 10, the adjusting strip 34 is provided with outwardly flaring lips 52 (Fig. 11) which engage under tension the recessed portions 52^a at the bottom of the casing grooves. The adjusting strip 34 is provided with a slot 53, which permits the strip 34 to have sidewise movement relatively to the sash.

In Fig. 12 I provide the outer margins of the sash members 5 with offset portions 54 in which are located the bow springs 55, having ears 55^a entering cooperating slots in the said offset portions. The outer edges of the sash members 5 are inwardly lipped at 56.

In Fig. 13, the adjusting strip 34 has its edges turned backward at 34^c and is automatically thrust forward into yielding engagement with the bottom of the casing groove guides by the bow spring 57, which is fastened to the back wall of the sash member 5.

In Fig. 15 I show a side elevational view of a bow spring 49 attached to the sash by a hooked end 49^a.

Fig. 15^a shows a modification of the bow spring feature introducing an anti-friction feature designed to lessen the friction of the sash in the guide. In said figure 49^b designates the bow-spring which, in this case is secured as by rivets 49^c to the transverse member of the stile and carries at its ends anti-friction rollers 49^d bearing against the

bottom of the guide groove. While I have described the rollers as carried by the bow-spring 49^b, it is evident that they might be applied to any of the other members herein described as operating between the edges of the stile and the casing guides, such, for instance, as the bow-springs 55 or adjusting strip, 34.

In Fig. 16, I show lips 7^a formed at the ends of the glass-engaging strip 7, the intention being to provide bearing surfaces for the abutting ends of the adjacent strips of sufficient extent to prevent the end of one strip from becoming caught within the end of another.

I claim:

1. The combination, with a window casing having a sash guide, of a metal sash having a transversely elastic stile in transversely yieldable engagement with said guide, and means carried by the sash and capable of movement relatively thereto whereby the sash is held in yieldable engagement with the window casing.

2. The combination with a window casing having a sash guide, of a metal sash adapted to move widthwise of the casing and having a transversely elastic stile, and means for holding the sash in widthwise yieldable engagement with the casing.

3. The combination with a window casing having a sash guide, of a metal sash having a transversely elastic stile adapted to engage said guide, and means adapted to have movement relative to the latter and to maintain the sash in yieldable engagement with the window casing.

4. The combination with a window casing having sash guides, of a metal sash adapted to move widthwise of the casing and having a transversely elastic stile, and spring-actuated means for holding the sash in yielding engagement with the casing.

5. The combination with a window casing having a sash guide, of a metal sash adapted to move widthwise of the casing and having a transversely elastic stile, and spring-actuated means carried by the sash for holding the latter in yieldable engagement with the casing.

6. The combination with a window casing having a sash guide, of a metal sash having a transversely elastic stile, and means thrust outwardly relatively to the sash for holding the latter in yieldable engagement with the window casing.

7. The combination with a window casing having a sash guide, of a metal sash having a transversely elastic stile engaging said guide, and means thrust outwardly relatively to the sash for holding the latter in yieldable engagement with the window casing.

8. The combination with a window cas-

ing having a sash guide, of a metal sash having a transversely elastic stile adapted to engage the said casing guide, and means carried by the sash and also elastically engaging the said casing guide and tending to increase the strength of the engagement between the stile and the said window casing.

9. The combination with a window casing having a sash guide, of a metal sash having a transversely elastic stile adapted to engage the casing guide, and transversely elastic means adapted to adjust the sash to the casing and to increase the strength of the yielding engagement between the stile and the casing guide.

10. The combination with a window casing having a guide, of a widthwise movable sash having a transversely elastic stile engaging the said guide, and transversely elastic means adapted to hold the sash in sidewise engagement with the window casing and to increase the strength of the yielding engagement between the stile and the casing guide.

11. The combination with a window casing having a sash guide, and a sash, of an anti-friction device carried by the sash and held in yielding engagement with said guide.

12. The combination with a window casing having a sash guide, and a sash having a transversely yieldable stile, of an anti-friction device carried by the latter and yieldingly engaging said guide.

13. The combination with a window casing having a sash guide, and a metal sash, of a spring-actuated anti-friction device affording a yieldable engagement between said sash and guide.

14. The combination with a window casing having a guide groove, of a sash having a transversely elastic hollow stile and movable widthwise of the casing, an outwardly movable transversely elastic member mounted in said stile and adapted to engage the casing groove, and a spring backing for said member.

15. The combination with a window casing having a guide groove, of a sash having a transversely elastic hollow stile and movable widthwise of the casing, an outwardly movable member carried by said stile and adapted to engage the casing groove, and a spring backing for said member.

16. The combination with a window casing having a sash guide, of a sash having a transversely elastic hollow stile and movable widthwise of the casing, and an outwardly movable spring-actuated member carried by said stile serving to afford yielding engagement between said stile and guide.

17. In a metal sash having a transversely elastic hollow stile, the combination with said stile and a transverse bar, of a connec-

tion between said parts comprising a plate secured to said bar and to the side of the stile.

18. In a metal sash having a hollow bar and a transversely elastic hollow stile, the combination with said bar and stile, of a connection therebetween comprising a rectangular shell secured to one of said parts with its side members secured to the sides of the other part, and with its transverse member lying back of the transverse wall of the stile, thereby permitting transverse elasticity for the full depth of the stile.

19. In a metal sash having a hollow bar and a transversely elastic hollow stile, the combination with said bar and stile, of a connection therefor comprising a rectangular shell secured at its sides to the sides of said stile and bar and having its transverse member disposed inwardly of the transverse wall of the stile, thereby permitting transverse elasticity for the full depth of the stile.

20. The combination with a sash stile and a guide therefor, of means operating to press the sides of the stile into engagement with the guide.

21. The combination with a hollow sash stile and a guide therefor, of means for securing yieldable engagement between a side of the stile and the guide.

22. The combination with a hollow sash stile and a guide therefor, of means carried by the sash for securing yieldable engagement between a side of the stile and the guide.

23. The combination with a sash and guides therefor, of means for adjusting the sash widthwise relatively to the guides and for securing yieldable engagement between a side of the stile and a guide.

24. The combination with sash guides and a sash having a stile in transversely yieldable engagement with its guide, of means for effecting widthwise adjustment of the sash relatively to the guides.

25. The combination with sash guides and a sash stile having transversely yieldable engagement with its guide, of automatic means for effecting widthwise adjustment of the sash relatively to its guides.

26. The combination with a stile having a movable side, and a guide for said stile, of means for securing yieldable engagement between said movable side and the guide.

27. The combination with a sash having a stile provided with a movable side, and sash guides, of means for adjusting the sash widthwise relatively to the guides and for securing yieldable engagement between said movable side and a guide.

28. The combination with sash guides, and a sash having a stile provided with a movable side, of means for effecting widthwise adjustment of the sash relatively to

the guides and for securing yieldable engagement between said movable side and a guide.

29. The combination with a sash stile and a guide therefor, of means operating to press the sides of the stile into elastic engagement with the guides.

30. The combination with a sash stile and a guide therefor, of means carried by the sash operating to press the sides of the stile into engagement with the guide.

31. The combination with a sash and guides therefor, of means lying within the plane of the guides and operating to automatically press a side of a sash stile into engagement with its guide.

32. The combination with a sash stile and a guide therefor, of means lying within the stile and operating to press the sides of the latter into engagement with the guide.

33. The combination with a sash and guides therefor, of means operating to adjust the sash widthwise relatively to its guides, said means also operating to press the sides of the stile into engagement with said guides.

34. The combination with a sash and guides therefor, of means operating to adjust the sash widthwise relatively to its guides, said means also operating to press a side of the stile into elastic engagement with its guide.

35. The combination with a sash and guides therefor, of means carried by the sash operating to adjust the sash widthwise in its guides, said means also operating to press a side of the stile into engagement with its guide.

36. The combination with a sash and guides therefor, of means carried within a stile of the sash serving to adjust the sash widthwise in its guides, said means also operating to press a side of the stile into engagement with its guide.

37. The combination with sash stiles and sash guide-grooves, of a strip carried by the sash and having interlocking engagement with said guide-grooves whereby to prevent lateral displacement of the sash from the guide-grooves under variations in distance between the latter.

38. The combination with sash stiles and sash guides, of a strip carried by the sash, and a detachable strip applied to one of said guides, said strips having interlocking relatively slidable parts whereby to prevent the sash from lateral displacement relatively to the guides under variations in distance between the latter.

39. The combination with a sash and a guide therefor, of a member between said sash and guide having elastic engagement with the latter both transversely of the guide and in the plane of the sash.

40. The combination with a sash and a guide therefor, of a member between said sash and guide having elastic engagement with both sides of the guide, said member being also yieldable widthwise of the sash.

41. The combination with a sash and guides therefor, of means lying within the

plane of the guides and operating to press the sides of a sash stile into engagement with its guide.

GEORGE H. FORSYTH.

Witnesses:

SAMUEL N. POND,

FREDERICK C. GOODWIN.