Aug. 16, 1932. H. G. KLOPP 1,871,618

WINDOW FRAME

Original Filed April 17, 1929

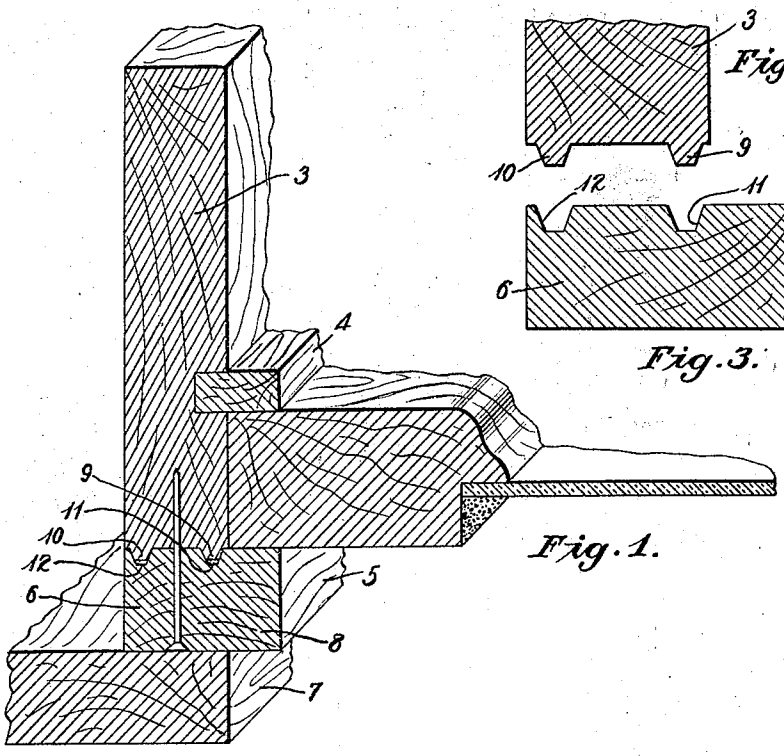

Fig. 1.

Fig. 2.

Fig. 3.

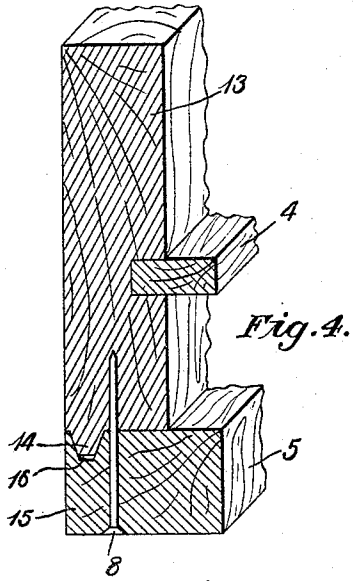

Fig. 4.

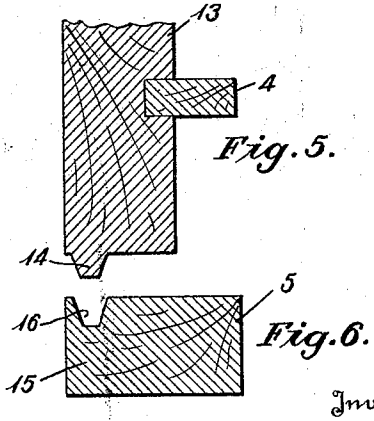

Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE

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WINDOW FRAME

Original application filed April 17, 1929, Serial No. 355,865. Patent No. 1,790,428. Divided and this application filed December 13, 1930. Serial No. 502,216.

This invention relates to window frames.

The invention relates particularly to the construction of the pulley stiles and blind stops, the former being the side, upright rails of the frame and the latter being wooden strips that are secured to the stile and cooperate with parting strips to form the groove in which the upper sash slides.

The invention concerns particularly an interlocking groove and tongue connection between the pulley stiles and blind stops respectively, whereby the same are weatherproof and can be mated at the point of assembly, irrespective of expansion and contraction of the wood composing the same.

In the window frame art the connection between the blind stop and the pulley stile respectively was, at first, of flat formation. In the practical art this was called a "surfaced four sides" connection. For windproofing and weatherproofing the connection relied entirely upon the tightness of the connection between the flat contacting surfaces of the blind stop and pulley stile respectively.

The practical art later utilized a tongue and groove connection between these parts in an effort to increase the weatherproof and moistureproof qualities of the connection. These tongue and groove connections comprised a square bottom groove and a round nose tongue or a square tongue. In the industry today the sections constituting the window frames are required to be shipped in knock-down condition to the point of assembly. Thus they may be manufactured in the State of Washington and shipped in knocked-down condition to say the State of New York. Due to the expansion and contraction a tight interfitting connection between the tongue and walls of the groove could not be obtained because the grooves necessarily were required to be of considerably wider dimensions than the tongues.

Such connections, therefore, would afford merely an air baffle but their waterproofing characteristics proved to be negligible. As the result, in the practical art, it has been my experience that manufacturers considered the disadvantages attending the use of the square groove and tongue connection to outweigh their advantages and as the result, up until the advent of this invention, most practical workers in the art preferred the original construction wherein the faces between the blind stops and pulley stiles respectively were flat.

My invention is based upon the conception that a blind stop may be provided with oppositely beveled walls of tapered formation acting in cooperation with complemental tapered tongues, which tongues are preferably not as great in length as the grooves for the purpose hereinafter stated.

I have found that this construction actually seals the connection against weather because of the constantly contacting faces of the tapered tongues with the grooves irrespective of problems of expansion and contraction, when shipping in knocked-down condition, the parts constituting the window frame.

By the utilization and embodiment of my invention in window frames the parts of the frame may be shipped to the job and there assembled with convenience and accuracy, a weather-tight joint between the pulley stile and the blind stop is insured; warping of the parts is prevented, and a permanently true groove is provided in which the sash may slide without binding. The parts may also be accurately assembled without the necessity of special tools and also without the necessity of skilled labor.

Referring now to the drawing wherein corresponding numerals represent like parts,

Figure 1 illustrates one complete example of the physical embodiment of the invention in a horizontal perspective view in section at one side of the window frame;

Figures 2 and 3 are sectional views of a portion of a pulley stile with wedge-shaped tongues and a blind stop or strip having complementary grooves in its face;

Figure 4 is a sectional view partly in perspective of a portion of a window frame in which a single tongue and groove is used; and

Figures 5 and 6 are sectional views showing respectively a portion of the pulley stile and a portion of the blind stop of Figure 4.

This application is a divisional of my application Serial No. 355,865, filed April 17,

1929, which matured into Patent 1,790,428, Jan. 27, 1931, which application is addressed to the improvement set forth in Figures 1 and 2 while the present application is addressed to the invention disclosed in Figures 4, 5 and 6.

The window frame comprises the vertical or upright stile 3, one used at each side of the frame although only one stile is herein shown, and the parting strip 4 is secured in the usual manner in the groove provided in the inner face of the stile.

The groove for the upper sash is formed by the parting strip 4 and the overlapping edge 5 of the blind stop 6, the latter being partly covered by the outer casing 7. The blind stop 6 is wider than the thickness of the pulley stile to provide the overlapping edge 5 after the sash and a suitable number of nails 8 are used to secure the blind stop in the edge of the pulley stile.

For use as guides in accurately assembling the parts, to secure a weathertight joint, and to interlock the parts to prevent warping, the edge of the pulley stile adjacent the blind stop is provided with a pair of spaced parallel tongues 9 and 10 which are wedge-shaped in cross section, with both sides being correspondingly tapered, and these tongues are fitted into complementary grooves 11 and 12 in the adjoining face of the blind stop. The depth of the grooves is preferably greater than the depth of the tongues in order that the wedge-shaped tongues may be forced into the grooves to insure maximum frictional contact of the sides of the tongues with the side walls of the grooves and to hold the adjoining faces of the pulley stile and the blind stop in close contact. These tapering sides of the tongues and tapering side walls of the groove also insure a tight joint even though shrinkage should take place in either the stile or blind stop.

The stile and blind stop are thus capable of being assembled with accuracy as the tongues and grooves act as guides to secure tightness and true alignment in assembling the parts.

In Figures 4, 5 and 6 the invention is disclosed wherein the stile 13 has a single groove 14 and the blind stop 15 has a single complementary groove 16. The claim of this application is addressed to this latter invention.

As will be noted from an inspection of Figure 4, the blind stop 5 is grooved near an edge thereof and the pulley stile has formed thereon the wedge-shaped tongue 14 near a corresponding edge thereof. This is highly important because it provides a space for the nail 8, in a perpendicular direction, whereby to equalize compressive forces relative to the tapered contacting surfaces without splitting the tongue. If a tongue and groove connection were placed in the middle it would be difficult to drive the nail in a perpendicular direction without splitting the tongue or without causing the compressive forces upon the tapered contacting surfaces to be equalized.

It will be apparent from the foregoing description that the weather proof joint is in the connection between the sides of the tongue and the side walls of the groove and is present at all times irrespective of differential expansion or contraction of the blind stop and pulley stile respectively. The tongue and groove connection thus performs not only a wind baffle but a weathertight, seal joint, as well.

As the grains of the stile and blind stop run in different directions these parts themselves, together with the tongues and grooves, aid in stiffening the frame against warping and in maintaining the sash groove in true alignment, thus avoiding the danger of binding the sash.

Having thus described my invention, what I claim is:

In a window frame, the combination with a pulley stile having a longitudinally extending tongue near one side thereof, said tongue having its opposite edges correspondingly tapered relatively to each other to define a wedge-shaped element, of a blind stop having a groove complemental in shape to the tongue, said groove being placed near the corresponding side of the blind stop, and a fastening device driven into the blind stop in a perpendicular direction whereby to equalize the compressive forces relative to said tapered contacting surfaces, said fastening device being offset from the tongue and groove connection whereby to prevent splitting of the tongue.

In testimony whereof I affix my signature.

HENRY G. KLOPP.