July 3, 1945. H. P. RICHARDS 2,379,747

DETACHABLE FRAMELESS SCREEN

Filed Sept. 9, 1944 2 Sheets-Sheet 1

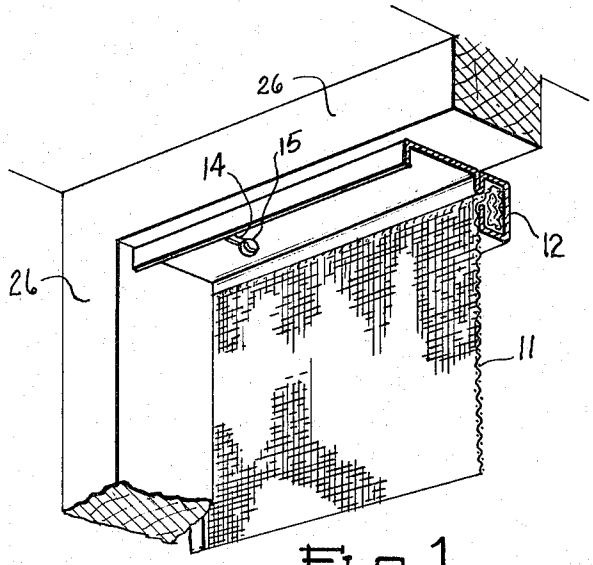
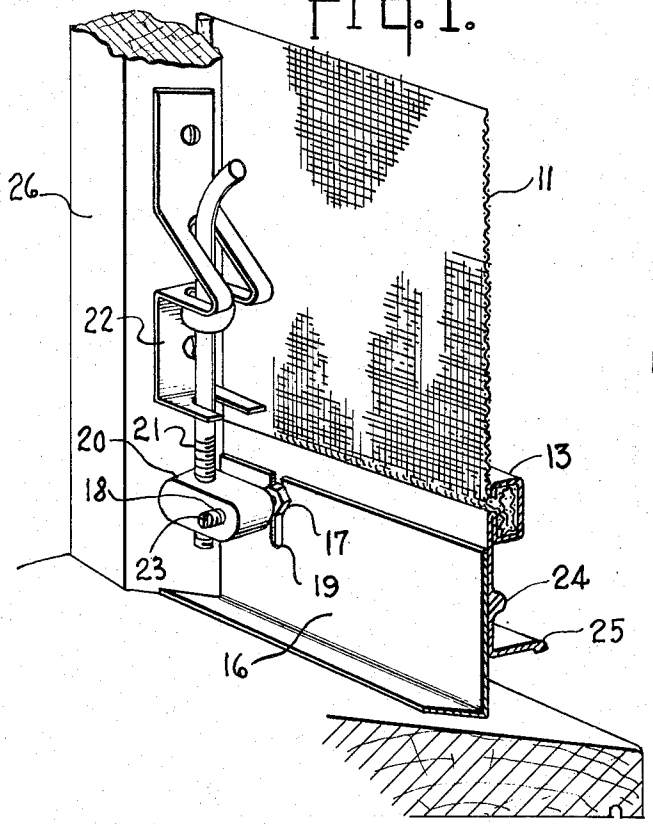


Fig. 1.



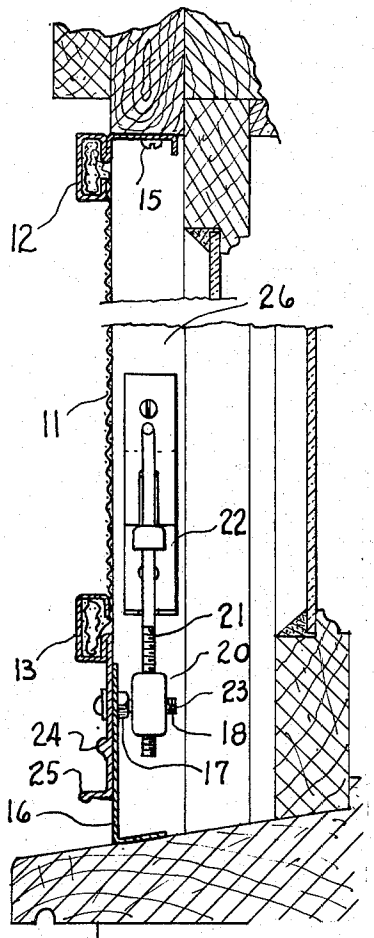


Fig. 2.

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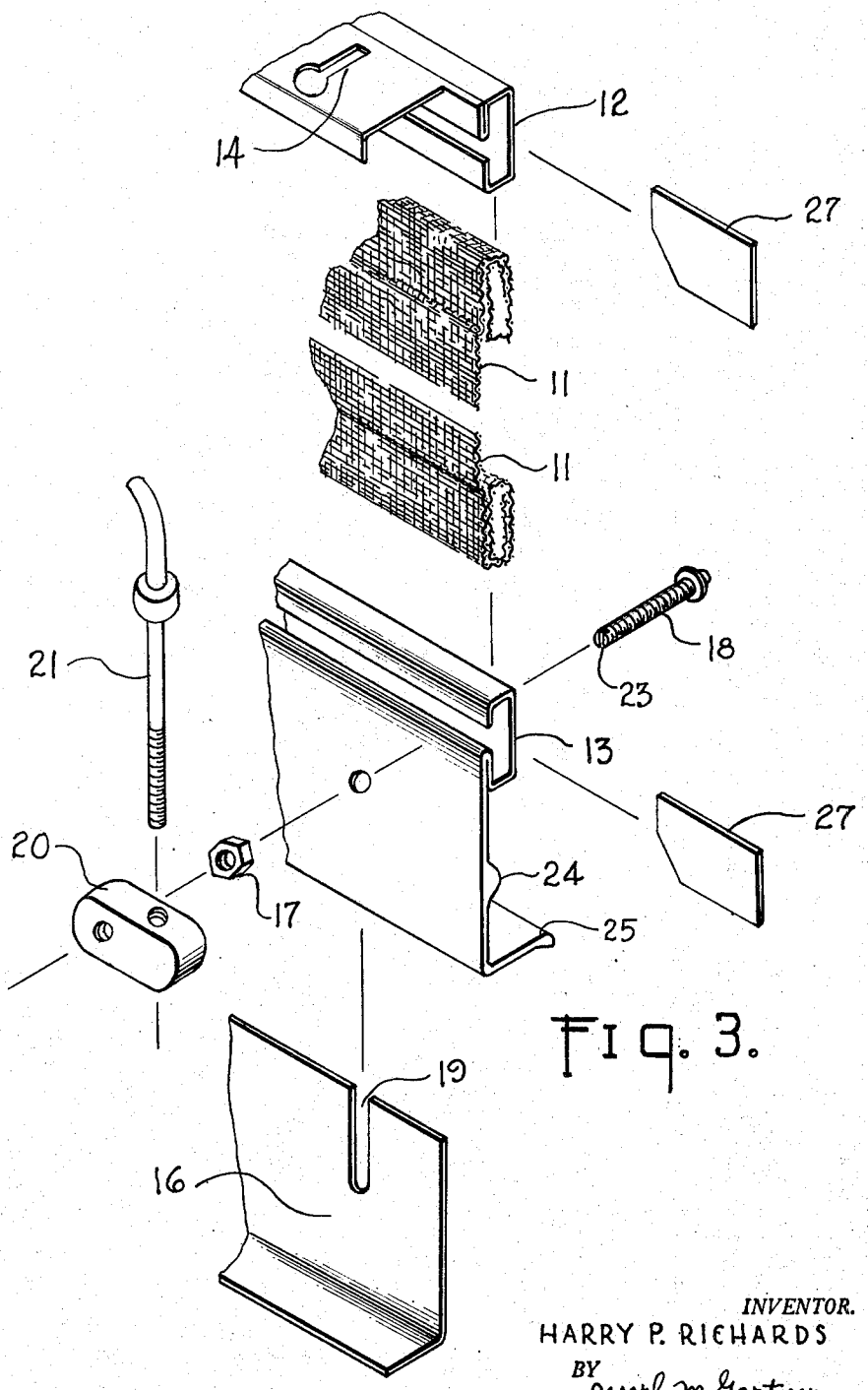


Fig. 3.

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DETACHABLE FRAMELESS SCREEN

Harry P. Richards, Elmhurst, Ill.

Application September 9, 1944, Serial No. 553,302

8 Claims. (Cl. 160—328)

This invention relates to improvements in detachable window screens of the type commercially referred to as frameless, that is, detachable window screens without the usual distending and supporting frame. By reason of the omission of the frame as a fixed part of the screen, the screen may be readily attached and detached from the window frame, or a frame surrounding any other opening which it may be desired to have screened, and when not in use may be rolled up compactly about the frame members for safe storage.

The invention accordingly consists of a detachable window screen provided with top and bottom rails only, said top rail being fixed to the window frame by screws, and said bottom rail being duplex, being composed of two relatively vertical sliding parts and fitted with holding devices for attachment to the window casing, or to any other structure to which it is desirable to attach the screen, said holding devices being constructed so that the screen may be put under tension after the latter has been placed in position in the window frame, thus holding it taut with the edges, though unprovided with side rails, and said screen is held tight against the sides of the window casing or other support to which the screen is applied.

It is recognized that in the prior art numerous attempts have been made to provide a detachable frameless window screen of this general class, but to best of the applicant's knowledge, none of the prior art structures have been in any way successful and none have been accorded commercial recognition. It is believed that this fact results from deficiencies of the prior art structures, and their non-adaptability to standard parts and construction which so greatly increase the cost as to seriously handicap sales acceptance.

The present improvement in detachable frameless screens is directed to simplify the upper and lower rails of the screen and their mode of attachment to the window frame, and also to the use of conventional screen parts wherever possible to effect a reduction in cost over the prevailing types of rails and fastening devices employed for frameless screens.

It is therefore a particular object of the invention to provide a readily detachable adjustable screen without a continuous frame which is easily installable in a window frame or the like, in such a manner as to seal the frame against insects and the like and yet be inexpensive to manufacture, be light in weight, and be strong enough to stand up under rigorous use and bad weather conditions.

Another object of the invention is to provide a detachable frameless screen that may be placed in position, or removed, from the inside of the window, thus greatly facilitating its application to all windows irrespective of their altitude above the ground.

Another object of the invention is to provide a detachable screen with certain adjustable features so that sizes can be standardized to fit any opening thus reducing the cost of manufacture.

A further object of the invention is to provide a detachable screen which will extend across the entire opening of the window frame thus allowing the opening of both the upper and lower window sashes.

A further object of the invention is to provide a detachable screen which will extend across the entire opening of the window frame and also contain certain adjustable features so that said screen can be easily fitted into a window frame opening whose sides or top and bottom are not parallel or plumb. Such a condition would cause undue stresses upon the screen wire and cause an unsightly appearance on screens heretofore manufactured.

A further object of the invention is to provide an improved screen of the frameless type, of simple construction so that it can be easily fitted and installed by a layman and be readily removable from the window frame from the inside to be compactly rolled for storage.

Other and further objects of this invention will be apparent from the disclosures in the drawings and specification.

With these objects in view, together with others which will appear as the description proceeds, the invention resides in the novel construction, combination of parts and the arrangement thereof, as illustrated in the drawings, and which will be more fully described hereinafter, and particularly pointed out in the claims.

In the accompanying drawings in which is shown one of the various embodiments of my invention,

Figure 1 is a fragmentary perspective view of my screen installed in a window frame;

Figure 2 is a longitudinal central section of my screen installed in a window frame; and

Figure 3 is a fragmentary exploded perspective view of my screen showing its parts and their relationship to each other.

Referring to Figure 1 of the drawings, I have shown a fragmentary perspective view of my screen at the left-hand side of the window frame 26, it being understood that the right-hand por-

tion of the window frame and the screen shown installed thereon are substantially identical.

Screen wire 11 comprises a sheet of screening of a type commercially manufactured for this purpose and application, but the invention may be employed with any type of screen whether for excluding flies, insects, or even small animals. The entire screen assembly, including the screen wire, rails, and holding devices are preferably made of some non-rusting light metal such as bronze.

The upper rail 12 is formed with flanges to provide a rigid transverse top member to fit snugly against the top window stop designated by the numeral 26. A plurality of slotted holes 14 are provided to provide an easy means of fastening the rail 12 to the window stop as shown in Figure 1 and Figure 2 of the drawings.

The lower rail 13 is formed in a pleasing design and to provide a rigid transverse lower member. The webs 24 and the flange 25 provide this necessary rigidity. The secondary rail 16 is used to take up any irregularity in the wood window sill, is adjustable, and can be raised or lowered to suit conditions of the sill by using a wrench to hold lock nut 17 and then placing a screw driver in slot 23 of screw 18 and turning same. The secondary rail 16 then can be raised or lowered through slot 19 thus making a snug, tight fit between the screen and the wood sill. The lock nut 17 is then tightened and the secondary rail 16 is held firmly in position. The same procedure is followed for each side of the window frame. The advantage of having rail 16 adjustable is that standard sizes can be made up and any variance in the size of the window frames can be taken up by rail 16. In many cases the side stops and the bottom and the top of the window frame are not parallel or plumb. This condition would cause undue cross stresses on the other known types of frameless screens. In my invention the secondary rail 16 will take care of any variations in the sills or the top rails. The screen is always evenly stretched which will give the screen long life and will not elongate any of the holes in the screen wire to admit insects or flies. If the screen wire should stretch thus loosing its tautness, and the rail 13 drops lower, an adjustment can be made very easily and quickly by an adjustment of rail 16 to suit.

As a means of bringing the screen 11 in a taut position so that it will fit snugly and tightly to the side window stops, I use a latch 21 which is pivotally mounted on screw 18 as shown on the drawings. The latch shank 21 engages a bracket 22 which is mounted on the side window stops. The screw 18 is threaded full length and to obtain lateral adjustment for the purpose of bringing the lower rails 13 and 16 inwardly so that the wire screen fits snugly and tightly against the side window stops 26, the block or link 21 is taped so that when it is pivoted around screw 18 the block 21 can be moved inwardly or outwardly to the desired position. For vertical adjustment the shank 21 is threaded at its lower end for engagement into block 20. By turning the shank 21 in either direction the desired tension can be exerted to position the screen 11 tautly against the window stops. Lateral adjustment of the top rail is accomplished by the slots 14 as shown in Fig. 3. The wood screws 15 are left loose when the screen is placed in position in the window frame. The top rail 12 is placed so that the screws 15 fit into slots 14 through the eye hole. The rail 12 is then pulled inwardly into position so that the screen wire 11 is snugly fit against the window stops at the sides of the window and then the screws 15 are tightened. It should be noted that all adjustable parts are readily accessible from the inside thus providing a detachable frameless window screen that can be readily mounted on any window frame irrespective of the altitude from the ground.

Referring to Figure 2 which is a longitudinal central cross section of my screen installed in a window frame, it should be noted that my invention allows the opening of both upper and lower window sashes and provides a detachable frameless window screen which will extend across the entire window frame opening.

In the assembly of my screen the screen wire 11 is curled up at each end as shown in Figure 3 which is an exploded view of my invention and shows the parts comprising my invention and their relation to each other. The rails 12 and 13 are provided with longitudinal recesses for admission of the screen wire 11. The ends of both rails 12 and 13 are open and the screen wire 11 is forced through either end into position. To lock the screen wire 11 into position and hold it firmly in place I force wedges 27 into each end of each rail thus providing an inexpensive holding device. The wedges 27 can be easily removed for adjustment or the replacement of a new screen wire. After fixing the adjustable holding devices to the lower rail 12 and the secondary rail 16 the screen is ready for installation or may be stored in a compact manner by rolling the screen wire 11 around either of the rails 12 or 13. It should be noted that my invention provides an easy and quick assembly of the screen and also the installation of the same. The installation of my screen into position in a window frame requires no undue amount of skill and may be done easily by the ordinary layman. The assembly and the installation requires only the use of common ordinary tools such as a small wrench, screw driver, and possibly a hammer.

In the design of my screen I have overcome an objection of the building trade to prior frameless screens in that I do not use any screws in the window sill to fasten my screen to the window frame. When screws are used to fasten screens to the window sill, the screws break the paint surface and cause the window sills to rot. It has been proven that when such screws are used in the sills and removed when the screen is put away for storage, the sill will rot and the holes in the sill will not hold the same screws again.

It may accordingly be seen that I have provided a screen which efficiently fulfills the several objects hereinabove described in a thoroughly practical manner.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is understood that all matter hereinbefore set forth, or shown in the accompanying drawings, is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a detachable frameless window screen, the combination comprising, a wire screen, a top cross rail having a longitudinal groove and a slotted hole near each end and each slotted hole engaging a screw fixed to a window frame to hold said top rail against the window frame, a bottom rail having a longitudinal groove and stiffening ribs and flanges, an adjustable secondary bottom rail and means for facilitating the adjustment of same, said rail being adjustably

connected to the bottom rail, means for attaching said wire screen to the rails at opposite ends of said screen, said means comprising wedges respectively placed at the corners of the screen and wedging and holding said wire screen into the longitudinal grooves in each rail, means for supporting the assembled screen upon a window frame, said means comprising a latch placed at each lower corner of the screen and each latch engaging a bracket fixed to the window frame and each latch having a pivotal connection with the bottom rail to hold the bottom rail against the window frame and take up the slack in the wire screen and align the latter in the window frame.

2. In a detachable frameless window screen, the combination comprising, a wire screen, a top cross rail having a longitudinal groove and a slotted hole near each end and each slotted hole engaging a screw fixed to the window frame to hold said top cross rail against the window frame, a bottom cross rail having a longitudinal groove and stiffening ribs and flanges, an adjustable secondary bottom rail and means for facilitating the adjustment of same, said rail being adjustably connected to the bottom rail, and means for attaching said wire screen to the rail at opposite ends of said wire screen, said means comprising wedges respectively placed at the corners of the screen and wedging and holding said wire screen into the longitudinal grooves in each rail.

3. In a detachable frameless window screen of the character disclosed, a means for attaching said wire screen at opposite ends to a top and a bottom longitudinally grooved rail, said means comprising wedges respectively placed at the corners of the screen and wedging and holding said wire screen in the longitudinal grooves of each rail.

4. In a detachable frameless window screen of the character disclosed, a means for supporting the screen upon a window frame at its lower corners, said means comprising a latch placed at each lower corner of the screen and each latch engaging a bracket fixed to the window frame and each latch having a pivotal connection with the bottom rail to hold the bottom rail against the window frame and take up the slack in the wire screen and align the latter in the window frame.

5. In a detachable frameless window screen comprising a wire screen, a top cross rail having a longitudinal groove and a slotted hole near each end and each slotted hole engaging a screw fixed to the window frame to hold said top cross rail against the window frame, in combination with a bottom cross rail having a longitudinal groove and stiffening ribs and flanges, a secondary bottom rail having a slot near each end and adjustably connected to the bottom rail, and means for facilitating adjusting and holding same in a fixed position in relation to the bottom rail and window sill.

6. In a detachable frameless window screen comprising a wire screen, a top cross rail having a longitudinal groove and a slotted hole near each end and each slotted hole engaging a screw fixed to the window frame to hold said top cross rail against the window frame, in combination with a bottom cross rail having a longitudinal groove and stiffening ribs and flanges, a secondary bottom rail having a slot near each end and adjustably connected to the bottom rail, and means for facilitating adjusting and holding same in a fixed position in relation to the bottom rail and window sill, said last mentioned means comprising a bolt threaded full length with a slot at its end, and a lock nut.

7. In a detachable frameless window screen comprising a wire screen, a top cross rail having a longitudinal groove and a slotted hole near each end and each slotted hole engaging a screw fixed to the window frame to hold said top cross rail against the window frame, in combination with a bottom cross rail having a longitudinal groove and stiffening ribs and flanges, and means for attaching said wire screen at opposite ends to the top and bottom rails, said means comprising wedges respectively placed at the corners of the screen and wedging and holding said wire screen into the longitudinal grooves in each rail.

8. In a detachable frameless window screen comprising a wire screen, a top cross rail having a longitudinal groove and a slotted hole near each end and each slotted hole engaging a screw fixed to the window frame to hold said top cross rail against the window frame, in combination with a bottom cross rail having a longitudinal groove and stiffening ribs and flanges, means for attaching said wire screen at opposite ends to the top and bottom rails, said means comprising wedges respectively placed at the corners of the screen and wedging and holding said wire screen into the longitudinal grooves in each rail, and a secondary bottom rail having a slot near each end and adjustably connected to the bottom rail and means for facilitating adjusting and holding same in a fixed position in relation to the bottom rail and window sill.

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