Aug. 12, 1958 J. A. TOLMAN ET AL 2,847,065

SCREEN DOOR

Original Filed May 2, 1951 2 Sheets-Sheet 1

Fig. 1.

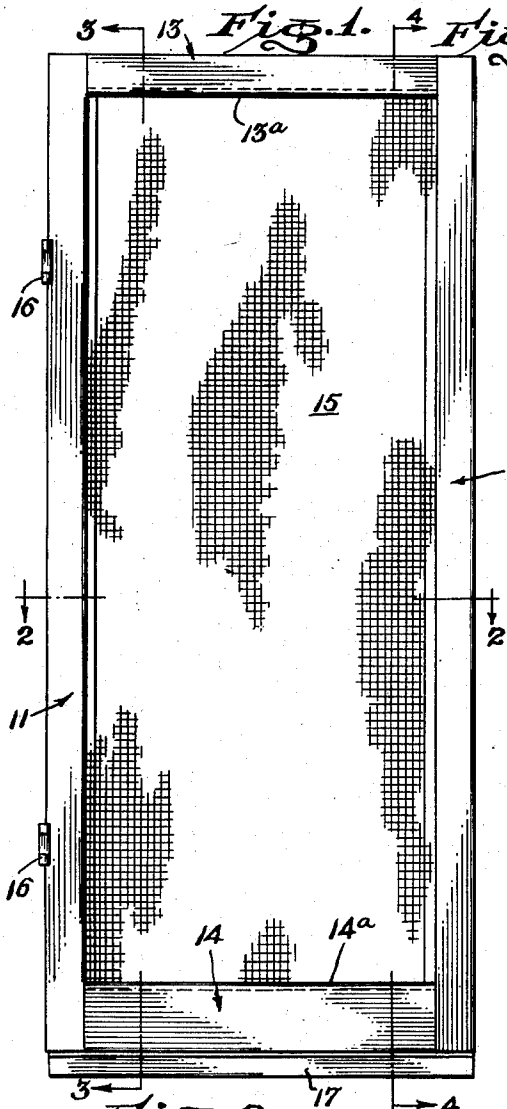



Fig. 3.

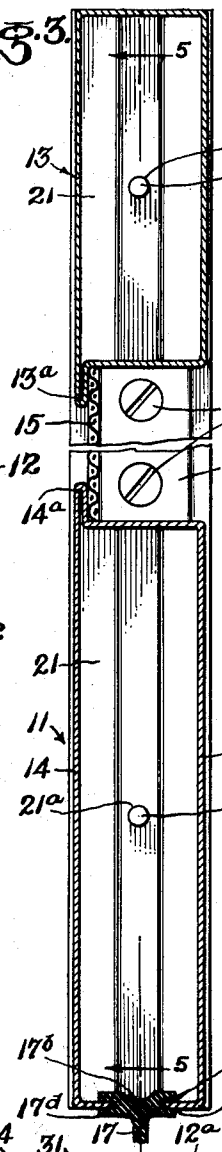



Fig. 4.

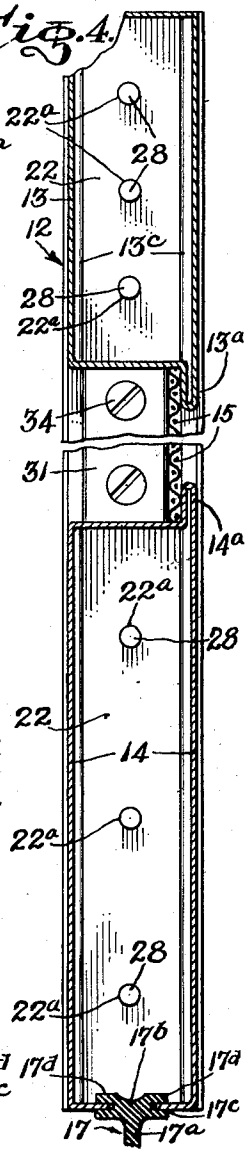
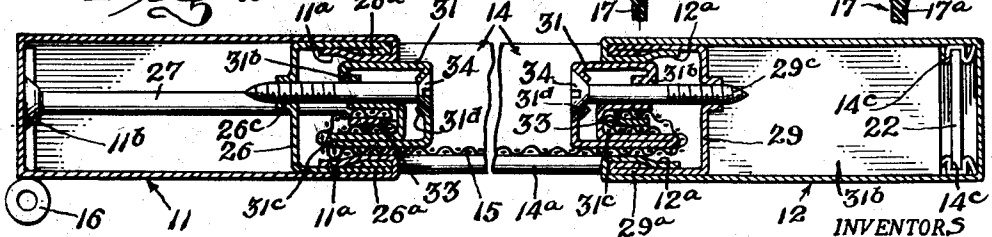



Fig. 2.




INVENTORS
John A. Tolman
Herbert W. O'Farrell
BY
W. T. Adams
Attorney.

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Fig. 5.

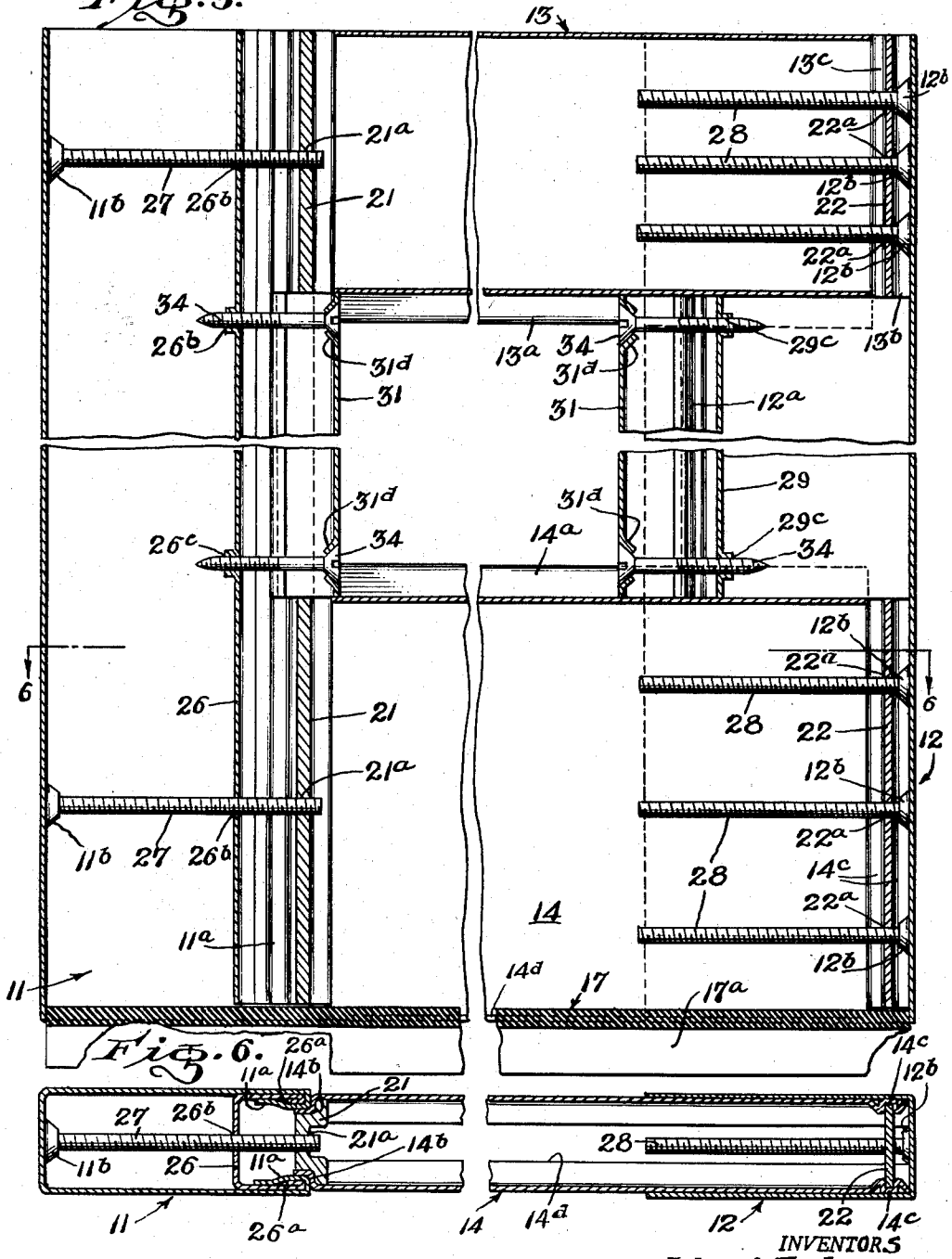



Fig. 6.

INVENTORS
John A. Tolman
Herbert W. O'Farrell
BY
W. N. Elkins
Attorney.

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# SCREEN DOOR

John A. Tolman, Hollywood, Calif., and Herbert W. O'Farrell, Detroit, Mich., assignors to Andean Corporation, Pasadena, Calif., a corporation of California

Continuation of abandoned application Serial No. 224,212, May 2, 1951. This application December 7, 1953, Serial No. 396,472

15 Claims. (Cl. 160—378)

The present invention relates to screen doors in general and particularly to a new and improved fabricated metal screen door. More specifically the invention comprises a fabricated metal screen door incorporating improved screen tightening facilities and means by which its own size can be varied.

The present application is a continuation of allowed application Serial No. 224,212, filed May 2, 1951, and now abandoned.

The ordinary screen door supplements the conventional exterior door in many homes and buildings and provides a means by which the ambient atmospheric conditions can be made available to the interior of the building without at the same time permitting free access to insects and objectionable foreign materials suspended in the air. Screen doors have conventionally been made of wood with an aperture across which extends a flexible screen secured to the frame around the aperture by an overlying nailed strip. The screen in such structures is usually drawn tight and nailed in place, no means being provided to take up slack or looseness resulting from aging or other causes.

The improved fabricated metal screen door constructed in accordance with the present invention resembles the conventional wood door in that it is provided with a frame which surrounds the screened aperture. The screen, however, is adjustably mounted in the door frame in an improved manner which enables it to be removed at will and tightened and drawn taut when necessary. Additionally, the unique construction of the frame provides for variations in its exterior dimensions, thereby adapting it to use in openings of different sizes, and further insuring a satisfactory fit within a chosen aperture.

It is an object of the present invention to provide a new and improved screen door.

It is another object of the invention to provide an improved fabricated metal door provided with readily available tightening means by which the flexible screen may be tightened or removed, as desired.

A still further object of the invention is to provide an improved fabricated metal door incorporating laterally adjustable frame members increasing its range of usefulness.

These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawings to which they relate.

Referring now to the drawings in which a preferred embodiment of the invention is illustrated:

Figure 1 is a side elevational view of a screen door constructed in accordance with the present invention;

Figure 2 is a broken enlarged horizontal transverse section upon the line 2—2 of Figure 1;

Figure 3 is a broken enlarged vertical section upon the line 3—3 of Figure 2;

Figure 4 is a broken enlarged vertical section looking in the direction of the arrows upon the line 4—4 of Figure 1;



Figure 5 is a broken vertical transverse section looking in the direction of the arrows upon the line 5—5 of Figure 3; and

Figure 6 is a broken horizontal section looking in the direction of the arrows upon line 6—6 of Figure 5 and illustrates the width-varying means.

The screen door constructed in accordance with the present invention is made of rolled or stamped sheet metal and, as is seen most clearly in Figure 1, comprises inner and outer side members 11 and 12, a top member 13, and a bottom member 14. A foraminous element or wire screen extends between the frame members and is indicated generally by the reference character 15. The door accessories comprise hinges 16 and weather stripping 17. Suitable latch means may be provided in any conventional manner forming no part of the present invention.

Top and bottom members 13 and 14 of the frame are seen to comprise hollow rectangular sectioned elements formed of sheet metal, preferably of light weight such as aluminum, and provided upon their inner sides and along one face with a lip or flange 13*a* and 14*a*, respectively. Both members 13 and 14 make abutting contact with the inner vertical surfaces of inner side member 11 but extend telescopically within or inside outer side member 12, a relationship illustrated most clearly in Figure 6.

Lower or bottom member 14 is identical to top member 13 and reference is made to Figure 6 in which its relationship to the side members 11 and 12 is clearly shown. Member 14 is seen to be provided at its left end, as seen in Figure 6, with inwardly extending shoulders 14*b* and at its other end with opposed vertically extending channels or grooves 14*c*. Member 13 has corresponding shoulders and grooves 13*b* and 13*c*, only the latter being illustrated. Rigid plate members 21 and 22 extend vertically in members 13 and 14 in abutting contact with their shoulders *b* and grooves *c*, respectively, and form, in effect, the end walls of those members. Member 21 is provided in each instance with a centrally positioned threaded screw-receiving bore 21*a* while plate member 22 is provided with a plurality of similar bores 22*a*.

Inner side member 11 (on the left as viewed in Figure 6) is seen to comprise an elongated U-sectioned sheet metal member the open side of which faces inwardly and has its edges folded back upon itself at 11*a* to form retaining means for a similarly sectioned channel member 26 having it own edges folded back upon itself at 26*a* as to provide additional thickness and to enable the folded edges 11*a* more securely to retain it in place. Channel member 26 in effect forms the inner wall of the side member 11 and provides, as is seen clearly in Figures 2 and 6, a channel having an open side.

Member 11 is also provided along one edge with inwardly recessed seats 11*b* suitable to receive the conical heads of elongated screws 27. The latter extend through the seats 11*b* and also through apertures 26*b* in member 26, to seat at their inner ends in the threaded seats 21*a* of the end walls 21 of top and bottom members 13 and 14. Between the top and bottom members 13 and 14 channel member 26 of side wall member 11 is provided with a plurality of flanged openings 26*c* for a purpose to be described. The tightening of screws 27 draws the end member 21 of top and bottom members 13 and 14 toward the side member 11 and forces the folded inner edges of member 11 into abutting contact with the shoulders 13*b* and 14*b* of the top and bottom members 13 and 14, respectively, a relationship shown clearly in Figure 6 with respect to the bottom member 14.

The outer side member 12 (on the right as viewed in Figure 6) is also an elongated U-sectioned sheet metal member the side walls of which extend along the outer ends of the side walls of top and bottom members

13 and 14 in close fitting telescopic relationship and in a manner clearly illustrated in Figure 6 for member 14. Between the top and bottom frame members 13 and 14 side member 12 carries a channel member 29 identical to member 26 carried by member 11 and its own side walls are folded back upon themselves, as at 12*a*, to retain the channel member in place. Member 29 in side member 12, however, ends at the top and bottom members 13 and 14 to enable the ends of those members to be telescopically enclosed by member 12. Member 12 is adapted to be adjusted inwardly and outwardly relative to the ends of members 13 and 14 and to accomplish this adjustment is provided in its outer face or edge with a plurality of inwardly extending conical seats 12*b* each adapted to seat the conical head of an elongated screw member 28 which threadedly engages the seats 22*a* of the end plates 22 of the end members 13 and 14. The screw seats 12*b* enclose the screw heads so that member 12 is moved toward and from the ends of members 13 and 14 as the screws 28 are advanced or retracted from the interior of members 13 and 14.

As stated, channel member 29 is identical to member 26, save as to length, and is formed with folded thickened edges 29*a* which are clamped by the folded edges 12*a* of the side member 12. Member 29 is also formed with screw-receiving seats 29*c* for screws 34 and corresponding to and opposed in height to the seats 26*c* of channel member 26.

The screen 15, which extends between the interior faces of the various frame members as is clearly illustrated in Figure 1, is held in place by means of seating and adjusting means positioned in channel members 26 and 29, respectively. The upper and lower edges of the screen 15 extend adjacent the inner faces of the lips 13*a* and 14*a*, the relationship being illustrated clearly in Figures 2, 3 and 4, but its vertical sides are adjustably and removably held in place by means to be described.

Positioned within channel members 26 and 29 of vertical side members 11 and 12 are elongated adjustable slide members 31 having a width such that they are adapted to slide on one side adjacent the inner surface of the inturned edge of side members 11 and 12 while their opposite sides are spaced sufficiently from the corresponding inturned edges as to enable the screen 15 to extend therebetween. As is clearly seen in Figure 2, each member 31 is formed with one side having an inturned lip 31*b* while its opposite side is folded back upon itself and into the form of an interior channel 31*c* facing in the same direction as the open side of the slide member 31. Two or more conical seats 31*d* are formed in the exterior face of each slide adapted to seat the conical head of a self-seating screw 34 which extends in close fitting relationship between the inner wall of the channel 31*c* and the spaced lip 31*b*. The threaded ends of screws seat within the seats 26*c* and 29*c*, respectively, of members 26 and 29. An elongated strip member 33 extends midway between the sides of each channel 31*c* around which the adjacent edges of the screen 15 is wrapped, in a manner clearly illustrated in Figure 2. The tightening of the screws 34 serves to draw the slide members 31 into the channel members 26 and 29 and to draw taut the screen 15. Similarly, if the screws 34 are loosened sufficiently the slide member 31 can be entirely removed and the screen replaced.

The weather strip 17 is secured in place in the lower face of bottom member 14 which is there formed with an elongated slot 14*d*. The weather strip, as is clearly seen in Figures 3 and 4, is formed with a vertically extending flange 17*a* from a transverse body 17*b*, the extremities of the latter being slotted at 17*c* to receive the edges of the slots 14*d*. Strip 17 is made of suitable resilient deformable material, such as rubber or a synthetic equivalent, and upon being suitably deformed can be wedged into place and thereafter is retained by its own resilience.

Door hinges 16, shown in Figure 1 as positioned on one edge of the door, and particularly on the inner side member 11, are suitably secured in place.

While the particular apparatus herein shown and described in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiments of the invention and that no limitations are intended to the details of construction or design herein shown other than as defined in the appended claims.

We claim:

1. A fabricated metal screen door of the type having top, bottom and side sheet metal peripheral frame members forming an aperture and a foraminous screen extended across the aperture defined by said members, said side frame members comprising hollow sheet metal elements provided on their inwardly facing opposed edges with vertically extending channels, elongated slide members seating opposite sides of said screen and positioned in said channels, and screw elements extended between each of said slide members and the channel in which it is positioned to adjust said slide members laterally relative to said side members.

2. A fabricated metal screen door of the type having top, bottom and side sheet metal peripheral frame members forming an aperture and a foramionus screen extended across the aperture defined by said members, said members forming a rectangular aperture and a pair of opposite members comprising hollow sheet metal elements formed on their inwardly facing opposed edges with elongated channels, elongated slide members seating opposite edges of said screen and positioned slidably in said channels for lateral displacement, and manually adjustable screw elements extended between each of said slide members and the channel in which it is positioned to adjust said members laterally relative to said pair of opposite members.

3. A fabricated metal screen door of the type having top, bottom and side sheet metal peripheral frame members forming an aperture and a foraminous screen extended across the aperture defined by said members, said members forming a rectangular aperture and a pair of opposite members comprising hollow sheet metal elements formed on their inwardly facing opposed edges with elongated channels, elongated slide members seating opposite edges of said screen and positioned slidably in said channels for lateral displacement, manually adjustable screw elements extended between each of said slide members and the channel in which it is positioned to adjust said members laterally relative to said pair of opposite members, and a second pair of opposite members extended perpendicularly to the members of said first pair of opposite members along the sides of said screen and formed along their opposed faces with walls extending inwardly and immediately adjacent the surface of said screen to function as a positioning guide therefor.

4. A fabricated metal screen door of the type having top, bottom and side sheet metal peripheral frame members forming an aperture and a foraminous screen extended across the aperture defined by said members, said members forming a rectangular aperture and a pair of opposite members comprising hollow sheet metal elements formed on their inwardly facing opposed edges with elongated channels, elongated hollow slide members open on their sides facing the bottom wall of said channels positioned slidably in said channels at each side, said screen extending in close fitting relation between a side of the slide and the adjacent wall of the associated channel, the open face of the slide retaining the associated edges of said screen, and screws extended through said slide members and seated in the bottom walls of said

channels to draw said slide members into said channels to tighten said screen.

5. A fabricated metal screen door of the type having top, bottom and side sheet metal peripheral frame members forming an aperture and a foraminous screen extended across the aperture defined by said members, one of said side frame members comprises a hollow sheet metal element having its inner longitudinal edge formed by spaced parallel walls, said top and bottom frame members being formed at their ends with shoulders abutting said spaced parallel walls, and screws extended between the outer face of said one side frame member and the ends of said top and bottom frame members to draw said top and bottom frame members against said one side frame member.

6. A fabricated metal screen door of the type having top, bottom and side sheet metal peripheral frame members forming an aperture and a forminous screen extended across the aperture defined by said members, one of said side frame members comprises a hollow sheet metal element having its inner longitudinal edge formed by spaced parallel walls, said top and bottom frame members being formed at their ends with shoulders abutting said spaced parallel walls, rigid plates extending across the ends of said top and bottom frame members parallel to said one side frame member, and screws extended between the outer face of said one side frame member and said rigid plates to draw said top and bottom frame members into abutting contact with said one side frame member.

7. A fabricated metal screen door of the type having top, bottom and side sheet metal peripheral frame members forming an aperture and a foraminous screen extended across the aperture defined by said members, each one side frame member comprising a U-sectioned rigid sheet metal member at its opposite ends telescopically enclosing the ends of said top and bottom frame members which are formed at their ends with parallel slots, rigid plates seated in the slots of said top and bottom frame members, and screws extended between the outer face of the associated side frame member and said rigid plates to adjust said one side frame member telescopically relative to said top and bottom frame members.

8. In a fabricated metal screen unit, a frame comprising pairs of opposed frame members forming an aperture, and a foraminous screen extended across the aperture formed by said members, a first pair of said frame members being formed of members each of which comprises an elongated hollow sheet metal element having inner and outer edges the latter being formed in each instance by a U-channel having spaced parallel walls, the second pair of said members being formed of members having seats at their ends seating said walls, a rigid plate positioned in the end of each member of said second pair of members, screws extended between the outer side of each member of said first pair of members through guide apertures in the bottom walls of said channels and into said rigid plates to draw the seats of said members of said second pair into abutting contact with said walls of the members of the first pair, elongated hollow slide members open on their faces facing the bottom wall of said channels positioned slidably in said channels between the members of said second pair of members at each side, said screen extending in close fitting relation between a side of the slide and the adjacent wall of the associated channel, the open faces of said slides retaining the associated edges of said screen, and screws extended through said slide members and seated in the bottom walls of said channels to draw said slide members into said channels to tighten said screen.

9. The construction recited in claim 8 wherein opposite edges of said screen extend closely adjacent said members of said second pair of members, and each member of said second pair is formed on one side with an elongated lip lying adjacent and in guiding reinforcing relationship to the adjacent edge of the screen.



10. A fabricated sheet metal screen door, comprising horizontally disposed upper and lower sheet metal members, vertically disposed sheet metal side members connected at their ends to the ends of said upper and lower members and forming with said upper and lower members a rectangular frame, each of said side members being of channel section and being disposed with the channel webs relatively remote from each other, second and relatively shallow channel members nested between and locked to the flanges of the respective side members and with the webs of said second channel members relatively remote from each other, the vertical edges of the flanges of the respective side members being return bent over the flanges of said second channel members to form lips, third channel members slidably nested in the respective second channel members and with their webs relatively adjacent each other so that each third channel member forms with its associated second channel member a general box section, one flange of each of said third channel members being in sliding contact with one of said lips, the other flange of each of said third channel members being spaced from the associated lip a distance barely sufficient to receive a mesh screen therebetween, said screen being inserted between said other flange and said associated lip and being secured to said third channel members and completely covering the opening defined by said frame, and a plurality of horizontally disposed screws extending parallel to said screen through openings in the webs of said second channel members and said third channel members, said screws being threadedly associated with the webs of said second channel members so that tightening of said screws operates to move said third channel members into their associated second channel members and thereby tension said screen.

11. The invention as claimed in claim 10, in which means are provided to adjust the position of at least one of said side members relative to said upper and lower members so that said one side member may be adjusted toward or away from the other side member, said arrangement permitting widening or narrowing of said frame to fit door openings of various widths.

12. The invention as claimed in claim 11, in which a weatherstrip is mounted in dependent relation from the bottom edge of said lower member, said weatherstrip being formed of a resilient, deformable non-metallic material.

13. A screen door of thin gauge metal formed to provide rigid vertical and horizontal peripheral framing members, means rigidly connecting said framing members, the inwardly facing edges of at least said vertical members having U-shaped grooves for seating the opposite lateral edges of screening adapted to extend tautly between said grooves, said screening including outwardly facing U-shaped rigid members secured to the opposite lateral edges thereof and adapted to form a snug sliding fit with the side walls of the U-shaped grooves in said framing members and forming a closure for the open edges of said U-shaped grooves, and fastener means for pulling said U-shaped rigid members into said grooves sufficiently to stretch said screening taut and to anchor the same in assembled position with respect to said framing members.

14. A fabricated screen door formed from metal framing members including opposed side members having a wide mouthed inwardly facing U-shaped groove along their inner edges, a flexible screening covering the open area enclosed by said framing members, and means for detachably securing said screening in place in said grooves comprising a unitary U-shaped rigid strip secured to the opposite lateral edges of said screening, the open side of said U-shaped rigid strip facing outwardly and its laterally opposed side walls and said screening having a snug sliding fit with the side walls of said U-shaped groove at

the open edges thereof, and fastener means cooperable with said side framing members and with said rigid strip for pulling the latter into said grooves sufficiently to tension said screening and holding the same tautly assembled thereto.

15. The invention defined in claim 14 wherein said fastener means comprises a plurality of metal screws spaced along said side framing members with their axes lying in planes offset from and parallel to the plane of said screening.



**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,045,837 | Hager | Dec. 3, 1912 |
| 1,431,071 | Willhoite | Oct. 23, 1932 |
| 2,173,334 | Julien | Sept. 19, 1939 |
| 2,417,711 | Smith | Mar. 18, 1947 |