W. W. WATSON.

SHEET METAL WINDOW SCREEN FOR CASEMENTS.

APPLICATION FILED MAR. 26, 1917.

1,241,794.

Patented Oct. 2, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

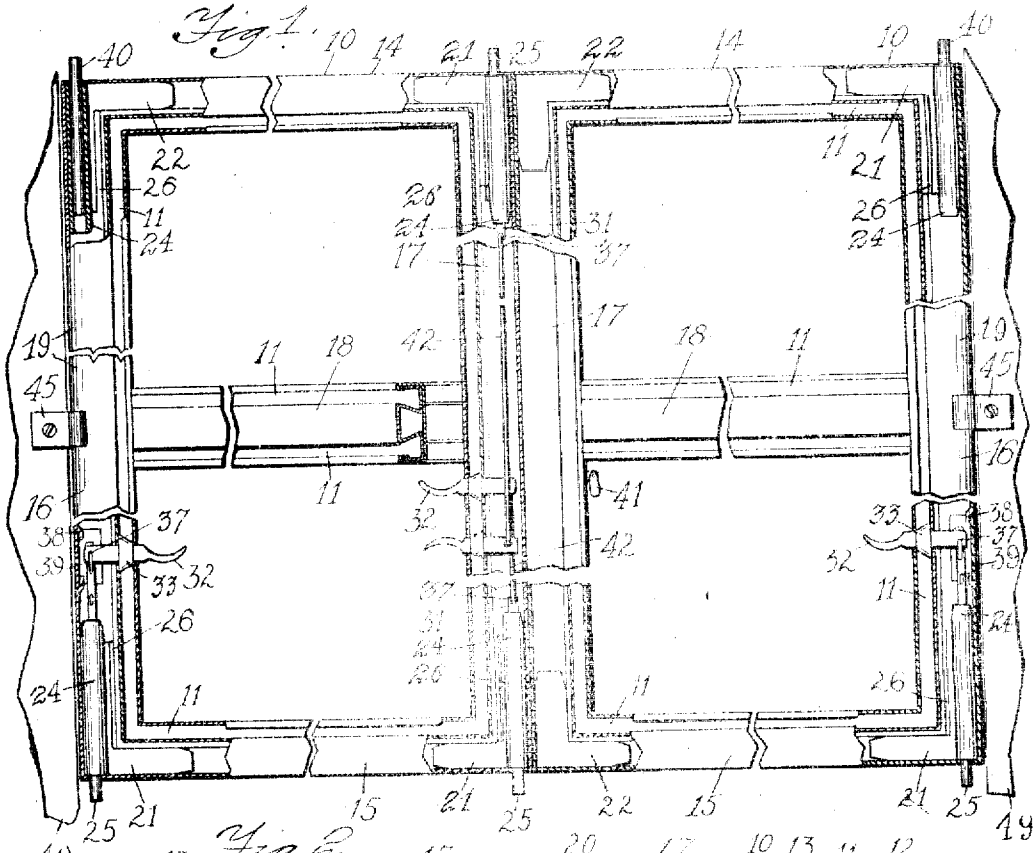


Fig. 2.

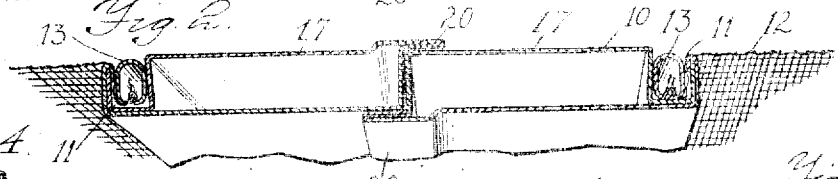


Fig. 4.



Fig. 5.

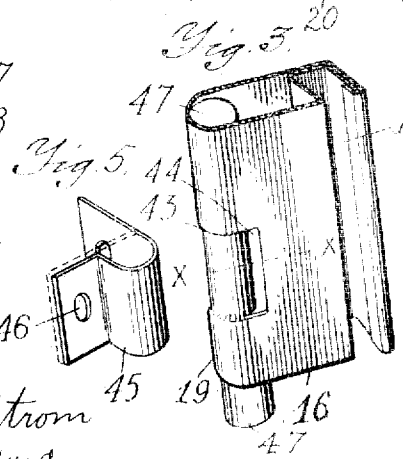


Fig. 6.

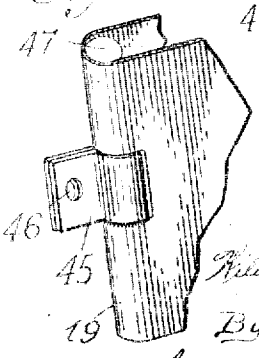
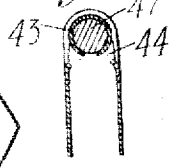


Fig. 7.



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2 SHEETS—SHEET 2.

Fig. 8.

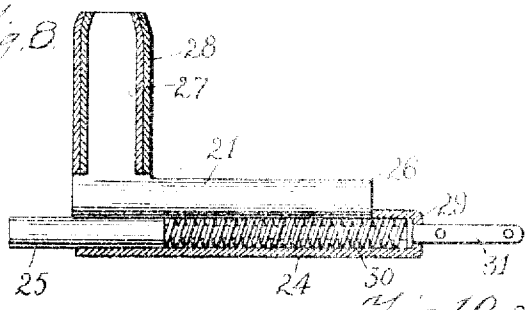


Fig. 9.

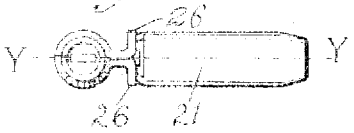


Fig. 10.

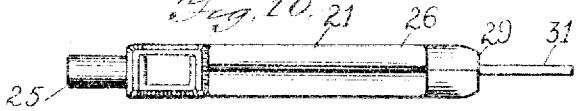


Fig. 11.

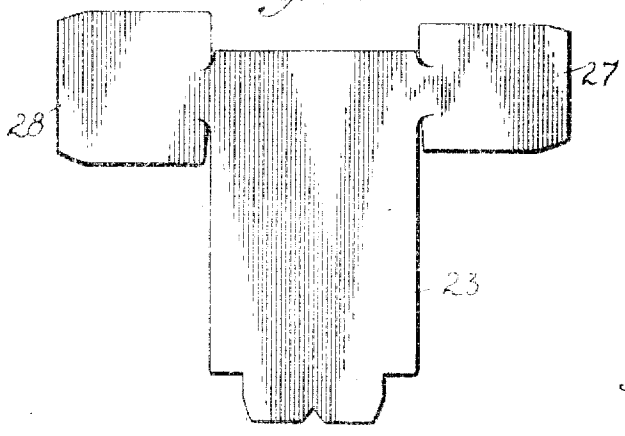


Fig. 15.

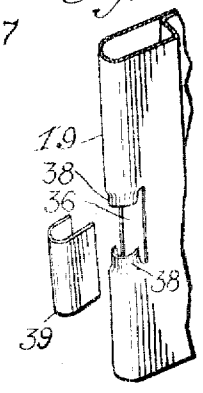


Fig. 13.

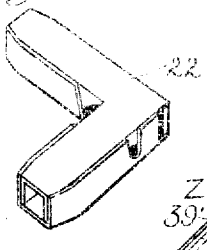


Fig. 12.

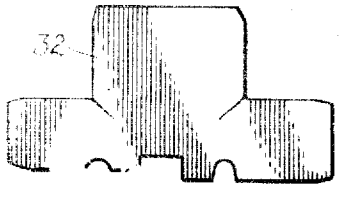


Fig. 14.

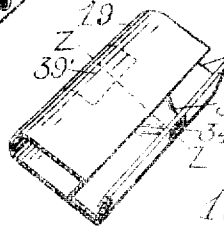
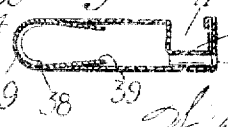


Fig. 16.



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SHEET-METAL WINDOW-SCREEN FOR CASEMENTS.

1,241,794. Specification of Letters Patent. Patented Oct. 2, 1917.

Application filed March 26, 1917. Serial No. 157,359.

To all whom it may concern:

Be it known that I, WILLIAM W. WATSON, a citizen of the United States, residing at the city of Jamestown, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Sheet-Metal Window-Screens for Casements, of which the following, taken in connection with the accompanying drawings, is a specification.

The invention relates to sheet metal window screens which are hinged to their frames as in casements and similar constructions; and the object of the improvement is to provide a tubular screen frame with strong well braced corner construction and to pivotally hinge the same to the supporting frame so that said screens may be quickly and easily removed from said frame; and the invention consists in the novel features and combinations hereinafter set forth and claimed.

In the drawings, Figure 1 is an elevation of a pair of screens pivotally hinged in a frame, portions being shown in section to show the construction of the parts; and Fig. 2 is a sectional view of the central frame sides showing the interlapping astragals and the manner of making the same in the tubular sheet metal construction. Fig. 3 is a perspective sectional view of a portion of the outer frame side showing the construction of the same for hinging the frame side to the supporting window frame; and Fig. 4 is a perspective view of the hinge pin removed from the frame side; and Fig. 5 is a perspective view of the strap piece or hasp for engaging around the hinge pin in the frame side and attaching the same to the window frame; and Fig. 6 is a perspective sectional view of a portion of the frame side showing the strap hinge in position upon the pin; and Fig. 7 is a sectional view at line X—X in Fig. 3, showing the manner of securing the hinge pin in the frame side. Fig. 8 is a sectional view of the combined corner brace and spring bolt holder at line Y—Y in Fig. 9; and Fig. 9 is an end elevation of the corner brace and bolt barrel showing the end of the bolt barrel with the bolt stem therein; and Fig. 10 is a top plan view of the corner brace and bolt barrel; and Fig. 11 is a plan view of the flat pattern for the combination corner brace and bolt barrel before it is shaped in the tubular form by the forming dies; and Fig. 12 is a plan view of the flat pattern for the simple tubular sheet metal corner brace for the corners wherein the bolts are not used; and Fig. 13 is a perspective view of the simple tubular sheet metal corner brace formed from the flat pattern shown in Fig. 12. Fig. 14 is a perspective sectional view of a portion of the outer frame side showing the opening for the operating lever and, in dotted outline, a plate inserted in the rounded outer edge to fill the opening which is necessary to couple the operating lever to the bolt stem; and Fig. 15 is a perspective view showing said plate before insertion in the opening in said curved edge, the plate being in position for insertion; and Fig. 16 is a sectional view at line Z—Z in Fig. 14 showing the filling plate inserted in the edge of the screen side and the covered opening through the grooved inner edge of the frame side for the operating lever.

Like characters of reference refer to corresponding parts in the several views.

The numeral 10 designates the tubular sheet metal screen frame which is cut and bent from the flat sheet metal strip by means of suitable dies so as to form the lengthwise groove 11 which opens sidewise along the inner edges of the frame sides to receive therein the screen fabric 12 which is held in place by the spline or holding strip 13.

The screen frame comprises the top cross rail 14 and the bottom cross rail 15 with the outer stiles or lateral frame sides 16 and inner stiles or central frame sides 17, and the central cross rails 18 in the screen frames 10 which are of sufficient length to need said central cross rails 18. The outer stiles or frame sides 16 have the rounded outer edges 19 and the central stiles or frame sides 17 have the interlapping astragals 20 which are preferably made by a return bend folded in the corner of the sheet metal tubular frame side 17, as shown in Fig. 2. The cross rails 18 are preferably

made of two sheets of metal with the grooves 11 along the inner side thereof, which groove 11 extends around the entire frame and enlarges inwardly.

The corners of the screen frames 10 are preferably mitered and are preferably united by soldering or welding though they may be united by any other suitable method, for example, sweating, bolting or screwing. Each of said corners is provided with an angular tubular corner brace, which in those corners where a pivot pin or spring bolt is needed the tubular corner brace is in the form of a combined brace and bolt barrel 21, as shown in Figs. 8–11, and in those corners wherein the pivot pin or spring bolt is not needed, the simple tubular corner brace 22, shown in Figs. 1 and 13, is used.

The tubular corner braces 21 and 22 are made from the flat sheet metal as follows: The combined corner brace and bolt barrel 21 is formed from the flat sheet metal blank, as shown in Fig. 11, and has the central portion 23 which is formed into the tubular bolt barrel 24 for the spring bolt 25 and has the outwardly extending flanged edges 26 which brace against the inner walls of the frame side. The two wings 27 and 28 of the flat sheet metal blank extend out from the opposite sides of one end of the central portion 23. The wing 28 is sufficiently larger than the wing 27 so that when they are formed in the channel shape and folded into one another in the tubular form the wing 27 shuts into the wing 28, suitable cuts being made at the corners adjacent the portion 23 to permit the folding of the wings 27 and 28.

The end 29 of the barrel 24 is closed sufficiently to hold one end of the coil spring 30 around the bolt stem 31 so that said coil spring 30 bears against the end 29 at the one end and against the bolt 25 at the other and works freely back and forth around the stem 31 within the barrel 24 holding the bolt 25 normally in the extended position. The inner end of the bolt stem 31 is pivotally attached to the lever 32, which lever 32 is pivotally mounted in the screen frame side through the tube 33 which crosses the bottom of the groove 11, an opening 34 being provided through the flange 35 which forms the inner wall of the groove 11 on the screen frame side. The mounting of the levers 32 and pivotal connection 37 to the stem 31 is attained through an opening 36 in the curved edge 19 of the outer frame side 16. At the upper and lower ends of the openings 36 the rounded frame side 19 is inset sufficiently, as shown at 38, to receive the curved plate 39 which fits smoothly into the opening 36 because of being inset so that said plate 39 can be brazed or soldered into place and finished smoothly along with the rest of the edge 19, as shown in dotted line in Fig. 14. This arrangement permits free access to the end of the bolt stem 31 so that the inner end of the lever 32 can be pivotally attached at 37 to said bolt stem, as shown in Fig. 1.

The simple tubular corner brace 22 is formed from the blank pattern as shown in Figs. 12 and 13, the wings folding into one another in substantially the same manner as the combined corner brace and bolt barrel 21. Both of these corner braces are designed to fit snugly within the tubular frame side to brace the sides of the same as well as strengthen the corner of the frame.

In order to removably hinge the screen in the window frame, a combined corner brace and bolt barrel 21 is provided for each of the outer corners of the pair of screens to thereby hinge said screens in the casement frame. One of the combined corner braces and bolt barrels preferably contains a fixed pivot pin 40 at the upper or lower corner, and the opposite corner has a spring bolt 25 so that said spring bolt 25 may be withdrawn thereby permitting the outward movement of the screen frame withdrawing the fixed pin 40 from its pivotal hold in the casement. One of the central frame sides 17 is provided with a pair of spring bolts 25 while the other frame side should have a spring latch 41. The spring bolts 25 for the central frame side 17 are preferably arranged with levers 32 adjacent one another so that they can be operated with one hand. The ends of the bolt stems 31 are connected to the inner ends of the levers 32 by links 42 which intercross so that said levers 32 will withdraw the bolts 25 when they are pressed toward one another.

In large size casement screens that are hinged, it is usually necessary to hinge the frame side midway between the pivotal ends of the same. For this purpose a strong strap hinge is provided by insetting the curved sheet metal frame side 19 as shown at 43 and providing the slots 44 for the insertion of the strap piece 45, which strap piece is provided with holes 46 therethrough for the attaching screws to the window frame 49. A bolt 47 is provided which is cut away at 48 the same as the inset 43 so that said inset 43 can be attained by pressing the sheet metal down into the cut 48 around the bolt as shown in Figs. 3 and 7, after which the strap piece 45 can be quickly and easily inserted, as shown in Figs. 1 and 6. This provides a pivotal hinging of the frame side with an extended bearing therein so that the frame side is strengthened and held stiffly in line with the pivotal pins or bolts 25 and 40.

It is apparent that the combination bolt barrel and corner brace 21 could be cast or otherwise made from metal and serve a good purpose, but it would be more expen-

sive and not as light and strong as the folded sheet metal, which is accordingly preferred.

I claim as new:—

1. In combination with a tubular frame corner, an interior corner brace comprising an angular tube formed from folded sheet metal to fit within said tubular frame corner, and one portion of said angular tube formed in a spring bolt barrel to receive a spring bolt therein.

2. In combination with a tubular frame corner, an interior corner brace consisting of a T-shaped metal plate, the central portion of said T-shaped plate folded in a spring bolt barrel having open ends and fitting within one of the sides of said tubular frame corner, and the wing portions of said T-shaped metal plate interfolded in a tube to fit within the other frame side of said frame corner.

3. In a window screen, a sheet metal frame with tubular side and end pieces mitered at the corners, an interior corner brace for a corner of said frame comprising an angular tube formed from sheet metal with a spring bolt barrel in one side thereof, said mitered corner being attached to said corner brace, and a spring bolt in said barrel.

4. In a sheet metal tubular frame corner, a combination corner brace and spring bolt barrel comprising a T-shaped metal plate with the central portion folded in a spring bolt barrel with flanged edges to fit within and brace against the inner walls of one of the frame sides, and the wings of said T-shaped metal plate interfolded in a tube at an angle to said bolt barrel to fit within the end of the adjacent tubular frame side.

5. In a hinged window screen, a tubular sheet metal frame comprising side and end pieces, means for attaching said pieces to one another at the corners thereof, combination angular corner braces and spring bolt barrels folded from sheet metal and fitting within the adjacent corner portions of the tubular frame sides, said corner portions being attached to said combination corner braces and bolt barrels, spring bolts in said barrels, and operating levers pivotally attached in said frame side for said spring bolts.

6. In a hinged window screen, a tubular sheet metal frame comprising side and end pieces connected at their corners, combination angular corner braces and bolt barrels in the upper and lower corners of said frame with said bolt barrels adjacent an outer side of the frame, a fixed pin in one of said bolt barrels, and a spring bolt in the other bolt barrel to removably hinge said frame in the casing.

7. A casement screen comprising a pair of tubular sheet metal screen frames having folded astragals on their inner tubular frame edges, combination corner braces and bolt barrels in the upper and lower outer corners, a fixed pin in one of the upper or lower bolt barrels on said outer corners, lever actuated spring bolts in the other bolt barrels on said outer corners, a combination bolt barrel and corner brace in each of the inner corners of one screen frame, a pair of spring bolts one in each of said inner corner bolt barrels to lock the frame, and a latch in the other inner frame side to lock the pair of screens.

8. In a hinged window screen, a tubular sheet metal frame comprising side and end pieces preferably mitered at the corners, combination angular corner braces and spring bolt barrels in the upper and lower outer corners, a fixed pin in one bolt barrel and a lever actuated spring bolt in the other bolt barrel to removably hinge said frame, and a pivotal strap hinge in said outer side between said upper and lower corners to hold said outer side in line.

9. In a hinged window screen, a tubular sheet metal frame having a rounded edge adjacent the supporting casing, a strap hinge for said frame comprising a pin having a central portion thereof reduced in diameter, said sheet metal rounded edge slotted and pressed into said reduced portion of said pin to hold the same, and a metal strap piece inserted around said reduced portion and the sheet metal frame side clamping thereon and attached to the supporting casing to form a pivotal hinge for said frame.

10. In combination with a tubular frame corner, an interior angular corner brace to fit in said frame corner, and one portion of said corner brace having a bolt barrel therein and a bolt received in said bolt barrel.

11. In combination with a tubular sheet metal frame corner, an angular corner brace to fit within said tubular frame corner, one portion of said angular corner brace having an open ended bolt barrel therein, and a spring bolt in said barrel.

12. In a hinged window screen, a tubular sheet metal frame, a combined brace and pivot pin carrier for the adjacent portions of the corners of said frame, and a pivot pin carried by said brace and extending through one of the horizontal parts of the frame.

13. In a hinged window screen, a tubular sheet metal frame, a bolt in a side of the frame having a peripheral depression, the side of the frame being slotted and inset to engage said depression of the bolt and hold the latter against movement, and an attaching member insertible through the slot and engageable over the bolt depression in encircling relation thereto.

14. In a hinged window screen, a tubular

sheet metal screen, a bolt in a side of the frame, said side of the frame being slotted, a part of said side of the frame being forced into engagement with the bolt to hold the latter against movement, and an attaching member insertible through the slot and formed to encircle the bolt.

In testimony whereof I have affixed my signature in the presence of two witnesses.

WILLIAM W. WATSON.

Witnesses:
H. O. SANDBERG,
I. E. NORDSTROM.