No. 803,138. PATENTED OCT. 31, 1905.

A. M. SCHEURLE.

SCREEN.

APPLICATION FILED SEPT. 12, 1904.

2 SHEETS—SHEET 1.

Fig. 1

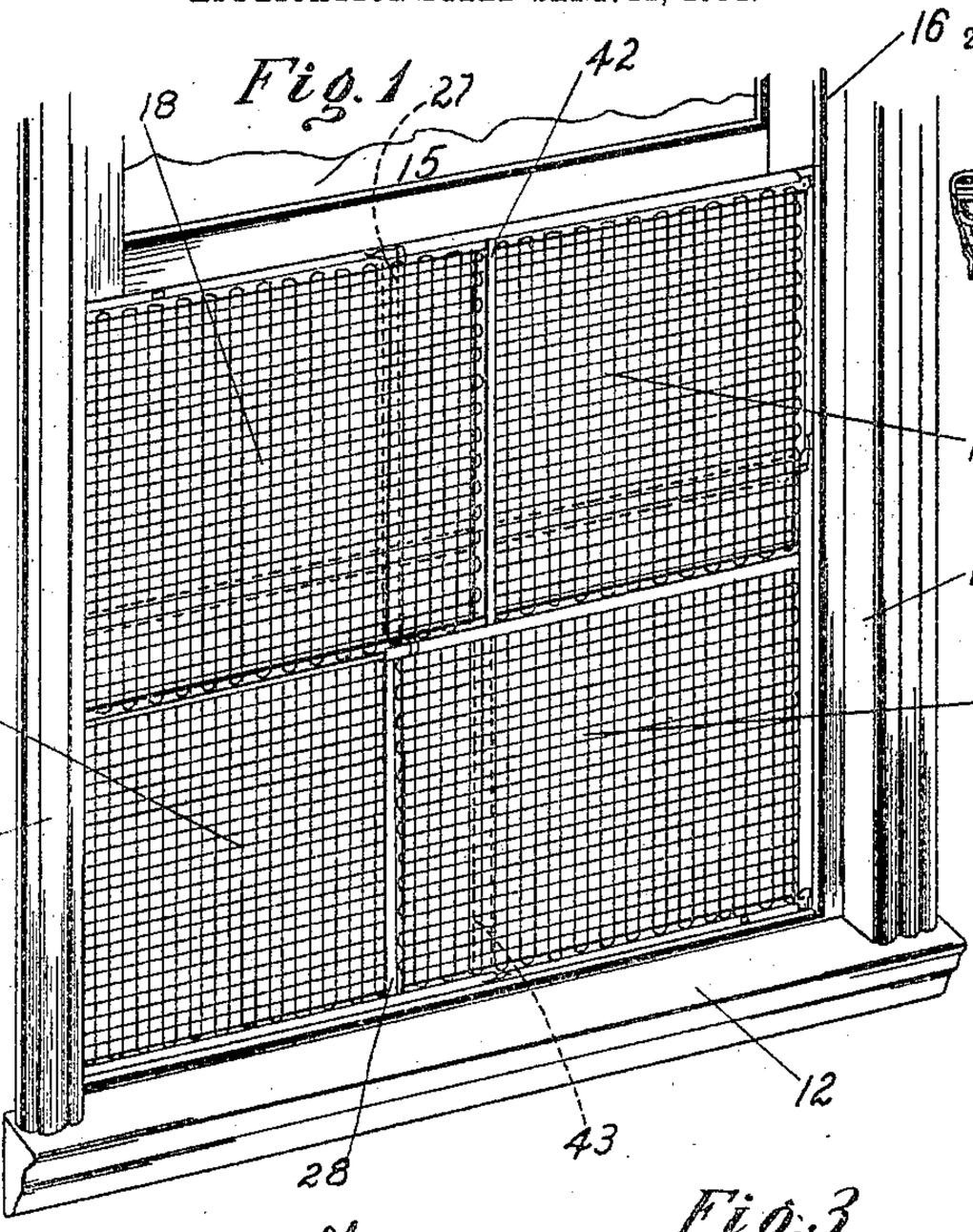


Fig. 6

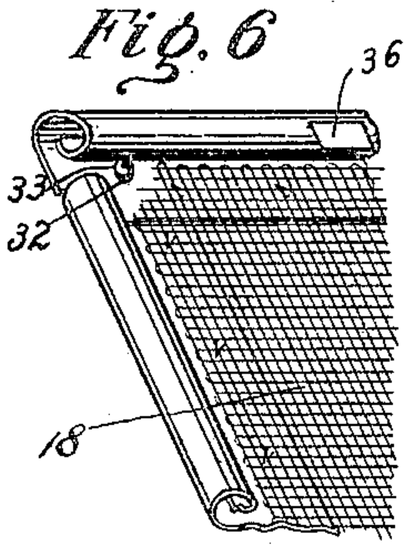


Fig. 7

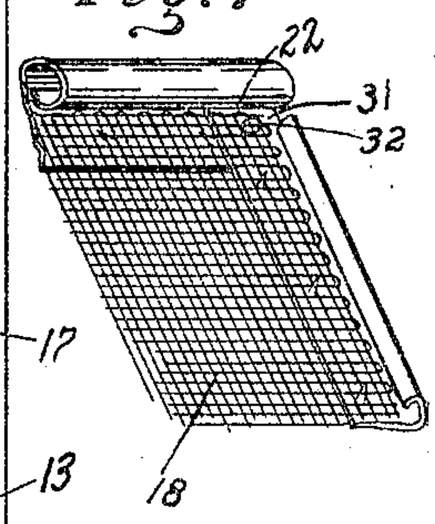


Fig. 8

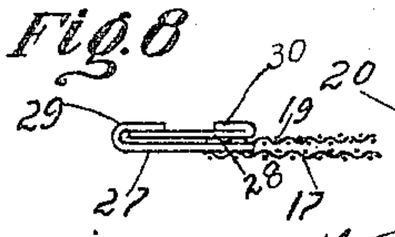


Fig. 9

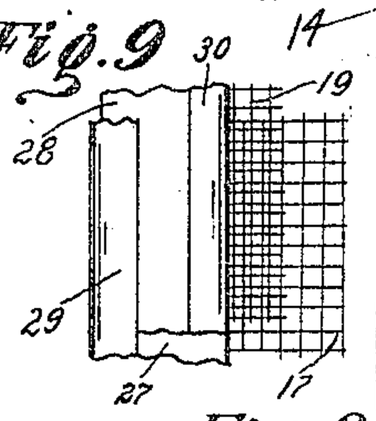


Fig. 10

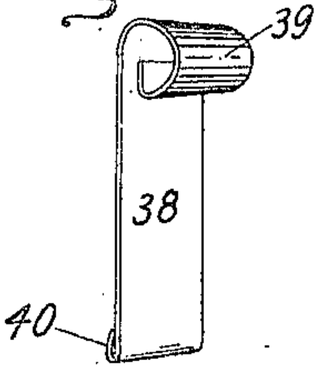


Fig. 2

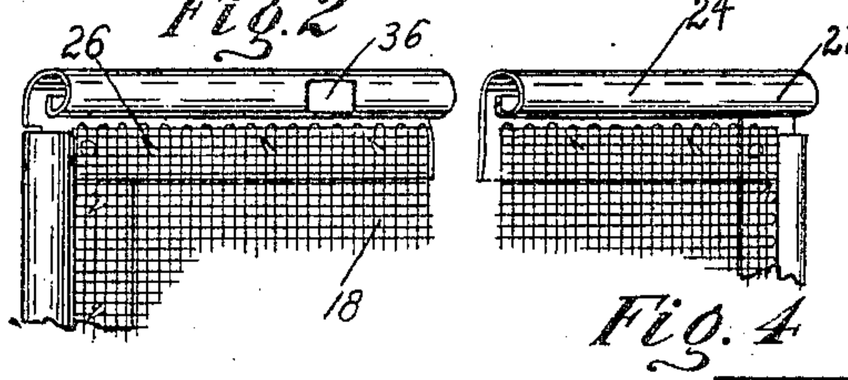


Fig. 3

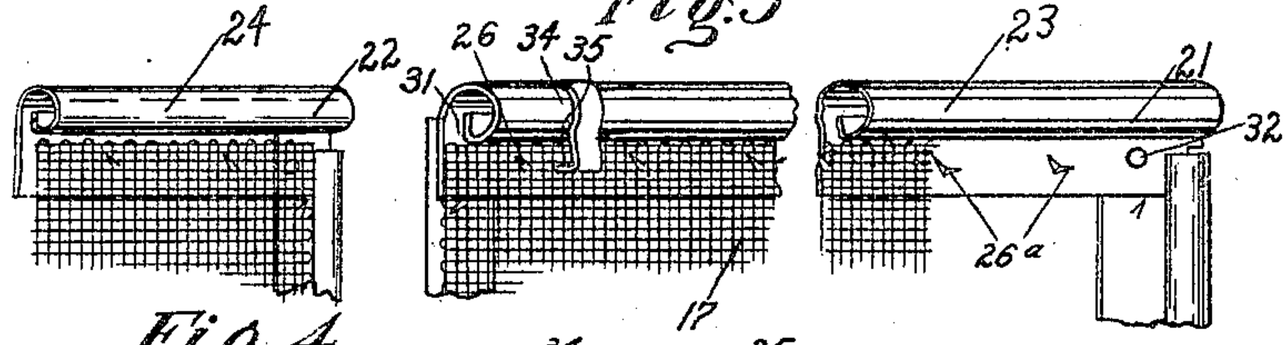


Fig. 4

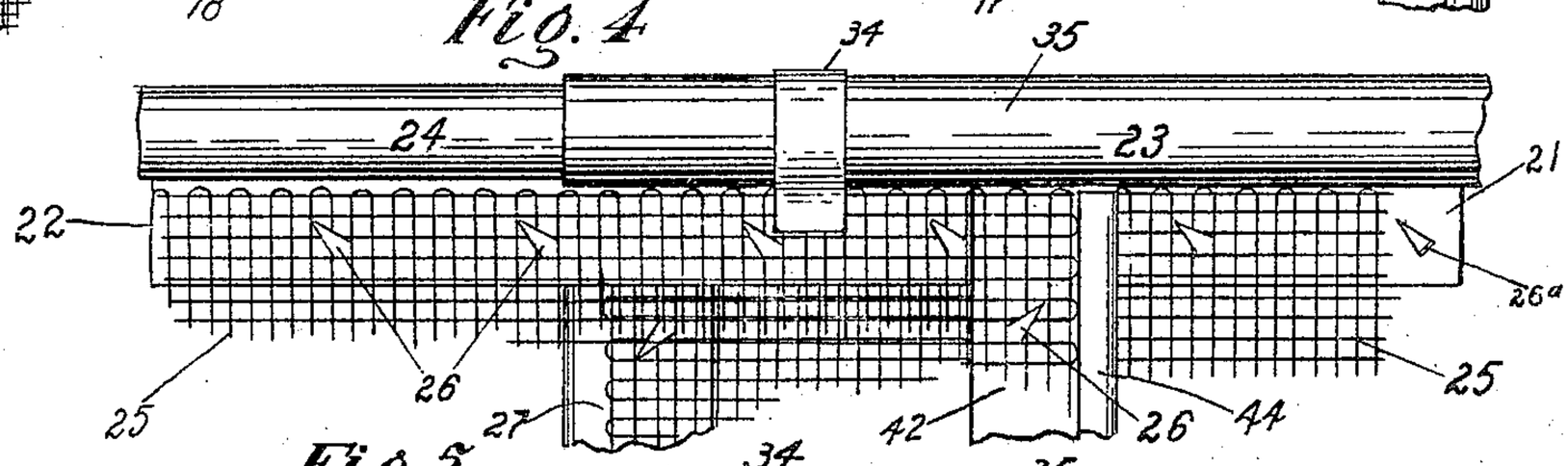


Fig. 5

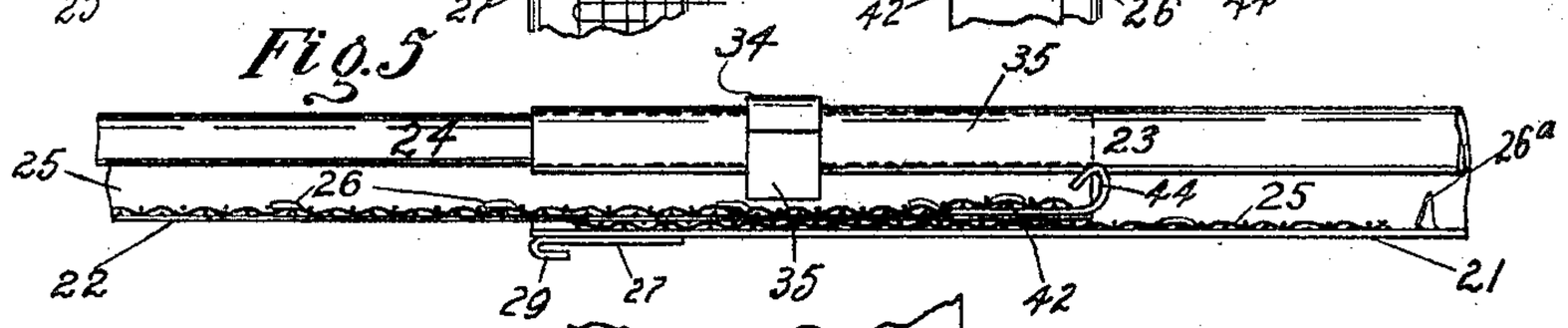
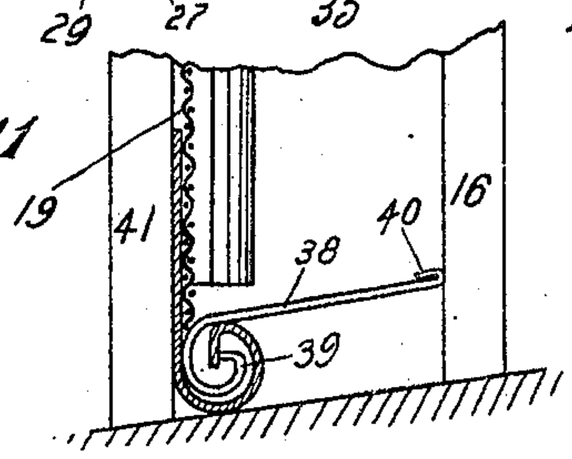


Fig. 11



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2 SHEETS—SHEET 2.

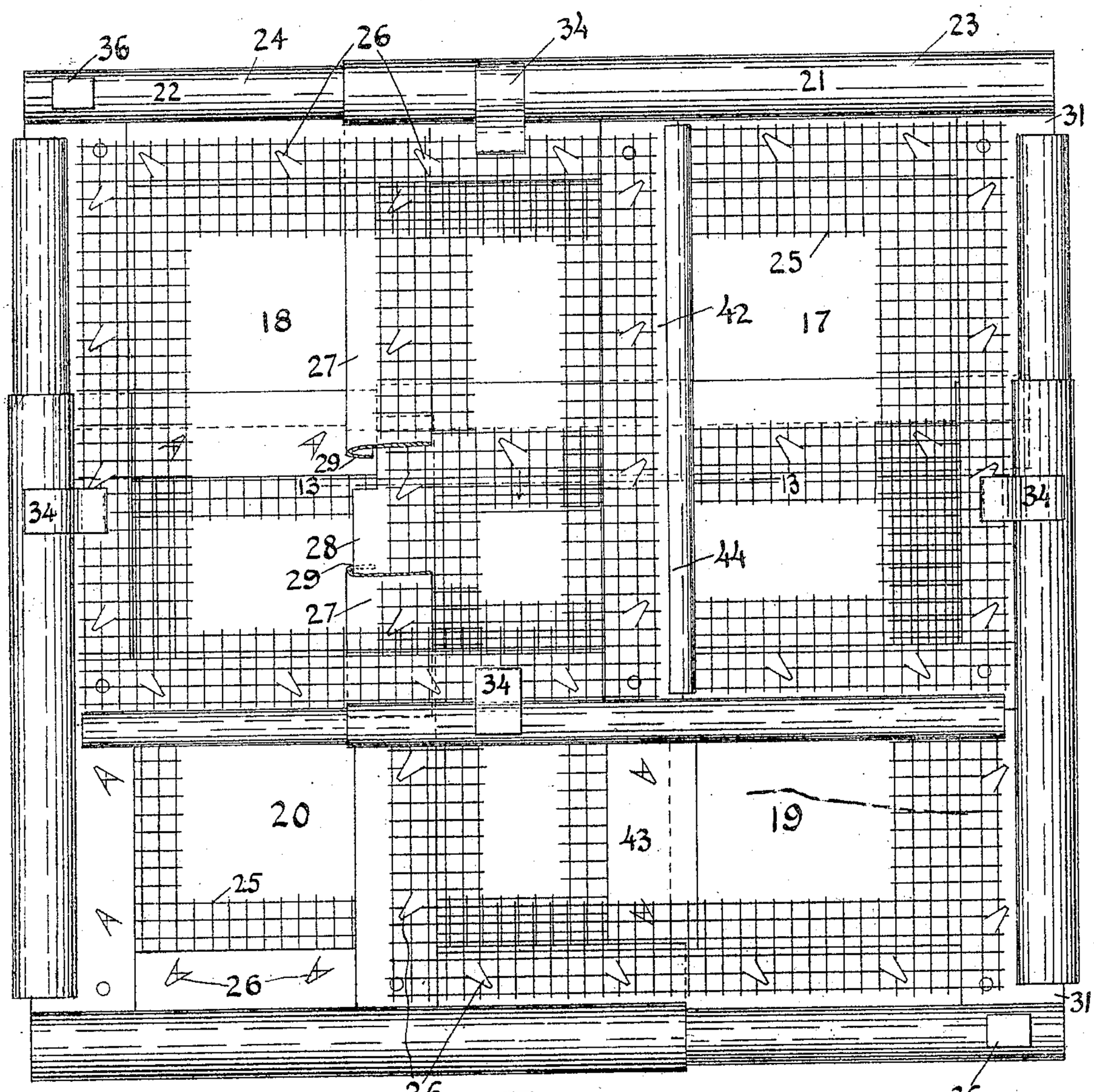

Fig. 12

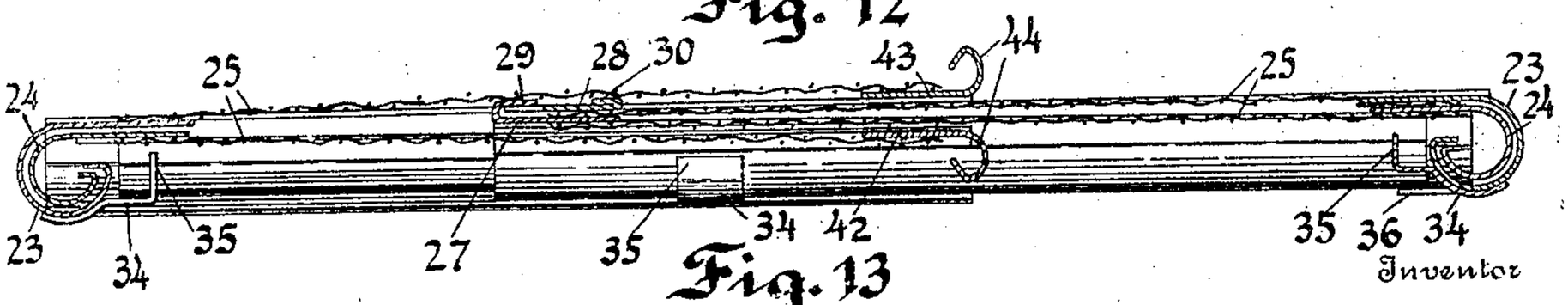

Fig. 13

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SCREEN.

No. 803,138. Specification of Letters Patent. Patented Oct. 31, 1905.

Application filed September 12, 1904. Serial No. 224,125.

To all whom it may concern:

Be it known that I, ANTON M. SCHEURLE, a citizen of the United States, residing in the city of Kiel, in the county of Manitowoc and State of Wisconsin, have invented certain new and useful Improvements in Screens, of which the following is a specification.

This invention relates to an improved fly-screen for windows, doors, and other like openings; and its object is to so improve the design and combination of the parts that a stronger, more rigid, and generally better screen may be produced than heretofore, and at the same time to materially reduce the labor and material used in its manufacture, whereby the cost of production may be reduced to a commercial basis.

The present screen is of the all-metallic type—that is to say, employing no wood or material other than metal in its construction—and is also of the four-section adjustable type—that is to say, the screen is made in four sections, which may be so adjusted with relation to each other as to fit any size of opening within the capacity of the screen.

An important feature of my present improvements lies in the construction of the outer frame-bars, which are made of but one fold or thickness of metal instead of a double fold as heretofore, this construction being made possible by my novel way of securing the wire. This form of frame-bar is a hollow cylindrical metal roll which is formed with the greatest ease and rapidity and presents the greatest possible rigidity for a given weight of metal.

Another important feature of my present invention lies in the means for securing the frame-bars together by solder, whereby a perfect soldered joint is formed almost instantaneously without any solder becoming spilt on the exposed edges of the metal.

Another important feature of my invention is my improved means for securing the corners of the screen in place within the corner of a window-frame, so that the means for securing each corner is independent of the other corners.

I have also improved the means for interlocking the interior members of the frame, whereby they have a sliding connection and provided simple means for limiting the expansion of the screen to its proper capacity.

In order that my invention may be fully understood, I have clearly illustrated it in the accompanying drawings, wherein—

Figure 1 is a perspective view of a window-frame, showing my improved screen in position therein. Fig. 2 is a fragmentary perspective view of the upper part of the left-hand upper section of the screen. Fig. 3 is a similar view of the upper portion of the right-hand upper section of the same. Fig. 4 is a side elevation of the upper central portion of the screen, on an enlarged scale, showing the latter drawn out nearly to its fullest extent. Fig. 5 is a reverse plan view of the parts as shown in Fig. 4. Fig. 6 is a perspective view of the upper left-hand corner of the upper left-hand section of the screen, showing the method of soldering the joint. Fig. 7 is a similar view of the upper right-hand corner of the same section. Fig. 8 is a transverse section in a horizontal plane at about the center of the screen of the interlocking vertical inner bars of the screen, showing my improved form of sliding joint. Fig. 9 is a side view of a portion of said interlocking vertical inner bars. Fig. 10 is a perspective view of the corner-fastener. Fig. 11 is a side view of the same as in position when in use, being a longitudinal vertical section through the screen and showing the lower part of the inner side of the window-frame in elevation. Fig. 12 is a front elevation of a small screen on a large scale, showing a part of the wire-netting removed to illustrate clearly the interlocking of the interior frame-bars. Fig. 13 is a horizontal transverse section through the center of the same and on the line 13 of Fig. 12.

In Fig. 1 is shown a window-frame composing a sill 12 and jambs 13 and 14, between which lies a sash 15, which is an upper sash, as shown, the lower sash being removed for the sake of clearness. 16 is a parting-bead or strip between the upper and lower sash. Below the upper sash 15 is located my improved screen, comprising four sections 17, 18, 19, and 20, each composed of four frame-bars, on which is stretched wire-netting, the inner or adjacent members or bars of the respective sections being formed to have sliding connections one with another.

Referring to Figs. 2 and 3, at 21 is shown the upper member or bar of the right-hand upper section and at 22 the corresponding member of the left-hand upper section. Each of these bars comprises a flat metal plate of one thickness, having a roll 23 24 formed on its outer edge, as shown. This is formed with the greatest ease by inserting one edge of the roll in a slit of a cylindrical bar and bending the member around said bar. The machinery

for doing this will form the subject of a separate application; but it is here mentioned to show how little labor is required to form the roll, besides which it will be noted that it has necessarily great rigidity owing to its circular shape. The roll 24 of one section is made slightly smaller than the roll 23 of the adjacent section, so as to slide within it in the manner illustrated in Figs. 4 and 5. The manner of attaching the wire-netting 25 to these bars is as follows: In the flat portion of the bars 21 and 22 are cut V-shaped tongues 26, which are set obliquely to the axis of the frame-bar, as shown, the tongues being turned up at right angles to the surface of the bar by the machine that cuts them, as shown at 26ª in Figs. 3, 4, and 5. Thereupon the wire is pressed down upon the surface of the bar, (it being understood that this is only after the four bars comprising the frame of each section have been assembled and soldered,) the teeth 26 being caused to enter diagonally between the squares or meshes formed by the netting. The last step in securing the wire on the frame is to hammer down the teeth 26ª, so as to be flat with the surface of the frame-bar and to cover each the juncture of two crossing-wires of the wire-mesh in such manner that there is no possibility of the wire slipping in any direction and a strong hold is secured thereon.

The exterior side bars of each section are formed in the same manner as the horizontal bars; but one pair of the interior vertical bars—namely, those of the right-hand upper and lower sections, which are adjacent—are of the form shown in Figs. 8 and 9. Heretofore these interior vertical bars could not conveniently be made so as to interlock for their entire length, owing to the double thickness necessary for said bars in order to secure the wire between two laps of metal, whereby they interfered somewhat with the horizontal interior bars which crossed them. With my improvements this can be avoided, and the vertical bars of the upper and lower right-hand sections are shown at 27 and 28, respectively. The bar 27 has a lap 29, which extends the complete length thereof, and thus completely overlaps and has a sliding engagement with the bar 28 and prevents the ingress of insects between the bars, as well as increasing the rigidity of the screen as a whole. The bar 28 may likewise have a small lap 30 to give it increased rigidity. The wire is attached to these interior frame-bars in the same way as already described for the interior bars 21 22. The other pair of vertical frame-bars 42 and 43—namely, those belonging to the two left-hand frame-sections—are separated from each other by the wire-netting of the two right-hand sections, and therefore do not interlock, but are each formed with a half-roll sufficient for the necessary rigidity, as shown at 44.

The horizontal inner frame-bars are arranged in interlocking pairs—that is to say, the two belonging to the two upper screen-sections telescope together and the two belonging to the two lower screen-sections also telescope together in the same manner, as shown in Figs. 4 and 5.

My novel method of securing the four frame-bars of each screen-section together by their corners is as follows, (illustrated more especially in Fig. 6:) Each of the vertical frame-bars has a tongue or tab 31 (see Fig. 7) on its end, which forms the overlapping portion, soldered to an adjacent end of a horizontal bar. In the ends of each horizontal bar is punched centrally a hole 32. The two bars being then laid in position, a ball of solder 33, the size of a shot, which has been dipped in an acid flux, is placed in the hole 32 and heat applied immediately underneath or on the overlapping ends, whereupon the solder melts and spreads between the overlapping ends by capillary force, thus perfectly soldering them together without wasting any solder or spilling any on the edges and with only so much time as is requisite to bring the parts to the proper temperature.

Means are provided for limiting the extension of the screen consisting of a small strip 34, of galvanized sheet metal or the like, soldered to the outer of the two telescoping members 23 24 (and similarly at the bottom and sides of the screen) at a point near its inner end. The strip 34 has a downwardly-projecting finger 35, which forms an abutment against which the roll 44 of the bar 42 strikes when the screen is fully extended. In like manner a small piece of sheet metal 36, soldered to the inner member 24 near its outer end, limits the compression of the screen by forming an abutment against which strikes the inner end of the member 23 when the screen is folded up.

In Figs. 10 and 11 is illustrated one of my improved corner-fasteners, (designated 38,) and consisting simply of an oblong strip of sheet metal having formed on one end a cylindrical roll 39 of the same form as the rolls 23 and 24, but fitting within the latter, as shown in Fig. 11. The remaining portion of the strip is straight, except that it is preferably provided with a turned-over flap 40 on its opposite end. The material of the strip is sufficiently rigid to sustain the necessary compression to hold it against bending when jammed between the guiding-strips of a window-sash, as shown in Fig. 11. In this figure, 16 represents the parting-bead, and 41 the outer bead, against which the screen is placed, the end 40 being jammed down into position, as shown, being slightly oblique and biting into the wood, and in this position the screen-section with which the fastener 38 engages is held securely in position against upward or lateral strain. This enables the person setting up the screen to fix one corner or two

corners at the same time and the others afterward independently. Thus, for instance, the screen may first be extended laterally to adjust it to the width of the window-frame, then a fastener 38 secured in position at each lower corner. Then the upper sections of the screen are raised vertically until they abut against the lower edge of the upper sash, it being unnecessary to hold the lower sections separately, because they are held in position by the fasteners 38. The upper sections when adjusted to the proper height are similarly held by fasteners 38 in the respective upper corners.

Suppose, now, the householder desires to have an opening free from the screen without removing it from the window—as, for instance, to open or close shutters, to throw something out of the window, to shake out rugs, or the like—it is only necessary to disengage the free ends of the lower corner-fasteners 38 and raise the two lower screen-sections in the same manner as a window-sash, the upper two sections being held firmly in position by the upper fasteners, and the lower sections may be lowered again and refastened in the same manner. It will thus be seen that my improved screen possesses the greatest facility in operation and the least incumbrance to the window.

My improved screen is no less applicable to doors than to windows when the sections are made in proper form, and is even more particularly adaptable to doors, because being all of metal it leaves no possibility for warping or sticking, can readily be adjusted to any door, and any screen may be used for any door indifferently. Heretofore the cost of an all-metal door was so high as to prevent its wide commercial use; but a much handsomer screen-door can be made by my invention and at a less cost than the cheap wooden screen, which has not its advantages.

My invention is open to numerous modifications, and I do not limit myself to the precise form shown or otherwise than in the following claims.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a screen, a sheet-metal frame member, a screening fabric, and a V-shaped tongue engaging diagonally between one of the meshes of the fabric and pressed down over the junction of two crossing fibers of the fabric.

2. In a screen, sheet-metal frame members, a screening fabric having square meshes parallel to the lines of said members, and metal tongues cut obliquely in the material of said members and engaging diagonally between the meshes of said fabric and over a junction of two crossing fibers thereof.

3. In a screen, a frame member comprising a strip of sheet metal having a hollow cylindrical roll formed on its outer edge, and oblique tongues cut in the flat portion thereof, in combination with wire fabric secured by engagement with said tongues.

4. An adjustable screen comprising four rectangular sections having the colinear external frame-bars arranged to slide one upon the other, one pair of colinear internal frame-bars on adjacent sections being arranged to slide one upon another and to interlock with one another, and one pair of colinear internal frame-bars on adjacent sections at right angles to the first pair being similarly arranged.

5. An adjustable screen comprising four rectangular sections having frame-bars around their respective sides, each pair of external frame-bars on adjacent sections being arranged to interlock one with the other and slide one upon the other, both pairs of internal frame-bars on adjacent sections running in one direction being arranged to similarly interlock with and slide upon each other, and one pair of internal frame-bars running in a transverse direction being similarly arranged to interlock with and slide upon each other.

6. In combination with an adjustable screen having a hollow roll formed at the corner thereof, a corner-fastener comprising a metallic bar having one end bent into a roll interlocking with the roll of said screen and having a straight portion of length such as to jam between the two sides of a sash-slide.

7. In combination with a screen having a hollow roll, means for fastening it in place in a window-casing, comprising a strut member having one end formed to interlock with said roll interiorly and arranged to oscillate about said end as an axis, the free portion of said strut member having a length slightly in excess of the distance to the guide-strip of the casing opposite the screen, whereby the end of said strut member is adapted to occupy an operative position nearly at right angles with the window-casing and to exert a binding pressure against that point of the guide-strip on which its end rests.

8. A screen having a frame member consisting of a single thickness of sheet metal having a flat portion to which is secured screening material, a substantially cylindrical roll formed outside the flat portion, and a substantially flat stiffening-rib forming the outer edge of the sheet metal bent inward diametrically across the said roll.

In witness whereof I have signed my name, this 7th day of September, 1904, in the presence of two witnesses.

ANTON M. SCHEURLE.

Witnesses:
CHAS. HEINS,
OTTO STOELTING.