

Dec. 23, 1941.

G. A. BORTS

2,267,188

WINDOW SCREEN SHUTTER

Filed March 21, 1940

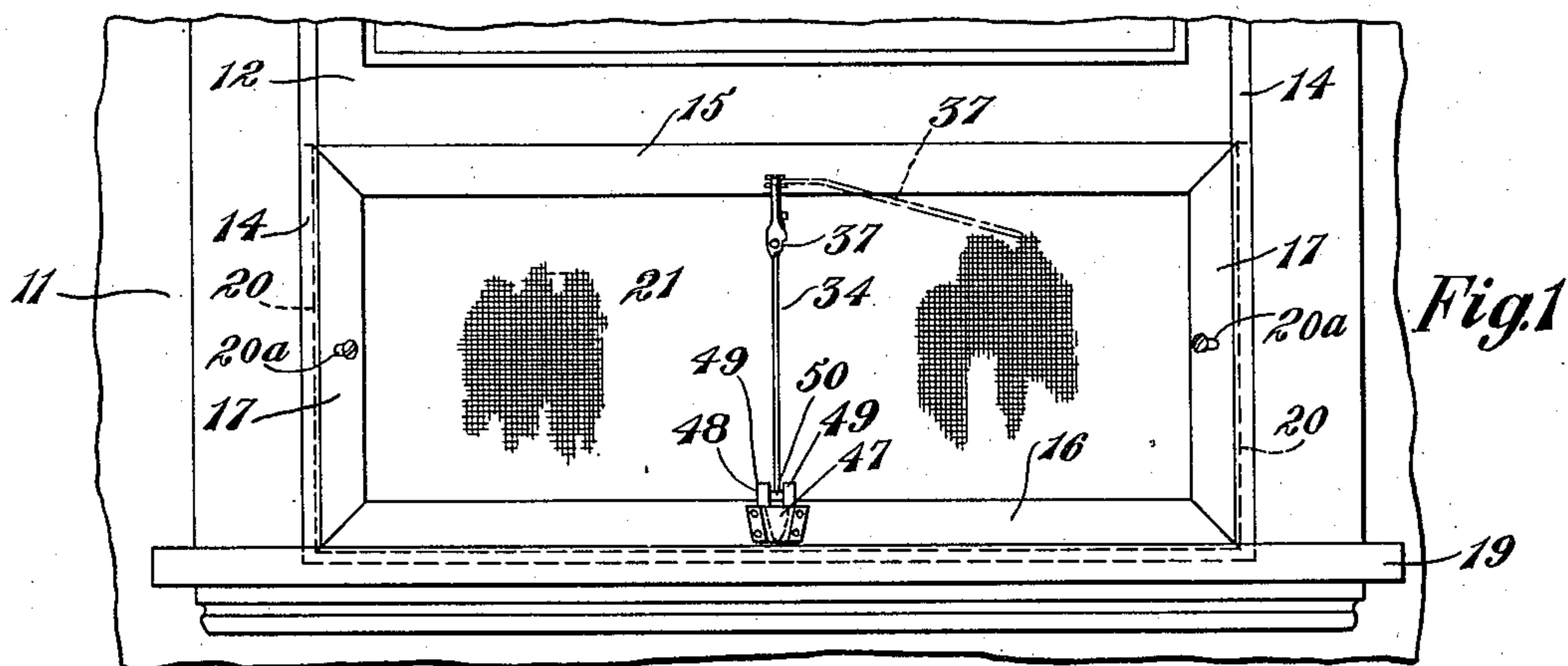


Fig. 1

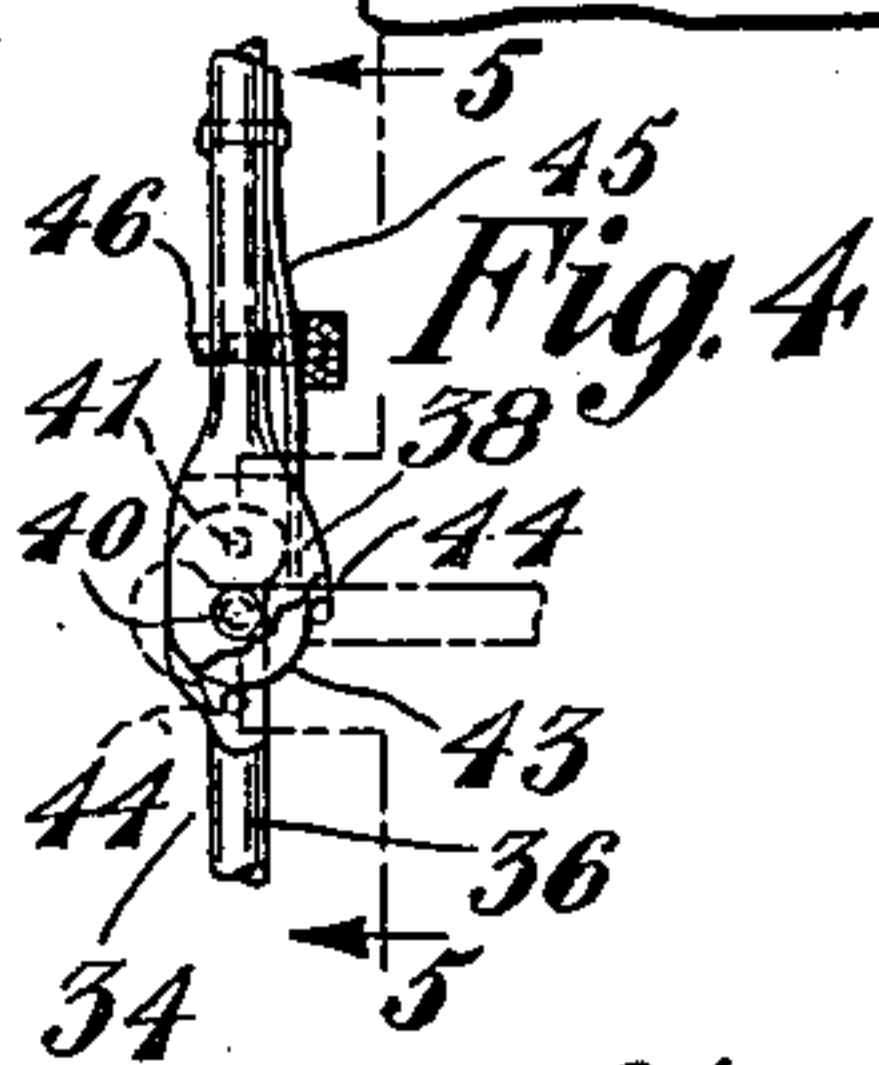


Fig. 4

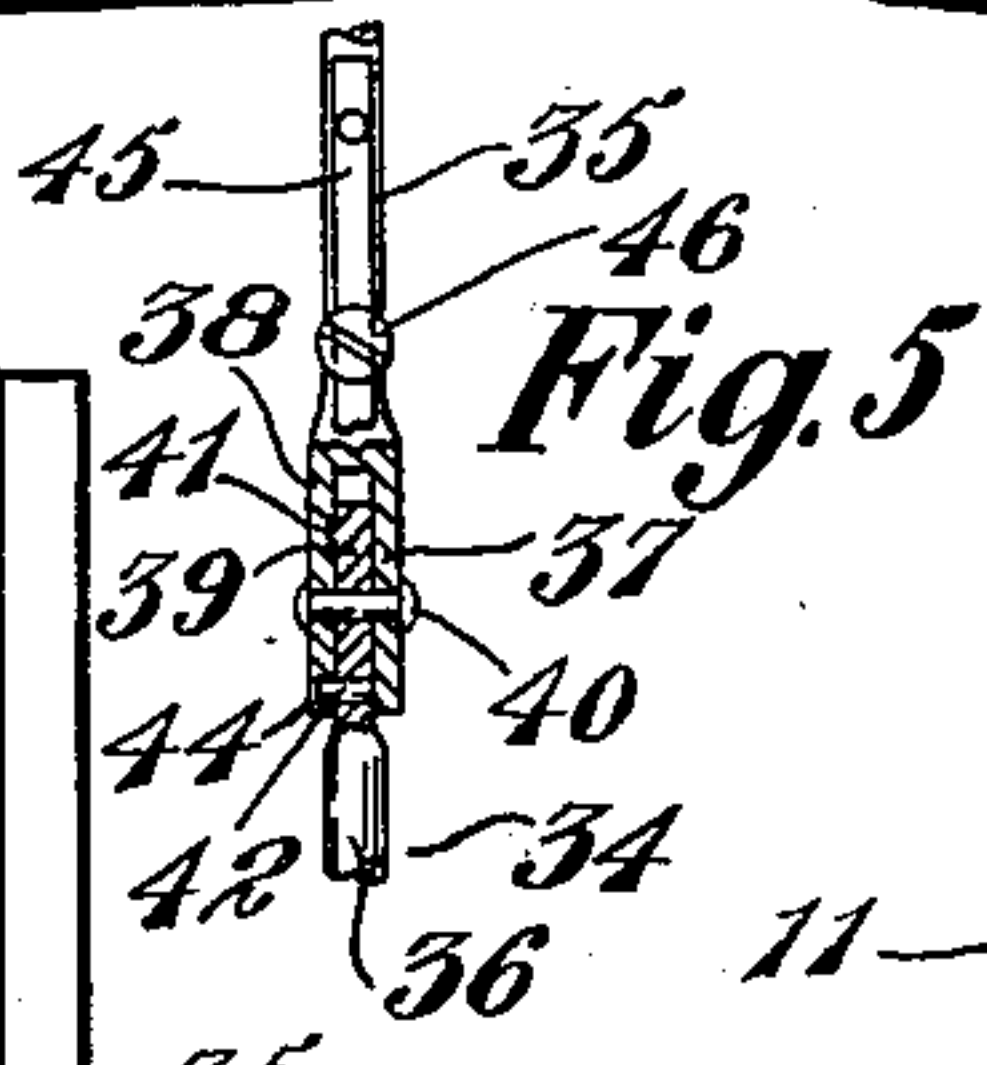


Fig. 5

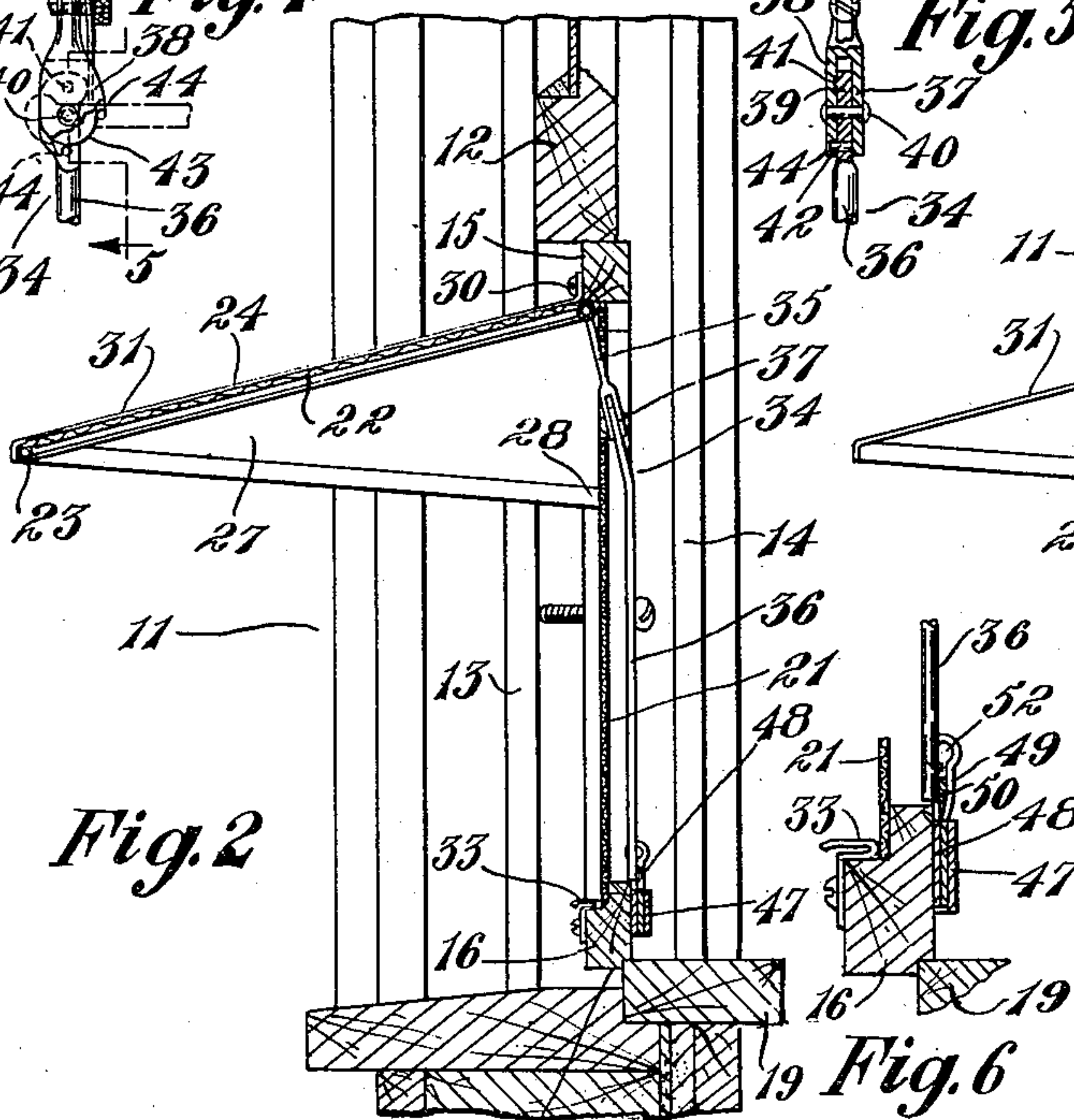


Fig. 2

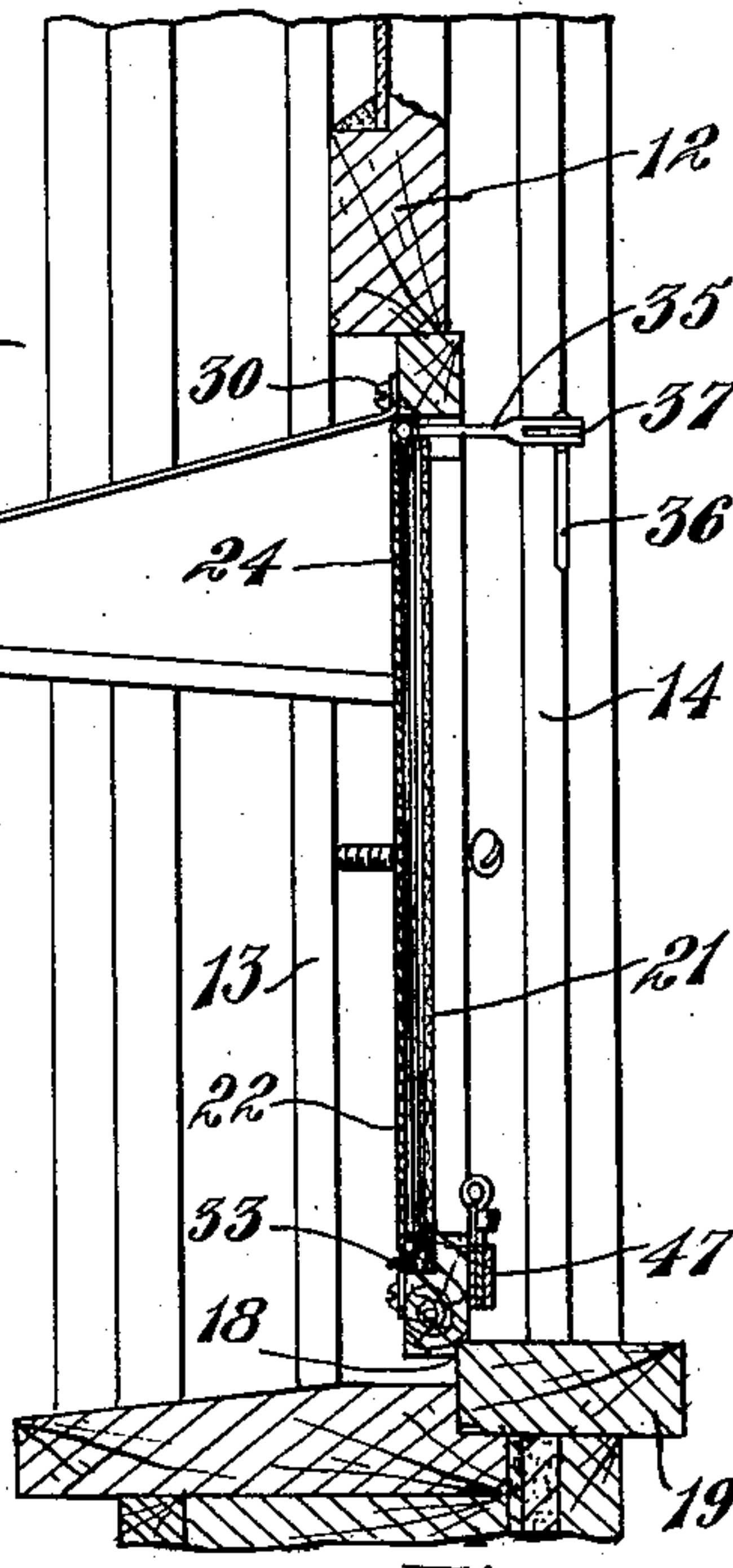


Fig. 3

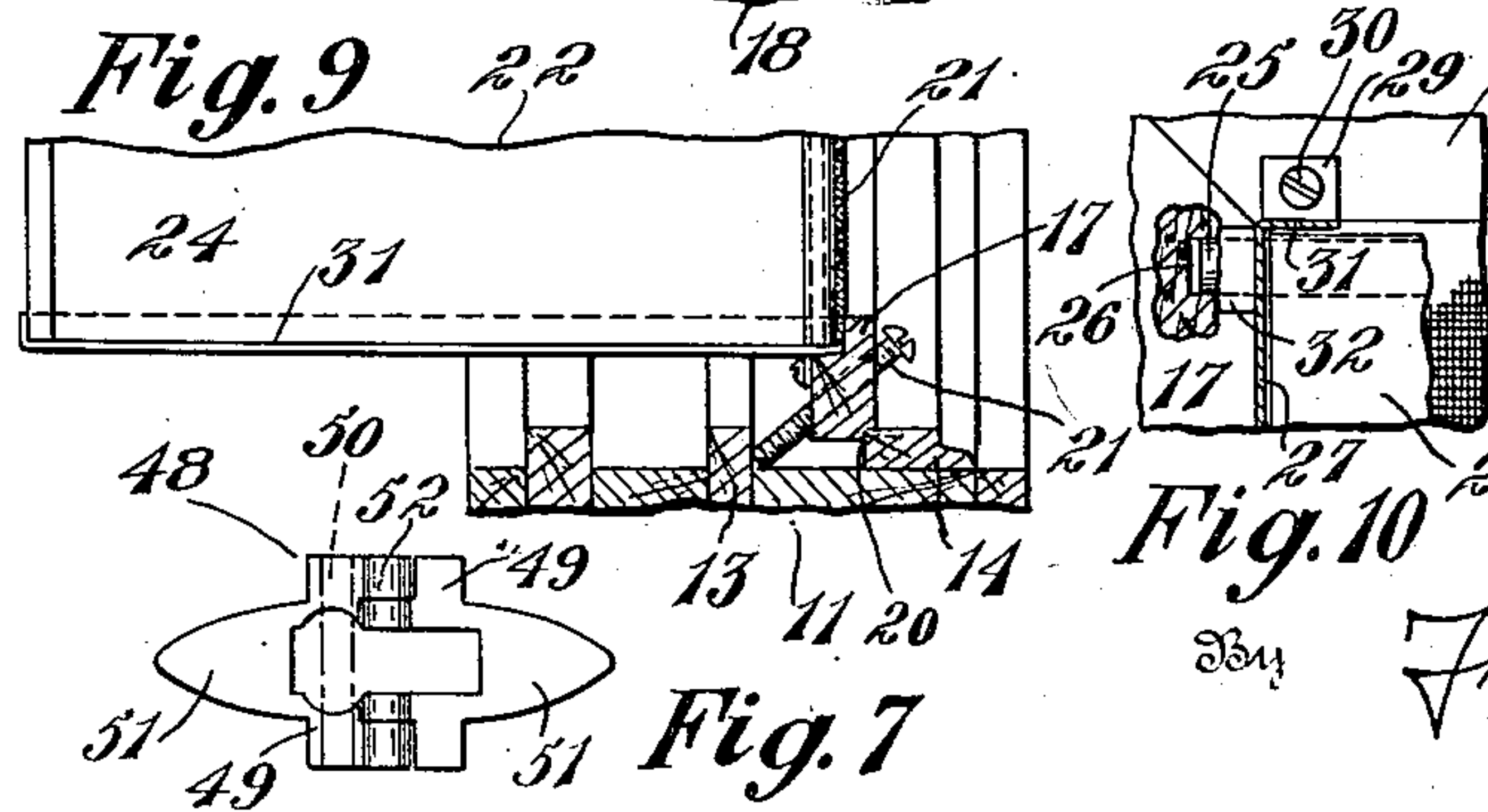


Fig. 7

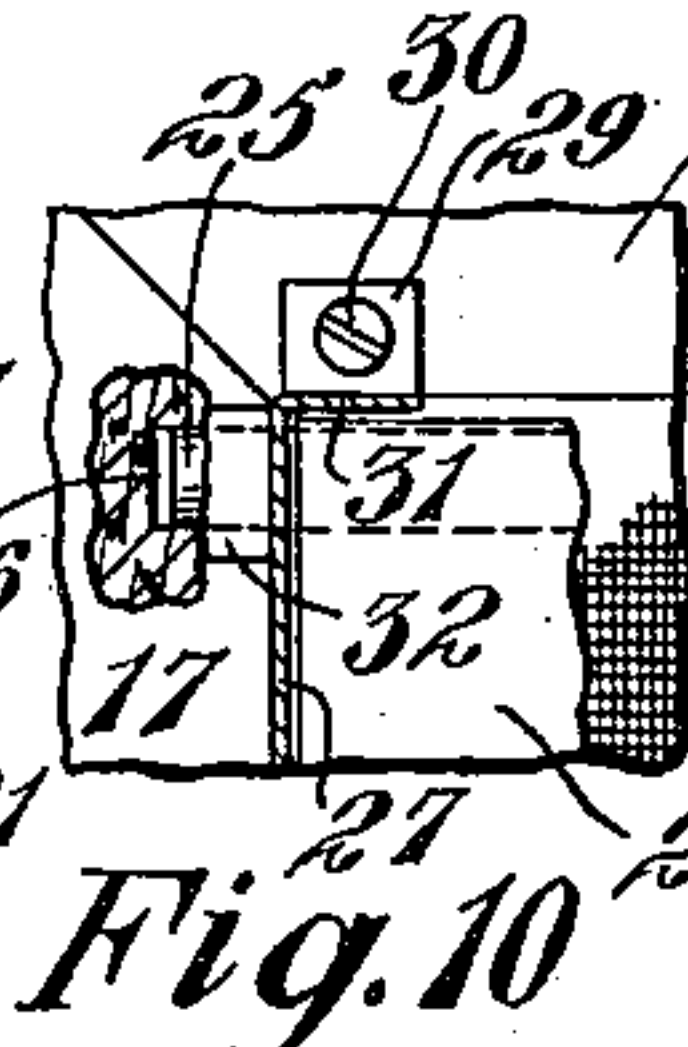


Fig. 10

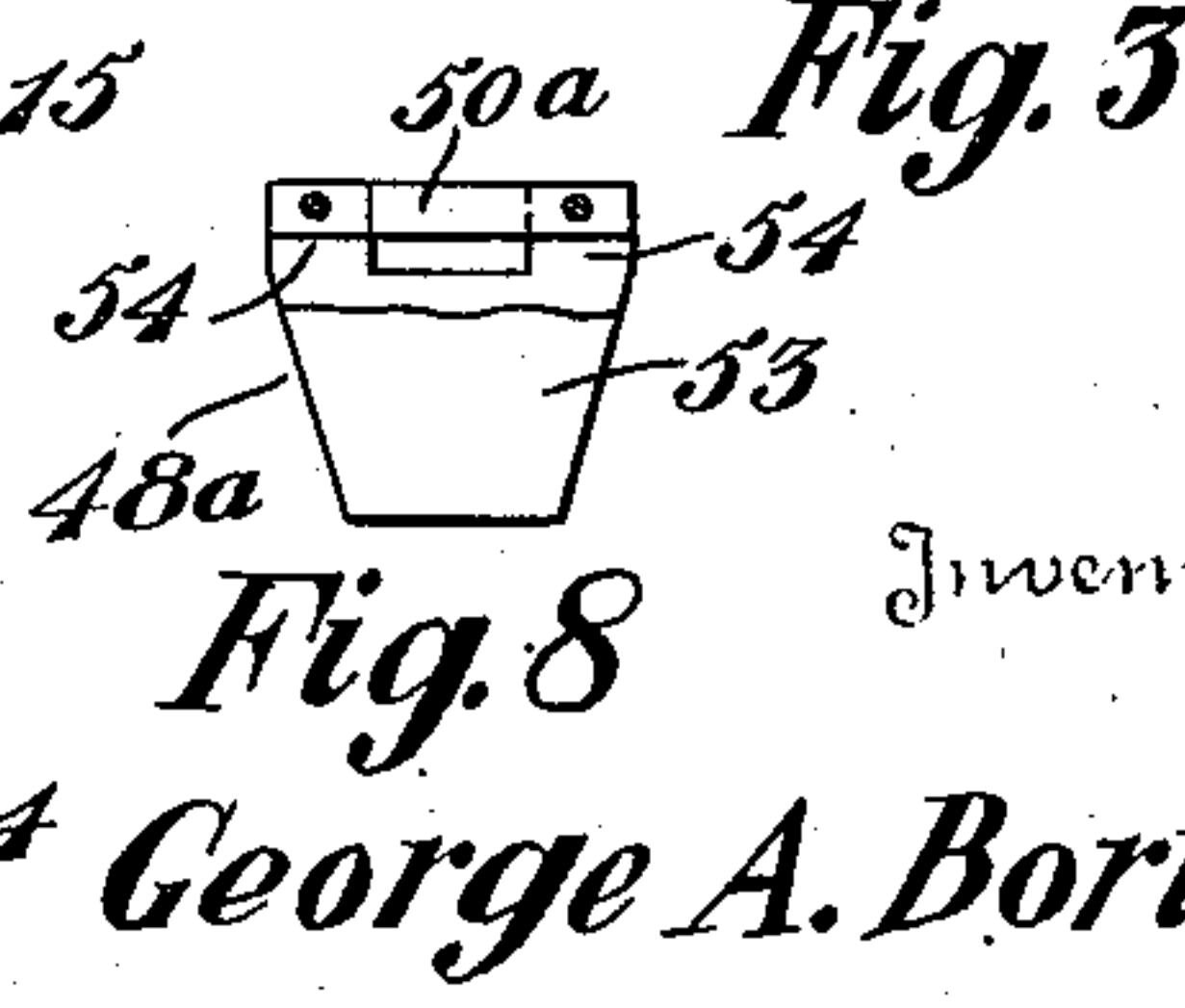


Fig. 8

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2,267,188

WINDOW SCREEN SHUTTER

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Application March 21, 1940, Serial No. 325,206

6 Claims. (Cl. 98—1)

The invention relates generally to ventilating screens for windows, and more particularly to an improved ventilating screen having shutter means for automatically closing the screen opening in wet or inclement weather.

It is very desirable, especially in sleeping rooms, to raise the window sash and place a ventilating screen thereunder, or to locate a ventilating screen in the window frame outside the window sash, so that the room can be ventilated while at the same time excluding insects and the like. However, if weather conditions change to cause excessive moisture, or rain while the occupant of the room is absent or asleep, the moisture has free access into the room through the screen and unless the window is quickly closed by someone, much damage frequently results.

It has been proposed to provide shields or awnings for protecting the window opening or ventilator opening, but such devices are expensive and at best provide only partial protection against the entrance of moisture, especially when the rain is accompanied by wind.

Accordingly, it is a principal object of the present invention to provide a novel and improved ventilating screen having shutter means operative to close automatically by the occurrence of increased moisture in the atmosphere.

Another object is to provide an improved ventilator frame having an automatic shutter and adapted for detachably fitting in conventional window frames, without requiring additional fastening means.

A further object is to provide an improved ventilator frame having an automatic shutter for fitting in a window, and so constructed that none of the parts project inwardly of the window to any substantial extent, when the shutter is in open or closed position.

A still further object is to provide a simple and inexpensive ventilating screen construction embodying the foregoing objectives, which may be quickly positioned in or removed from a conventional window frame by unskilled or inexperienced persons.

These and other objects are accomplished by the parts, improvements, constructions and arrangements comprising the present invention, which is hereinafter described in detail and defined in the appended claims, and which may be generally stated as including a ventilator frame adapted for fitting in a window frame, a shutter hinged to said ventilator frame, a lever arm on said shutter, and latch means on said ventilator frame for normally holding the shutter in open

position, said latch means having a relatively weak member for normally engaging said lever and being adapted to fracture and automatically release said lever to close the shutter upon the occurrence of excessive moisture in the atmosphere.

Referring to the drawing forming part hereof, in which a preferred embodiment of the invention is illustrated by way of example

Figure 1 is a fragmentary inside elevation of a window frame having the improved ventilator screen positioned therein with the shutter in open position;

Fig. 2 is an enlarged fragmentary vertical sectional view thereof;

Fig. 3 is a similar view showing the shutter in closed position;

Fig. 4 is a fragmentary elevation of a preferred form of knuckle joint embodied in the shutter lever arm;

Fig. 5 is a fragmentary view thereof, partly in section, as on line 5—5, Fig. 4;

Fig. 6 is an enlarged fragmentary view similar to a portion of Fig. 2, showing the lever arm engaging one form of latch means;

Fig. 7 is a detached view of said latch means in unfolded position;

Fig. 8 is a detached view of another embodiment of the improved latch means;

Fig. 9 is a fragmentary plain sectional view through the window frame and ventilator frame, showing the manner in which the ventilator frame fits in the window frame; and

Fig. 10 is a fragmentary outside elevation, partly in section, of the ventilator frame, showing the manner in which the shutter is hinged therein.

Similar numerals refer to similar parts throughout the several views of the drawing.

The invention is shown by way of example in the drawing as applied to a ventilator adapted for being placed underneath the sash of a partially opened window, but it will be understood that the invention may be applied to a ventilator or screen positioned in a window frame outside of the window sash, without departing from the scope of the invention defined in the claims.

A conventional window frame is indicated generally at 11 in the drawing and has the usual window sash 12 slidable vertically therein between the parting strips 13 and the inner stop strips 14.

The improved ventilator and shutter shown in the drawing is adapted to fit within the window frame underneath the partially raised sash 12,

and includes a frame consisting of a top member 15, bottom member 16, and side members 17, which frame members may be of wood mitered together at the corners in a usual fashion as shown. Preferably the bottom member 16 is rabbeted along its inner edge as at 18 to engage over the corner of the sill member 19, and the side frame members 17 are similarly rabbeted as indicated at 20, to engage over the corners of the stop strip 14. Means for holding the ventilator frame securely in the window frame preferably includes screws 21 screwed angularly through the side frame members 17 and having their outer ends abutting the parting strips 13 for holding the frame against the outer edges of the parting strips and sill member, as best shown in Fig. 9.

Preferably, a ventilating screen 21, which may be open mesh fabric or ordinary wire screening, is mounted in the ventilating frame and secured at its margin to the frame members in a usual manner. The shutter 22 for covering the screen 21 is preferably hinged adjacent the top frame member 15 for swinging outwardly and upwardly from the frame, and the shutter preferably includes a wire frame 23 forming a rectangle adapted to fit closely within the confines of the ventilator frame members, said wire frame being completely covered with moisture impervious material indicated at 24 which may be waterproof fabric such as airplane cloth or the like. As shown in Fig. 10 the wire forming the upper shutter frame member preferably has lateral projections 25 entering sockets 26 formed in the ventilator frame members 17 to provide a hinge or pivotal mounting for the shutter.

Stop shields for the shutter in open position are preferably provided at each side thereof and may consist of triangular sheet metal shields 27 secured to the ventilator side frame members by screws 28 and having upwardly projecting ears 29 secured to the top ventilator frame member 15 by screws 30. The upper edges of the shields 27 preferably have inturned flanges 31 which serve as stops for limiting the upward swinging movement of the shutter, and the shields 27 serve to prevent rain from passing laterally under the shutter when the same is open. As indicated in Fig. 10 the projecting pivots 25 of the shutter frame pass through apertures in the shields 27 into the sockets 26, and cover plates 32 project laterally from the shields 27 for covering the projections 25 and the sockets 26.

Preferably a friction spring clip 33 is secured to the bottom ventilator frame member 16 at its outer face and arranged to frictionally engage the bottom of the shutter when the same swings to closed position, for maintaining it in that position.

A folding lever arm indicated generally at 34 is secured at its upper end to the top of the shutter frame as by welding, so that the shutter may be actuated by the lever arm. Preferably, the folding lever arm 34 includes an upper arm portion 35 secured to the shutter and a lower arm portion 36 having a pivotal connection or knuckle joint indicated at 37 for permitting the lower arm portion 36 to fold laterally with respect to the upper arm portion 35 as indicated in dot-dash lines at 37 in Fig. 1.

The knuckle joint 37 may include a clevis 38 on the lower end of the upper arm 35 and a flat portion 39 on the lower arm 36 pivoted in the clevis by means of a pin 40 and having a slight protuberance 41 engaging in a depression in the

clevis for normally tending to maintain the arms in the extended position shown in Figs. 1, 2, 4 and 5. Means for limiting the folding movement of the arm portion 34 may include a pin 42 in the flat portion 39 thereof which moves along the edge 43 of the clevis and engages stop shoulders 44 thereon at the limits of its swinging movement.

Means for yieldingly urging the lower arm portion 34 toward folded position preferably includes a spring 45 secured to the upper arm portion 35 and having its lower end slidably engaging the flat portion 39 of the lower arm above the pivot 40, there being an adjusting screw 46 screwed into the arm portion 35 and engaging the spring 45 for adjusting the tension on the spring.

Improved latch means are provided for releasably engaging the lower end of the lever arm 36 when the same is extended to hold the shutter in the open position shown in Fig. 2. As shown the latch means may include a plate 47 secured to the inside of bottom ventilator frame member 16 and forming a slot therewith. A fiat latch member 48 is adapted to slidably enter the slot formed by the plate 47 and has laterally spaced upwardly projecting legs 49 between which a latch element 50 extends in a position to engage behind the lower end of lever arm 36 when the same is extended with the shutter in open position, as best shown in Fig. 6.

The latch element 50 is of frangible material which has sufficient strength to hold the shutter open under normal conditions, but which is easily broken by increased downward pressure on the shutter, or which is weakened by the presence of excessive moisture so that it will break and release the lever arm 36 without any increased pressure on the shutter. A strip of absorbent paper such as blotting paper functions very well as the latch element 50 because such paper readily absorbs moisture and is quickly weakened thereby so as to possess little or no strength. The latch member 48 may consist of two thin metal plates 51 hinged together at their top ends as at 52, the top ends 49 thereof being spaced apart, so that a strip of paper 50 may be inserted between the plates 51 in a position to extend between the ends 49 when the plates are folded together, as indicated in Figs. 1, 6 and 7.

A modified form of latch member is shown at 48a in Fig. 8 in which the latch element 50a is secured between the plies 53 of heavy paper or cardboard, the lower ends of the plies being tapered to fit in the slot formed by the latch plate 47, and the plies being provided with upwardly projecting laterally spaced legs 54 between which the latch element 50a extends as shown. The advantage of such a latch member is that it is very inexpensive and can be thrown away and replaced when the latch element becomes broken.

In the operation of the improved shutter, when the ventilator frame has been positioned in a window, the lever 34 is extended by swinging the lower lever arm 36 to a substantially vertical position against the pressure of the spring 45, and the lever 34 is then pushed outwardly of the window to raise the shutter to its open position shown in Fig. 2. The latch 48 or the modified form 48a shown in Fig. 8 is inserted behind the ventilator frame member 16 and in the slot formed by the latch plate 47, and the latch element 50 is positioned behind and engaged with

the lower end of lever arm 36 for holding the shutter in its open position.

When an excess of moisture occurs in the atmosphere or if it begins to rain, the paper latch element 50 will immediately absorb moisture and in a very short time will be weakened to such an extent that the pressure exerted by the lever arm due to the weight of the shutter will fracture the latch element, and the shutter will swing by gravity to a closed position and will be frictionally held in that position by the spring clip 33, so as to completely close the ventilator opening against the entrance of moisture.

When the lever 34 is released by the fracture of the latch element 50 the spring 45 at the knuckle joint 37 immediately causes the lower lever arm 36 to swing or fold laterally about the pivot 40 so that the lever arm does not project into the room to any extent so as to catch on curtains and the like.

If the shutter is being held in open position by the latch element 50 and a wind storm occurs, the force of the wind against the shutter will fracture the latch element and close the shutter even though the wind is not accompanied by rain, so as to protect the inside of a room from the effects of a storm or high wind.

After the frangible latch element has been broken, the latch member 48 may be removed and unfolded; and a new strip 50 inserted and the latch member replaced in a few seconds by the most inexperienced persons. If the modified latch member 48a is being used, it is merely thrown away and a new one substituted. In either case the latch is ready again to hold the shutter in open position when desired.

I claim:

1. Ventilator and shutter construction including a ventilator frame for fitting in a window, a shutter hinged at its upper end to said frame for swinging upwardly thereon, a folding lever arm rigidly attached at one end to said shutter, latch means on the frame releasably engaging the other end of said lever arm when the same is extended for holding the shutter in open position and arranged to fracture when moistened to release the lever arm for automatically closing the shutter, and means yieldingly urging said lever arm toward folded position.

2. Ventilator and shutter construction including a ventilator frame for fitting in a window, a shutter hinged at its upper end to said frame for swinging upwardly thereon, a lever having two folding arms hinged together and rigidly attached at one end to said shutter, latch means on the frame releasably engaging the other end of the lever when the arms are extended for holding the

shutter in open position and arranged to fracture when moistened to release the lever arm for automatically closing the shutter, and spring means urging said lever arms toward folded position.

3. Ventilator and shutter construction including a ventilator frame adapted for fitting in a window, a shutter hinged at its upper end to said frame for swinging upwardly thereon, a folding lever arm rigidly attached at one end to said shutter, latch means on said frame including a frangible element for engaging the other end of said lever arm when extended with the shutter in open position and adapted on fracturing to release the lever arm for automatically closing the shutter, and means yieldingly urging said lever arm toward folded position.

4. Ventilator and shutter construction including a ventilator frame adapted for fitting in a window, a shutter hinged at its upper end to said frame for swinging upwardly thereon, a folding lever arm rigidly attached at one end to said shutter, latch means on said frame including an element rendered easily breakable by contact with excessive atmospheric moisture and engaging the other end of said lever arm when extended for normally holding said shutter in open position, and means yieldingly urging said lever arm toward folded position.

5. Ventilator and shutter construction including a ventilator frame adapted for fitting in a window, a shutter hinged at its upper end to said frame for swinging upwardly thereon, a folding lever arm rigidly attached at one end to said shutter, latch means on said frame including an absorbent paper member normally engaging the other end of said lever arm when extended for holding the shutter in open position, said paper member being adapted to become weakened by moisture to cause fracture thereof by the pressure of the lever arm, and spring means urging the lever arm toward folded position.

6. Ventilator and shutter construction including a ventilator frame adapted for fitting in a window, a shutter hinged at its upper end to said frame for swinging upwardly thereon, a folding lever arm rigidly attached at one end to said shutter, a latch plate on said frame forming a slot therewith, a latch member slidably inserted in said slot, an absorbent paper strip in said latch member arranged to engage behind the free end of said lever when extended, said free end of the lever being held by said latch member for holding said shutter in open position, and spring means urging said lever arm toward folded position when it is released.

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