J. SYLVAN.

VENTILATING SKYLIGHT.

APPLICATION FILED DEC. 17, 1921.

1,427,175.

Patented Aug. 29, 1922.

2 SHEETS—SHEET 1.

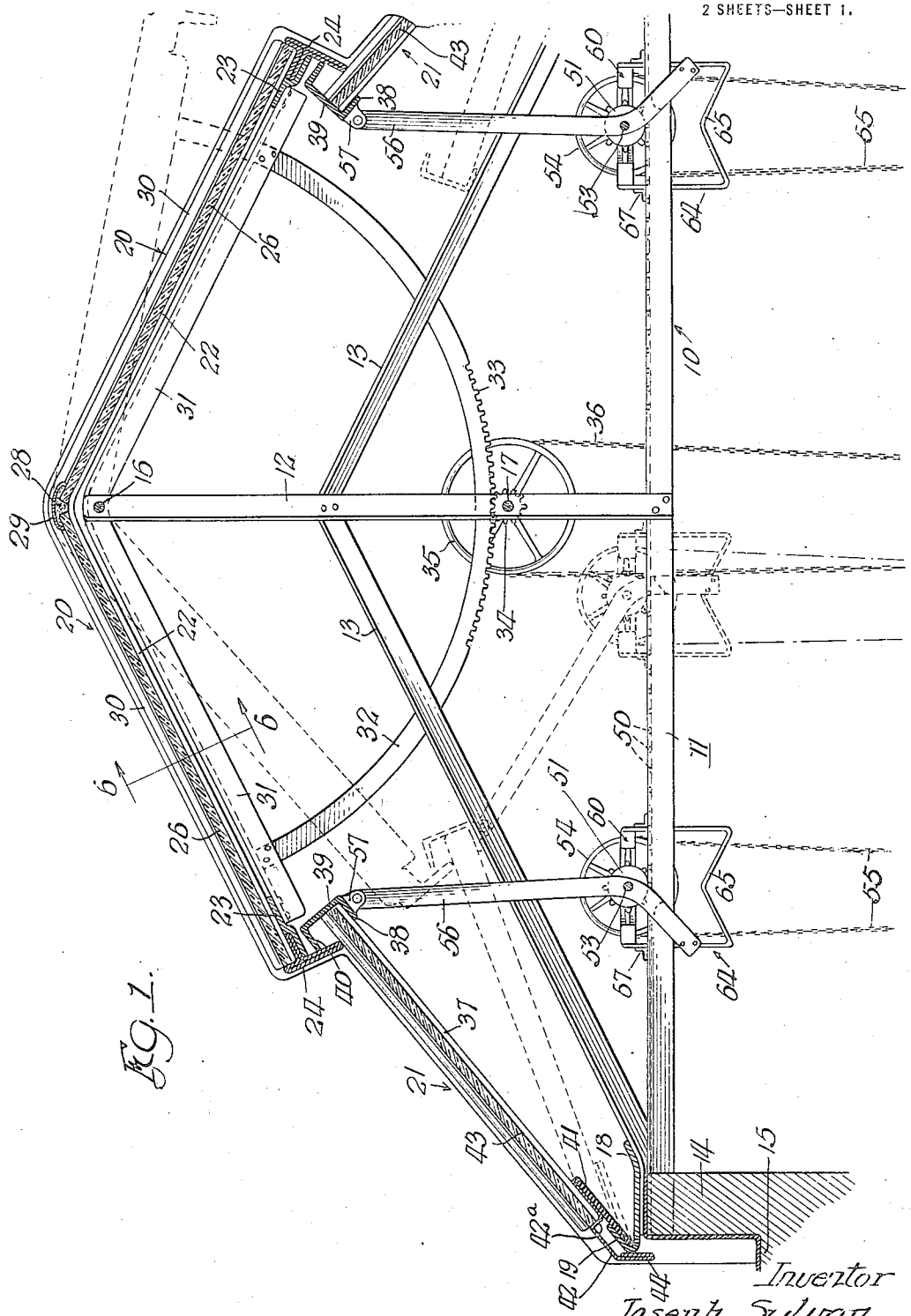


FIG. 1.

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2 SHEETS—SHEET 2.

FIG. 3.

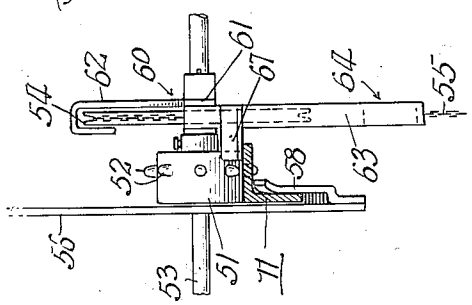


FIG. 5.

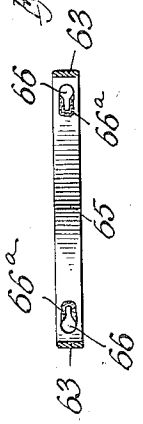


FIG. 6.

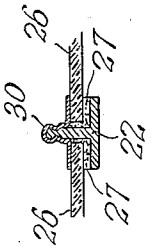


FIG. 2.

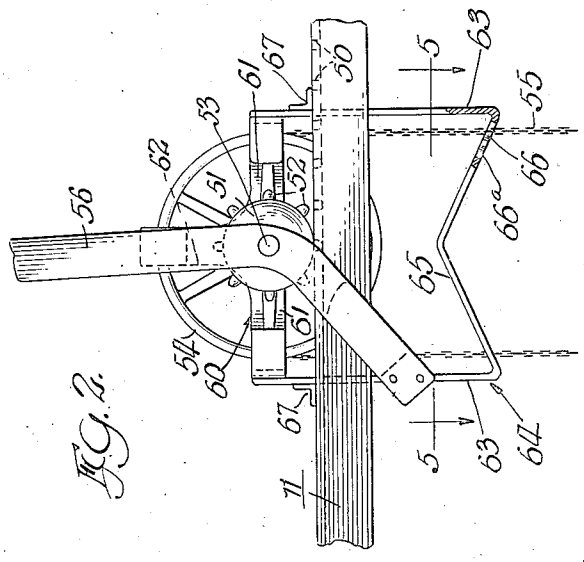
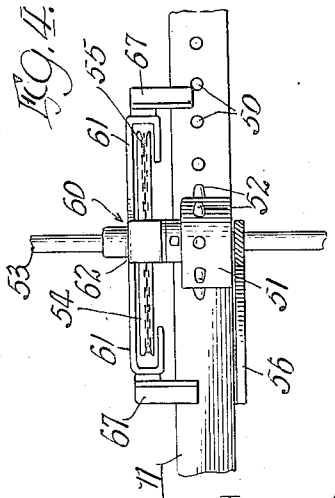


FIG. 4.



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UNITED STATES PATENT OFFICE.

JOSEPH SYLVAN, OF CICERO, ILLINOIS.

VENTILATING SKYLIGHT.

1,427,175. Specification of Letters Patent. Patented Aug. 29, 1922.

Application filed December 17, 1921. Serial No. 523,019.

To all whom it may concern:

Be it known that I, JOSEPH SYLVAN, a citizen of the United States, and a resident of Cicero, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Ventilating Skylights; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in ventilating skylights and consists of the matters hereinafter described and more particularly pointed out in the appended claims.

One of the objects of the present invention is to provide a skylight wherein the upper or ridge panel sections are so connected as to be capable of being swung as a unit, and the two lower sections are each pivotally connected, at their outer margins, to the frame structure so as to be swung inwardly, independently of each other.

Another object of the invention is to provide a simple and efficient pivotal connection between the outer marginal parts of the lower panel sections and the skylight structure.

Still a further object of the invention is to provide a new and novel operating mechanism for swinging the lower panel sections from a full closed to a full open position and vice versa, or for holding them in any position between said full closed and full opened position.

These objects of the invention as well as others, together with the many advantages thereof will more fully appear as I proceed with my specification.

In the drawings:—

Figure 1 represents a transverse section through a skylight construction embodying my invention;

Figure 2 is a view in elevation on an enlarged scale of an operating mechanism embodied in my improved skylight;

Figure 3 is a view in end elevation of the parts shown in Fig. 2;

Figure 4 is a top plan view of the parts shown in Fig. 2;

Figure 5 is a horizontal detail section on the line 5—5 of Fig. 2, and

Figure 6 is a detail section through one of the glazing bars, as taken on the line 6—6 of Fig. 1.

Referring now in detail to that embodinent of my invention illustrated in the accompanying drawings, 10 indicates as a whole one of the trusses of the skylight frame or structure. This truss includes a transversely extending bottom bar 11, a centrally arranged upright post or bar 12, and oppositely inclined rafter bars 13. The rafter bars are connected at their outer ends to the like ends of the horizontal bar 11 and are connected at their inner ends to the upright post 12 intermediate its ends. The ends of all the horizontal bars 11 rest upon and are embedded in the top marginal parts of the curb walls 14 (only one of which is shown in Fig. 1) which define the skylight opening in the building roof 15. The structure thus far described is preferably made of angle bar. Journalled in the posts 12 are two longitudinal shafts 16 and 17 respectively, the purpose of which will appear later. The shaft 16 is located at the extreme top ends of said posts, while the shaft 17 is located in a plane between the transverse bar 11 and the point of attachment of the rafters to said middle posts or standard 12. Secured to the outer ends of the transverse frame and rafter bars, in the vetical plane of each curb-wall 14, is a substantially heavy gutter strip 18, the outer marginal part of which is bent back towards the main part of the gutter strip to provide an inwardly and upwardly facing hook flange 19.

Supported on the frame structure are upper and lower panel sections 20 and 21, respectively. The upper or ridge panel section is made up of a plurality of longitudinally spaced, inverted T-shaped glazing bars, each bent at its middle to provide downwardly and outwardly, oppositely inclined legs 22, normally extending in planes parallel to the rafter bars 13. The outer ends of the said legs of the glazing bars are fixed to longitudinally extending, flat panel frame bars 23 and to each frame bar is attached a weather strip having a flange 24 arranged at a right angle to the legs of said glazing bars. Resting at their lateral margins upon the glazing bars are the panels 26 preferably of glass, there being layers or pads of putty 27 interposed between the glazing bars and the margins of said panels (see Fig. 6). Said panels substantially meet at the ridge of the skylight where putty 28 (see Fig. 1) is provided to fill

the space between the adjacent ends of the panels. Said ends are further enclosed by a longitudinally extending ridge strip 29. Associated with each glazing bar 22 is a sheet metal cap strip 30, extending from end to end of the glazing bar and over the ridge strip 29 in such manner as to hold the same in its proper position. The top marginal parts of the weather strip flanges 24 provide the end stops for the outer ends of the panels 26.

Associated with the upper or ridge sections 20 is a plurality of secondary rafter bars 31 which extend parallel with the glazing bars 22 and are fixed at their ends to the panel frame bars 23. At the middle of each secondary rafter bar is a hole through which the shaft 16 extends, so that both panel sections 20 may be swung as a unit about said shaft as an axis through a predetermined degree. The outer ends of each secondary rafter bar are further connected and braced by an arcuate bar 32, having an axis coincident with that of the shaft 16. Said arcuate bar has rack teeth 33 at its middle which are in mesh with a gear pinion 34 fixed to the shaft 17. Also fixed to said shaft is a chain pulley wheel 35 actuated from below by a chain 36. It is apparent from the foregoing that the sides of the upper or ridge panel sections will counter-balance each other so that they will normally stand in the full line position shown in Fig. 1 when they cover or overhang substantially one-half of the skylight opening 15.

The lower panel sections 21 normally extend at an angle different from that of the upper panel sections 20 and are made up of a plurality of longitudinally spaced, inverted T-shaped glazing bars 37 which are fixed at their top or inner ends to one flange 38 of a longitudinal channel bar 39. The other flange 40 of said channel normally engages against the inner surface of the bottom part of the weather-strip flange 24. The outer or bottom ends of the glazing bars 37 are secured to a longitudinal flat bar 41, one marginal part of which engages beneath the hook flange 19 of the gutter strip 18. Interposed between the ends of the glazing bars 37 and the flat bar 41 is a cover strip 42 which has a web shoulder 43 associated with the glazing bars, which are secured thereto in the same manner as the panels 26 are secured to the glazing bars 22. The outer marginal part 44 of each cover strip is bent back upon itself and engages the outer surface of the hook flange 19 as shown in Fig. 1 and thus prevents the formation of ice or the entrance of snow or rain into the gutter strip 18.

As is apparent, the hook flange 19 and the bar 41 provide a pivotal or hinged connection for the lower panel section 21, about which the same may be swung, the inclined position of said lower panel section acting to hold the hook flange and bar in the proper coacting position.

Means are provided for swinging each lower panel section 21 about the pivotal connection before mentioned to open or close the same, and said means are as follows:

The horizontal flange of each truss bar 11 is provided at each side of the upright post 12 with series of equally spaced holes 50. Capable of a rolling movement on said flange are toothed cylindrical members or rollers 51, one associated with each of the lower panel sections 21. Each roller has teeth 52 which engage in the holes 50 in the manner of a rack and pinion. The rollers 51 are fixed on longitudinal shafts 53 and to each shaft is fixed a chain pulley 54 about which an endless operating chain 55 is trained. Associated with each toothed roller is a link 56, through which the shafts 53 extend as shown in Figs. 1 and 2, said link being arranged adjacent the vertical flange of the truss bar 11. The top end of the link is pivotally connected to an eye 57 on the channel bar 39, while the bottom end of said bar is bent as shown and has affixed to one side a bracket or hook 58, the bottom end of said bar and said bracket receiving, between them, the vertical flange of the truss bar 11. The top end of the hook 58 is so constructed that it will substantially engage, at all times, with the bottom surface of the horizontal flange of the truss bar. It is apparent that the link can not shift in a direction parallel with the shafts nor can the shafts and rollers be vertically displaced with reference to the truss bar. Thus the rollers are held in proper position and can only travel or be rolled longitudinally of the truss bar 11.

Associated with each chain pulley 54 is a chain guard which includes a spider plate 60 having two horizontal arms 61 and a vertical arm 62, said plate having a bearing hole through which the shaft 53 extends. The arms 61, 62 have their ends bent to partially embrace the other side of the pulley wheel and thus prevent the chain 55 from jumping off the pulley. Secured to the horizontal arms of the chain guard are the vertical arms 63 of a depending U-shaped bracket or yoke 64. The horizontal cross member 65 of said bracket is bowed upwardly at its middle and near the ends thereof are provided key-hole shaped openings 66 through which the laps of the chain extends. The restricted ends of said openings are defined by fusible metal blocks 66ª (see Fig. 5) which, under certain conditions, act in a manner to appear later. Secured to the vertical arms of said yoke are horizontal bars 67, the free ends of which engage upon the top surface of the horizontal

flanges of the truss bars 11 and prevent the chain guard from rotating with the shaft 53.

The operation is as follows: Assume that all the sections are in their normally closed position as shown in full lines in Fig. 1 and that the lower sections have been locked in this position against opening under the action of gravity, by reason of the chains being caught in the restricted parts of the openings 66. Assume that it is desired to swing that lower section 21 at the left-hand side of the skylight, into open position. The operator grasps the right-hand lap of the chain 55 and frees it from the restricted part of the associated slot 66 and pulls downwardly on the same. This will rotate the pulley 54 and the roller 51 in a clockwise direction, causing the roller to travel or roll on the truss bar 11 toward the post 12. As the roller thus moves, the shaft 53 will move with it, the link 56 changing its position to allow the panel section 21 to swing downwardly about the hook flange pivotal connection until it rests upon the rafter bars 13 as shown in dotted lines in Fig. 1, which is the full open position for this panel section. Said panel section may, if desired, be locked in a partway open position, simply by pulling the active lap of the chain 55 inwardly toward the middle of the yoke 64 to again engage and catch it in the restricted narrower part of the key-hole opening 66 defined by the fusible block 66^a, in said yoke.

The righthand lower panel section 21 may be swung in the same manner as just described, into the full open position shown in dotted lines in Fig. 1. When both lower sections are in their full open positions, the wind may blow in beneath one margin of the top panel section and then over or across the skylight opening and out beneath the other margin of the top panel section.

When both lower sections are in the open position and it is desired to have an opening at one side only, of an increased area, the chain 36 associated with the upper panel section is actuated to swing the same as a unit about the shaft 16 as an axis, until the margin of one side thereof (the lefthand side as shown in dotted lines in Fig. 1) rests upon the lefthand lower panel section. As the top sections swing as a unit, the righthand half will of course move upwardly away from the righthand lower panel section, into substantially a horizontal plane, increasing the area of the opening as is apparent from the dotted lines in Fig. 1. Thus when the wind is blowing from left to right, a vacuous condition is set up at the margin of the righthand half of the upper section, which will establish a suction action providing an up-draft through the said opening. It is apparent that a wide variety of openings may be had by the different relative positions of the panel sections, so that any degree of ventilation within certain limits is possible.

Should the sections be in the closed position shown in full lines in Fig. 1 and should a fire occur in the building room beneath the skylight, the fusible blocks 66^a defining the restricted parts of the slots 66 in the yokes 64, will fuse and free the chains 55 so that the lower sections would swing downwardly, under gravity, into open position, the operating mechanisms moving toward the post 12 to accommodate for such opening of said panel section. In this movement the said operating mechanisms will act to somewhat retard the opening movement of the said sections so that no slam will occur to break the panels. Thus the lower section will open automatically in case of fire.

The many advantages are readily apparent from the foregoing description. While in describing my invention I have referred to certain details of mechanical construction and arrangement of parts, I do not wish to be limited thereto except as may be pointed out in the appended claims.

I claim as my invention:—

1. A ventilating skylight comprising in combination, a frame structure, upper and lower panel sections, on said frame structure, means providing a hook flange on said frame structure, and a member on one longitudinal margin of the lower panel section engaged with said hook flange and providing a hinge joint between the frame structure and said lower panel section, about which the lower panel section may be swung.

2. A ventilating skylight comprising in combination, a frame structure, upper and lower panel sections on said frame structure, means on the outer marginal part of the frame structure providing a longitudinal, upwardly opening hook flange, and a longitudinal member on the outer marginal part of the lower panel section, engaged with said hook flange and providing a hinge joint between the frame structure and said lower panel section, about which said lower panel section may be swung.

3. A ventilating skylight comprising in combination, a frame structure, upper and lower panel sections on said frame structure, means on the outer marginal part of the frame structure providing a longitudinal, upwardly opening hook flange, a longitudinal member on the outer marginal part of the lower panel section, engaged with said hook flange and providing a hinge joint between said frame structure and lower panel section about which said lower panel section may be swung, and a weather strip carried by the outer marginal part of said lower panel section for enclosing said hinge joint.

4. A ventilating skylight comprising in combination with a frame structure, includ-

ing frame bars, upper and lower panel sections on said frame structure, means providing a hinged connection between the bottom margin of said lower panel section and said frame structure about which said lower panel section may be swung, an operating device mounted on and capable of being moved along one of said frame bars, and means connecting said operating device with the inner margin of said lower panel section.

5. A ventilating skylight comprising in combination with a frame structure, including frame bars, upper and lower panel sections on said frame structure about which said lower panel section may be swung, a toothed member having a traveling engagement with one of said frame bars, means operable from below for causing said toothed member to travel on said frame bar, and a link operatively connecting said toothed member with the inner marginal part of said lower panel section.

6. A ventilating skylight comprising in combination with a frame structure, including frame bars, upper and lower panel sections on said frame structure about which said lower panel section may be swung, a toothed member having a traveling engagement with one of said frame bars, means operable from below for causing said toothed member to travel on said frame bar, a link operatively connecting said toothed member with the inner marginal part of said lower panel section, and means for holding said toothed member in engagement with said frame bar as it travels along the same.

7. A ventilating skylight comprising in combination with a frame structure, including frame bars, upper and lower panel sections on said frame structure about which said lower panel section may be swung, a toothed member having a traveling engagement with one of said frame bars, means operable from below for causing said toothed member to travel on said frame bar, a link operatively connecting said toothed member with the inner marginal part of said panel section, said link being constructed to prevent displacement between said toothed member and said frame bar.

8. A ventilating skylight comprising in combination with a frame structure, including a transversely extending angle bar having spaced holes in its horizontal flange, upper and lower panel sections on said frame structure, means providing a hinged connection between the bottom margin of said lower panel section and said frame structure about which said lower panel section may be swung, a toothed wheel capable of traveling upon the horizontal flange of said angle bar with the teeth thereof engaging in said spaced holes, a link operatively connecting said toothed member with the inner margin of said lower panel section, and means operable from below and connected with said toothed member for causing it to travel along said angle bar.

9. A ventilating skylight comprising in combination with a frame structure, including frame bars, upper and lower panel sections on said frame structure, means providing a hinged connection between the bottom margin of said lower panel section and said frame structure about which said lower panel section may be swung, a toothed member having a traveling engagement with said frame bar, a shaft fixed coaxially of said toothed member, a link pivoted at one end to the top margin of said lower panel section and having a hole near its other end through which said shaft extends, a pulley fixed to the shaft near one end of said toothed member and a chain passing over said pulley and operable from below for rotating said pulley in either direction.

10. In combination with a frame structure, including a bar, a panel section having a hinged connection along one margin with said frame structure, an operating device for swinging said section about its hinged connection, comprising a member having a toothed engagement with said bar, a shaft to which said member is fixed, a chain pulley wheel fixed to said shaft, and a chain guard mounted on said shaft for preventing the chain from jumping the pulley, and means on said guard engaging said bar for guiding said guard in its movement as said toothed member travels along said bar.

11. In combination with a frame structure, including a bar, a panel section having a hinged connection along one margin with said frame structure, an operating device for swinging said section about its hinged connection, comprising a member having a toothed engagement with said bar, a shaft to which said member is fixed, a chain pulley wheel fixed to said shaft, an endless chain passing over the pulley, and a chain guard mounted on the shaft adjacent the pulley, and including a bottom cross bar having key hole openings through which the laps of said chains extend and by means of which the chain may be locked to determine the position of the toothed member on said frame bar.

12. A ventilating skylight comprising in combination with a frame structure, including a transversely extending frame bar, upper and lower panel sections on said frame structure, means providing a hinged connection between the outer margin of the lower panel section and the frame structure about which said lower panel section may be swung, and an operating device mounted on and capable of being moved along said transversely extending frame bar, away from and toward said lower panel section, and

means connecting the operating device with the inner margin of said lower panel section.

13. A ventilating skylight comprising in combination, a frame structure including upright center posts, upper and lower panel sections on said frame structure, said upper panel sections having two downwardly and outwardly diverging sides which are pivoted on a horizontal axis at the top ends of said posts, means connecting the outer margins of the sides of said panel together, means providing a pivotal connection between the bottom margins of said lower panel sections and said frame structure, about which the lower panel section may be swung, and an operating mechanism associated with each panel section for swinging it about its pivot, the parts being so arranged that one or the other of the lower panel sectiones must be at least in a partway open position before a swinging movement can be imparted to the upper panel section.

14. In combination with a skylight frame structure, a panel section having a pivotal connection therewith, a chain actuated, operating mechanism for swinging said panel, a chain guard having parts with holes therein through which said chain extends, and fusible means carried by the guard and adapted to be engaged by the chain to lock the same against movement through the guard.

15. In combination with a skylight frame structure, a panel section having a pivotal connection therewith, an operating mechanism capable of movement on said frame structure, a chain for actuating said mechanism, and a chain guard having key-hole shaped openings through which the chain passes, the narrower part of said openings being defined by a fusible block adapted to be engaged by one of the links of the chain.

In testimony that I claim the foregoing as my invention, I affix my signature in the presence of two witnesses, this 14th day of December, A. D. 1921.

JOSEPH SYLVAN.

Witnesses:
CLARENCE E. MEHLHOPE,
T. H. ALFREDS.