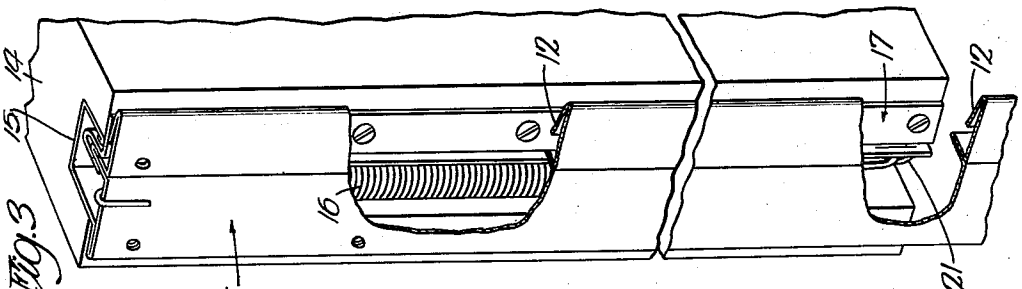
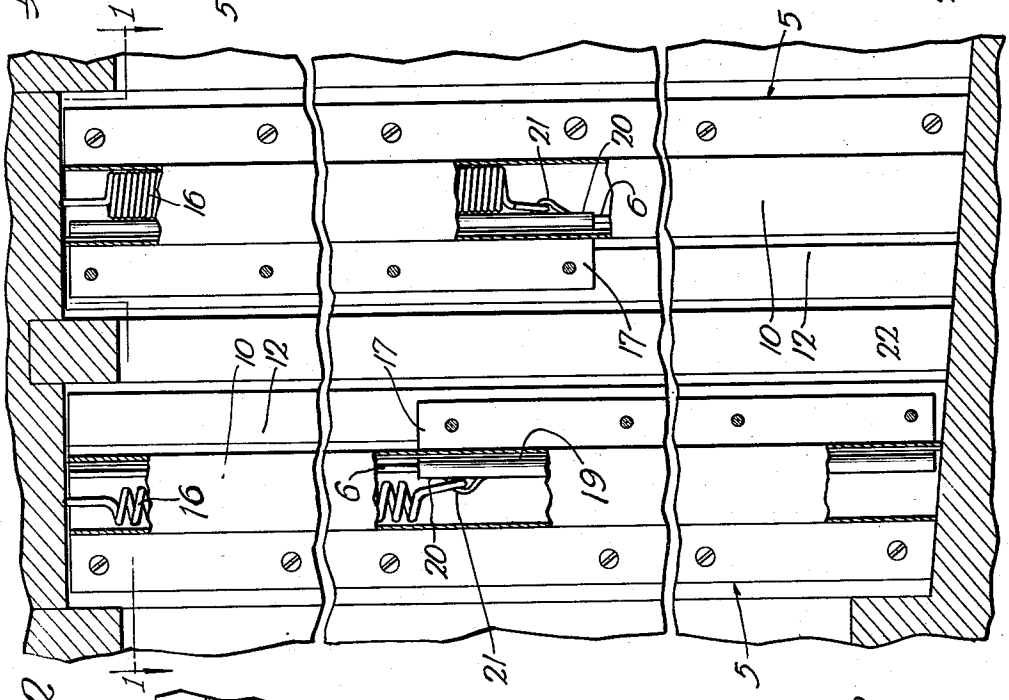
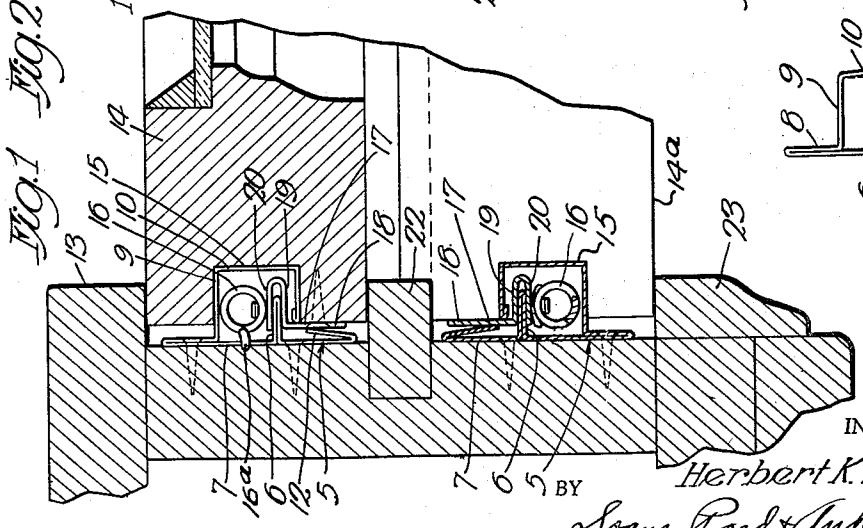
May 26, 1942. H. K. LUNDGREN 2,284,438

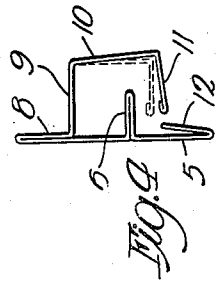
COMBINATION SASH BALANCE AND WEATHER STRIP

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COMBINATION SASH BALANCE AND WEATHER STRIP

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11 Claims. (Cl. 20—69)

This invention relates to an improvement in a combined sash balance and weather strip and more particularly to an improvement in devices of this character which rely for their sash balancing function upon a coil spring.

The main objects of the invention are to provide a combined sash balance and weather strip structure wherein the coil spring and other parts are effectively housed or concealed so as to be thereby protected from the weather and whereby the structure when installed has a clean-cut, neat appearence free from suggestions of complicated mechanical construction; to provide such a structure which may be manufactured economically and at low cost and which may be easily installed either in new or old work; to provide a combined sash balance and weather strip which will be durable and efficient in use both in respect of its sash balancing function and its weather stripping function; and in general, it is the object of the invention to provide an improved sash balance and weather strip device of the character indicated.

Other objects and advantages of the invention will be understood by reference to the following specification and accompanying drawing wherein there is illustrated a selected embodiment of the improved structure.

In the drawing:

Fig. 1 is a cross-section on a horizontal plane through a window structure, the section being taken at the upper end of the window substantially as indicated by the line 1—1 of Fig. 2;

Fig. 2 is a side elevation of the window frame showing the parts of the improved sash balance and weather strip structure in place but with the sash itself removed so as to clearly illustrate the relationship of the parts of the improved structure;

Fig. 3 is a perspective illustrating a step in the method of installing the improved structure; and

Fig. 4 is an end view of an element of the improved structure illustrating its condition before installation.

Referring now to the drawing, the improved sash balance and weather strip structure herein illustrated comprises a main member 5, the same being formed of suitable sheet metal, preferably of resilient character and of such thickness as best suits the purpose of the structure. In the drawing, the thickness of the metal is considerably exaggerated for illustration purposes. The body member 5 is formed so as to provide a rib 6 extending laterally from a base part 7 which includes portions on both sides of the rib, the latter being of two-ply construction incident to its formation by folding as illustrated. From one edge of the base 7 a portion 8 is rebent and then bent to form an outwardly facing tubular formation or channel shaped part having a side wall 9 connected at its outer edge to said base part, a front wall 10 and another side wall 11. As shown, the side wall 11 overlaps the flange or rib 6 in spaced relation thereto and it has its outer edge disposed in spaced relation to said base part 7. The side walls 9, 10 and 11, together with the base part 7 form a housing which substantially encloses the rib 6. Also, the housing thus formed together with said rib 6 constitutes a housing for completely enclosing a counter-balancing spring which will presently be described.

In initial condition, the side walls 9, 10 and 11 assume an expanded position as illustrated in full lines in Figure 4, but the resiliency of the metal permits said parts to assume a substantially compressed or contracted position as indicated in dotted lines in Figure 4. The other edge of the base 7 has a portion 12 rebent to an angular position as illustrated for a purpose which will presently appear.

Body members or strips such as 5 are employed at each of the vertical sides of each vertically slidable sash, the base part 7 being seated and suitably secured in fixed position in the ways of the window frame structure 13 wherein the sash is slidably mounted.

The drawing illustrates the present invention as applied to an ordinary window structure wherein upper and lower sashes 14 and 14*a*, respectively, are vertically slidable in the frame structure 13.

Each sash 14 and 14*a* is provided with a groove 15 in each side to receive the wall portions 9, 10 and 11, said portions being caused to assume a squared-up position to correspond with the walls of the groove 15. The sash 14 is adapted to slide vertically on the rectangular housing structure comprising the walls 9, 10 and 11 and the normal tendency of the said housing structure to expand results in the production of weather-proof contact between such housing structure and the adjacent walls of the sash groove 15, and also in a desirable frictional resistance to vertical movement of the sash.

The said frictional resistance to vertical movement of the sash is preferably relatively light and insufficient to prevent such movement of the sash either by gravity or by manually applied force, although if preferred the structure may be made of such strength that this holding

power may alone serve to hold the sash in a selected position. Preferably, however, the arrangement is such that a counter-balancing spring 16 is employed for counter-balancing the weight of the sash 14, the frictional resistance of the walls 9, 10 and 11 against the sash being relied upon to hold the window in any adjusted position against the tendency of the spring to restore the window to closed position.

The spring 16 is an elongated helical coil spring, the upper end of which is hooked over the upper end of the base part 7 of the body member 5 as indicated at 16a. The lower end of the spring is connected to the sash through the agency of a member 17 which has a base part 18 suitably secured to the side of the sash. Said base part extends toward the groove 15 in the sash and is bent outwardly to provide a wall part 19 and then inwardly to provide a wall part 20. The base part 18 extends past the free edge of the wall 11 and the wall parts 19 and 20 are adapted to snugly embrace the rib 6 of the main body member. The member 17 is preferably coextensive in length with the vertical length of the sash 14, so that it constitutes a weather strip element which cooperates with the rib 6 and the wall part 11 of the main body member to prevent draft between the side of the sash and the window frame. The wall part 20 is provided near its lower end with a suitable eye-formation 21 which receives the lower end hook of the spring 16 as most clearly illustrated in Figure 2. It will be observed that inasmuch as the member 17 is secured to the sash 14 so as to move vertically therewith, the connection of the spring 16 to said member 17 constitutes a connection between the lower end of the spring and the sash, so that downward movement of the sash 14 will cause the spring 16 to be stretched with consequent counter-balancing effect on the sash.

The described combined sash balance and weather strip, when installed in connection with a lower sash such as indicated at 21, which moves upwardly from closed position, is similar to the described installation for an upper sash which moves downwardly from closed position. However, it is preferred to reverse the arrangement so that as shown in Figure 2 the rib 6 and sash strip or liner 17 are adjacent the outside of the sash instead of the inside as in the case of the upper sash. The spring for the lower sash is enclosed in the main member 5 and stretched between the upper end of said main member 5 and the upper end of the sash. The lower end of the spring is connected to the sash through the agency of the sash strip 17, which is in inverted position relative to the sash strip 17 of the outer or upper sash.

If the weather stripping function of the member 17 is not desired, said member 17 may be replaced by means of short length of such a member which will constitute merely an anchoring clip for connecting one end of the spring 16 to the sash. Such a clip would, of course, eliminate from the structure the cost of the full sash length of the strip 17 and in some instances might be preferable.

The rebent portion 12 of the main body member 5 is adapted to yieldingly engage the adjacent side portion of the sash or the base 18 of the adjacent strip 17 if employed to cooperate therewith to form a further draft preventive. This weather strip element may also be wholly dispensed with if desired with attendant economies in the cost of metal and in the cost of production.

The main body member of the structure may be fastened in place by nails, screws or in any other suitable manner, but I prefer to employ so-called drive screws which are a form of wood screws adapted to be driven with a hammer instead of a screw driver. Such drive screws may be easily removed by means of a screw driver and thus facilitate removal of the sash and of the balancing structure should occasion require. The fastening means are preferably driven to such an extent that their heads are flush with the respective surfaces of the parts fastened thereby.

The described structure may be installed in the following manner. A member such as 17 is first secured in place in the sash and a spring 16 then secured at one end to the eye 21 of such member 17, the spring being then placed lengthwise in the groove 15 of the sash. A main body member 5 may then be slid endwise into the groove 16 and into cooperative relation with the member 17, the then free end of the spring being manipulated so as to cause its hook to be engaged over the end of the main member 5 when the length of the spring has been traversed. The sash will then have associated with it the member 17 secured thereto and the body member 5 which is slidable relative to the sash, the structure appearing then as illustrated in Figure 3.

Both sides of the sash have the combination sash balance and weather strip structure thus assembled with it, whereupon the assembled structure may be moved into place in the window frame, it being understood, of course, that the intermediate parting strip such as indicated at 22 and the inner strip 23 are preliminarily removed or not yet in place.

When installing an upper sash equipped with the described balance and weather strip structure, the portion of the body member 5 which depends below the sash may be anchored by nails or screws as explained, after which the sash may be lowered and the then exposed upper portion of the main member 5 similarly anchored, it being understood that the body member 5 extends the full length of the window frame. Installation of the lower sash equipped with the described balance and weather strip structure is similarly effected. The intermediate or parting strip 22 is of course placed in position after the upper or outer sash is installed and the inner strip 23 after the inner or lower sash is installed.

It will be observed that the described structure completely encloses the counter-balancing spring 16 so that it is effectively protected from the weather, and whereby the spring is concealed from view. Hence the appearance of the structure is clean-cut and neat and impairment of operation by the entrance of dirt, snow, sleet, etc., effectively prevented. Furthermore, the complete enclosure of the spring serves to reduce or eliminate noise incident to working of the spring within its enclosure. The improved structure involves no difficult manufacture, assembling or installing operations and is entirely practicable. It may be made of various kinds of metals or combinations of metal which are commonly used for weather stripping purposes and the thickness of the parts may be such as will provide the desired resilient holding effect of the main body member and the necessary strength characteristic especially of the sash

strip 17, the latter being usually made of heavier and stiffer metal than the main body member 5.

Changes in the described construction may be made without departing from the spirit of the invention, the scope of which should be determined by reference to the following claims, the same being construed as broadly as possible consistent with the state of the art.

I claim:

1. A sash balance comprising an elongated coil spring adapted to be secured at one end to a window frame and at its other end to the sash, a housing structure completely enclosing and concealing said spring and secured to said frame, said housing comprising relatively spaced but mtually overlapping wall portions, means movable between said wall portions for connecting one end of the spring to the sash, said means comprising a member having a base part adapted to be disposed against and secured to the side of the sash, a wall part disposed between said overlapping wall portions and a further wall part cooperating with the first mentioned wall part to embrace one of said overlapping wall portions.

2. A sash balance structure of the class described comprising a base member formed of sheet metal and folded so as to form a laterally extending rib adjacent one side of the base and a rectangular tubular formation having a side wall extending laterally from said base adjacent its other side, a front wall extending substantially parallel to said base and another side wall extending from said front wall toward said base but terminating in spaced relation thereto, said base member being adapted to be secured to a window frame, and a member comprising a flange adapted to be secured to one side of the sash and extending into said tubular formation between said last mentioned side wall and one side of said rib and being provided with a part disposed in parallel relation to said rib on the other side thereof, a coil spring disposed within said tubular formation and having one end secured to an end portion of said base member and its other end secured to the last mentioned part of said member.

3. A sash balance comprising a housing having a base part and a tubular formation extending from said base part, said tubular formation being integrally connected at one side to said base and free of attachment thereto at its other side, a member extending between said base part and the free edge of the tubular formation into the latter, an elongated coil spring disposed within said housing and having one end connected to said housing and its other end to said member within said housing, and interfitting weather strip means within said housing and comprising parts respectively formed integrally with said housing and member.

4. A window structure comprising a frame, a sash, and a combined sash balance and weather strip, the latter comprising a spring metal member having a base, a rib extending outwardly from said base, and a tubular formation embodying portion extending outwardly from said base on one side of said rib, transversely of the rib and then inwardly toward the base into spaced, overlapping relation to the other side of said rib and terminating in spaced relation to said base, said tubular formation having a normally expanded, open condition but being resiliently contractible, said sash having a groove in its side and said tubular formation being contracted and slidably fitted into said groove so as to yieldingly frictionally engage the walls of said groove to stop air leakage between the sash and said tubular formation, said base, rib and tubular formation cooperating to form a housing, a spring disposed within said housing and thereby concealed, and means secured to the sash and having a portion extending between said inwardly extending portion of said tubular formation and said rib into said housing, said spring having one end connected to said last mentioned means within said housing and its other end connected to said housing.

5. A window structure comprising a frame, a sash, and a combined sash balance and weather strip, the latter comprising a spring metal part having a base, a rib extending outwardly from said base, and a tubular formation, said tubular formation extending outwardly from said base on one side of said rib, transversely of the rib and then inwardly toward the base in spaced, overlapping relation to the other side of said rib and terminating in spaced relation to said base, said tubular formation having a normally expanded, open condition but being resiliently contractible, said sash having a groove on its side and said tubular formation being contracted and slidably fitted into said groove so as to yieldingly frictionally engage the walls of said groove to stop air leakage between the sash and said tubular formation, said base, rib and tubular formation cooperating to form a housing, a spring disposed within said housing and thereby concealed, and a sash strip substantially coextensive with the height of the sash, secured thereto and having a portion extending between said inwardly extending part and said rib into said housing and having a channel formation embracing said rib to provide a supplemental air stop, said spring having one end connected to said channel formation within said housing and its other end connected to said housing.

6. A sash balance structure of the class described comprising a part having a base member, a rib extending laterally from said base, and a tubular formation having a side wall portion extending laterally from said base in spaced relation to one side of said rib, a front wall portion extending transversely of said rib and a second side wall portion extending from said front wall portion toward said base into overlapping relation close to the other side of said rib but terminating in spaced relation to the base; a sash strip substantially coextensive with the height of the sash and comprising a sash engaging portion and a portion extending between said second tubular formation wall portion and said rib into said tubular formation, said strip also having a channel formation embracing said rib within said tubular formation, and a coil spring disposed within said tubular formation and having one end secured to said first mentioned part and its other end secured to the channel portion of said sash strip.

7. A combination sash balance and weather strip comprising a main member having a base portion for attachment to a window frame, a tubular part connected at one of its sides to the base part and having its other side terminating in an edge adjacent but spaced from said base part, an element extending laterally from one of said parts into the interior of said tubular part; and a second member entering between said base part and the adjacent spaced

edge of the tubular part into the interior of the latter and embracing said laterally extending element within said tubular part, said second member being of such length as to be substantially coextensive with the height of a sash, whereby said second member and said element cooperate to form a stop against the passage of air between the sash and window frame.

8. In a spring balance for supporting in selected position a sash which is vertically slidable in a frame, an elongated coil spring, a tubular housing structure enclosing and concealing said spring and comprising relatively spaced but mutually overlapping wall portions, a member substantially coextensive in length with the length of the sash and having a base, a portion of which base extends between said overlapping wall portions into said housing, said spring having one end connected to said member within said housing and its other end to said housing, and said member having an additional wall portion cooperating with said base to embrace one of said overlapping wall portions.

9. In a sash balance of the class described, a main member comprising a base part for attachment to a window frame, and an outwardly facing channel shaped part, said channel shaped part having one side portion connected to said base part and its other side portion terminating in spaced relation to said base part, said base part and said channel shaped part cooperating to form a housing, a rib extending from one of said parts into overlapping but spaced relation to a portion of the other of said parts, said rib being disposed within said housing, a second member substantially coextensive in length with the height of the sash and having an outer part for attachment to the sash, and an inner channel shaped part extending between said rib and said other side portion into said housing and embracing said rib, and a spring disposed in said housing and having one end connected to said main member and its other end connected to said second member.

10. In a spring balance for supporting in selected position, a sash which is vertically slidable in guide-ways in a window frame, an elongated coil spring, a housing for said spring comprising a U-shaped member embracing said spring and having a base flange extending laterally from the free edge of one side of said U-shaped member, said flange being adapted to be secured to the window frame within the guide-way in which the sash is slidable and said U-shaped member being adapted to be recessed into the sash so that the sash is slidable longitudinally thereover, the free edge of the other side of said U-shaped member terminating in proximity to but in spaced relation to the wall of the guide-way to which said flange is secured, and a member for attaching one end of said spring to the sash, comprising a flange adapted to be secured to a portion of an edge of the sash which is normally disposed in said guide-way, said flange extending transversely of the sash through the space between the free edge of said other side of the U-shaped member and the adjacent wall of the guide-way, and a leg extending laterally from said last mentioned flange into said U-shaped member and connected therein to said spring.

11. In a spring balance for supporting in selected position, a sash which is vertically slidable in a guide-way in a window frame, an elongated coil spring adapted to be disposed along a side edge of the sash and to have one end anchored in fixed relation to the window frame, a housing for said spring comprising a U-shaped member having its open side facing away from said side edge of the sash, embracing said spring, and having a mounting flange adapted to be secured to the window frame for maintaining said U-shaped member in fixed position, said U-shaped member being adapted to be recessed into the sash so that the sash is slidable longitudinally thereover, the free edge of one side of said U-shaped member terminating in proximity to but in spaced relation to the bottom wall of the guide-way in which the sash is slidable, and a member for attaching the other end of said spring to the sash, said member comprising a flange adapted to be secured to a portion of the sash, extending transversely of said side edge of the sash through the space between said free edge of one side of the U-shaped member and said bottom wall of the guide-way, into said U-shaped housing and connected therein to the other end of said spring.

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