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AWNING ARM

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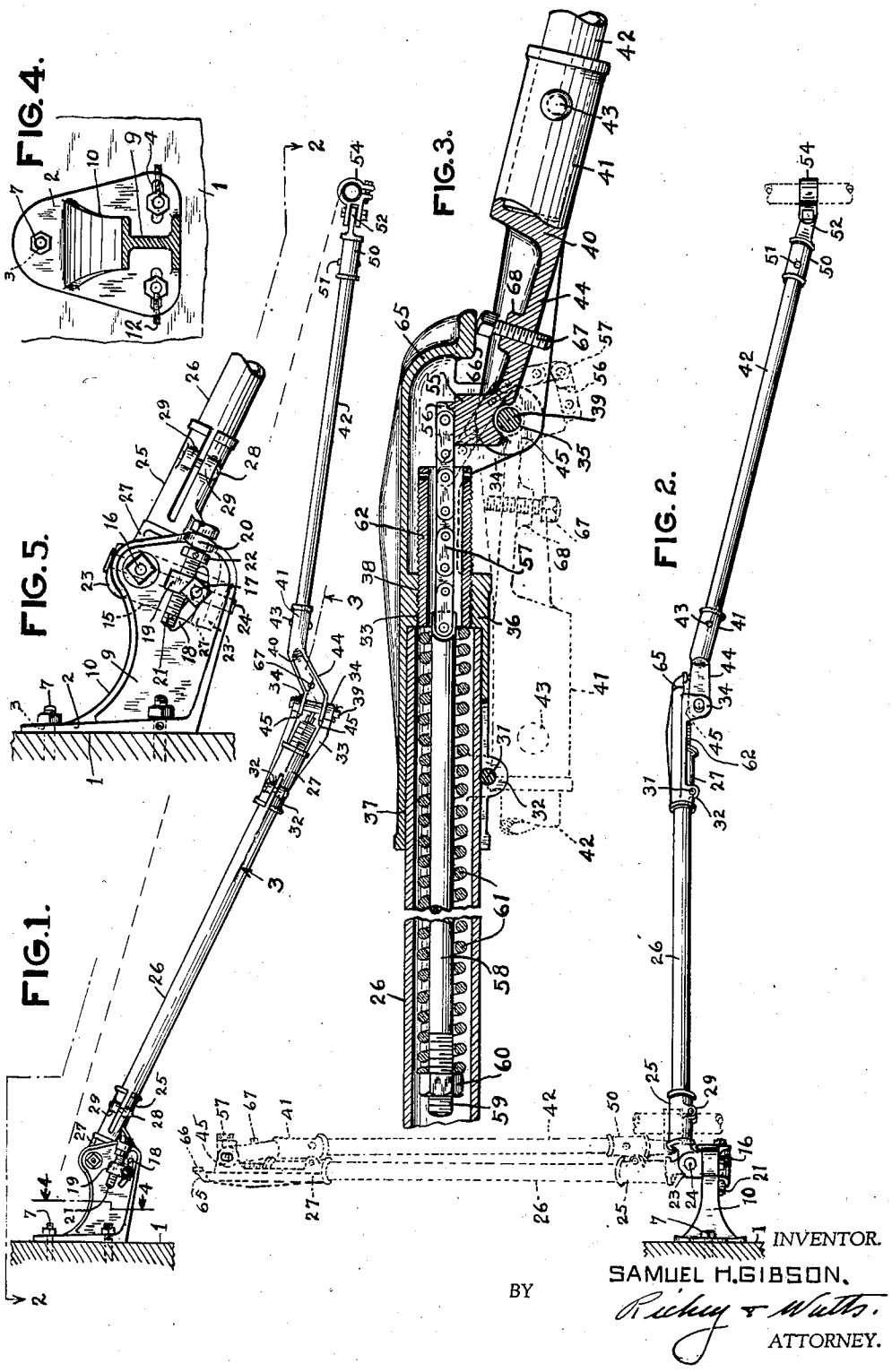

FIG. 4.

FIG. 3.

FIG. 5.

FIG. 2.

FIG. 1.

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AWNING ARM

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3 Claims. (Cl. 156—44)

This invention relates to improvements in awning arms and more particularly to folding awning arms.

Although folding awning arms are well known in the art as well as spring tension means for unfolding the arms and/or for holding the arms in extended position, the previous arms have had numerous disadvantages which it is the purpose of the present invention to eliminate. One of the disadvantages of the prior art arms resides in the fact that they were extremely difficult to adjust to their proper desired position. Heretofore it has required the concerted efforts of two or more workmen to properly position the arms, and because of the weight, the adjustment was difficult to maintain, making it necessary for repeated return or "service" trips by the workmen to readjust the same to their desired position.

Furthermore, in the prior awning arms, the spring mechanism for unfolding the arms had greater tension effect on the arms at that position (folded) where the least tension was desired. Still other disadvantages resided in the fact that the working parts of the spring tension systems were exposed to the elements where they accumulated ice, snow and other foreign matter, all of which seriously hampered the efficiency of operation. Although some of the prior arms did acquire some degree of protection for the mechanism, they at the same time acquired other undesirable features, more particularly being that of facility of adjustment of the spring tension.

By the present invention, a great many of the disadvantages of the prior art arms are eliminated and an arm is provided which is extremely simple and positive in its adjustment, light in weight and wherein there are no parts that are liable to catch and mutilate the fabric of the awning. Being light and easy to adjust, a minimum number of workmen are required to install the same and a single workman can easily adjust the same to any desired position. Furthermore, the tension upon the spring operated unfolding means can be easily, positively and quickly adjusted without the aid of special tools or equipment. In shipment the spring tension can be so regulated as to make it unnecessary to employ any special locking means therefor to prevent unfolding of the arms, which effect in the prior arm usually presented a danger of injury to the workmen or shippers if it should accidentally become released. The spring mechanism is housed in the arm itself protecting it against the elements, and the design of the connecting means is such that the tension of the spring in the folded position has substantially less unfolding effect than is found in the prior art arms.

Still other advantages of the invention and the invention itself will become more apparent from the following description of an embodiment thereof, which description is illustrated by the accompanying drawing.

In the drawing:

Fig. 1 is a side elevational view of the awning arm in extended position and attached to the front of a building, the position of the awning fabric being indicated by dash lines;

Fig. 2 is a plan view thereof taken on the line 2—2 of Fig. 1 and showing in dotted lines the position taken by the arm in its folded position;

Fig. 3 is an enlarged fragmentary section taken along the lines 3—3 of Fig.1 and illustrating the spring tension mechanism;

Fig. 4 is an enlarged section taken on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged side elevational view of the bracket of Fig. 1.

Throughout the drawing, like parts have been designated by like reference characters.

Generally the arm includes a wall bracket for attachment to the front of a building which bracket adjustably and pivotally supports an inner arm of tubular construction. Pivotally secured to the end of the inner arm is an outer arm also of tubular construction, the outer end of which is adapted to be attached to the front awning bar. Spring actuated means for urging the arms to an open position is provided and includes a spring preferably housed in the inner arm, although it may be housed in the outer arm, and adapted to exert tension on a rod extending therethrough, which rod is connected by a flexible chain to a lever integral with the outer arm.

More specifically, the wall bracket includes a flat back plate or base 2 of substantially triangular formation having bolt opening 3 through its apex and two arcuate slots 4 disposed at opposite sides near the bottom. The top of the bracket is pivotally secured by a bolt 7 which extends through the aperture 3 into the wall 1, and the lower portion of the bracket is secured by bolts 7 extending through the slots 4 into the wall 1. Set screws 12 extend through the edge of the plate and are adapted to engage the bolts 7 to shift the bottom of the bracket laterally to the desired position, the plate swinging on the pivot at the top, when the proper position is once ascertained, the bolts 7 may be

securely tightened and the bracket securely clamped against the wall. The bracket is provided with an outwardly and downwardly extending support or web 9 adapted to support the inner end of the inner arm as hereinafter described and provided with a wide peripheral flange 10.

A support for the inner arm is provided and comprises a member 15 pivotally secured at its upper end by a bolt 16 extending through the support and the upper portion of the web 9. A second bolt 17 extends through the bottom of the support 15 and through a slot 18, the slot being concentric to the pivot bolt 16, and carries on the opposite side of the web a block 19 which bridges the slot 18 and is adapted to be clamped against the web by a nut on the end of the bolt 17.

The flange 10 at the lower forward extremity of the bracket is provided with laterally extending bosses 20 through one of which a bolt 21 is disposed with the head outside of the flange and the stem threaded through the block 19. The support 15 may be adjusted about its pivot by loosening the bolt 17 and rotating the adjusting bolt 21, the bolt 21 being provided with a thrust and locking nut 22 on the opposite or inner side of the boss 20. The bolt being threaded in the block 19, rotates causing the block to be moved and carrying with it the bolt 17 and the support 15. Once adjusted the nuts on the bolts 16 and 17 are tightened and the support is thus held fixed.

The support 15 has a pair of outwardly extending parallel arms 23 at its upper and lower extremity which are provided with axially aligned apertures and carry therein a pivot pin 24. Pivotally journalled on the pin 24 between the arms 23 is a coupling for the inner arm which comprises a split cylindrical socket 25 adapted to receive and be clamped to the tubular inner arm 26 by a bolt or rivet 28 which extends through parallel bosses 29 on opposite sides of the split. The end of coupling is provided with a pair of spaced parallel ears 27 through which the pivot pin extends, the ears bearing against the opposite inner surfaces of the arms 23.

The other end of the inner arm extends into a hinge coupling which comprises a split socket 37 similar to that at the bracket end, the arm being securely held in the socket by a rivet or bolt 31 extending through lugs 32 on opposite sides of the split. It should be noted that the rivets which secure the tube into the sockets also pass through and engage in notches in the periphery of the tube positively insuring against the tube or couplings' turning relative to each other. The inner arm hinge coupling is provided with a body 33 extending in prolongation of the socket which supports a pair of oppositely disposed parallel ears 34 provided with axially aligned hinge pin holes 35. It should be noted that the axis of the hinge pin holes is considerably spaced from the axial center of the tube.

As best shown in Fig. 3, the tube extends into the socket 37 abutting an inturned annular boss 36 in the socket adjacent the hinge end. The boss 36 is provided with a threaded bore 38, the internal diameter of which is less than that of the tube 26, the purpose of which will later be described.

A hinge pin 39 is carried by the ears 34 and supports thereon between the ears 34 an outer arm hinge member 40.

The outer arm hinge member includes a cylindrical socket 41 in which the tubular outer arm 42 is disposed being held in the socket by a rivet 43 extending through the socket and arm. The socket is provided with an offset extension 44 which terminates in a pair of spaced ears 45 which are provided with axially aligned apertures adapted to receive the hinge pin 39, said member being disposed on the pin between the ears 34 of the inner arm hinge coupling.

The arm 42 is provided at its terminus with a coupling 50 which comprises a socket into which the end of the arm extends being secured thereon by a rivet 51. The socket is provided with an apertured lug 52 extending from the end and adapted to be pivotally secured to an awning front bar coupling 54 which coupling is in turn clamped to the front awning bar.

Spring means is provided to urge the arm from a folded to an unfolded position and also to hold it in the unfolded position. The outer arm member is provided with an integral boss 55 having faces disposed at right angles to each other substantially as shown, and terminating in an apertured ear 56 which in combination with the arm constitutes a bellcrank lever pivoted at the hinge pin 39. In the unfolded position of the arms, the end of the aperture in the ear 56 is opposite to the threaded opening 38 in the inner arm coupling and has pivotally connected thereto a flexible chain 57 which extends from the ear into the inner arm. The first link of the chain lies against the flat surface of the boss 55 at the base of the ear. The other end of the chain 57 is connected to a rod 58 which thus extends in prolongation of the chain into the tube and terminates in a threaded end 59 on which is disposed, in threaded engagement, a crosshead comprising a nut 60; a separate nut, not shown, may be provided to lock the crosshead in position, or the threads may be mutilated to prevent removal of the crosshead. In some instances I may form the crosshead and rod as an integral unit. A helical spring 61 is disposed about the rod and chain in the tube with one end in engagement with the crosshead 60 and the other end abutting the inner end of a threaded sleeve 62 adjustably disposed in the threaded bore 38 and through which the chain and rod may extend.

The inner arm hinge member is provided with an offset extension 65 having a flat face 66 adapted to engage the head of a stop screw 67 threaded in a boss 68 of the outer arm hinge member, the purpose being to adjustably determine the position where the arms stop relative to each other when unfolded.

The device operates generally in a manner well known to those versed in the art. The inner arm may swing laterally on the pivot pin of the support 15 when folded, as best shown by the dotted lines in Fig. 2. The downward angle at which the arm extends may be determined by adjustment of the inner arm support 15 in the manner previously described.

It is to be particularly noted that the spring mechanism is effectively housed against the elements and that the amount of pressure exerted by the spring is determined by the tension on the spring and that the tension of the spring is determined by the position of the crosshead 60 and also the position of the adjustable sleeve 62. The crosshead 60 permits a rough adjustment of the spring tension to be made prior to assembly to allow for slight differences in spring length, while the sleeve 62 permits exact tension to be had after assembly.

The sleeve **62** also permits easy assembly of the spring mechanism in the tube, it being provided with radially disposed apertures **63** adjacent its outer end into which a nail or pointed tool may be inserted to revolve the same. The sleeve may be screwed inward when the arms are in an extended position which compresses the spring and places the exact tension desired upon the spring to hold the arms against folding.

It will be noted by reference to Fig. 3 that the force exerted by the spring and connecting linkage on the outer arm has greater effect during the first part of the folding movement because the lever formed by the lug **55** and ear **56** is then the longest. However, as the arm is rotated, the second link comes in contact with the face of the boss **55** at right angles to the face at the base of the ear and thus the chain moves closer to the pivot. Hence in substantially 90° of rotation of the lever formed by the boss the effective lever is materially shortened. Because the effective lever is thus shortened, the spring tension has substantially less effect upon the arm. When the lever is rotated, another 90° the links of the chain come still closer to the pivot axis actually resting against the pivot pin and making the effective lever still shorter and still further reducing the effective tension of the spring on the outer arm. For instance, it may be found that it takes four pounds of effort of the end of the arm (at the front awning bar) to start folding the arm. This effort increases as the spring tension increases until the first 90° position mentioned is reached. It is then found that due to the decrease in length of the lever the force necessary to move the arm is still four pounds. Further rotation of the arm to the folded position shown by the dotted lines, shows that although the spring has been compressed materially, the actual force being applied at the outer end of the outer arm is still four pounds.

This is ample pressure to start the arms unfolding and also ample pressure to hold the arms in the unfolded position. At the same time the pressure is not so great in the folded position as to put an undue strain on the awning fabric. This pressure as previously explained, may be varied to the amount desired by screwing the sleeve in or out of the arm.

Although I have described both arms as being tubular, it is within the purview of the invention to only make one of the arms tubular if so desired. Furthermore, although the spring mechanism is housed in the tubular inner arm, it could be readily housed in the outer arm with the chain connected to the inner arm, and it is not my intention to limit the invention otherwise than expressed in the appended claims.

Having thus described my invention, I am aware that numerous and extensive departures may be made therefrom without departing from the spirit or scope of the invention.

I claim:

1. In a folding awning arm including inner and outer arm hinged sections at least one of said arms being tubular, means for unfolding said arms comprising a spring disposed in the tubular arm, a crosshead engaging one end of the spring and a connection between said crosshead and the other arm, an adjustable abutment for the other end of said spring for varying the tension of the spring.

2. In a device of the class described comprising hingedly connected inner and outer arms, a wall bracket for one of said arms and a coupling for the other arm end, means for unfolding said arms including a helical spring disposed inside of one of the arms, an adjustable abutment for said spring comprising a threaded sleeve threaded into the arm and projecting out of the arm, a crosshead engaging the other end of the spring and a connection extending from the crosshead through said spring and sleeve and connected to the other arm.

3. In an awning arm, tubular inner and outer arm sections, a hinge including a hinge pin for connecting said sections and permitting the same to fold, spring means for unfolding said sections and including a helical spring disposed inside of one of said arms, a threaded sleeve screw threaded into the arm containing the spring and furnishing an abutment for said spring and formed to provide means for screwing the same into or out of said arm to change its longitudinal position, a lever extending from the other arm section adjacent the hinge pin and forming with said arm a bellcrank lever with the hinge pin as a pivot, a crosshead engaging the other end of said spring and a connecting rod screw threaded into said crosshead, a chain connecting said rod to said lever.

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