

PATENT SPECIFICATION

770,142



Date of Application and filing Complete Specification: June 20, 1955.

No. 17751/55.

Application made in India on May 25, 1955.

Complete Specification Published: March 13, 1957.

Index at acceptance:—Classes 20(3), P4(B: M); and 137, A2(A2: C1).

International Classification:—A47h, F24f.

COMPLETE SPECIFICATION

Improvements in or relating to Louvres

I, HERBERT JOSEPH LONGLEY, of 22, Gobra Road Entally, Calcutta 14, West Bengal, India, of British Nationality, do hereby declare the invention, for which I pray

5 that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to louvres such as are fitted to windows or other openings in buildings and other places or structures. The invention relates more particularly, but not exclusively, to adjustable louvres in which the louvre elements (slats or panels, depending

15 upon the size of the louvre) are rotatably mounted so that their angle of tilt is adjustable and are mechanically coupled together for simultaneous operation for opening and closing the louvre. Such louvres usually have

20 their said elements arranged either horizontally or vertically according to requirements.

Louvres have various practical uses and applications, such as for ventilation and for protection from the sun and elements, and take various constructional forms for different purposes of use. One form of louvre for which the present invention has especially, but not exclusively, been devised is that kind

30 of adjustable louvre which finds service primarily as a sun shield for buildings in hot climates, and which is fitted to the exterior of the building and is controlled from inside the building so that it can be opened

35 and closed to any extent necessary to obtain the desired shielding from the sun and control over the admission of light and air.

Until now, louvres whatever their type have been constructed with louvre elements which

40 are of inherently rigid nature, being rigid slats or panels. With large louvres, such as adjustable louvre installations on buildings like those above-mentioned, the louvre elements become large panels of substantial and heavy

45 construction which necessitates correspondingly

robust and heavy construction of their mountings and actuating gear.

An object of the present invention is to provide an improved construction of louvre which obviates the disadvantages attendant upon the heavy type of construction above-mentioned and enables a comparatively light construction to be achieved regardless of how big the louvres may be while yet producing a louvre which is at least as efficient and durable in service as its counterpart of conventional construction.

The principle underlying the present invention is to dispense with rigid slats or panels for the louvre elements and to utilise in their stead strips or sheets of such thin or light nature or construction as to be flexible, and to impart the necessary rigidity to them in the louvre by means of applied tension.

Accordingly, the present invention provides a louvre having flexible louvre elements held taut between end members supporting said elements. By holding the elements taut rigidity is imparted to the otherwise flexible elements.

The present invention also consists in a louvre having flexible louvre elements attached by their ends to end members which support said elements between them, and tensioning means arranged for applying tension to said elements through their attachments to said supports so as to hold said elements taut and thereby impart rigidity to them.

According to a feature of the invention, the louvre elements are cambered to increase their rigidity.

The use of tensioned flexible louvre elements as described affords numerous advantages. Considerable savings in weight, costs of manufacture, storage, transportation and installation can be achieved. Owing to the elements being held in tension no reinforcement or other special provision to support the weight of the elements is necessary. The elements can be made of any material that can

[Price 3s. 0d.]

withstand tension, thus making available for louver construction materials never hitherto used or regarded as usable for the purpose. For instance, the elements may be made of thin, flexible metal strip or sheet material, such as aluminium strip. As another example, each element may be constructed of two parallel flexible wires or the like which support between them sheets or strips of asbestos, fibre, or any other suitable thin, flexible material attached to the wires or the like. The latter are held taut to tauten the material attached to them. The elements can be made of any size, length, width or breadth required.

Tensioning of the louver elements may be effected in various ways. For instance, each individual louver element may be tensioned by spring or equivalent tensioning means provided at each end of the element, or alternatively at only one end thereof. In another arrangement two or more or all of the louver elements of a louver may be connected at their ends in series and the whole series of elements tensioned by tensioning means common to the series, such as for instance spring or equivalent tensioning means provided at each end, or alternatively at only one end, of the series. Such series connection of louver elements may be effected by flexible connecting wires or the like which are passed around pulleys carried by the end supports of the louver elements so that the elements each get tensioned. It may be found generally convenient to employ spring means for tensioning the louver elements but the invention is not limited in this respect since any equivalent tensioning means, for example a weight or weights, may be employed.

In an adjustable louver embodying the invention, the louver elements are rotatably attached to their end supports abovementioned by means of mountings which allow the elements to be maintained taut while also allowing them to be turned for adjusting their angle of tilt. Any suitable mountings which will meet these requirements may be employed, but a simple and preferred form of mounting is one utilising round link chains. The required tension can readily be applied through such a chain while its links can twist relatively to one another to permit the element to be turned.

The adjustable louver elements may be attached at one or more places along their length to pivoted members (hereinafter called keepers) which are mechanically coupled to a common actuating member for turning the keepers and through them the louver elements, simultaneously. The keepers may camber the louver elements to increase their rigidity.

An adjustable louver as described may be installed on the outside of a building with the louver elements supported by upright end members fixed to the building and with the

keepers and their mechanical transmission carried by one or more intermediate upright members fixed to the building between the end uprights. The actuating member for operating the louver elements may comprise a handle, crank or handwheel which may be arranged inside the building or otherwise at a suitably accessible position and suitably connected with the keeper actuating mechanism.

In order that the invention may be more clearly understood and readily carried into practice, an embodiment and modifications thereof as applied to adjustable louvers suitable for buildings will now be described with reference to the accompanying drawings, in which:

Figs 1 and 2 are diagrammatic front elevations showing a general arrangement of one form of the louver in the open and closed positions respectively.

Fig. 3 is a diagrammatic plan view.

Fig. 4 is a fragmentary view drawn to a larger scale showing the end mounting of the louver elements in greater detail.

Figs. 5 and 6 are fragmentary end views drawn to a larger scale showing details of the keepers and their operating mechanism, in the open and closed positions of the louver respectively.

Fig. 7 is a view similar to Fig. 2 showing a modified arrangement for tensioning the louver elements.

Referring to the drawings, the louver comprises a pair of upright angle irons 1, 1 intended for fixture to a building at a desired location and serving as end supports for the louver elements 2. The latter are made of whatever length is desired, and of flexible material in accordance with this invention. They may be made of aluminium strip, for instance. These elements are held taut between the uprights 1, 1 so that rigidity is imparted to the otherwise flexible elements. Further, each element is rotatably mounted. In this embodiment the required swivel mountings for the elements are provided by round link chains 3 attaching each end of each element 2 to the adjacent upright 1, as shown in detail in Fig. 4. The end link 3a, adjacent the upright 1, of each chain 3 is provided by the eye of an eye bolt 4 which passes through a hole 5 in the upright 1 and is fitted with an encircling helical compression spring 6 which abuts at one end against the upright 1 and at the other end against an abutment 7 on the bolt. The abutment 7 is adjustable along the bolt 4 by means of a nut 8 screwed on the bolt end, whereby the power of the spring 6 may be adjusted. It will be evident that since the upright 1 is fixed the spring 6 acts against the abutment 7 to urge the bolt 4 away from the end of the element 2, thus applying tension longitudinally through the bolt and chain 3 to the louver element 2. In the illustrated embodiment, each element 2

70

75

80

85

90

95

100

105

110

115

120

125

130

has such a spring tensioning arrangement as shown in Fig. 4 at each end of the element, as is indicated in Figs. 1, 2 and 3. Each element 2 is thereby held taut while its attaching chains 3 allow it to be turned for adjusting its angle of tilt.

Referring to Figs. 3, 5 and 6, at points along their length the elements 2 are attached to keepers 9 which are pivoted at 10 on projecting arms 11 mounted on suitably placed intermediate uprights 12 fixed to the building. The number of these intermediate uprights 12 may be two or more, as desired according to requirements and the length of the louvre elements 2. The elements 2 are attached to the keepers 9 in any convenient manner. For example, with elements 2 made of aluminium or other thin metal strip the keepers 9 may be provided with a lip or channel 13 (see Figs. 5 and 6) receiving the edges of the elements 2 as shown. For each louvre element 2 the bolt holes 5 in the two end uprights 1, 1 and the pivots 10 of the intermediate keepers 9 are all aligned in a straight line as indicated by the chain-dotted line 14 in Fig. 3. Thus, the faces of the keepers 9 against which the element 2 bears are offset from the pivots 10, as is seen in Figs. 5 and 6, and hence the keepers hold the louvre element offset from the centre line 14 so that the element is cambered (i.e. slightly bowed outwardly) between the end uprights 1, 1 as is shown in Fig. 3. This camber increases the rigidity of the tensioned element.

The louvre elements 2 are mechanically coupled for simultaneous operation to adjust their angle of tilt. For this purpose, the vertical bank of keepers 9 carried by each upright 12 are linked at 15 to a common upright coupling bar 16. In turn, the coupling bars 16 of the respective banks of keepers are respectively linked at their lower ends at 17 to arms 18 fixed to a common horizontal operating bar 19 which is mounted for rotation on its axis. The pivot axes 10 of the keepers 9 and the axis of the bar 19 all lie in the same vertical plane. By turning the bar 19 its arms 18 move arcuately up or down and thus turn the keepers 9 to open or close the louvre elements 2, as is indicated in Figs. 5 and 6. The bar may be rotated by means of a handle 20 (Figs. 1 and 2) fitted to the bar, or any other convenient means may be provided according to requirements, such as for instance, any suitable mechanical transmission for operating the bar 19 from a remote point.

In the embodiment of Figs. 1 to 6, each louvre element 2 is tensioned by a spring 6 at each end of the element. Instead of this arrangement a spring 6 may be provided at only one end of the element and in that case the swivel chain 3 at the other end of the element would be fixed to a fixed anchorage on the adjacent upright 1 without provision of a tensioning spring at that place. As a

further alternative, instead of providing each louvre element individually with a tensioning spring at each, or at one, of its ends as has been described above, tensioning means may be provided common to two or more or all of the louvre elements by connecting them in series and arranging for such tensioning means to act on all the louvre elements in the series. An example of such an arrangement is illustrated in Fig. 7 in which the uppermost louvre element 2 is attached by its swivel chain 3 at one end (the right hand end as seen in the Figure) to a fixed anchorage 21 on the adjacent end upright 1. The swivel chain 3 at the other end of that top-most louvre element is attached to one end of a flexible connecting wire or the like 22 which passes round a pulley 23 mounted on the adjacent upright 1, the other end of the connecting member 22 being attached to the swivel chain 3 of the next element 2 below. This manner of connecting the elements is repeated at each end as shown in Fig. 7 so as to connect the elements in series by means of the connecting members 22 until at the bottom louvre element the last connecting member 22 in the series is attached to a weight 24. The latter thereby applies tension to each and all of the louvre elements 2 so that each one of them is held taut. Naturally, instead of the weight 24 a spring or any other suitable tensioning device may be provided.

What I claim is:—

1. A louvre having flexible louvre elements held taut between end members supporting said elements.

2. A louvre having flexible louvre elements attached by their ends to end members which support said elements between them, and tensioning means arranged for applying tension to said elements through their attachments to said supports so as to hold said elements taut and thereby impart rigidity to them.

3. A louvre as claimed in claim 1 or 2 and in which the louvre elements are cambered to increase their rigidity.

4. A louvre as claimed in claim 1, 2 or 3, wherein each individual louvre element is tensioned by spring or equivalent tensioning means provided at each end of the element.

5. A louvre as claimed in claim 1, 2 or 3, wherein each individual louvre element is tensioned by spring or equivalent tensioning means provided at one end of the element.

6. A louvre as claimed in claim 1, 2 or 3, wherein two or more or all of the louvre elements are connected at their ends in series and the whole series of elements is tensioned by tensioning means common to the series.

7. A louvre as claimed in claim 6, wherein the series of elements is tensioned by spring or equivalent tensioning means provided at each end of the series.

8. A louvre as claimed in claim 6, wherein



has such a spring tensioning arrangement as shown in Fig. 4 at each end of the element, as is indicated in Figs. 1, 2 and 3. Each element 2 is thereby held taut while its attaching chains 3 allow it to be turned for adjusting its angle of tilt.

Referring to Figs. 3, 5 and 6, at points along their length the elements 2 are attached to keepers 9 which are pivoted at 10 on projecting arms 11 mounted on suitably placed intermediate uprights 12 fixed to the building. The number of these intermediate uprights 12 may be two or more, as desired according to requirements and the length of the louvre elements 2. The elements 2 are attached to the keepers 9 in any convenient manner. For example, with elements 2 made of aluminium or other thin metal strip the keepers 9 may be provided with a lip or channel 13 (see Figs. 5 and 6) receiving the edges of the elements 2 as shown. For each louvre element 2 the bolt holes 5 in the two end uprights 1, 1 and the pivots 10 of the intermediate keepers 9 are all aligned in a straight line as indicated by the chain-dotted line 14 in Fig. 3. Thus, the faces of the keepers 9 against which the element 2 bears are offset from the pivots 10, as is seen in Figs. 5 and 6, and hence the keepers hold the louvre element offset from the centre line 14 so that the element is cambered (i.e. slightly bowed outwardly) between the end uprights 1, 1 as is shown in Fig. 3. This camber increases the rigidity of the tensioned element.

The louvre elements 2 are mechanically coupled for simultaneous operation to adjust their angle of tilt. For this purpose, the vertical bank of keepers 9 carried by each upright 12 are linked at 15 to a common upright coupling bar 16. In turn, the coupling bars 16 of the respective banks of keepers are respectively linked at their lower ends at 17 to arms 18 fixed to a common horizontal operating bar 19 which is mounted for rotation on its axis. The pivot axes 10 of the keepers 9 and the axis of the bar 19 all lie in the same vertical plane. By turning the bar 19 its arms 18 move arcuately up or down and thus turn the keepers 9 to open or close the louvre elements 2, as is indicated in Figs. 5 and 6. The bar may be rotated by means of a handle 20 (Figs. 1 and 2) fitted to the bar, or any other convenient means may be provided according to requirements, such as for instance, any suitable mechanical transmission for operating the bar 19 from a remote point.

In the embodiment of Figs. 1 to 6, each louvre element 2 is tensioned by a spring 6 at each end of the element. Instead of this arrangement a spring 6 may be provided at only one end of the element and in that case the swivel chain 3 at the other end of the element would be fixed to a fixed anchorage on the adjacent upright 1 without provision of a tensioning spring at that place. As a

further alternative, instead of providing each louvre element individually with a tensioning spring at each, or at one, of its ends as has been described above, tensioning means may be provided common to two or more or all of the louvre elements by connecting them in series and arranging for such tensioning means to act on all the louvre elements in the series. An example of such an arrangement is illustrated in Fig. 7 in which the uppermost louvre element 2 is attached by its swivel chain 3 at one end (the right hand end as seen in the Figure) to a fixed anchorage 21 on the adjacent end upright 1. The swivel chain 3 at the other end of that topmost louvre element is attached to one end of a flexible connecting wire or the like 22 which passes round a pulley 23 mounted on the adjacent upright 1, the other end of the connecting member 22 being attached to the swivel chain 3 of the next element 2 below. This manner of connecting the elements is repeated at each end as shown in Fig. 7 so as to connect the elements in series by means of the connecting members 22 until at the bottom louvre element the last connecting member 22 in the series is attached to a weight 24. The latter thereby applies tension to each and all of the louvre elements 2 so that each one of them is held taut. Naturally, instead of the weight 24 a spring or any other suitable tensioning device may be provided.

What I claim is:—

1. A louvre having flexible louvre elements held taut between end members supporting said elements.

2. A louvre having flexible louvre elements attached by their ends to end members which support said elements between them, and tensioning means arranged for applying tension to said elements through their attachments to said supports so as to hold said elements taut and thereby impart rigidity to them.

3. A louvre as claimed in claim 1 or 2 and in which the louvre elements are cambered to increase their rigidity.

4. A louvre as claimed in claim 1, 2 or 3, wherein each individual louvre element is tensioned by spring or equivalent tensioning means provided at each end of the element.

5. A louvre as claimed in claim 1, 2 or 3, wherein each individual louvre element is tensioned by spring or equivalent tensioning means provided at one end of the element.

6. A louvre as claimed in claim 1, 2 or 3, wherein two or more or all of the louvre elements are connected at their ends in series and the whole series of elements is tensioned by tensioning means common to the series.

7. A louvre as claimed in claim 6, wherein the series of elements is tensioned by spring or equivalent tensioning means provided at each end of the series.

8. A louvre as claimed in claim 6, wherein

the series of elements is tensioned by spring or equivalent tensioning means provided at one end of the series.

5 9. A louvre as claimed in claim 6, wherein the series of elements is tensioned by a weight.

10 10. A louvre as claimed in any preceding claim, in which the louvre elements are rotatably attached to their said end supports by mountings which allow the elements to be maintained taut while allowing them to be turned for adjusting their angle of tilt.

15 11. An adjustable louvre as claimed in claim 10 wherein said mountings comprise round link chains.

20 12. An adjustable louvre as claimed in claim 10 or 11, wherein the louvre elements are attached at one or more places along their length to pivoted keepers which are mechanically coupled to a common actuating member for turning the keepers, and thereby the louvre elements simultaneously.

25 13. An adjustable louvre as claimed in claim 12, wherein said keepers camber the louvre elements to increase their rigidity.

14. An adjustable louvre as claimed in claim 12 or 13 installed on the outside of a building with said louvre elements supported between and attached at their ends to upright

end members fixed to the building and with said keepers carried by one or more intermediate upright members fixed to the building between said end uprights. 30

15. A louvre as claimed in any preceding claim wherein the louvre elements are made of thin, flexible metal strip or sheet material, such as aluminium strip. 35

16. A louvre as claimed in any of claims 1 to 14, in which the louvre elements each are made of two parallel flexible wires or the like which support between them sheets or strips of asbestos, fibre or other suitable thin, flexible material attached to the wires or the like, the latter being held taut to tauten the material attached to them. 40

17. An adjustable louvre constructed, arranged and adapted to operate substantially as hereinbefore described with reference to and as shown in Figs. 1 to 6 of the accompanying drawings. 45

18. An adjustable louvre as claimed in claim 17 modified substantially as hereinbefore described with reference to and as shown in Fig. 7 of the accompanying drawings. 50

BARON & WARREN,
16, Kensington Square, London, W.8,
Chartered Patent Agents.

Leamington Spa: Printed for Her Majesty's Stationery Office, by the Courier Press.—1957.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which
copies may be obtained.



* C L M S *