

## SPECIFICATION

## Locking mechanism for hinged lighting column

The present invention relates to a locking mechanism for a hinged lighting column.

- 5 One known type of hinged lighting column is disclosed in British Patent Specification No. 1,289,074. This comprises a base member and a stem projecting upwards therefrom on the upper part of which is pivoted a tiltable arm carrying an elevated extension. The overall contour of the structure formed by the stem and that part of the tiltable arm which is brought up against it being polygonal. The stem is constituted by a single sheet metal plate, bent in such a manner as to
- 10 give the stem a polygonal section which is symmetrical about a median plane. The base is integrally formed with the stem from the same sheet-metal plate.

- 15 The arm is locked to the stem by means of a locking device the details of which are not disclosed.

- 20 One of the problems with such a column is the safety factor of such a locking device. Careless operation of the locking mechanism may render the column unsafe, so that it could tilt about the pivot point in a high wind if the locking mechanism either has not been properly secured or it fails for one reason or another.

- 25 Moreover, known types of locking mechanisms are exposed and are thus liable to be damaged by vandalism making the columns unsafe.

- 30 It is therefore an object of the present invention to obviate partially or wholly the above disadvantage thus ensuring a safer construction for the locking mechanism to prevent collapse of the column.

- 35 According to the present invention there is provided a locking mechanism for a hinged lighting column having upper and lower mast sections and a base member, said locking mechanism including: a wedge-shaped member engageable with the upper mast section to hold it fixed with relation to the lower mast section when in the locked position; a two stage release mechanism to enable the wedge-shaped member to be moved to the unlocked position; and a safety mechanism in the base member of the column which prevents complete operation of the two-stage release mechanism until said safety mechanism has been operated.

- 40 The present invention will now be described in greater detail by way of examples with reference to the accompanying drawings, wherein:—

- 45 Figure 1 is a diagrammatic representation of a hinged lighting column shown in the normal position;

- 50 Figures 2A to 2C illustrate the lowering of the hinged lighting column;

- 55 Figure 3 is a side view of a first embodiment of the locking mechanism;

- 60 Figure 4 is a cross sectional view taken along the line A—A of Figure 3;

- Figure 5 is a cross sectional view of a first modified form of the locking mechanism shown in

- 65 Figures 3 and 4;

Figure 6 is a cross sectional view of a second modified form of the locking mechanism.

- Referring first to Figures 1 and 2, the hinged lighting column comprises a base member 10 having a lower mast 12 secured thereto or integrally formed therewith. The upper end of the lower mast 12 carries a pivot 14 to which an upper mast 16 is mounted thereon. The upper mast 16 carries a lamp unit 18 at its upper end and is provided with an integrally formed extension arm 20, extending downwards from the pivot point 14 when the mast is in the normal position. A fixing point 21 is provided at the lower end of the extension arm 20 to enable a rope to be fixed thereto for the purpose of lowering the lighting column. A door 64 to be described in greater detail later, is provided in the base member 10.

- The locking mechanism to be described in Figures 3 and 4 ensures that the end of the extension arm 20 is held secured to the lower mast 12 when the column is in the normal position but which may be released to lower the upper mast 16 to the position shown in Figure 2C for maintenance purposes by means of a rope 22, which is secured to the fixing point 21 to enable the lighting column to be lowered by hand.

- The locking mechanism is mounted on the base member 10 and essentially comprises a wedge shaped lock tongue 30, a spring 32, a retaining pin 34, and a retained locking bolt 36.

- As can be best seen from Figure 4, the lower end of the upper mast 16 consists of an outer section 40 and an inner section 42, a plate 44 extending upwards at an angle from the lower end of the inner section 42 to define a cavity 46. A downwardly projecting member 48 is secured to the outside wall of the upper mast 16 and is provided with an aperture 50 at its lower end to enable one end of the rope 22 to be secured thereto.

- The lock tongue 30 is arranged to slide between a plate 52 welded to the inside wall of the base 10 and a plate 54 which is welded to a bottom plate 56 of the lower mast 12 and also to supporting bracket 58 secured to the bottom plate 56. The lock tongue 30 is provided firstly with a chamfered surface 31 which engages against the surface of the plate 44 when the lock tongue is in its uppermost position, and secondly with a radiused surface 33 which allows automatic operation of the mechanism during closing. A plate 60 is welded to the bracket 58 and also to the plate 52. This plate 60 is provided with a threaded aperture which receives the bolt 36 having an unthreaded portion 62, the spring 32 being located around the stem of the portion 62 between the lower end of the lock tongue 30 and the plate 60. The lower end of the lock tongue 30 is provided with a cylindrical aperture into which the end of the portion 62 can project. The pin 34 is located within a threaded offset hole in the lower end of the lock tongue 30 and a circumferential groove provided in the end of the

portion 62, the pin 34 effectively securing the bolt 36 to the lock tongue 30 but permitting rotation of the bolt 36. The end of the bolt 36 is provided with an operating knob 63.

- 5 The door 64 located in the base member 10 is provided with a safety bar 66 projecting inwards from the door 64 and adapted to firstly prevent the threaded part of the bolt 36 from being unscrewed from the plate 60 when the door is closed, and secondly to ensure that the door cannot be closed until the bolt 36 has been returned from the open to the closed position, thus ensuring the lock tongue 30 has engaged in the cavity 46 so as to prevent the upper mast 16 tilting out of the vertical position.

In operation, when it is desired to lower the upper mast 16 in order to carry out maintenance of the lamp unit 18, the following sequence of steps is carried out:

- 20 (a) The door 64 is opened to enable bolt 36 to be reached.  
 (b) The rope 22 is fixed to the aperture 50 in the member 48 and to the releasing means provided on the base member 10.  
 25 (c) The bolt 36 is now unscrewed until the threaded portion is clear of the plate 60. Due to the action of the spring 32 the lock pin is still partially engaged in the space 46 and prevents unintentional disengagement of the upper mast.  
 30 (d) The operating knob 63 is then pulled down in order to release the upper mast 16, the lock tongue 30 being pulled out of the cavity 46.  
 (e) The mast is lowered to the position shown in Figure 2C by the operator manually by means of the rope 22.

- 35 The operator first of all pulls on the rope 22 and walks away from the base 10 until the lighting column reaches its balancing point shown in Figure 2A. Once past the balancing point, the operator allows the column to continue to swing about the pivot point 14 controlling the acceleration with the aid of the rope 22 thus allowing the column to pivot through the position shown in Figure 2B to the final position shown in Figure 2C. It is preferable that once the lighting column has reached the position shown in Figure 2B, the angle between the rope 22 and the extension arm 20 should be approximately 90° and when the lighting column has reached the position shown in Figure 2C the angle should be approximately 50°.

In order to raise the upper mast 16 to the position shown in Figure 1, the following sequence of steps is carried out:

- 55 (f) The upper mast 16 is raised to the vertical position by the operator pulling on the rope 22. The column automatically latches into safe position due to the radiused surface 33, since the lock tongue has partially returned into the cavity 46 due to the bias of the spring 32 which urges the bolt 36 upwards until the threaded part engages with the plate 60.  
 60 (g) The bolt 36 is then screwed into the plate 60 so that its upper end pushes the lock tongue 30 right home into the cavity 46, thus securing

the upper mast 16 preventing vibration by wedging action.

- (h) The door 64 is replaced, the safety bar 66 passing below the lower end of the operating knob 63.

It should be noted that when in service, should the spring 32 fail and the thread on the bolt 36 becomes stripped off, the upper mast 16 will not collapse because the safety bar 66 will prevent the lock tongue 30 from clearing the cavity 46. However, if this should happen the door 64 should not be released. Such a failure would of course be observable to the maintenance men who will note that the joint is loose.

- 80 Referring now to the first modified form shown in Figure 5 the following modifications will be apparent from the construction shown in Figures 3 and 4.

- (a) The inner section 42 of the upper mast 16 instead of comprising a plate 44, is replaced by a plate 70 carrying a thickened part 72 at its end remote from that welded to the inside surface of the upper mast 16.

- (b) The safety bar 66 is replaced by an angled plate 74.

- (c) The retaining pin 34 is provided with a hexagonal head 76 to enable easy removal of the pin 34 for maintenance purposes.

- (d) A captive shackle 78 is secured in the aperture 50 by means of suitable fixing means 80. A loop 82 on the end of the rope 22 engages within the shackle 78. Apart from the above minor modifications the locking mechanism is otherwise identical with that disclosed in Figures 3 and 4.

- 100 Referring now to the second modified form shown in Figure 6, which modification is applicable to columns of relatively simple construction where the lower mast 12 follows a similar cross-section as the base 10 and the extension arm 20 in this instance fits around the lower mast section, the following modification will be apparent from the construction shown in Figures 3 and 4.

- 110 Instead of the plate 44 in the first embodiment, there is provided a hoop 84 which is welded at its two bases to the outer section 40 of the upper mast 16. The hoop 84 passes through an aperture 87 in a part 86 of the lower mast section 12. The chamfered surface 31 of the lock tongue 30 is adapted to engage with the cross-bar 85 of the hoop 84, which performs the same function as the plates 44 and 70 in the previous embodiments.

The advantages of the above described locking mechanisms for a hinged lighting column are as follows:—

- (a) The locking mechanism is internal with half latch safety position and visual indication of failure of spring and thread on the bolt.

- (b) It is substantially vandal proof.

- (c) The door cannot be replaced with the mast in the unsafe position.

## CLAIMS

1. A locking mechanism for a hinged lighting column having upper and lower mast sections and



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portion 62, the pin 34 effectively securing the bolt 36 to the lock tongue 30 but permitting rotation of the bolt 36. The end of the bolt 36 is provided with an operating knob 63.

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40 operator allows the column to continue to swing about the pivot point 14 controlling the acceleration with the aid of the rope 22 thus allowing the column to pivot through the position shown in Figure 2B to the final position shown in Figure 2C. It is preferable that once the lighting column has reached the position shown in Figure 2B, the angle between the rope 22 and the extension arm 20 should be approximately 90° and when the lighting column has reached the  
45 position shown in Figure 2C the angle should be approximately 50°.

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#### CLAIMS

1. A locking mechanism for a hinged lighting column having upper and lower mast sections and



a base member, said locking mechanism including: a wedge-shaped member engageable with the upper mast section to hold it fixed with relation to the lower mast section when in the locked position; a two stage release mechanism to enable the wedge-shaped member to be moved to the unlocked position; and a safety mechanism in the base member of the column which prevents complete operation of the two-stage release mechanism until said safety mechanism has operated.

2. A locking mechanism according to Claim 1, wherein said two stage release mechanism comprises a locking bolt having a threaded portion and an unthreaded portion, the unthreaded end being secured to the lower end of the wedge-shaped member, said threaded portion being arranged to engage with an internally threaded hole in a plate fixed to the base member, the first stage of release being the unscrewing of the threaded portion of the bolt from the plate whilst the second stage of release is a free sliding of the unthreaded portion of the bolt within the threaded hole.

3. A locking mechanism according to Claim 2, wherein spring means is provided between the plate and the lower end of the wedge-shaped member for urging the wedge-shaped member into engagement with a surface of the upper mast section for holding said upper mast section in an upright position.

4. A locking mechanism according to Claim 2,

wherein said safety mechanism is a bar secured to a door provided in the base member, said bar engaging with the head of the locking bolt thus preventing the wedge-shaped member from being fully lowered out of contact with the upper mast section.

5. A locking mechanism according to any one of the preceding claims 2 to 4, wherein the locking bolt is secured to the wedge-shaped member by means of a removable retaining pin.

6. A locking mechanism according to any one of the preceding claims, wherein the wedge-shaped member has a chamfered surface which engages with an inclined surface fixed to the inside of the upper mast section.

7. A locking mechanism according to any one of the preceding claims, wherein the wedge-shaped member has a chamfered surface which engages with a hoop-shaped member fixed to the inside surface of the upper mast section.

8. A locking mechanism according to Claim 2, wherein said safety mechanism is an angled plate secured to a door in the base member, said plate engaging with the head of the locking bolt thus preventing the wedge-shaped member from being fully lowered out of contact with the upper mast section.

9. A locking mechanism for a hinged lighting column constructed and arranged to operate substantially as herein described with reference to and as illustrated in Figures 3 and 4, or Figure 5, or Figure 6 of the accompanying drawings.