

## PATENT SPECIFICATION

786,187

Inventor:—CYRIL BEST.



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(Divided out of No. 777,337).

(Patent of Addition to No. 745,419, dated July 2, 1953).

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Index at Acceptance:—Classes 12(1), A1; and 45, G2.

International Classification—F06c.

## COMPLETE SPECIFICATION.

## Improvements in or relating to Weighing Mechanism.

5 We, MOLINS MACHINE COMPANY LIMITED, a British Company, of 2 Evelyn Street, Deptford, London, S.E.8, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The invention concerns improvements in or relating to wire tensioning devices, for example for tensioning a wire on which is pivoted a weighbeam in weighing mechanism, and relates to an improvement in or modification of the mechanism disclosed in 15 British Patent Specification No. 745,419. The latter Specification discloses a device for adjustably tensioning a wire (e.g. a wire for pivoting a weighbeam) comprising a pair of support members spaced a fixed distance apart about which the wire is passed, and a differential pulley to which the ends of the wire are attached so as to permit fine adjustment of the tension in the wire on rotation 20 of the pulley. The present invention provides a device for enabling the tension in the wire to be adjusted to a desired standard.

25 According to the present invention there is provided a device for facilitating adjustment of the tension in a wire looped about a pair of pulleys mounted on a support, said wire being connected to an adjusting pulley whereby its tension can be adjusted, one of the pulleys being movable away from the other against the tension of the wire, said 30 device comprising pressure-means adapted to engage the support and said one pulley so as to urge the latter in a direction away from the other pulley, the said pressure-means exerting a desired pressure on the pulley in relation to the required tension in the wire, so that the tension in the wire can be adjusted by means of the adjusting pulley 40

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so as to balance the pressure of the said pressure-means.

A device in accordance with the invention will now be described with reference to the 45 accompanying drawing, in which:—

Figure 1 is a perspective view of the device; and

Figure 2 shows a set of gauges used with 50 the device.

Figure 1 shows a mounting for a wire 2 on which a beam (such as a weighbeam) is mounted. The wire is looped about pulleys 3 and its opposite ends are secured to a differential pulley 27 which can be rotated 55 for adjusting the tension in the wire. The differential pulley 27 is fixed on a tubular support 4, and the trunnions 103 of the pulleys 3 are supported in grooves in the ends of the support 4 as shown in Figure 1. This arrangement as so far described is the same as that disclosed in the Specifications and drawings of British Patent Specification No. 745,419. 60

65 The present invention provides a device for enabling the tension in the wire to be adjusted to a desired standard. The device, illustrated in Figure 1, comprises a member 115 provided at opposite ends with abutments 116 and 117 between which a pressure element can be accommodated. The 70 abutment 116 is forked, the forks being notched on their inner surfaces so as to be capable of being hooked on to the ends of the trunnions 103 of one of the pulleys 3, as shown in Figure 1, the trunnions being 75 extended for the purpose. The pressure element comprises a compression spring 118 arranged to be located between the two abutments 116 and 117. At one end of the spring is a pressure block 119 arranged to bear against the abutment 117. Another block 120 is adapted to be caused to press against 80

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the end of the tubular support 4, and is provided with a locating register 121 capable of entering the forks in the end of the support 4. When the device is thus brought into engagement with the trunnions of the pulley 3, and with the end of the support 4, as just described and as illustrated in Figure 1, the effect of the compression spring 118 is to tend to urge the pulley 3 lengthwise of the support 4 in a direction such as to urge the trunnions 103 out of their seating in the forks in the end of the support 4, since the forked abutment 116 hooked over the trunnions is spring-urged in one direction while the support 4 is spring-urged in the opposite direction. The tension in the wire 2, of course, opposes this movement.

The compression spring 118 is pre-adjusted so as to exert a desired force which is determined in relation to the degree of tension which it is desired that the wire 2 should have. When the device is in place, the differential pulley 27 is first turned so as to adjust the tension in the wire, against the pressure of the spring 118, until the trunnions 103 bear on their forked seatings in the support 4. The resulting tension in the wire will then probably be in excess of that required. To determine the correct setting feeler gauges 122 (Figure 2) of suitable thickness are provided, the appropriate combination of the leaves of which can be selected to equal the distance between the trunnions 103 when they are in their seatings as mentioned above, and the locating register 121 of the pressure block 120 which presses on the support 4. By turning the differential pulley 27 slightly so as to slacken off the wire 2, the distance between the trunnions and the locating register of the pressure block 120 can be reduced until the previously selected combination of feeler leaves will not enter

the gap between the trunnions 103 and the locating register 121. If now the pulley 27 is carefully turned so as to tighten the wire until the selected combination of feeler leaves will just enter the gap just mentioned this will be the point at which the trunnions are just contacting their seatings and the tension of the wire just balances the force of the compression spring 118. The tension of the wire 2 will now be at the desired standard and the screw on which the differential pulley 27 rotates is tightened to clamp the pulley. The device for setting the desired tension may now be removed.

What we claim is:—

1. A device for facilitating adjustment of the tension in a wire looped about a pair of pulleys mounted on a support, said wire being connected to an adjusting pulley whereby its tension can be adjusted, one of the pulleys being movable away from the other against the tension of the wire, said device comprising pressure-means adapted to engage the support and said one pulley so as to urge the latter in a direction away from the other pulley, the said pressure-means exerting a desired pressure on the pulley in relation to the required tension in the wire, so that the tension in the wire can be adjusted by means of the adjusting pulley so as to balance the pressure of the said pressure-means.

2. A device as claimed in Claim 1, constructed, arranged, and adapted to operate substantially as described herein with reference to Figure 1 of the accompanying drawing.

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#### PROVISIONAL SPECIFICATION.

##### Improvements in or relating to Weighing Mechanism.

We, MOLINS MACHINE COMPANY LIMITED, a British Company, of 2 Evelyn Street, Deptford, London, S.E.8, do hereby declare this invention to be described in the following statement:—

This invention concerns improvements in or relating to weighing mechanism, and relates to an improvement in or modification of the mechanism disclosed in the Specifications and drawings of British Patent Application No. 884652 (Serial No. 745350).

In that mechanism a mirror, arranged to swing with the weighbeam of a weighing device, intercepts light from a fixed source

and causes it to be reflected on to a translucent screen to provide a visual indication of the result of a weighing operation. As described in the Provisional and Complete Specifications of the said Application, with reference to the drawings accompanying the Provisional Specification, an enlarged optical image of a straight horizontal filament 32 of an electric lamp 33 is projected on to a translucent screen 31. Light from the filament is focused by a lens 34 in an adjustable tube 35, and the resulting light beam is thrown on to a mirror 36 which swings with the weighbeam, and is reflected from the

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mirror 36 on to a fixed opposing mirror 37 from which it is twice reflected back to the swinging mirror 36. Further fixed mirrors intercept the light and reflect it on to the screen 31, where an image of the filament appears in the shape of a straight horizontal bar of light which moves up and down the screen with the movements of the weigh-beam.

For easy and accurate observation it is desirable that this bar of light should be sharply defined on the screen. To assist in this it is preferable that the filament holder of the lamp should be arranged directly behind the filament in line with the tube 35, as shown in Figure 2 of the drawings referred to above. It is found, however, that in standard lamps of the kind employed, the filament is not always exactly in line with the axis of the lamp, which therefore has to be rotated so as to bring the filament into horizontal position. For this reason it is not always practicable to arrange the filament holder exactly behind the filament, and in such cases it is found that light tends to be reflected on to the screen from the filament holder. Also light is sometimes reflected from the inner surface of the glass envelope of the lamp. Such reflected light sometimes tends to appear on the screen in the form of faint horizontal bands or on occasion as irregularly shaped illuminated areas above or below the image of the filament. This not only tends to confuse and distract the attention of the operator but blurs the definition of the bar of light by whose position on the screen the results of the weighing operations are indicated.

According to the present invention there is provided in a weighing device in which an optical image of a lamp filament is projected on to a screen by a deflecting member movable with or in proportion to the angular movement of a weighbeam or the like, a mask between said filament and said reflecting member, said mask having an aperture so proportioned, in relation to its distance from the filament, as to permit light to pass therethrough directly from said filament, and to exclude light reflected from for example, the filament holder or the glass envelope of the lamp.

Referring to Figures 1 and 2 of the drawings accompanying the Provisional Specification of British Patent Application No. 8846/52, (Serial No. 745,350), the end of the tube 35 adjacent the lamp 33 is in a construction according to the present invention, provided with a mask which has an oblong rectangular slit or aperture through which light from the filament 32 can pass. In the particular construction being described, the filament is about 6 mm. long and 0.5 mm. in diameter, and the mask which is located 26 mm. from the centreline of the filament,

has a slit 7 mm. long and 2.5 mm. wide. It is found that with this arrangement, the lamp may if necessary, be rotated, by rotation of the holder 40, to a position in which the filament holder is not immediately behind the filament, without reflected light from the filament holder being able to pass through the aperture so as to be reflected on to the screen 31. Similarly light reflected from the back of the envelope of the lamp is excluded from the light which is reflected on to the screen.

With lamps having filaments of a different size, or in an arrangement in which the lamp is a different distance from the tube 35, the dimensions of the aperture may have to be altered to suit the particular case.

The mirror 37, referred to above with reference to the drawings accompanying the Provisional Specification of British Patent Application No. 8846/52 (Serial No. 745,350) may sometimes need to be adjusted angularly in order to adjust or correct the direction of the light beam reflected on to the screen 31. For this purpose it is now proposed to mount the mirror 37 on a fixed back plate to which it is fastened by screws, with a curved spring steel strip interposed between the back plate and the back of the mirror so as to tend to urge the mirror forwardly. Adjustment of the angle of the mirror can then be easily effected by adjustment of the screws, either at the upper or the lower edge of the mirror. If for example the screws at the upper edge of the mirror are slackened off slightly, the pressure of the spring will cause the mirror to tilt forwardly to a slight extent.

A further modification to the apparatus described in the Specification referred to provides a safeguard against accidental twisting of the scale pan 11 and the post 10 and bridge 109 which support it. For this purpose a pair of stop members are fixed to the fixed mounting for the tube 111, Figure 1 of the drawings referred to. These members, which lie beneath the bridge 109, have recesses in which opposite ends of the bridge can be accommodated so as to limit lateral movement of the ends of the bridge due to accidental twisting of the latter. The recesses are deep enough to allow the bridge to move up and down within them during weighing operations.

Figure 4 of the drawings referred to shows a mounting for a wire 2 on which a beam (such as the weighbeam 1) is mounted. The wire is looped about pulleys 3 and its opposite ends are secured to a differential pulley 27 which can be rotated for adjusting the tension in the wire. The differential pulley 27 is fixed on a tubular support 4, and the trunnions of the pulleys 3 are supported in grooves in the ends of the support 4 as shown in the drawing referred to.

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 for enabling the tension in the wire to be  
 adjusted to a desired standard. The device  
 comprises a member provided at opposite  
 10 ends with abutments between which a pres-  
 sure element can be accommodated. One of  
 the abutments is forked, the forks being  
 notched on their inner surfaces so as to be  
 capable of being hooked on to the ends of  
 15 the trunnions of one of the pulleys 3, the  
 trunnions being extended for the purpose.  
 The pressure element comprises a compres-  
 sion spring arranged to be located between  
 the two abutments mentioned above. At  
 20 opposite ends of the spring are two pressure  
 blocks one of which is arranged to bear  
 against the abutment which is opposite to  
 the forked abutment. The other block is  
 adapted to be caused to press against the end  
 25 of the tubular support 4. When the device  
 is thus brought into engagement with the  
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 of the support 4, as just described, the effect  
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 selected to equal the distance between the  
 trunnion and the locating register of the  
 pressure block which presses on the support  
 4. By turning the differential pulley 27  
 50 slightly the distance between the trunnion  
 and the locating register of the pressure  
 block can be reduced until the previously  
 selected combination of feeler leaves will  
 not enter. If now, the pulley 27 is carefully  
 55 turned until the selected combination of  
 feeler leaves will just enter, this will be the  
 point at which the trunnions are just con-  
 tacting their seatings and the tension of the  
 wire just balances the force of the compres-  
 60 sion spring. The tension of the wire will now  
 be at the desired standard and the screw on  
 which the differential pulley 27 rotates is  
 tightened to clamp the pulley. The device  
 for setting the desired tension may now be  
 65 removed.

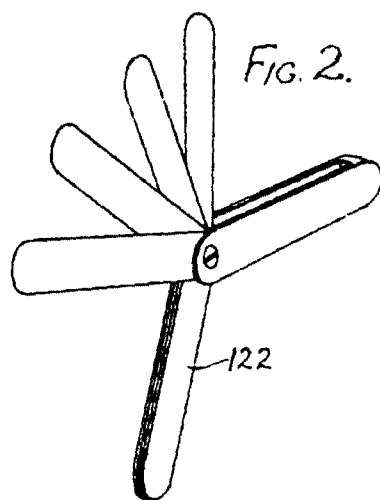
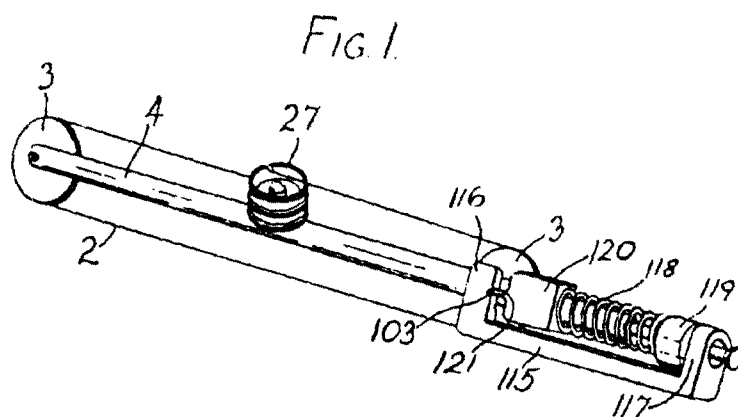
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COMPLETE SPECIFICATION

1 SHEET

This drawing is a reproduction of  
the Original on a reduced scale.



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