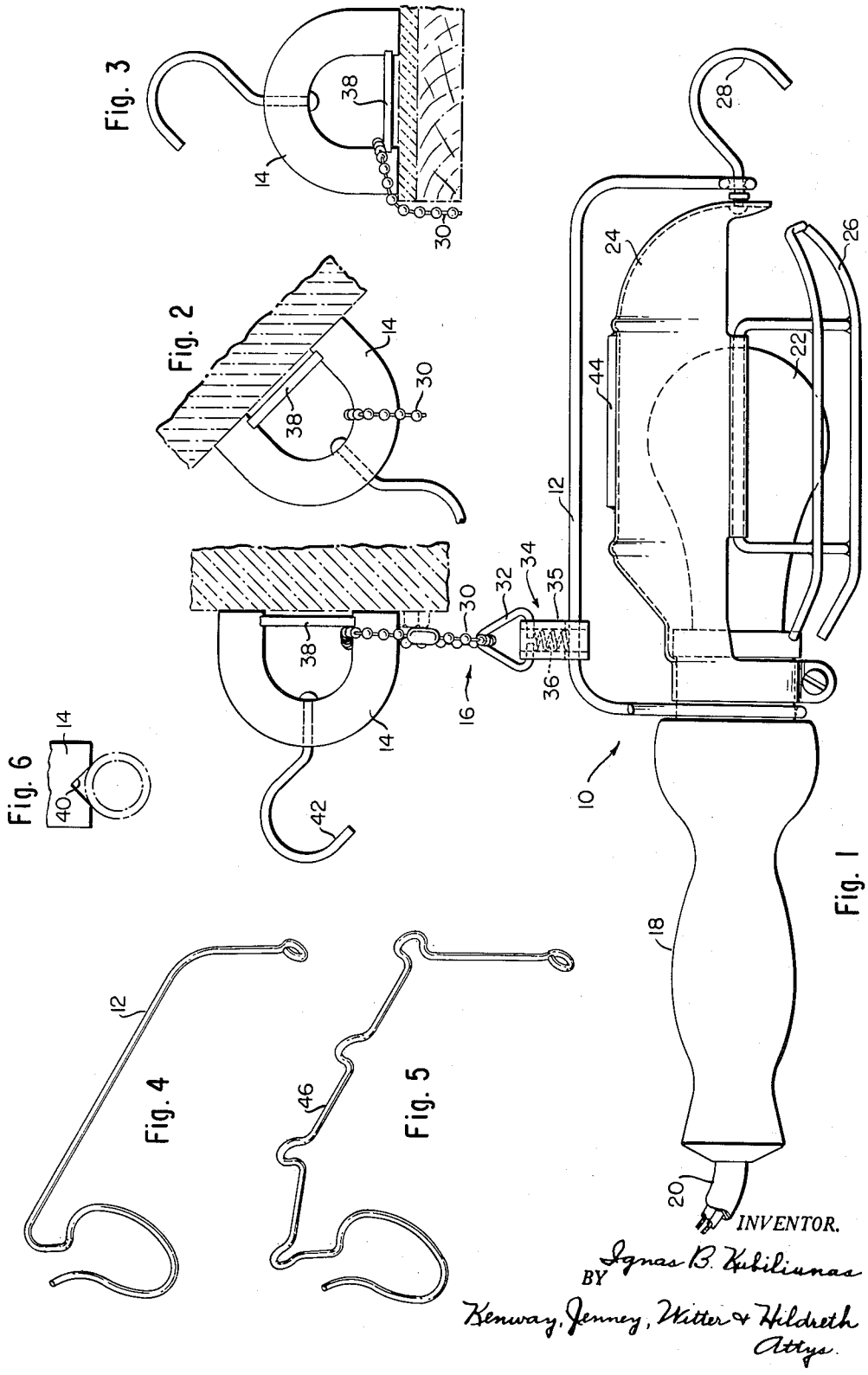
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TROUBLE LIGHT AND SUSPENSION MEANS

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TROUBLE LIGHT AND SUSPENSION MEANS

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This invention relates to trouble lights, and more particularly to means for suspending trouble lights in a multiplicity of places and positions.

Conventional trouble lights generally comprise a base member in the form of a handle, a light mounted on the handle, and a protective framework extending from the handle around the light. The protective framework usually includes a reflector screen which extends part-way around the light and a wire network which extends the remainder of the way around the light and protects the same. A wire cord for supplying current to the light, of course, extends out of the lower end of the handle.

Trouble lights are used by mechanics working in areas which are difficult to light, and as such it is often important to the mechanic to adjust the position of the angle of the light to meet the demands of unusual working conditions. A major disadvantage of the trouble lights heretofore employed is that it is difficult to position them so that the light will shine on the work and not shine into the eyes of the mechanic. One way for supporting trouble lights hitherto has been to provide a hook at the upper end of the light and to suspend the light from the hook. This latter type of suspension is often unsatisfactory because there may not be a small enough protuberance or rod to receive the hook. When such is the case, the trouble light is often simply laid on the ground, where it provides poor lighting in the working area and shines into the eyes of the operator or mechanic.

The primary object of my invention is to provide a trouble light with suspension means which will be extremely versatile in that it can be attached to many types of surfaces. Another object of my invention is to provide such a trouble light with means for adjusting the attitude of the light when suspended in a multiplicity of angles relative to the horizontal, as well as providing a swivel for the reflector screen which will permit 360° adjustment.

In the accomplishment of these and other objects of my invention in a preferred embodiment thereof, I employ a trouble light having a handle upon which the light is mounted and a protective framework extending around the light. For suspending the light I employ a stiff wire mounted on the said base handle for swivel motion 360° relative to the protective framework of the trouble light, and I connect a strong magnet to the said wire by means of a chain or other flexible coupling. It is a feature of my invention that the magnet is employed for suspending the light from any ferro-magnetic surface regardless of contour and that means are provided for positioning the chain along the wire in a multiplicity of positions relative to the center of gravity of the trouble light such that the attitude of the light relative to the horizontal may be adjusted thereby.

It is a feature of my invention that the light may also be suspended from non-magnetic surfaces by hooking the chain around protuberances or pipes with the weight of the magnet being sufficient to support the light, or in some

cases with the magnet held in place against the trouble light by the magnetic attraction of the ferro-magnetic elements on the protective framework for the light. Also a hook may be attached to the magnet so that in certain cases the magnet itself can be suspended from non-magnetic surfaces by hooking thereon.

It is a further feature of my invention that the magnet may be secured to the protective frame which surrounds the light itself, and when so connected it will provide a firm base for resting the light on the floor.

A further feature of my invention lies in the cooperative relationship between the magnet and the flexible coupling which connects the magnet to the swivel wire. The magnet is in the form of a conventional horseshoe and is provided with a retaining plate welded across the gap between the ends of the legs of the magnet. The flexible coupling is secured around the magnet entering through the enclosed area formed by the retaining plate. Thereafter when the magnet is secured to a surface for the purpose of supporting the light, the flexible coupling automatically seeks the lowest point with relation to the enclosed loop of the magnet. In this way a better leverage is obtained for the magnet and the magnet holds better than if the wider thrust were at the lower end and fixed.

Further objects and features of my invention will best be understood and appreciated from the following detailed description of a preferred embodiment of my invention selected for purposes of illustration and shown in the accompanying drawing in which:

Fig. 1 is a view in side elevation of the trouble light and supporting means of my invention;

Figs. 2 and 3 illustrate different attitudes of connection with the supporting means;

Fig. 4 is a view in perspective of the stiff swivel wire which permits 360° adjustment on the axis of the trouble light;

Fig. 5 is a view in perspective of another embodiment of a supporting wire; and

Fig. 6 is a view in end elevation of the magnet secured to a round surface, such as a pipe.

The preferred embodiment of my invention herein shown includes in its general organization a trouble light indicated generally at **10** and means for supporting the trouble light including a stiff wire **12** mounted for swivel motion about the axis of the light **10**, a magnet **14** and a flexible coupling, indicated generally at **16**, connecting the magnet **14** to the swivel wire **12**.

The trouble light comprises a base member **18** in the form of a handle through the end of which passes electrical leads **20**. Handle **18** supports a lamp **22** and also a protective framework for the lamp which includes a reflector screen **24** extending part-way around the light and a wire network **26** connected to the reflector **24** extending the remainder of the way around the light. A supporting hook **28** of stiff wire is mounted on the end of the reflector screen.

The swivel wire **12** extends longitudinally around the protective framework of the trouble light from a point adjacent to the base of the lamp **22** up to the base of the hook **28**, and is provided with suitably bent circular contour to permit free sliding swivel motion 360° around the light. The flexible coupling indicated at **16** which connects the magnet **14** to the swivel wire **12** includes a feed chain **30**, a wire link **32** and a spring loaded slip member **34**. The said slip member **34** includes a short cylindrical tube **35** perforated at its base to receive a wire **12** and perforated near its upper end to receive a link **32**. Between these two elements is mounted a compression spring **36** which continuously exerts pressure against the swivel wire **12** and the link **32** thereby re-

sisting motion of the flexible coupling **16** along the wire **12**, but not preventing such motion.

When the tube **35** is normal to the wire **12**, the slip member **34** slips easily along the said wire **12** in response to pressure at the base of the tube **35**. However, when the chain **30** urges the slip member **34** longitudinally of the wire **12**, the tube **35** tilts against the pressure of the spring **36** and by presenting corner points of contact to wire **12** effectively locks the slip member from longitudinal motion.

The magnet **14** is U-shape in form and provided with a retaining plate **38** which is secured across the gap between the two legs of the magnet. Plate **38** is of non-magnetic substance and as such does not adversely influence the magnet, in fact, tests have shown that the magnetic forces of the magnet **14** seem to be improved thereby.

The feed chain **30** forms a loop passing through the enclosed area of the magnet **14**, and also through the link **32**. With reference to Figs. 1, 2 and 3, it will be seen that the chain **30** automatically drops to the lowest point in the enclosed area of the magnet **14** when the magnet is employed to suspend the trouble light. In this way an improved leverage is provided for the magnet thereby lessening torsional effects against the magnet which would tend to unseat it from a ferro-magnetic surface.

In order to facilitate attachment of the magnet to a rounded surface, such as a pipe, the magnet **14** is provided with a transversely extending groove **40**, as may be seen in Fig. 6.

From the foregoing description, it will be seen that a hook **42** may be secured to the magnet **14** in order to facilitate supporting the trouble light from non-magnetic surfaces. Also in connection with supporting the magnet from the non-magnetic surface, it will be seen that the chain **30** may be hooked around a protuberance with the magnet **14** being locked back against the wire **12** or the reflector screen **24** by magnetism, or else simply holding the trouble light in such a position by the weight of the magnet. A soft iron keeper **44** is provided on the rear face of the reflector screen **44** and in idle periods the magnet **14** will remain attached to the keeper **44** by magnetism.

In Fig. 1 the trouble light is illustrated as being suspended at the lower end of the swivel wire **12**. In this position the flexible coupling **16** is connected directly above the center of gravity of the trouble light, and therefore, the trouble light will take a horizontal position. As the flexible coupling is moved upward along the wire **12**, the trouble light will gradually tilt downward until it reaches a substantially vertical position when the flexible coupling approaches the upper end of the swivel wire **12**. In any one of these positions of incline, of course, the reflector screen **24** may be pivoted around to the desired position for maximum light upon the work and minimum light directly upon the eyes of the operator.

In another embodiment of my invention, I omit the link **32** and the slip member **34** of the flexible coupling, and I provide instead of the swivel wire **12**, a swivel wire **46** (see Fig. 5) having bent sections for accommodating the chain **30** in different positions. It will be seen, therefore, that with this embodiment only a limited number of position of the flexible coupling **16** are available, but that it has the advantage of avoiding the further expense of the slip member **34**.

It will now be seen that in addition to great versatility of suspension, the trouble light of my invention is also adapted for convenient position while on the floor. The magnet **14** may be secured in any position around the reflector screen **24**, or the wire network **26**, and due to its weight will hold the trouble light from rolling on the floor. Thus the screen may be adjusted to any desired angle on the floor and will stay there.

Since numerous minor variations of these preferred embodiments of my invention will now become apparent to those skilled in the art, it is not my intention to confine the invention to the precise form herein shown, but rather to limit it in terms of the appended claims.

Having thus described and disclosed preferred embodiments of my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A trouble light having in combination, a base, a light mounted on said base, a reflector screen mounted on said base and extending part-way around said light; and means for suspending said light including a swivel element mounted on said base for motion around said base, a magnet, a flexible coupling connecting said magnet to said swivel element.

2. A trouble light having in combination, a base, a light mounted on said base, a reflector screen mounted on said base and extending part-way around said light; and means for suspending said light including a swivel element mounted on said base for motion around said base, a magnet, a flexible coupling conecting said magnet to said swivel element, said swivel element extending longitudinally of said light, and said flexible coupling adapted to move longitudinally relative to said swivel element.

3. A trouble light having in combination, a base, a light mounted on said base, a reflector screen mounted on said base and extending part-way around said light; and means for suspending said light including a swivel element mounted on said base for rotary motion around said base, a permanent magnet, a retaining plate for said magnet, and defining between itself and said magnet an open area, a flexible coupling connected to said magnet through said opening and slidably connected to said swivel element, and means for limiting the sliding motion of said flexible coupling along said swivel element in a multiplicity of positions.

4. A trouble light having in combination, a base, a light mounted on said base, a reflector screen mounted on said base and extending part-way around said light; and means for suspending said light including a swivel element mounted on said base for rotary motion around said base, said swivel element extending longitudinally of said light and being anchored at the longitudinal extremity of said reflector screen, a U-shaped permanent magnet, a retaining plate secured to said magnet across the gap between the legs thereof and defining between itself and said magnet an open area, a flexible coupling connecting said magnet to said swivel element and passing through said open area, said flexible coupling being adapted to descend to the lowest point in said opening when said magnet is employed to suspend said trouble light.

5. A trouble light having in combination, a base, a light mounted on said base, a reflector screen mounted on said base and extending part-way around said light; and means for suspending said light including a swivel element mounted on said base for rotary motion around said base, a U-shaped magnet, a flexible coupling connecting said magnet to said swivel element, and a transversely extending groove on the base of said magnet whereby to facilitate securing said magnet to a rounded surface.

6. A trouble light having in combination, a base, a light mounted on said base, a reflector screen mounted on said base and extending part-way around said light; and means for suspending said light including a swivel element mounted on said base for rotary motion around said base, a permanent magnet, a flexible coupling connecting said magnet to said swivel element, said swivel element extending longitudinally of said light, said flexible coupling adapted to slide longitudinally of said swivel element, and means for arresting the sliding relative motion between said flexible coupling and said swivel element at a multiplicity of positions, one of which is in vertical alignment with the center of gravity of the trouble

light when the trouble light is in the horizontal position and of which other positions are in vertical alignment with the center of gravity of the trouble light when the trouble light is in a multiplicity of positions of incline.

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