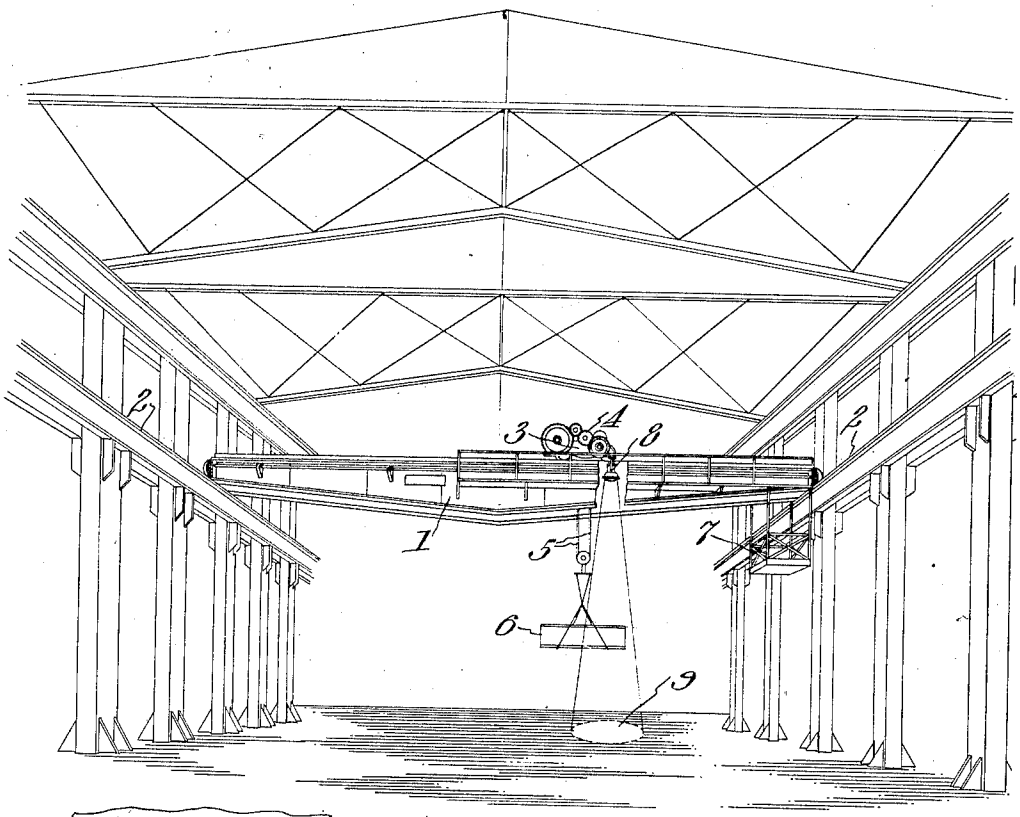
May 14, 1929. F. P. CLARK 1,712,650

SAFETY DEVICE

Filed March 10, 1928

Fig. 1.



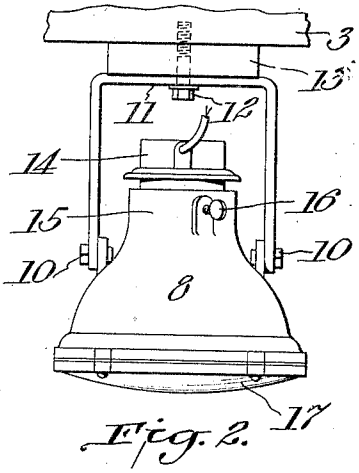


Fig. 2.

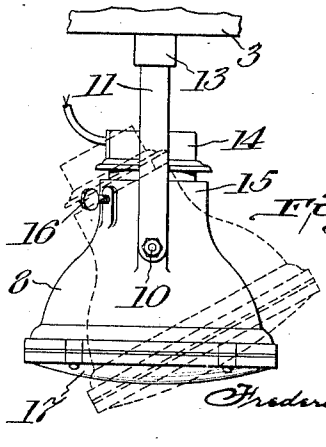


Fig. 3.

Inventor:
Frederick P. Clark,
By Byrnes, Townsend & Brickenstein,
Attorneys.

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UNITED STATES PATENT OFFICE.

FREDERICK P. CLARK, OF EAST CHICAGO, INDIANA.

SAFETY DEVICE.

Application filed March 10, 1928. Serial No. 260,756.

In industrial plants it is common practice to handle materials of all kinds by means of cranes and derricks, and particularly by means of overhead travelling cranes. These overhead cranes cover, in their travel, the entire length and width of floors used for various operations and, consequently, pass, and carry their loads, over the men employed in such operations. Thus, the men working within the area served by such a crane are constantly subjected to the hazard of injury by material falling from the crane loads passing above them.

In order to guard against this danger, it is customary to equip the cranes with warning devices, such as bells, horns, whistles or other audible signals, which may be sounded either by the crane operator or automatically when the crane is in motion. Such signals have been found to be unsatisfactory for the reason that they give no definite indication of the location of the danger, and, the sound being more or less monotonous, is apt to be unnoticed in the confusion of noisy operations.

Another type of signal which has been employed is a system of colored lights, mounted upon the bridge of the crane, and indicating, by color, the direction of travel of the crane. Thus, if a worker sees a red light on the crane he will know that it is travelling toward him, and if he sees a green light he will know that it is moving away from him. But this type of signal is open to the serious objection that, in order for it to be at all effective, the workman must be looking at the crane, and since he is otherwise occupied, he is not likely to have his attention directed upon the crane.

The primary object of my invention is to provide a safety device or warning signal for cranes and other load carrying apparatus, of such a nature that it is not likely to be ignored, but on the contrary will cause those in the path of the load carried by the crane to take notice instinctively of its approach and avoid the danger of possible injury.

To this end, the invention consists in the employment of means for projecting upon the floor of the shop, either slightly in advance of the load carried by the crane, or directly beneath it, but in any event in a definite relation to it, a spot of light of appreciable intensity, either white or suitably colored, which cannot be easily ignored, even by the most phlegmatic person, but will be practically certain to cause instinctive avoidance of the possible danger. Such a spot of light will travel over the floor as the crane moves and will define the path traversed by the crane load.

If desired, the means for projecting the light may be so mounted that when the crane bridge is moving the light will travel a fixed course, and when the crane trolley moves or stops abruptly the light will be given a rapid movement, thus adding to the efficacy of its warning influence, all as I will proceed now to explain and finally claim.

In the accompanying drawings, illustrating the invention, in the several figures of which like parts are similarly designated:

Fig. 1 is a perspective view of a portion of a conventional shop provided with a travelling crane equipped with the safety device of my invention.

Fig. 2 is a front view of a preferred embodiment of the light projector proper, and

Fig. 3 is a side view thereof, showing in broken lines one position which may be assumed by it upon oscillation.

In the embodiment illustrated, I haye shown a crane of the single hoist type, having a bridge 1 capable of travel upon tracks 2 longitudinally of the shop in the usual manner, and provided with a trolley 3 movable upon the bridge transversly of the shop, as is customary, and provided with a conventional hoist 4 and falls 5 from which a load 6 may be suspended. The operations of the bridge, trolley and hoist are controlled by an operator stationed in the usual cab 7.

Upon the trolley 3, and preferably at a point thereon adjacent to the operator and between him and the load, I mount the light projector 8 which is preferably of such design as to project a highly concentrated intense spot or beam of light upon the floor of the shop, and is so arranged as to project such spot or beam at a desired point relatively to the crane load 6, either directly below same, as shown at 9, or slightly in advance of and in the path of its travel.

As shown in detail in Figs. 2 and 3, the projector 8 is mounted upon horizontally arranged pivot bearings 10 in a bracket 11 secured to the frame of the trolley 3 by any suitable means such as a cap screw 12. Interposed between the frame of the trolley and the bracket 11 is a block or pad 13 of some resilient material, such as rubber or felt, to lessen vibration which might be in-

jurious to the lamp of the projector. In order that the light may be properly focused, I provide an adjustable socket member 14 for the lamp. This socket member 14 is sleeved in the portion 15 of the body of the projector, and may be fixed in adjusted position by a set screw 16. The projector is provided with a suitable lens 17 which may be either clear or colored, depending upon the character of light desired.

The projector 8 is preferably mounted with the axes of its pivots 10 in line with the direction of travel of the bridge 1, and thus normal to the transverse travel of the trolley 3. Hence, when the bridge is travelling and the trolley is stationary relatively thereto, the projector 8 will be relatively motionless and the spot of light 9 will travel in a straight path longitudinally of the floor, but when the trolley moves and stops the projector will swing upon its pivots 10 and the spot of light will oscillate transversely.

Obviously, the spot of light, even when travelling in a straight path, cannot easily be ignored by those near it or upon whom it is projected, but when it oscillates to and fro upon its pivots, under the influence of the moving trolley, its capacity for warning is augmented.

It will be apparent that, the projector 8 being mounted upon the trolley 3 which carries the hoist 4 from which the load is suspended, the spot or beam of light will always travel with the load no matter what its movement, and will warn those over whom the load is suspended of the danger.

As shown in Fig. 1, the projector 8 is mounted on the trolley 3 between the two girders which form the frame of the crane bridge 1, but it could be located elsewhere on the trolley, or on some other moving part, if desired, it being essential only that the spot of light projected bear a definite relation to the moving load of the crane.

It is to be noted that, to be effective, it is not necessary that the light or projector itself be seen, but merely that the spot or beam of light projected thereby be visible upon the floor or other surface.

It will thus be seen that I provide a safety device which has none of the objectionable features of the devices heretofore used, and which is of such a nature that it will be effective as a warning of danger whether those in the danger zone are indifferent to the travel of the crane or not.

Obviously, my invention is not limited to any particular type of light projector, or to any particular kind of crane or load-carrying apparatus, nor is it limited to the manner in which the two are associated.

Moreover, the principle of the invention is applicable to the marking or indication of any dangerous area, it being apparent that a bright spot or patch of light projected upon the area in question will be practically certain to call attention to the danger, thus making unnecessary the erection of guards or barriers or other solid structures which are hazards in themselves.

Various changes are contemplated as within the spirit of the invention and the scope of the following claims.

I claim:

1. A safety device for overhead travelling load-transporting apparatus, comprising means carried by the load-transporting apparatus adapted to project a beam of light upon the surface below and in definite relation to the load transported.

2. A safety device for overhead cranes of the type having a travelling bridge and a trolley movable on said bridge and provided with a load-carrying hoist, said device comprising a light projector adapted to project a spot of light on the zone of danger traversed by the load carried by said hoist and in definite relation to said load and means for so mounting said projector on said trolley that it is rigid in the direction of travel of said bridge and freely oscillatable in the direction of movement of said trolley.

In testimony whereof, I affix my signature.

FREDERICK P. CLARK.