July 22, 1969 G. E. McGUIRE 3,456,274

FOLDABLE TOE GUARD FOR DOCKBOARDS

Filed Sept. 6, 1967

Fig. 1

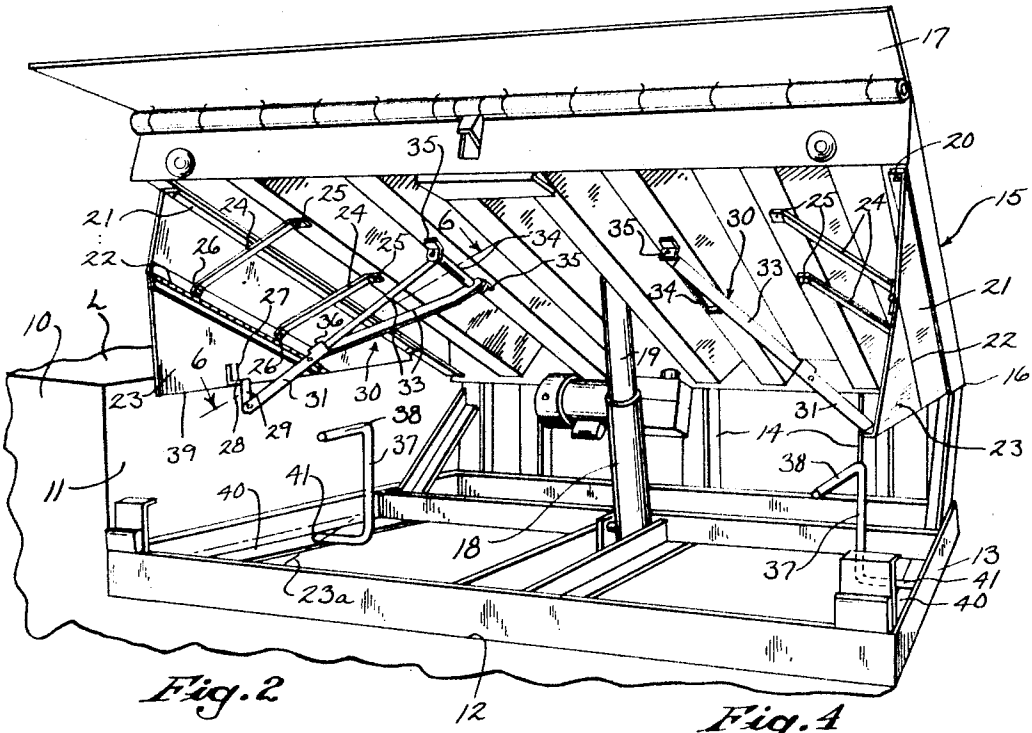


Fig. 2

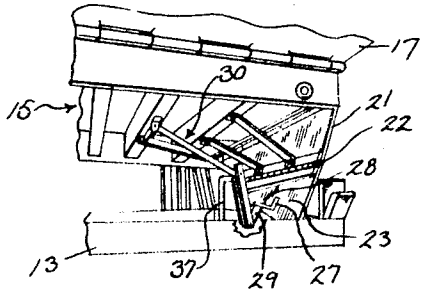


Fig. 4

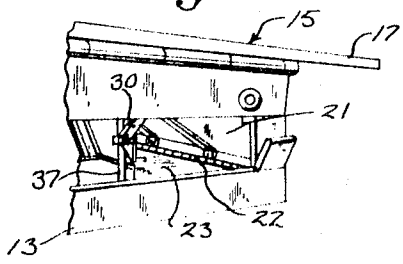


Fig. 5

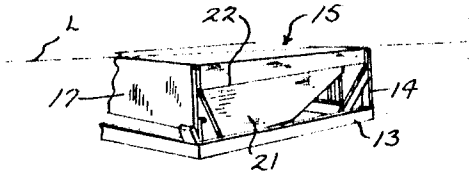


Fig. 3

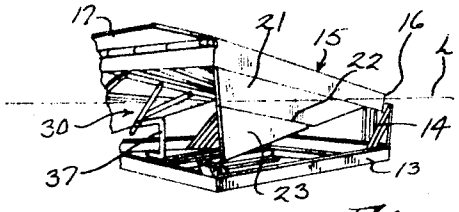
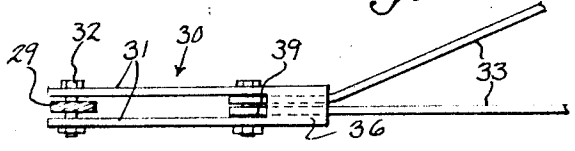


Fig. 6



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FOLDABLE TOE GUARD FOR DOCKBOARDS

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U.S. Cl. 14—71 7 Claims

ABSTRACT OF THE DISCLOSURE

A dockboard having a pair of depending skirts depending from its sides to provide toe guards, each skirt having a hinged lower extension section, knee joint mechanism holding the skirt sections in guarding position when the dockboard is raised so that the lower edge of the lower skirt section is always below dock level when the dockboard is fully raised, there being abutment members projecting upwardly from the pit for breaking the knee joints during lowering of the dockboard to cause the skirt extension sections to fold so that they can be accommodated in a relatively shallow pit.

BACKGROUND OF THE INVENTION

Field of the invention.—The present invention pertains to dockboard assemblies commonly used to bridge the space between a loading dock and the floor of a vericle which is backed into position adjacent the loading dock, and it relates to improvements in toe guard skirts for use with such dockboards.

Description of the prior art.—Heretofore dockboards have been provided with depending skirts which project rigidly from and move with the dockboard as it is raised or lowered. At the present time dockboard pits are relatively shallow and it has heretofore been considered necessary to have relatively short skirts so that they could be received in the shallow pit when the dockboard is fully lowered. Such relatively short skirts, however, are dangerous when the dockboard is fully raised as there is then a space between the lower edge of a skirt and the dock level in which an attendant's toe could be accidentally received to be injured as the dockboard is lowered. Short skirts of this type are disclosed in Ramer Patent No. 2,639,450, Watson Patent No. 2,714,735, Kelly Patent No. 2,751,615, and Fenton Patent No. 2,689,965. The Adley Patent No. 2,846,703 has a longer skirt, being a rigid, one-piece skirt, but this is shown in use with a dock having a deep pit of sufficient depth to accommodate such a skirt. The Adley skirt would not be suitable for use with the present day shallow pits.

SUMMARY OF THE INVENTION

The present invention provides skirts having articulated sections so that there is sufficient length in the depending skirts, when the dockboard is fully raised, to keep the gap between the raised dockboard and the dock protected, said articulated sections being so constructed that when the dockboard is lowered the skirts collapse in a manner to be accommodated in a relatively shallow pit.

A more specific object of the invention is to provide a dockboard having depending skirts wherein each skirt has multiple sections which automatically foldably collapse as the dockboard is lowered and which automatically straighten out as the dockboard is raised.

A further object of the invention is to provide a dockboard having depending skirts in which, in the preferred embodiment of the invention, each skirt has a lower foldable extension section which is maintained in depending position by knee action mechanism when the dockboard is elevated, there being abutment means which is automatically engaged by the knee mechanism as the dockboard is

being lowered to cause folding of said extension section into a collapsed position.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing, wherein the same reference numerals designate the same parts in all of the views:

FIG. 1 is a perspective view looking principally from the front and right showing a dockboard in fully raised position, a fragment of the dock and pit being shown on the left-hand side and being omitted on the right-hand side so as not to hide parts;

FIG. 2 is a fragmentary perspective view looking principally from the front and left and showing the dockboard partially lowered from the position of FIG. 1 to the point where the knee mechanism is being broken;

FIG. 3 is a fragmentary perspective view showing the dockboard in a partially lowered position similar to that of FIG. 2 but looking from a different direction in order to view the exterior of the right-hand skirt just as the skirt extension starts to fold, the dot-and-dash lines indicating the approximate dock level;

FIG. 4 is a fragmentary perspective view looking principally from the front and left showing the dockboard in fully lowered position;

FIG. 5 is a fragmentary perspective view looking from the front and right showing the dockboard in fully lowered position slightly below dock level, the dock and pit being omitted and the dot-and-dash lines indicating the approximate dock level;

FIG. 6 is a fragmentary sectional view taken approximately on the line **6—6** of FIG. 1 showing one of the knee assemblies.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring more particularly to the drawing, the numeral **10** designates a loading dock having a shallow pit **11** with a bottom **12**. Positioned in the pit is the bottom supporting frame **13** of the dockboard assembly, said frame having upstanding members **14** at the rear to which the dockboard **15** is hingedly connected for movement up and down on a fulcrum **16**. The front of the dockboard may have a pivoted lip **17** for bridging the space between the front of the dockboard and a truck which is backed up against the dock. As is customary with this type of dockboard, the pivotal movement is powered by a hydraulic cylinder **18** having an extensible ram **19** pivotally connected in any suitable manner to the underside of the dockboard.

Rigidly connected to the underside of the dockboard by bolts or in any other suitable manner at each side of of the dockboard is the fiange **20** of a rigid skirt portion **21**, preferably of metal. Inasmuch as each skirt is the same in construction except for the reversed position, only one will be described, and the same reference numerals will be used on the skirt on each side of the dockboard. Hinged as at **22** to the lower edge of the skirt portion **21** is a triangular foldable skirt extension section **23**. These skirt extensions are also preferably formed of sheet metal. The upper skirt section **21** is held rigidly in a depending position at right angles to the upper surface of the dockboard by braces **24**. The upper end of each brace is bolted to the underside of the dockboard as at **25** and to the skirt portion **21** as at **26**.

Welded to the inner side of the extension **23**, near its lower edge is an L-shaped bracket **27** having an inwardly projecting arm **28** from which a hinge ear **29** projects. Knee joint mechanism, designated generally by the numeral **30**, connects the hinge ear **29** to the underside of the dockboard. The knee joint mechanism includes a lower portion **31** formed of spaced bars as shown

in FIG. 6 between which the hinge ear 29 is pivotally connected as at 32. The knee joint also includes juxtaposed bar portions 39 having upwardly diverging arms forming a V-shaped portion 33 the ends of which are pivotal on a rod 34, the latter being supported in brackets 35 on the underside of the dockboard. As shown in FIG. 6 there is an abutment 36 on top of the bars 31 which is adapted to be engaged by the knee portion 39 to prevent the knee joint mechanism from pivoting past dead center as the skirt is opening out.

The sides of the base frame 13 have inwardly projecting horizontal shelves 40. Upright rods 37 have right-angularly bent, lower portions 41 which are welded to the shelves 40 and have their upper ends provided with right-angularly bent, forwardly-projecting abutments or cam portions 38. The abutments 38 are so positioned as to cause the knee joints 30 to break when they hit the abutments as the dockboard is being lowered.

OPERATION

In operation, it is apparent that when the dockboard is in the fully elevated position of FIG. 1 the knee joint mechanisms 30 are fully straightened out, holding the skirt extensions 23 rigidly in depending position closely adjacent the side walls 9 of the pit 11. It is also apperent that in this position the extended skirt is long enough to form an effective guard, the lower edge 39 of each skirt extension being below the dock level L in FIG. 1 (the dock level is omitted on the right hand side of FIG. 1 so as not to hide parts, but it is the same as shown on the left). Thus a toe cannot be inadvertently inserted between the lower edge of a skirt extension 23 and the dock surface.

As the hydraulic ram 19 lowers the dockboard the knee members 30 will eventually abut the abutment members 38, as shown in FIG. 2. This will cause the knee to break upwardly. As lowering continues, the skirt extensions 23 will be ultimately urged into a horizontal position shown by broken line 23*a* in FIG. 1 and also shown in FIG. 4, the rearwardly tapered portion of the skirt fitting outside of the rod 37 and over its botom supporting portion 41. Thus, the collapsed skirt can be readily accommodated in the relatively shallow pit 11 when the dockboard is in the fully lowered position of FIG. 5, which shows it somewhat below dock level L.

When the dockboard is being raised the weight of the sheet metal extension sections 23 is such that as soon as they clear the abutment members 38 the skirt extensions 23 will automatically fall to the vertical position, pulling the knee members to the stretched-out, bracing condition of FIG. 1 where the portions 36 act as stops.

From the above it is apparent that the improved dockboard assembly makes it possible to provide toe guard skirts which are sufficiently long, when the dockboard is fully raised, to prevent insertion of the toe beneath the lower edge of the skirts. It is also apparent that the movement of the skirt extensions to and from collapsed position is completely automatic as the dockboard is being raised and lowered. While the preferred form of the invention illustrates foldable skirt extensions, it is contemplated that other types of extension sections may be employed for increasing the effective length of the skirts when the dockboard is raised, with said extension sections movable to collapsed position in the pit when the dockboard is lowered.

Various other changes and modifications may be made without departing from the spirit of the invention, and all such changes are contemplated as may come within the scope of the clams.

What I claim is:

1. In a dock having a loading platform and having a pit which has a bottom, side walls, and a rear wall, there being a dockboard hinged adjacent said rear wall for pivotal movement over said pit, toe guard skirts depending from the sides of said dockboard for movement adjacent said side walls of the pit when the dockboard is pivotally moved, the improvement comprising an extension section foldably connected to each skirt for increasing the effective length thereof when the dockboard is raised, releasable means for rigidly maintaining the extension sections in extending position when the dockboard is raised, and means for releasing said last means and for causing automatic movement of said extension sections to collapsed position in the pit in response to lowering movement of the dockboard.

2. Apparatus as claimed in claim 1 in which the means for rigidly maintaining the extension sections in extending position when the dockboard is raised is connected between the dockboard and skirt.

3. Apparatus as claimed in claim 1 in which there is means for causing said extension sections to fold inwardly to positions parallel with the bottom of the pit when the dockboard is lowered.

4. Apparatus as claimed in claim 1 in which the releasable means includes a knee joint strut connecting each foldable section with the underside of the dockboard in a manner to hold said foldable sections rigidly in extending position when the dockboard is raised.

5. Apparatus as claimed in claim 4 in which there are abutment members projecting upwardly from the pit and positioned to break said knee joints when the dockboard is lowered.

6. Apparatus as claimed in claim 4 in which there is a stop on the knee joint preventing the joint from breaking in a downward direction.

7. Apparatus as claimed in claim 5 in which each abutment member comprises an upstanding rod having a right angularly bent upper end positioned to be engaged by the knee joint during lowering of the dockboard.

References Cited

UNITED STATES PATENTS

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JACOB L. NACKENOFF, Primary Examiner