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EXCAVATOR DIPPER LATCH

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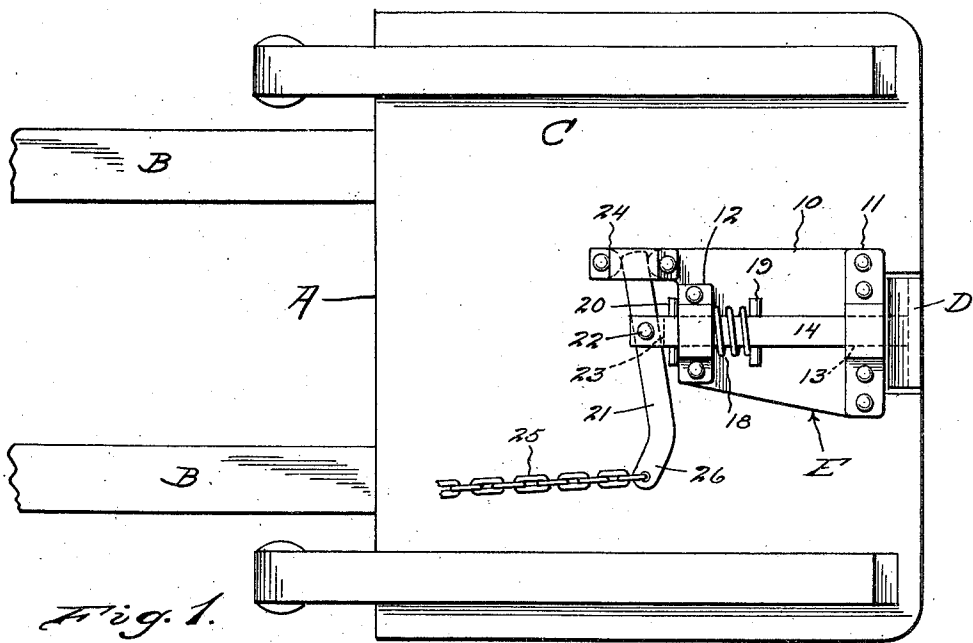


Fig. 1.

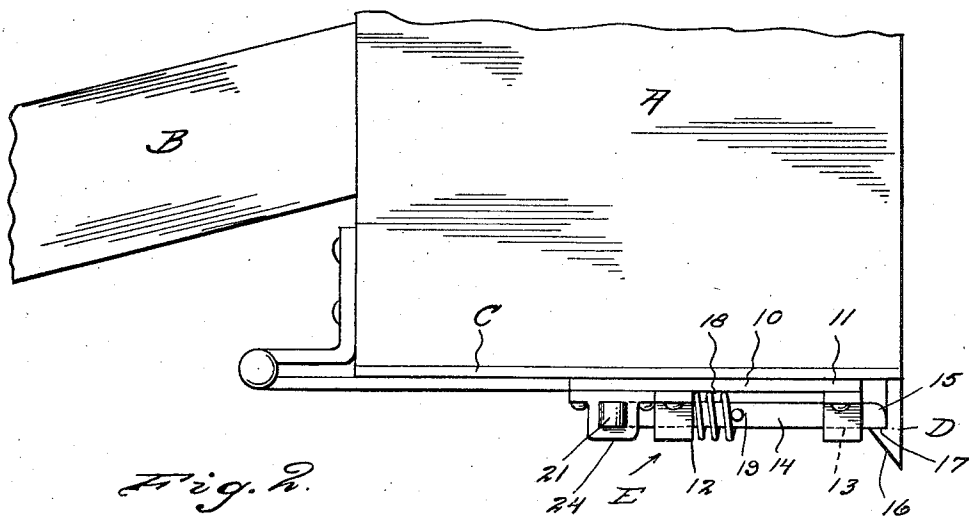


Fig. 2.

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EXCAVATOR-DIPPER LATCH

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This invention relates to excavating machines such as power shovels, and has for its general object the provision of an improved releasable latch mechanism for holding the

5 swingably mounted dipper door normally closed and permitting opening thereof when desired for the purpose of dumping the load. In the usual type of latch mechanism there is ordinarily provided a pivotally mounted

10 releasing lever which is connected in some operative manner with the latch and which has secured thereto a chain or other flexible member extending back to the cab or other point for convenient manipulation by the

15 operator of the machine so that the load may be dumped when the dipper is in the proper position for unloading. Such levers have been made straight and a great difficulty has been that the releasing chain, cable or the

20 like becomes fouled about the lever or caught at the end thereof, resulting in pulling the latch bar and releasing the dipper door prematurely, the load being then of course dumped at an undesired location.

25 It is with the above facts in view that I have designed the present invention which has for an important object the provision of a dipper door latch mechanism embodying a releasing lever so shaped as to prevent catching or fouling of the chain, cable or the like with respect thereto so that accidental opening of the door will be avoided.

Another object of the invention is to provide a latch mechanism embodying a novel

35 mounting for the releasing lever, the mounting being of such character as to eliminate any necessity for the employment of a bolt as the pivot, a socket means being provided in lieu thereof to serve as the fulcrum.

40 Still another object is to provide a mechanism of this character which may be constructed and assembled as a unit or complete and separate entity adapted to be used as a replacement for ordinary latch mechanisms and to be installed bodily upon an already

45 existing dipper door without involving any changes therein with the possible exception of drilling a few holes for the passage of securing rivets, bolts or the like.

50 An additional object is to provide a device

of this character which will be simple and inexpensive to manufacture, easy to install and operate, positive in action, efficient and durable in service, and a general improvement in the art.

With the above and other objects and advantages in view, the invention preferably consists in the details of construction and the arrangement and combination of parts to be hereinafter more fully described and

60 claimed, and illustrated in the accompanying drawing in which:

Figure 1 is a bottom plan view of a dipper having its door equipped with the invention,

Figure 2 is a side elevation thereof with the door in closed position.

Referring more particularly to the drawing, the letter A designates a dipper carried by the usual sticks B and constructed in the ordinary manner, the device being of the type forming part of the equipment of excavating machines such as the well known power shovels. A dipper of this type has a suitably hinged door C capable of swinging from open to closed position and vice versa, the door being equipped with a latch device cooperating with a keeper D on the dipper.

In carrying out the present invention I provide a latch mechanism indicated as a whole at E and here represented as comprising a supporting plate 10 upon which are formed or otherwise provided spaced guide brackets or guide portions 11 and 12, the former being comparatively near the free end of the door and the latter being located considerably inwardly with respect to said free end. These brackets are of such construction as to have openings 13 therethrough which slidably receive the latch bolt 14 which is movable longitudinally and which is located preferably at the longitudinal axis or center lines of the door. The latch bolt 14 has one end projecting beyond the guide bracket 11 and beveled or curved at 15 for cooperation with the inclined end 16 and shoulder 17 of the keeper.

As gravity cannot be safely relied upon to effect projection of the latch bar into opera-

tive relation to the keeper, owing to the possibility of clogging with earth or the like, it is preferable to provide a spring 18 for the purpose, it being possible to locate the spring or arrange it in various places. However, the spring is here disclosed as encircling the latch bar and abutting at one end against the bracket 12 and at its other end against a stop 19 carried by the bar, this stop being conveniently a pin driven through a suitable hole in the bar. For limiting the outward movement of the bar under the influence of the spring it is preferable to provide a similar stop 20 extending through or otherwise carried by the bar and engageable with the bracket 12 at the side thereof opposite that at which the spring is located.

To effect release of the latch so that the door may be opened or permitted to open for the discharge of the load in the dipper, I provide a lever 21 pivoted intermediate its ends, as shown at 22, within a bifurcation 23 in the inner end of the latch bar, this lever having one end fulcrumed within a socket-like bracket 24 carried directly by the door, if so desired, but preferably mounted upon the plate 10. A chain or other flexible member 25 is connected with the other or free end of the lever and may be brought over or through any suitable guide means, not shown, and conducted to the cab or other place convenient to the operator so as to be pulled for the purpose of retracting the latch bolt from engagement with the keeper.

A very important feature in the invention is the shape of the lever 21 which is here disclosed as having its free end 26 curved toward the direction in which the chain or flexible member 25 extends, the purpose being to prevent catching or fouling of the chain on the lever. Clearly, if the chain should by any chance, when slack or at any other time catch on the lever, the curved shape of the latter would prevent the chain from remaining in such caught position as it would immediately slip off upon the application of even a very slight pull or tension of any kind such as would result from entanglement.

As a matter of convenience and to facilitate the use of the device as a replacement for ordinary latch mechanisms, the brackets 11, 12 and 24 may conveniently be cast with or welded to or secured upon the plate 10 to define a unitary structure or assembly which may then be installed upon a dipper door without any necessity for the exercise of unusual skill or judgment in locating the parts in the proper relation to insure efficient action. If these parts be formed integrally, or secured together as indicated, it is apparent that to effect assembly, the latch bar must be inserted through the guide brackets 11 and 12 and through the spring, prior to the insertion of the abutment or stop pin 19. It is immaterial whether the pin 20 be placed in

position before or after the latch bar is inserted through the guide brackets. The lever 21 must then have its pivoted end engaged within the socket bracket 24 with its intermediate portion located within the bifurcation 23, subsequently to which the pivot bolt or its equivalent 22 must be applied. However, it is conceivable that certain variations in these respects may be resorted to.

From the foregoing description and a study of the drawing it will be apparent that I have thus provided a very simply constructed and inexpensive latch mechanism which will possess all the advantageous features above pointed out and which will efficiently perform all the functions for which it is intended. It is really believed that the construction, operation and advantages will be readily apparent to one skilled in the art without further explanation.

While I have shown and described the preferred embodiment of the invention, it should be understood that I reserve the right to make all such changes in the form, construction and arrangement of parts as will not depart from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:

1. In an excavator dipper having a hinged door and provided with a keeper, a latch mounted on the door and cooperating with the keeper for normally maintaining the door closed, a pivoted lever connected with the latch for releasing the same, said lever having one end projecting laterally beyond the latch, the projecting portion of the lever being curved away from the free end of the door, and a flexible member connected with said projecting curved end of the lever for effecting movement thereof, the curvature of the lever preventing fouling of the flexible member thereupon and permitting it to slip off if engaged thereabout.

2. A latch mechanism for the hinged door of an excavator dipper, the dipper having a keeper, comprising guide brackets carried by the door, a longitudinally slidable latch bar extending through said guide brackets, means normally urging said latch bar into extended position for cooperation with the keeper, a lever fulcrumed at one end and pivoted intermediate its ends to the inner end of the latch bar, and a flexible member connected with the other end of the lever, said second named end of the lever being curved in the direction of said flexible member.

3. A latch mechanism for a hinged door comprising a stationary keeper, guide brackets arranged in spaced relation and carried by the door, a longitudinally movable latch bar slidable through the guide brackets and cooperating with said keeper, means normally urging the latch bar into extended position for cooperation with the keeper, the

inner end of the latch bar being bifurcated, a lever having its intermediate portion pivoted within the bifurcation, a socket bracket carried by the door and having one end of the lever engaged therein whereby to serve as a fulcrum, and a flexible member connected with the other end of the lever.

4. A latch mechanism for a hinged door comprising a stationary keeper, guide brackets arranged in spaced relation and carried by the door, a longitudinally movable latch bar slidable through the guide brackets and cooperating with said keeper, means normally urging the latch bar into extended position for cooperation with the keeper, the inner end of the latch bar being bifurcated, a lever having its intermediate portion pivoted within the bifurcation, a socket bracket carried by the door and having one end of the lever engaged therein whereby to serve as a fulcrum, a flexible member connected with the other end of the lever, and a supporting plate permanently carrying the guide brackets and the socket bracket.

5. A latch mechanism for a hinged door comprising a stationary keeper, guide brackets arranged in spaced relation and carried by the door, a longitudinally movable latch bar slidable through the guide brackets and cooperating with said keeper, means normally urging the latch bar into extended position for cooperation with the keeper, the inner end of the latch bar being bifurcated, a lever having its intermediate portion pivoted within the bifurcation, a socket bracket carried by the door and having opposed ends formed with curved projections extending toward each other, one end of the lever being engaged between said projections to provide a fulcrum, a flexible member connected with the other end of the lever, and a supporting plate permanently carrying the guide brackets and the socket bracket and formed integrally therewith whereby the entire mechanism will constitute a unitary structure.

In testimony whereof I affix my signature.

ALFRED T. HANSEN.

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