

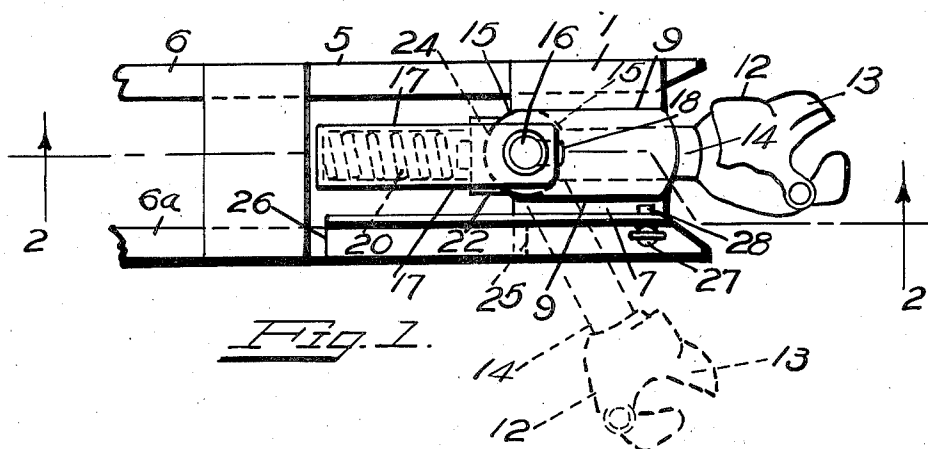
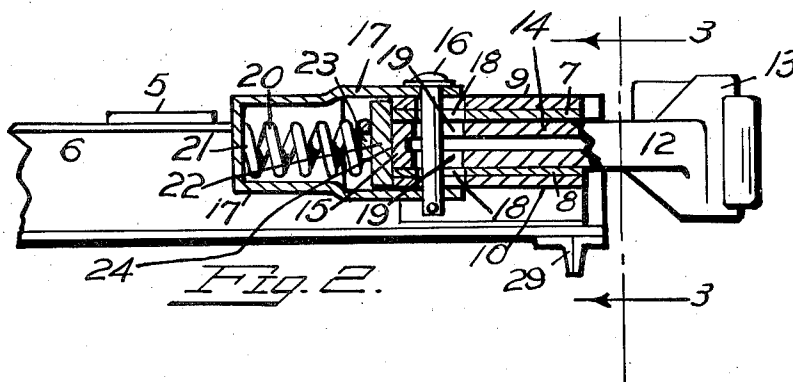
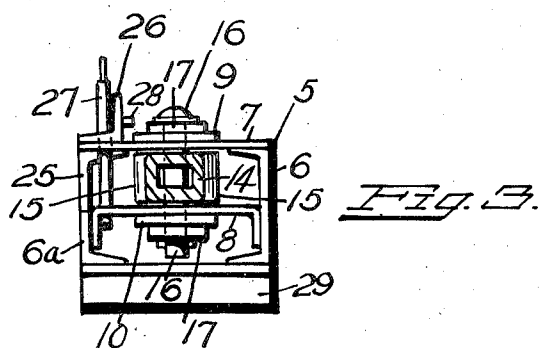
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RAILWAY CAR COUPLER

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RAILWAY CAR COUPLER

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6 Claims. (Cl. 213—12)

This invention relates to improvements in railway car couplers, particularly for use on mining cars and the like.

Mining railway cars usually operate under difficult conditions. Such cars operate in tunnels where space is limited. As driving of the tunnel progresses, ore, rock or whatever material is being encountered, must be dug at the head of the tunnel, loaded into cars and hauled out.

Modern practice in driving a tunnel makes use of digging machines or, as referred to in mining parlance, "mucking machines." These digging or mucking machines ordinarily operate on the narrow-gage railways that are typically used in such tunnels, and are provided with shovels or buckets which lift the material being excavated from immediately in front of the machine and dump it immediately at the rear. These digging or mucking machines have been particularly developed for use in crowded quarters where a swinging boom or ordinary power shoveling equipment would be entirely inoperative.

In use, such digging or mucking machines are run into the tunnel, to the head where the actual digging is in progress. A mine car, usually of the dump type, is run in and positioned immediately at the rear of the digging or mucking machine and just as close thereto as possible. Due to the limitations of space under these circumstances, the mucking machine has only a limited capacity for shoveling material. It is, therefore, important that the dump car being loaded be positioned just as close behind the mucking machine as possible.

In ordinary railway car construction, the coupler projects longitudinally from and beyond the car and it has been found that this projecting coupler prevents positioning the car being loaded as close to the mucking machine as is desired. Under such circumstances, the loading operation is not efficient and the car cannot be loaded to its maximum capacity. The mucking machine can move the material only a very limited distance. This problem has been solved by the present invention.

The operations herein described have particularly set forth modern practice in tunnel driving in the mining industry, but it is manifest that such practice may well be followed in driving a tunnel bore for any other purpose, such as for water conduction.

It is a principal object of the present invention to provide a railway car coupler that can be swung laterally out of the way so that the car

may be positioned in close proximity to a digging or mucking machine.

Another object is to provide in such a coupler, improved means for absorbing shock, both thrust and pull.

A further object of the invention is to provide a coupler of this type that may be locked securely in its operating position.

Other objects and advantages reside in details of design and construction which will be more fully disclosed in the following description and in the drawing wherein like parts have been similarly designated and in which:

Figure 1 is a fragmentary plan view of a central frame construction of a typical mining dump car on which is mounted a coupler that embodies the present inventive concept;

Figure 2 is a fragmentary sectional view taken approximately along the line 2—2 of Figure 1; and

Figure 3 is a cross sectional view taken along the line 3—3 of Figure 2.

In order clearly to disclose an operable reduction to practice of the present invention, the accompanying drawing will be described in detail. However, it is to be understood that the example herein disclosed is typical and is not intended to express or imply any limitation to the invention, the scope of which is, in reality, measured by the appended claims.

Changes in detail of design and construction may occur to those skilled in the art, but the example herein recorded is constructed as follows:

Reference character 5 denotes a typical mining dump car central frame element which is relatively narrow to provide for side dumping of the car body. The structure 5 typically is composed of complementary structural steel channels 6 and 6a. Secured across the structural channels 6 and 6a in vertically spaced relationship, are draft plates 7 and 8 which are reinforced by plates 9 and 10 respectively.

Carried between the draft plates 7 and 8 is a coupler 12 having a head 13 and a shank 14. The end of the shank 14 that is opposite the coupler head 13 is provided with an arcuate external contour, the plan view that is Figure 1 showing this end 15 of the coupler shank as enlarged into about three-quarters of a circle.

The entire coupler unit 12 is mounted for limited pivotal or angular movement about the center of this arcuate or three-quarter circular end as an axis, by means of a pin 16. In its normal operating position as shown in Figure 1, the coupler head 13 projects longitudinally from and be-

yond the frame structure 5 and, therefore, it will project in the usual manner beyond the completed dump car.

The pivot pin 16 is carried in a yoke 17 and passes through draft plates and reinforcing plates 7, 8, 9 and 10 through elongated holes 18. The pivot pin 16 likewise passes through the end 15 of the coupler shank 14 through an elongated hole 19, the shank 14 being made hollow as illustrated in Figure 2 to reduce its weight. The pin 16 passes through closely fitting holes in the yoke 17.

The yoke 17 houses a compression spring 20 which bears against the yoke at 21 and against a follower 22 that is provided on one side with a centering boss 23 and on the other side with an arcuate surface 24 that fits and bears against similarly arcuate adjacent edges of the plates 7, 8, 9 and 10 and also fits the shape of the end 15 of the coupler shank 14.

The structural channel member 6a is partially cut out as at 25 so that the entire coupler 12 may be swung or moved angularly about the pivot pin 16 through said cut-out opening to the dotted line position illustrated in Figure 1. A reinforcing structural angle member 26 is secured to the channel member 6a and positioned to extend over the cut-out portion 25 thereof.

A locking pin 27 is removably positioned in suitable apertures through reinforcing angle 26 and plates 7 and 8, to prevent the coupler assembly 12 from accidentally swinging to the side away from its normal operating position. The locking pin 27 is provided with a latch extension 28 that engages in a suitable stepped slot in the upstanding leg of the angle 26, by rotation of the pin. Thus, the locking pin 27 is prevented from inadvertent removal from its normal position.

It is clearly obvious that a thrust applied to the coupler 12 will be transmitted to the follower plate 22, the compression spring 20, the yoke 17, the pin 16 and thence to the draft plates 7, 8, 9 and 10. The spring 20 will compress to absorb the shock of the thrust, the elongated holes 19 permitting the shank 14 of the coupler 12 to move inwardly toward the car frame during such compression.

Similarly, if tension or drawbar pull is applied to the coupler 12, such force will be transmitted to the pin 16, the yoke 17, the compression spring 20, the follower 22 and thence to the draft plates 7, 8, 9 and 10, the elongated openings 18 in said draft plates permitting the spring 20 to compress by permitting the pivot pin 16 to move forward during such compression.

The limit of the openings 19 in the shank 14 of the coupler 12 determines the degree of compression of the spring 20 when thrust is applied to the coupler, and the limits of the openings 18 in the draft plates 7, 8, 9 and 10 determine the degree of compression of the spring 20 when tension is applied to the coupler 12. Thus, the spring 20 cannot be overloaded, but the shock of both thrust and tension is absorbed by the spring.

When the car equipped with the improved coupling is to be loaded by a digging or mucking machine, the lock pin 27 is removed and the entire coupler assembly 12 is swung or pivoted to its dotted line position as shown in Figure 1. In this position, it is out of the way and the car may be placed very close behind the mucking machine to be loaded thereby to its maximum holding capacity.

A downwardly projecting structural member 29 is positioned across the undersurfaces of the

frame structure 5 and cooperates with the mucking machine which typically is provided with a hook-like member which may engage the part 29 on the car to hold it from moving away from the machine. Different types of mucking machines have different arrangements for holding the car being loaded in close proximity and against accidental separating movement. The part 29 herein set forth is merely typical. A lug or projection to cooperate with a member on the mucking machine may be positioned elsewhere on the car structure according to the type of mucking machine to be used.

Thus, the stated objects of the invention are fully accomplished in that an improved car coupler is provided that absorbs shocks, both thrust and pull, and which readily may be swung out of the way to position the car in close proximity to a digging or mucking machine. Means also being provided for locking the coupler against inadvertent pivotal movement away from its normal operating position. In practice, the locking pin 27 may not always be essential. Under some circumstances, it may be dispensed with, as it has been found in actual use that there is very little tendency for a coupler made according to this invention, to move accidentally away from its normal operating position. Therefore, the locking feature or means for limiting angular movement of the coupler element, as exemplified by pin 27, may be optionally used or omitted.

What I claim and desire to secure by Letters Patent is:

1. In car coupler construction, vertically spaced draft plates having corresponding convex arcuate edges and having elongated vertically aligned holes, a coupler element having a coupler head and having a shank positioned between the draft plates and terminating in a convex arcuate contour corresponding to the arcuate edges of the draft plates, there being an elongated opening in the shank corresponding to the holes in the plate, a yoke embracing the plates, a pivot pin carried in the yoke and positioned through the holes in the draft plates and through the opening in the coupler shank whereby the coupler element is mounted for limited longitudinal and angular movements with reference to said plates, a compression spring in the yoke, and a follower pressed by said spring toward the plates and the arcuate end of the coupler shank and having an arcuate concave surface cooperating with the arcuate convex edges of the draft plates and cooperating with the arcuate convex surface of the coupler shank.

2. In a car coupler construction, vertically spaced draft plates having corresponding convex arcuate edges and having elongated vertically aligned holes, a coupler element having a coupler head and having a shank positioned between the draft plates and terminating in an enlarged end of circular contour corresponding to the arcuate edges of the draft plates, there being an elongated opening in the shank corresponding to the holes in the plate, a yoke embracing the plates, a pivot pin carried in the yoke and positioned through the holes in the draft plates and through the opening in the coupler shank whereby the coupler element is mounted for limited longitudinal and angular movements with reference to said plates, a compression spring in the yoke, and a follower pressed by said spring toward said plates and shank and having an arcuate concave surface cooperating with the arcuate convex edges of the draft plates and co-

operating with the circular convex surface of the coupler shank.

3. In car coupler construction, the combination with a car frame element having spaced complementary longitudinal structural members, of two vertically spaced draft plates attached to the members, a pivot pin positioned through the plates, and a coupler element pivoted to the plates between the structural members, by the pin, a portion of one of said structural members being open to provide clearance for said coupler element to move angularly through and beyond the vertical plane of said member.

4. In car coupler construction, vertically spaced draft plates having elongated vertically aligned holes, a coupler element having a coupler head and having a shank positioned between the draft plates and terminating in a convex arcuate contour, there being an elongated opening in the shank corresponding to the holes in the plates, a yoke embracing the plates, a pivot pin carried in the yoke and positioned through the holes in the draft plates and through the opening in the coupler shank whereby the coupler element is mounted for limited longitudinal and angular movements with reference to said plates, a compression spring in the yoke, and a follower pressed by said spring toward the plates and the coupler and having an arcuate concave surface cooperating with the arcuate convex terminal surface of the coupler shank.

5. In car coupler construction, vertically

spaced draft plates having elongated vertically aligned holes, a coupler element positioned between the draft plates, there being an elongated opening in said coupler element corresponding to the holes in the plates, a yoke embracing the plates, a pivot pin carried in the yoke and positioned through the holes in the draft plates and through the opening in the coupler element whereby said coupler element is mounted for limited longitudinal movement and for angular movement with reference to said plates, a compression spring in the yoke, and a follower pressed by said spring toward the plates and the coupler.

6. In car coupler construction inclusive of a car frame element, the improvement which comprises vertically spaced draft plates carried upon the frame element, and a coupling element inclusive of a coupler head, positioned between the draft plates substantially within the horizontal plane of said frame element for limited longitudinal movement and for angular movement with reference to said plates and frame element, means located inside of the end vertical plane of the frame element, said means being formed and arranged to provide for horizontal angular movement of said coupling element to a position where it is inside said end vertical plane of the frame element, whereby said coupler element is retractable to a position of non-interference when not in use as a coupler.

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