

Aug. 24, 1954

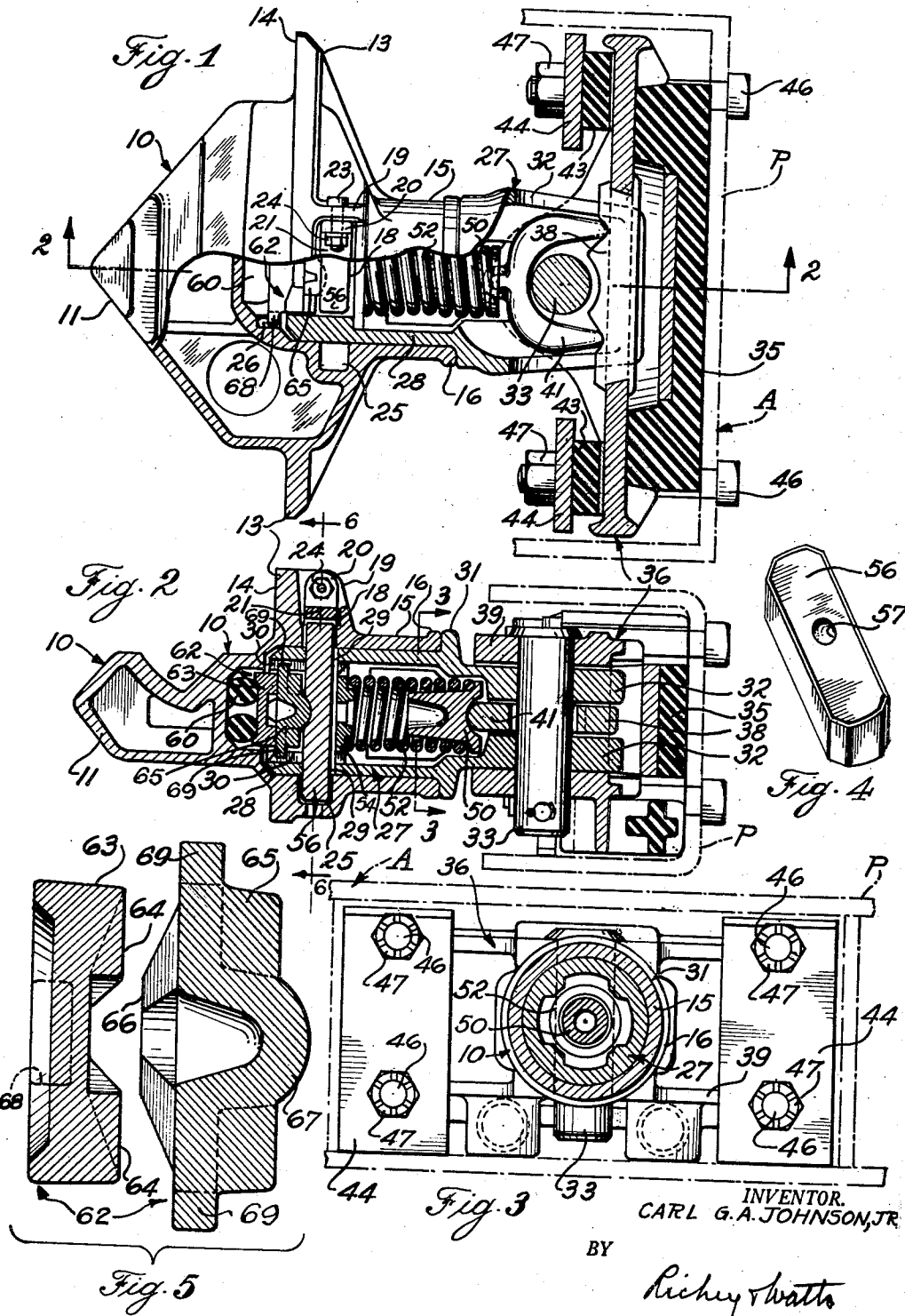
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2,687,218

CAR COUPLER

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2 Sheets-Sheet 1



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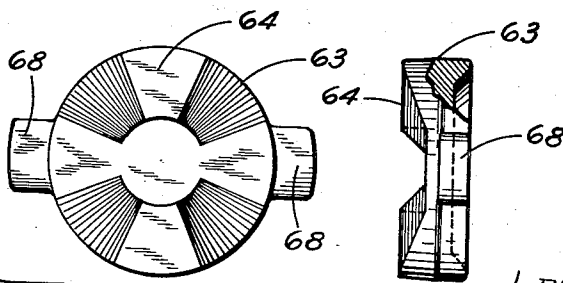
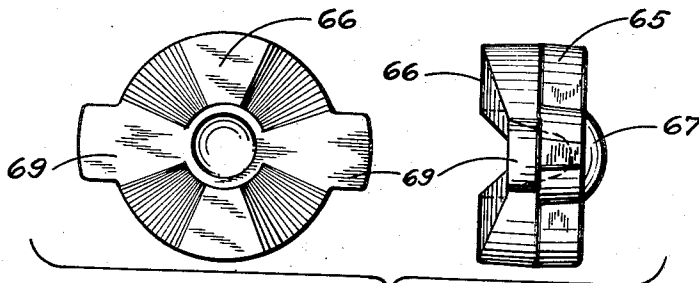
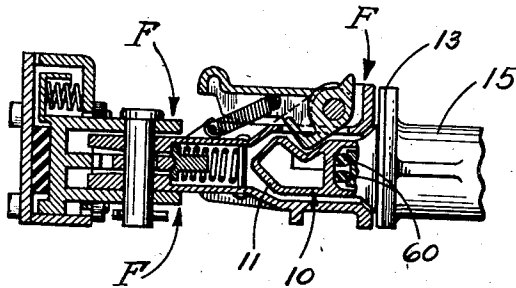
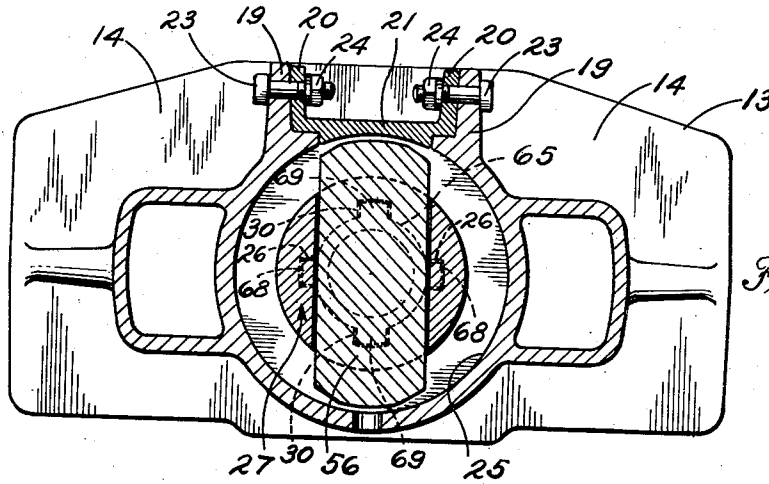
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2 Sheets-Sheet 2



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2,687,218

CAR COUPLER

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8 Claims. (Cl. 213—21)

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The present invention relates generally to coupling devices and is more particularly concerned with a novel and useful male coupling element for use in securing together mine cars and the like.

A principal object of this invention is to provide a male coupling element which will be more stable in service and longer lasting than elements of this type previously known and used.

Another object of this invention is to eliminate certain troublesome parts and features from prior mine car coupling devices.

Still another object of my invention is to provide adequate protection for parts which have heretofore been vulnerable in these devices.

A still further object of this invention is to provide a coupler element in which the head portion and the draw bar are automatically maintained in alignment, thereby to avoid any tendency to distortion of the parts under buffing shocks incident to normal use.

An additional object hereof, is to eliminate the customary collar block and its bolts from coupling devices of this type, while retaining the function of these parts.

Very generally, a car coupling device of this invention comprises a draw bar for attachment to a car body, a head for interlocking engagement with a complementary device and key means including a key engaging the head and draw bar and retaining them in assembly with the head rotatable relative to said bar. The head is provided with a substantially annular keyway groove to receive a portion of this key and the draw bar is provided with a key slot through which the key may extend to engage the head. In addition, resilient means is provided and associated with the head for resiliently opposing rotation of the head relative to the draw bar.

Those skilled in the art to which this invention relates will gain a further and better understanding of this invention upon consideration of the following detail disclosure thereof, reference being had to the drawings accompanying and forming a part of this specification, in which:

Fig. 1 is a plan view of a male coupling device embodying this invention in a preferred form, certain parts being broken away in the interest of clarity;

Fig. 2 is a vertical, sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a vertical, sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is a perspective view of the key element employed in the Fig. 1 device;

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Fig. 5 is a vertical, sectional view of the pair of spreader discs shown in Fig. 2 as part of the aforesaid resilient rotation-opposing means;

Fig. 6 is a transverse sectional view of the coupler of this invention taken on line 6—6 of Fig. 2;

Fig. 7 is a fragmentary view, partly in longitudinal section, of a coupling device of this invention assembled with a female coupling element and showing the latter in detail;

Fig. 8 is a composite of two views showing one spreader disc in plan and in side elevation; and,

Fig. 9 is likewise a composite made up of a plan view and a side elevational view of the other spreader disc.

Head 10 of the illustrated device has a tongue portion 11 of substantially conventional form for interlocking engagement with a complementary device such as the female coupling element fully illustrated and described in U. S. Patent No. 2,235,618, granted March 18, 1941 to Ernst A. Larsson. An interlocked assembly of this type is shown in Fig. 7 wherein the F represents the female coupling element shown in Fig. 7 of the aforesaid Larsson patent. Immediately back of this tongue portion, the head is provided with an annular flange 13, having a buffing face 14 for engagement with a similar part on the said female element. Rearwardly of the flange, the head has a hollow cylindrical collar 15, which terminates in an annular lip 16, for a purpose to be described. Adjacent to flange 13, collar 15 is provided in its upper portion (as viewed in Fig. 1) with a slot-like aperture 18, on each side of which a vertical web 19 is provided, joining the flange and the collar to support a bracket 20, having a portion 21 disposed adjacent to and partially covering the aperture. This bracket is retained in place by means of bolts 23 which extend through apertures provided for the purpose in webs 19 and registered apertures in the bracket, nuts 24 engaging the bolt and holding the parts in assembled relation.

A key groove 25 is provided in the head and together with aperture 18 this groove defines an annular key paralleling the plane of flange 13 and located just to the rear of said flange.

Within collar 14 and forwardly of flange 13 opposed longitudinally extending, relatively shallow recesses 26 are provided to receive for guiding purposes elements hereinafter to be described.

A draw bar 27 slideably mounted in collar 15 has a hollow cylindrical portion 28 of substantially the same outside diameter as the inside

diameter of the collar and having greater length than the collar to extend to a point within the flange 13. This telescoped portion 28 has a pair of diametrically opposed, registered slots 29 adjacent to its open forward end for registry with slot-like aperture 18 in the collar, and has two internal, longitudinally extending, relatively shallow recesses 30 adjacent to its forward end. The draw bar further has an annular flange 31 disposed at the rear end of said portion 28 for buffing engagement with lip 16.

The head and draw bar thus are formed and engaged in such a manner as to have substantially longer and greater annular rubbing surfaces than prior devices of this type, and consequently these parts are better-wearing and easier to make by machine.

Also, this construction has the advantage of assuring normal use, and since the buffing load is taken well back on the draw bar, there is no appreciable tendency for the head to tip in relation to the draw bar and shock-deformation of the parts attributable to misalignment is thereby eliminated.

Back of flange 31, the draw bar has two spaced portions 32 defining a clevis, registered openings being provided in said clevis to receive a pin 33 serving to connect the draw bar to an anchorage assembly A carried by a car body (not shown).

The anchorage assembly comprises a generally rectangular pan indicated in outline at P, which has a back surface to bear on the ends of a car body. A buffing pad 35 of rubber or the like is disposed in the pan to absorb shocks incident to the use of the coupler. A clevis 36 extending forwardly from the pan bears on the said pan and has an intermediate portion 38 disposed between its opposed horizontally projecting elements 39 which serves as a basis for supporting a U-shaped centering link 41 straddling pin 33. Adjacent to the opposite edges of the clevis 36 are two pulling pads 43 of rubber or similar resilient material and two sheet metal cover plates 44 covering the forward faces of the pads, as illustrated in Fig. 3. Plates 44, pads 43, and clevis 36 and buffing pad 35 are secured together and to pin P by means of four bolts 45 extending through registered apertures in the several said parts, and nuts 47 screwed on the forward threaded ends of bolts 45 and engaging cover 44.

Centering link 41 engages and retains a spring core 50 which has a flanged portion to engage a spring 52 extending forwardly from said link within cylindrical portion 26 of the draw bar. A spring-retaining disk 54 is disposed against the opposite end of spring 52 and seats on the inner end of the heavy section at the forward end of the draw bar.

The head and draw bar are secured together with the head rotatable relative to the draw bar by means of a key 56 which takes the form of a block having a centered, hemispherical recess 57 in its forward face, as shown in Fig. 4. This key is carried by the draw bar, extending through opposed slots 29 so that the end portions of the key project into the annular key groove in the head (Fig. 2). Bracket 20 serves to assure retention of the key in this relation to the head and draw bar. For further assurance of such retention and to assure at all times resilient opposition to the tendency for head and draw bar to move rotatably relative to each other the aforesaid resilient means is provided. This means comprises a rubber bun or ring 60 disposed within the head and bearing upon an internal parti-

tion or abutment wall, and a pair of spreader discs 62 bearing upon each other and upon the bun and key 26.

Disc 63 engaging the bun has a rearwardly facing surface provided with duplicate wedges 64 symmetrically arranged, and the other disc 65 is similarly formed with wedges 66 on its forwardly facing surface as illustrated in Fig. 5. Disc 65 further has a centered rounded bottom 67 projecting toward the key for receipt in recess 57 whereby the key discs and bun will be kept in line in use. Discs 63 and 65 have lug pairs 68 (Fig. 1) and 69 (Fig. 5), respectively, to be received in recesses 26 and 30 and retain the discs in position relative to the head and the draw bar.

The assembly and disassembly of this male coupling element will be apparent from the foregoing description and the accompanying drawings, as also will the general operation of the various parts of the device. It will be noted, however, that when a torque is applied to head 10, as for instance when a car carrying the couple is being dumped at a tipple, disc 63 turns relative to disc 65 with the double wedges of one disc riding on those of the other. As a result, bun 60 is deformed and an ever-increasing amount of force is required to continue this relative rotation because of the resistance of the bun to this deformation. A point may be reached in the course of this rotation where the flats of the double wedges ride on each other and although the bun is compressed to its maximum extent, the system will be in equilibrium and stable against any tendency for the parts to return to their starting relation. Further, rotation of the head relative to the draw bar will result in the wedges riding down each other until the bun is again in its normal expanded form. Likewise, reversal of the direction of rotation at the time of maximum deformation of the bun will bring this return to normal condition of the bun and relation of the parts, the bun assisting equally in either instance due to the symmetry of the double wedges.

Having thus described the present invention so that those skilled in the art may be able to understand and practice the same, I state that what I desire to secure by Letters Patent is defined in which is claimed.

What is claimed is:

1. A car coupling device comprising a draw bar for attachment to a car, a head for interlocking engagement with a complementary device, said head having a hollow portion to receive the draw bar and provided with an inner key groove extending substantially transversely of said hollow portion, key means including a key lockingly engaging the draw bar for movement with said draw bar and having an end portion disposed in said key groove for guiding rotational movement of the head relative to the draw bar, and means resiliently opposing relative rotation of said head and draw bar, said means comprising a rubber-body in the head, a spreader disc keyed to the head for rotation therewith and bearing on said rubber body, and a second spreader disc mating with and bearing upon the first spreader disc and keyed to the draw bar for rotation therewith.

2. A car coupling device comprising a draw bar for attachment to a car, said draw bar having a hollow cylindrical portion at one end, a head for interlocking engagement with a complementary device, said head having a hollow portion to receive the cylindrical portion of the draw bar and provided with an inner annular key groove

extending substantially transversely of said hollow portion, key means including a key disposed in the draw bar and having end portions disposed in said key groove for guiding rotational movement of the head relative to the draw bar, said key having a recess in one face, and means resiliently opposing relative rotation of said head and draw bar, said means comprising a rubber ring within and bearing against the head, a double wedge surface spreader disc keyed to the head for rotation therewith and bearing against said rubber ring, and a second double-wedge spreader disc mating with and bearing against the first said disc, said second disc having a centering projection disposed in the recess in said body.

3. A car coupling device comprising a draw bar for attachment to a car and having a generally cylindrical leading end portion, a head for interlocking engagement with a complementary device and having a buffing flange, said head having an integrally-formed, generally-cylindrical collar of substantially uniform inside diameter extending rearwardly from adjacent the buffing flange to receive said generally cylindrical portion of the draw bar and to bear upon an annular area of said cylindrical draw bar portion and having a key groove extending generally transversely of the collar, and key means including a key lockingly engaging the draw bar for movement with said draw bar and having an end portion disposed in said key groove for guiding rotational movement of the head relative to the draw bar.

4. A car coupling device comprising a draw bar for attachment to a car and having a generally cylindrical leading end portion, a head for interlocking engagement with a complementary device and having a buffing flange, said head having an integrally-formed, generally-cylindrical collar of substantially uniform inside diameter extending rearwardly from adjacent the buffing flange to receive said generally cylindrical portion of the draw bar and to bear upon an annular area of said cylindrical draw bar portion and having a key groove extending generally transversely of the collar, and key means including a key extending through the draw bar and lockingly engaging said draw bar for movement with the said draw bar and having end portions disposed in said key groove for guiding rotational movement of the head relative to the draw bar.

5. A car coupling device comprising a draw bar for attachment to a car and having a hollow cylindrical portion at one end and an outer annular flange between its ends, a head for interlocking engagement with a complementary device and having a buffing flange, said head having an integrally-formed, generally-cylindrical collar of substantially uniform inside diameter extending rearwardly from adjacent the buffing flange to bear against said annular flange and to receive said cylindrical end portion of the draw bar and to bear upon an annular area of said cylindrical end portion and having a key groove extending generally transversely of the collar and the said cylindrical end portion, and key means including a key lockingly engaging the draw bar for movement with said draw bar and having an end portion disposed in said key groove for guiding rotational movement of the head relative to the draw bar.

6. A car coupling device comprising a draw bar for attachment to a car and having a generally cylindrical leading end portion, a head for

interlocking engagement with a complementary device and having a buffing flange, said head having an integrally-formed, generally-cylindrical collar of substantially uniform inside diameter extending rearwardly from adjacent the buffing flange to receive said generally cylindrical portion of the draw bar and to bear upon an annular area of said cylindrical draw bar portion and having a key groove extending generally transversely of the collar, key means including a key lockingly engaging the draw bar for movement with said draw bar and having an end portion disposed in said key groove for guiding rotational movement of the head relative to the draw bar, and resilient means associated with the head and resiliently opposing rotational motion of the head relative to said draw bar.

7. A car coupling device comprising a draw bar for attachment to a car and having a generally cylindrical leading end portion and diametrically opposed slots therein, a head for interlocking engagement with a complementary device and having a buffing flange, said head having an integrally-formed, generally-cylindrical collar of substantially uniform inside diameter extending rearwardly from adjacent the buffing flange to receive said generally cylindrical portion of the draw bar and to bear upon an annular area of said cylindrical draw bar portion and having a key groove extending generally transversely of the collar, key means including a key in the draw bar and extending through said slots and lockingly engaging the draw bar for movement with said draw bar and having end portions disposed in said key groove for guiding rotational movement of the head relative to the draw bar, and resilient means including a rubber body in the head bearing against said head and the key and resiliently opposing rotational motion of the head relative to the draw bar.

8. A car coupling device comprising a draw bar for attachment to a car and having a generally cylindrical leading end portion, a head for interlocking engagement with a complementary device and having a buffing flange, said head having an integrally-formed, generally-cylindrical collar of substantially uniform inside diameter extending rearwardly from adjacent the buffing flange to receive said generally cylindrical portion of the draw bar and to bear upon an annular area of said cylindrical draw bar portion and having a key groove extending generally transversely of the collar, key means including a key lockingly engaging the draw bar for movement with said draw bar and having end portions disposed in said key groove for guiding rotational movement of the head relative to the draw bar, said collar having a key opening through which said key may be moved for engagement with said draw bar and having a movable key stop bracket disposed adjacent to said key opening to prevent inadvertent loss of the key from the assembly.

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