Dec. 21, 1965 M. SANYAS 3,224,601

MECHANISM FOR AUTOMATICALLY UNCOCKING AND RE-COCKING AUTOMATIC COUPLINGS FOR RAILWAY VEHICLES

Filed Feb. 26, 1964 3 Sheets-Sheet 1

Fig. 1

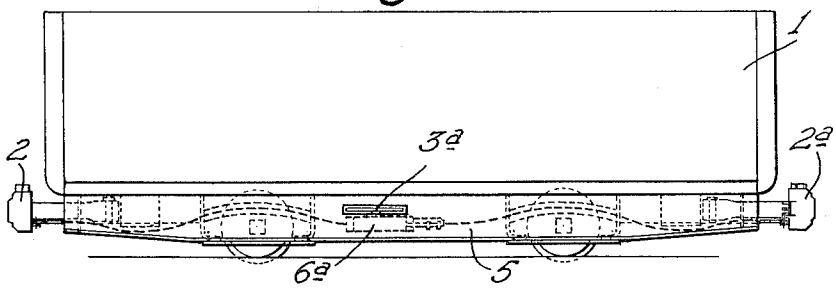

Fig. 2

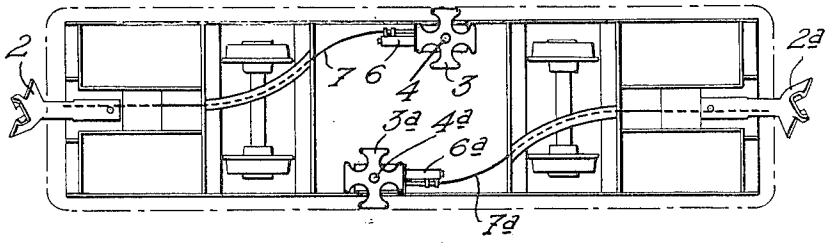

Fig. 3

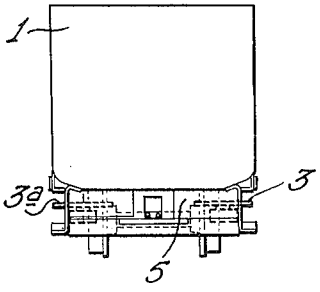

Fig. 4

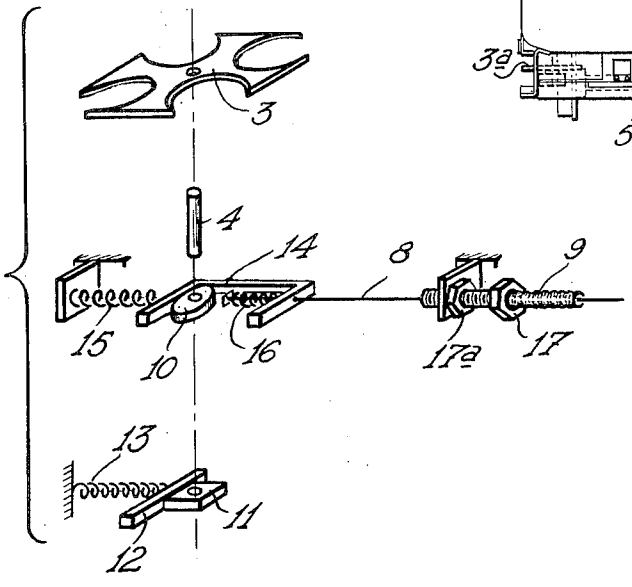

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Fig. 5

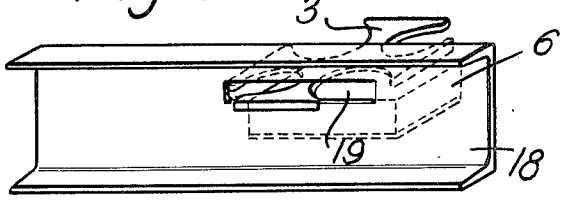


Fig. 6

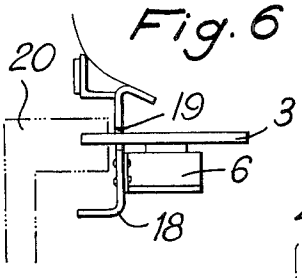
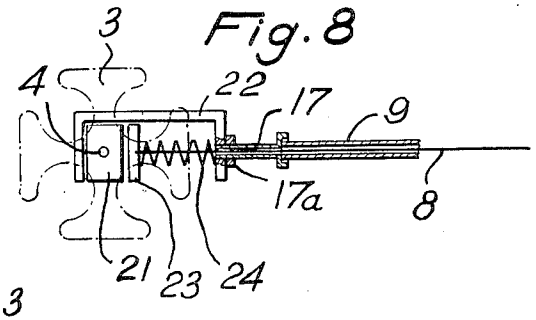


Fig. 8



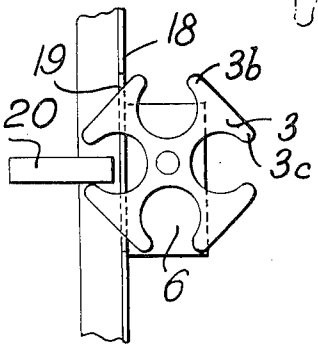


Fig. 7

Fig. 9

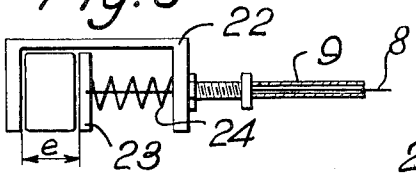


Fig. 11

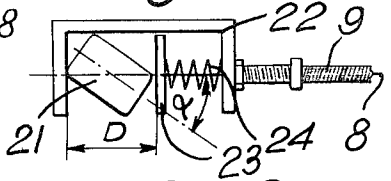


Fig. 10

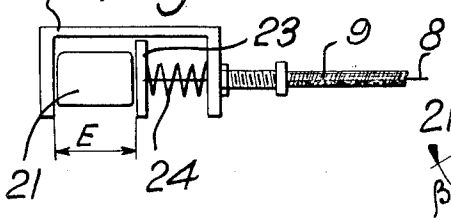
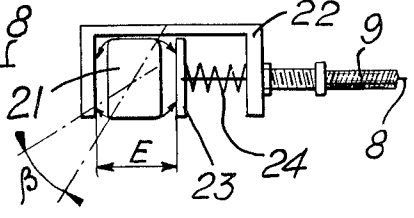


Fig. 12



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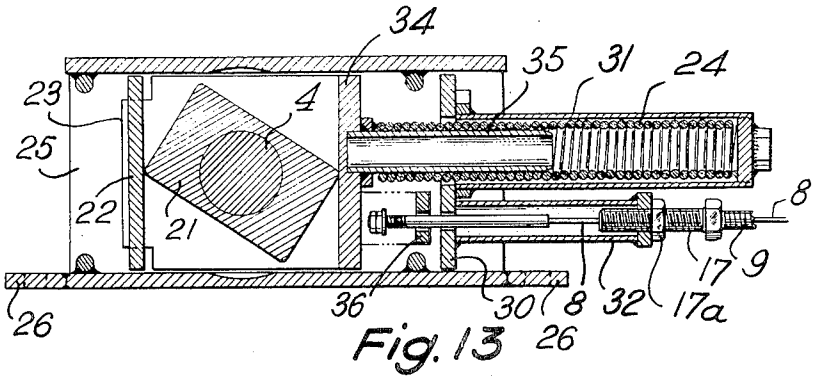


Fig. 13

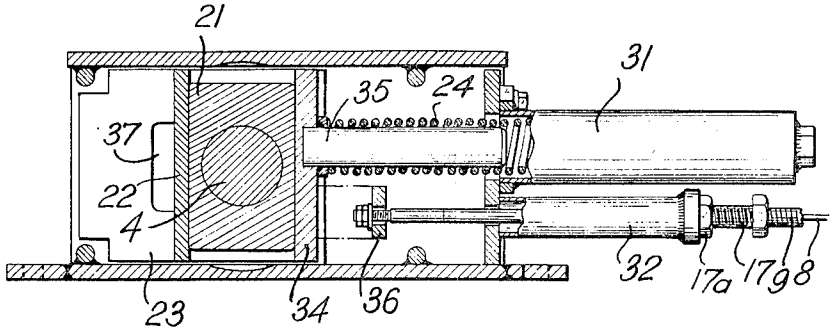


Fig. 14

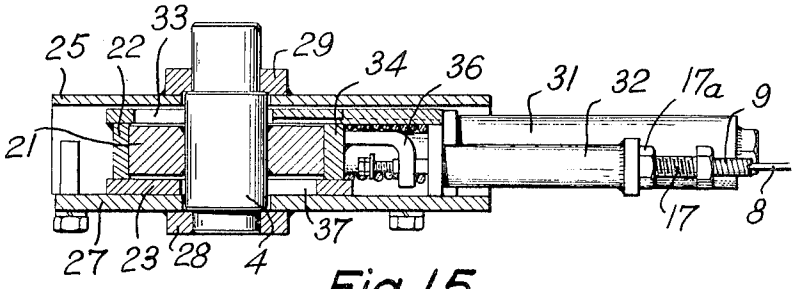


Fig. 15

Fig. 16

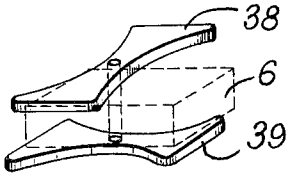
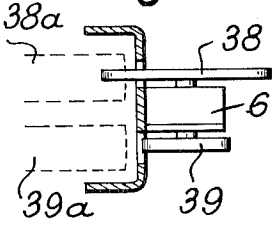


Fig. 17.



United States Patent Office 3,224,601 Patented Dec. 21, 1965

3,224,601

MECHANISM FOR AUTOMATICALLY UNCOCKING AND RE-COCKING AUTOMATIC COUPLINGS FOR RAILWAY VEHICLES

Maxime Sanyas, Freyming, Moselle, France, assignor to Houilleres du Bassin de Lorraine, Faulquemont, Moselle, France

Filed Feb. 26, 1964, Ser. No. 347,565
Claims priority, application France, Mar. 12, 1963, 927,641, Patent 1,359,235
10 Claims. (Cl. 213—75)

The present invention relates to improvements in so-called "automatic couplings" for use on vehicles running on steel tracks, such as railway, mine or quarry wagons. These devices are used by certain railway systems and also in mines for their surface or underground transportation needs.

Automatic couplings used heretofore provide for automatic hook-up on collision only. Such automatic couplings usually comprise a lever-operated lock and may be in either of two states: cocked or uncocked. Two couplings will hookup on collision only if both are cocked; if either of the couplings is uncocked, hook-up will not take place.

For a cocked coupling to be uncocked, its lock must be pulled along a few centimeters with a force corresponding to the weight of a mass of a few tens of kilograms. This pull moves the lock, which, if the pulling force is removed, is returned into the locking position by a spring, thereby re-cocking the coupling. This pulling force must be kept exerted on the lock for as long as the coupling is to remain uncocked.

While such couplings operate satisfactorily on collision, by hooking up automatically when the two contacting couplings are cocked, they can be uncocked manually only and consequently have numerous drawbacks, amongst which may be cited:

(a) the fatigue entailed for the personnel by the force having to be exerted;

(b) the danger created by moving vehicles, resulting in the established fact that accidents ascribable to these operations are among the most frequent;

(c) the inherent slowness of the method, which slows down the turn-around/rate for such vehicles, and creates a throttling in the circuit; and

(d) the high cost.

It has already been proposed to use a mechanism for automatically uncocking and re-cocking automatic couplings, in order to enable vehicles to be unhooked and hooked up at determinate points along the track, without any manual intervention.

Such mechanisms comprise a pivotal control member, often of cruciform shape, carried by the automatic coupling and subjected to a stepped rotation under the action of actuating pawls disposed at fixed points along the track and adapted to retract when a vehicle runs past and to project between consecutive vehicles, whereby to rotate said control member and consequently intermittently rotate an elongated transmission cam mounted on the same shaft as said cross member and operating on the lock of the coupling to uncock and cock it in alternation.

While such a mechanism provides a solution to the problem under consideration, it nonetheless has a number of major drawbacks. Firstly, since the pivoting control member is supported on the coupling, which is in turn movable with respect to the vehicle chassis, it may occasionally happen that the actuating stop or pawl does not engage with the control member over curved parts of the line. Secondly, as the result of accidental concussions, the control member may be displaced angularly in such manner that the actuating pawl it encounters after

the concussion may become inoperative. In both cases, the succession of unhooking and hooking up operations is offset by one step, thereby seriously interfering with operation and necessitating manual intervention.

Lastly, the actuating pawl retracts by a vertical or a pivoting motion relative to the track when a vehicle runs past. The components which permit such vertical or pivotal motion, particularly in the case of mines or quarries, may become jammed by dust or other extraneous matter and cause a breakdown to take place.

It is an object of this invention to overcome these drawbacks by providing an automatic uncocking and re-cocking mechanism for automatic couplings used on railway vehicles, of the type hereinbefore specified, characterized in that the actuating pawls are fixedly mounted and project into the loading gauge over a relatively large vertical height without reaching the area swept by the rolling members of the vehicle, the pivotal control cross member being mounted on the wagon chassis from which it projects sideways totally or partly, level with said pawls, while being contained within said loading gauge, the transmission cam actuated by said pivotal cross member moving a part which slides, within the mechanism enclosure, which part is resiliently applied in pressure contact against said cam and is connected through a flexible transmission line to the automatic coupling lock. Another notable feature of the invention is that the control cross member is restrained by a stabilizing device in each of its halted positions.

Thus, the step-by-step rotations of the cross member alternately apply uncocking pulls and cocking relaxations to the coupling lock, while the stabilizing member opposes accidental shifting of the moving parts of the mechanism due to accidental impact.

In one form of embodiment, there is spring-loaded against the transmission cam, a slide which is connected by said flexible transmission line to the automatic coupling lock, while a square or rectangular stabilizing cam mounted on the shaft common to the pivotal cross member and said transmission cam actuates a second slide urged thereagainst by a spring.

In a simplified form of embodiment, the transmission cam and the stabilizing member are constituted by a single rectangular cam, against two opposite sides of which two slides connected to the flexible transmission line are urged by a single spring disposed therebetween.

The pivotal control cross member may be provided wiht advantage in two different forms, according as it is devised to act as a tumbler device or a state selector. In the former case, said member is conventionally shaped as a Geneva stop the branches of which cooperate with pawls fixedly secured to the track at the same level, each individual actuation by a pawl causing a change of state in the coupling. In the latter case (state selector), the cross control member comprises two pairs of opposed arms disposed in mutually perpendicular relationship and located at different levels along their common rotation shaft. These pairs of arms are respectively associated to the cocked and uncocked states of the automatic coupling and are each actuated by pawls disposed at the corresponding level and which are stationary with respect to the track.

The description which follows with reference to the accompanying non-limitative exemplary drawings will give a clear understanding of how the invention can be carried into practice and will disclose further features thereof.

In the drawings:

FIGS. 1 to 3 are respectively side elevation, plan, and end views of a wagon equipped with an automatic un-

cocking and cocking mechanism according to the invention;

FIG. 4 shows schematically a first embodiment of an automatic uncocking and cocking mechanism according to the invention;

FIGS. 5 and 6 are respectively side perspective and cross-sectional views of the mechanism of FIG. 4 fitted to a wagon;

FIG. 7 is a plan view showing the manner of operation of the actuating pawls for the automatic mechanism of FIGS. 4 to 6;

FIG. 8 is a schematic plan view of a second embodiment of an automatic uncocking and cocking mechanism;

FIGS. 9 to 12 schematically illustrate the positions successively occupied by the slides of the mechanism of FIG. 8;

FIGS. 13 and 14 are vertical sections taken perpendicularly to the rotation axis of the mechanism, showing a form of embodiment of a mechanism of the type illustrated in FIG. 8, the cable being shown in the slack and taut positions respectively;

FIG. 15 shows in elevation with partial cutaway the mechanism of FIG. 13; and

FIGS. 16 and 17 are respectively perspective and side elevation views of the system of dual control arms of the state selector device of this invention.

Referring first to FIGS. 1 to 3, there is shown thereon a wagon **1** equipped with its automatic couplings **2** and **2***a* and provided in addition with automatic uncocking and cocking mechanisms adapted to coact with the locks of said automatic couplings. These mechanisms comprise a cruciform or Geneva stop-like wheel **3**, **3***a*, rotatable about a vertical shaft **4**, **4***a* and projecting from the wagon frame **5** while being contained within the loading gauge. Each such wheel controls an actuating mechanism to be described hereinafter, contained in an enclosure **6**, **6***a*. Said actuating mechanism is connected through a flexible transmission line **7**, **7***a* to the corresponding lock of the automatic coupling **2**, **2***a*.

The automatic coupling **2**, **2***a* is movable with respect to the frame **5** since it is usually positioned on the extremity of a pivotal coupling bar which enables the intercoupled wagons to negotiate curves, this bar being connected to the body of the wagon through suitable means for damping concussion and traction effects. For this reason the control mechanism contained in enclosure **6**, **6***a* cannot be positioned on the coupling since it could not readily be reached by the actuating pawls. The control mechanism **6**, **6***a* is therefore mounted on the frame **5** and connected to the corresponding coupling **2**, **2***a* through a steel cable **8** (FIG. 4) sliding through a spiral metal sheath **9**. This type of cable-sheath arrangement is simpler than the articulated lever type system which comes more readily to mind and has the additional advantage of being free from play, whereas in a lever system the inevitable plays which develop could be detrimental to reliable operation.

In the form of embodiment shown in FIG. 4, the control mechanism comprises, on the shaft **4** bearing the Geneva stop-like wheel, a first elliptic cam **10** and a second square cam **11** two opposed sides of which are parallel to the greater axis of said elliptic cam. The square cam **11** coacts with a movable member or slide **12** which is urged thereagainst by a spring **13**. The elliptic cam **10** actuated a stirrup-shaped slide **14** which straddles said cam and which is urged thereagainst by a spring **15**. On being moved longitudinally by the cam **10**, the stirrup **14** tensions or releases the cable **8** exerting the pull on the coupling lock, and the distance through which the stirrup **14** is moved is equal to half the difference between the major and minor axes of the cam **10**. The cable **8** is secured to the stirrup **14** through the medium of a compression spring **16** which affords protection against any danger of snapping thereof. The spring **16** is compressed when the pull exerted on the cable **8** exceeds a certain value determined by constructional requirements and the manner of fitting of said spring. A screw **17** having a locknut **17***a* is secured to the end of the sheath **9** and permits adjusting the length of the transmission line.

As shown in FIGS. 5 and 6, the Geneva stop-like wheel **3** supported in the enclosure **6** secured to the side member **18** of the wagon frame, extends through an opening **19** in said side member and projects inwardly thereof. The wheel **3** is actuated by fixed pawls **20** arranged at determinate points along the track, which coact with one of the branches of wheel **3**. These pawls project into the loading gauge over a relatively large vertical height, level with the wheel **3**, but without reaching the area swept by the rolling members, namely the wheels and the grease-boxes. Each time the wagon passes over a pawl, the wheel is rotated through a quarter of a revolution. The four positions which the wheel can occupy in succession correspond to the cable **8** in the slack, taut, slack and taut conditions respectively.

It is important that such stepped operations take place even if the wagon sustains a degree of parasite displacement with respect to its theoretical position, both in the transverse and the vertical directions, due primarily to the yawing, dipping and oscillating motions of the suspension or to wear on the wheel tyres. Since the actuating impulse imparted to the wheel **3** is directed in the direction of travel of the wagon, these parasite motions have no, or only secondary effects on the main driving motion.

To enable them to rotate through a full quarter of a revolution, each branch of the wheel is provided with laterally extending terminal lobes **3***b*, **3***c* which enable the pawl **20** to prolong its action at least up to the point where the mechanism becomes self-activated through the spring **13** coacting with the square cam **11**, which cam acts as a means for stabilizing the system in each of its halted positions.

It may happen on occasion that the wagons to be uncoupled are under tension, i.e. that the couplings interconnecting them are pulled powerfully away from each other. When this is the case, the respective locks of these couplings become jammed, and the force required to withdraw them is all the greater as the pull exerted by the wagons against each other is greater. Under such conditions, the force required of the cable would be too large. Moreover, two wagons under tension in this way are never uncoupled, although it may be pointed out that this can occur accidentally with automatic uncoupling systems.

When these conditions occur, the spring **16** inserted between the cable **8** and the stirrup **14** protects the cable, due to the fact that it is compressed when the pull exerted on it exceeds the fixed value indicated precedingly. If, then, it has proved impossible to effect the uncoupling operation, this command is "stored" and will be performed when the spring **16** subsequently relaxes once the couplings are no longer under tension.

The system hereinbefore described performs the operations previously described in respect of manual uncocking, to wit:

(a) exerting a pull on the lock in order to unlock it;

(b) maintaining this pull for as long as the coupling must remain in that condition; and

(c) relaxing this force to permit re-cocking.

In the form of embodiment schematically illustrated in FIGS. 8 to 12, the control mechanism is simplified. It comprises a single rectangular cam **21** with slightly rounded corners, which cam is supported on the shaft **4** bearing the cross control wheel **3**. As it moves, the cam **21** thrusts or releases two stirrup-shaped slides **22** and **23** which are applied thereagainst by a single spring **24**. The cable **8** is secured to the slide **23**, while the sheath **9** bears against the rear of the stirrup **22** through

the medium of the screw **17** with its locknut **17***a* which permits adjustment of the length of the transmission line.

The device described hereinabove operates in the following manner:

The spring **24** exerts on the two slides **22** and **23** a force F which overcomes the tension *t* in the cable **8** and applies the slides against the faces of cam **21** with a residual force equal to *F—t*. Since the spring is chosen such that F be greater than *t*, the cam will be maintained in one of its four possible positions of equilibrium. One of these positions is shown in FIG. 9, wherein the cable is taut, while FIG. 10 shows another position in which the cable is slack. The remaining two positions are identical, involving a further rotation of 180 degrees. Clearly, when the cam is not positively actuated by the wheel, the force *t* exerted on the cable will be equal to F. The length of the movement of cable **8** with respect to sheath **9** is equal to the difference between the lengths of the sides of the rectangle froming the cam **21**, i.e. *E—e*. In this simplified device, it is the relaxation of the spring, rather than the cam, which produces the pull on the cable.

As in the case of the general system shown in FIG. 4, the cable **8** must be protected against the contingency of an uncoupling operation to be performed when the lock is temporarily jammed in the cocked position (cable slack), which is the position shown in FIG. 10. In this position the coupling lock is fully released. By imparting to the cross wheel **3** a clockwise quarter-turn subsequent to rotation through an angle α (FIG. 11), the spacing between the two surfaces bearing against the cam increases from E to D, where D is the length of the diagonal. This increase in stroke from E to D has no effect on the coupling, for the lock is in any case fully released in the position shown in FIG. 10. This movement thus introduces an effective degree of slack into the cable **8** as the same relaxes completely. Beyond this position, the cam **21** rotates the wheel **3** as the spring **24** relaxes, and the slack in the cable is absorbed until the position in FIG. 12 is reached, wherein the cable is taut once more. If the lock is not jammed, the wheel **3** rotates through a full quarter-turn, and the position shown in FIG. 9 is reverted to. The pull on the lock was in this case *E—e*, representing the difference between the spacings of the movable parts in FIGS. 10 and 9 respectively.

Conversely, if the lock remains jammed in the cocked position, the movable part can return only up to a position corresponding to the spacing E, thereby giving the configuration of FIG. 12. The cross wheel **3** is not fully home in a stationary position, but is free between two positions corresponding to rotations of 90° $\pm\beta$ respectively, but this has no undesirable effects in practice. In the position shown in FIG. 12, the uncoupling command has not been executed but is "stored" by the device. As soon as the temporoary jamming of the lock ceases, the two slides **22**, **23** will be able to complete their strokes in response to the relaxing spring **24**. Although the cam **21** is free, it cannot rotate through an angle greater than the previous angle, i.e. it nevertheless retains a position such that the wheel can be correctly actuated by the pawl. Thus, the pulling force on the cable never exceeds the pull exerted by the spring.

The single spring **24** of the simplified device shown in FIGS. 8 to 12 fulfills the three functions of the three springs **13**, **15** and **16** of the general device shown in FIG. 4, to wit:

Returning the wheel;

Returning the slides;

Protecting the cable in the event of jamming.

In the form of embodiment shown in FIGS. 13 to 15, the mechanism enclosure is a channel section **25** bearing on one of its flanges two lugs **26** which are drilled to permit bolting the enclosure to the web of the wagon

side-member. A sheet-metal plate **27** acts as a cover and supports one of the bearings **28** for the shaft **4**, the other bearing **29** being supported on the web of channel section **25**. The rectangular cam **21** has extending therethrough the shaft **4**, to which it is welded. The U-shaped slide **22** carries on one of its flanges **30** two tubes, of which one, deisgnated by numeral **31**, houses the spring **24**, and the other, designated by numeral **32**, has extending therethrough the cable **8** and screwed thereinto the adjustment screw **17** against which bears the sheath **9**. These two tubes enable the thrust point of spring **24** to be spaced sufficiently from shaft **4** to lighten the load on the slide **22**. The web of slide **22** embodies an opening **33**, whereby it is movable to either side of shaft **4**. Manifestly, instead of supporting the two tubes **31** and **32**, slide **22** could support a single tube only for housing the spring through which the cable extends.

The L-shaped slide **23** carries on its flange **34** a tube **35** which acts as a guide-piece for the spring **24** and a yoke **36** which serves as an attachment for the cable **8**. This attachment is freely movable in the direction tending to crowd the cable and thereby enables the slack occurring between the positions of FIGS. 10 and 11 to be taken up. The slide **23** is provided with an opening **37** enabling it to move to either side of shaft **4**.

In one specific embodiment, the cam measures 0.11 by 0.07 meter while the cable has a diameter of 4 mm. and an ultimate load of 1.20 tons, the spring **24** being adapted to provide a force of 0.04 ton in the compressed condition obtained when the slides are applied against the long sides of the cam, as shown in FIGS. 9 and 14, and of 0.06 ton when the slides are applied against the shorter sides, as shown in FIG. 10.

The former condition corresponds to a pull exerted on the cable, the latter to release thereof. Since, with the type of coupling utilized, the traction required on the cable to open the lock is approximately 0.02 ton, it is possible to deduce therefrom the torques required for stabilizing the cam and the Geneva cross, to wit

$$(0.04-0.02)\times 0.11=0.0022 \text{ ton x meter}$$

$$0.06\times 0.07=0.0042 \text{ ton x meter}$$

The stabilization torque providing latching of the coupling is greater than that corresponding to opening thereof, the ratio being 0.0042 to 0.0022, thereby providing a satisfactory safety factor.

With a Geneva cross having arms 0.16 m. long, the forces to be applied thereon at the beginning of the movement are

$$\frac{0.0042}{0.16} \neq\neq 0.026 \text{ ton for unlatching}$$

$$\frac{0.0022}{0.16} \neq\neq 0.014 \text{ ton for cocking}$$

In the form of embodiment utilizing a tumbler device as referred to precedingly, the coupling changes its state each time it passes a pawl. If it presents itself in the cocked condition, it emerges uncocked, and vice versa, the device as a whole operating as a bistable system which trips each time it is actuated by a pawl.

Considering, for instance, the case of a dumping station, the string of wagons is towed along by a locomotive equipped with a similar but manually operated coupling. The driver uncocks the locomotice coupling and can then move the locomotive away. The string of wagons is then free, with all its couplings necessarily cocked, since otherwise the train could not remain strung together and would have separated along the way. The string of wagons is then pushed by an auxiliary engine towards the dumper. At some distance in front of the latter is an uncocking pawl. A further pawl is located on the exit side of the dumper. As the string of wagons is pushed towards the dumper, the two couplings of each wagon are uncocked since they were originally cocked. Each wagon can thus be moved separately into the

dumper. In the course of this operation, it bumps out the previously dumped wagon, without this bump causing the two wagons to be coupled together.

As they emerge from the dumper, all the couplings are re-cocked, so that as the wagons bump into the string of empty wagons being formed up, they are automatically hooked on to one another, thereby enabling a string of wagons having cocked couplings to be reformed automatically. It will then suffice for the locomative to bump into the string of wagons in order to be hooked on in turn, following which the train can be conveyed for loading. On returning to the dumping station, the operations are repeated as described above.

Thus, provided the rolling stock circuit is devised accordingly, the cross-type tumbler of FIGS. 1 to 15 presents no drawbacks. On the other hand, in the more general case in which wagons originating from different places are received at a given point, some being cocked and others uncocked, and it is desired to bring them all into the same state, said cross tumbler is no longer appropriate and must be replaced by a system operating as a "state selector," such as the system shown in FIGS. 16 and 17.

If an examination be made to ascertain to which states of the coupling the various positions of the Geneva cross wheel correspond, it will be seen that if a particular branch which projects from the wagon corresponds, say, to the cocked state, this state will be repeated when the diametrically opposed branch projects in turn from the wagon. Conversely, the branches perpendicular to these branches correspond to the opposite state, i.e. to the uncocked state.

The state selector is obtained by replacing the Geneva cross of the previous figures by two pairs of arms **38** and **39** each corresponding to one of the pairs of opposed branches of said cross. These two arms **38** and **39** are located at different levels, for instance above and below the enclosure **6** containing the mechanism. Complete retraction of an arm **38** corresponds to cocking and complete retraction of an arm **39** to uncocking of the coupling.

The actuating pawls are of two kinds. One kind, designated by numeral **38***a*, is disposed level with the pair of arms **38**, the other kind, designated by numeral **39***a*, level with the pair of arms **39**, whereby the pawl **38***a* cocks the coupling and the pawl **39***a* uncocks it. This is manifest, since after having moved past the pawl **38***a*, the system will have its arms **38** retracted irrespective of the previous state. Thus, the pawl **38***a* is the cocking agent and the pawl **39***a* the uncocking agent.

The association of this state selector to the general device shown in FIG. 4 or to the simplified device shown in FIGS. 8 to 15 provides a solution to the general problem of automatically coupling and uncoupling railway wagons.

In comparison with the manual type of control and its ensuing drawbacks, the automatic control system of this invention offers the following advantages:

(a) Elimination of personnel fatigue

(b) Elimination of a cause of accidents

(c) Rapidly executed maneuvers

(d) Possibility of complete automation for certain types of installations, thereby leading to increased efficiency and reduced cost.

What I claim is:

1. In an automatic uncocking and re-cocking mechanism for automatic couplings used on railway vehicles, of the type comprising a pivotal control cross member carried by the vehicle and subjected to a stepped rotation in response to retractable actuating pawls disposed at fixed points along the track, whereby an elongated transmission cam mounted on the same shaft as said cross member and actuating the coupling lock of the coupling is rotated intermittently to alternately uncock and re-cock said lock; the improvement according to which the actuating pawls are fixedly mounted and project into the loading gauge without reaching the area swept by the rolling members of the vehicle while the pivotal control cross member is mounted on the vehicle chassis from which it projects within said loading gauge at least partially, level with said pawls, the mechanism comprising an enclosure housing the transmission cam and the shaft common to said transmission cam and to the control cross member, a slidable part engaging said transmission cam and slidably mounted within said enclosure, resilient means within said enclosure for resiliently applying said part against said transmission cam, and a flexible transmission line interconnecting said part and the lock of the automatic coupling.

2. In an automatic uncocking and re-cocking mechanism for automatic couplings used on railway vehicles, of the type comprising a pivotal control cross member carried by the vehicle and subjected to a stepped rotation in response to retractable actuating pawls disposed at fixed points along the track, whereby an elongated transmission cam mounted on the same shaft as said cross member and actuating the coupling lock of the coupling is rotated intermittently to alternately uncock and re-cock said lock; the improvement according to which the actuating pawls are fixedly mounted and project into the loading gauge without reaching the area swept by the rolling members of the vehicle while the pivotal control cross member is mounted on the vehicle chassis from which it projects within said loading gauge at least partially, level with said pawls, the mechanism comprising an enclosure housing the transmission cam and the shaft common to said transmission cam and to the control cross member, a slidable part engaging said transmission cam and slidably mounted within said enclosure, resilient means within said enclosure for resiliently applying said part against said transmission cam, a flexible transmission line interconnecting said part and the lock of the automatic coupling, and means for stabilizing the control cross member in each of its halted positions.

3. A mechanism according to claim **2**, wherein the slidable part, the resilient means and the stabilizing means comprise a stirrup-shaped slide which straddles the elongated transmission cam and is connected to the flexible transmission line, a spring urging said stirrup-shaped slide against said elongated transmission cam, a square cam secured on the shaft common to the elongated transmission cam and to the control cross member, a second slide engaging said square cam, and a second spring urging said second slide against said square cam.

4. A mechanism according to claim **2**, wherein the elongated transmission cam is rectangular and wherein the slidable part, the resilient means and the stabilizing means comprise a stirrup-shaped slide which straddles said rectangular transmission cam and engages at rest one side thereof, a second slide engaging at rest the side of said rectangular transmission cam which is opposite said one side, which second slide is connected to the flexible transmission line, and a single spring interposed between said stirrup-shaped and second slides.

5. A mechanism according to claim **2**, wherein said flexible transmission line comprises a cable interconnecting the slidable part and the lock of the automatic coupling and a spiral metal sheath secured on said part and through which extends said cable.

6. A mechanism according to claim **2**, wherein said flexible transmission line comprises a cable connected at one of its ends to the lock of the automatic coupling and slidably mounted through said part, a spiral metal sheath connected at one of its ends to said lock, an adjustable means interconnecting said part and the other end of said sheath for adjusting the length of said sheath, and a spring interconnecting said part and the other end of said cable.

7. A mechanism according to claim **6**, wherein the adjustable means comprises an adjustment screw connected to the spiral metal wound and threaded by engaging the slidable part, and a locknut engaging said screw.

8. A mechanism according to claim 2, wherein the elongated transmission cam is rectangular and wherein the slidable part, the resilient means, the stabilizing means and the flexible transmission line comprise an enclosure made of a channel section, a U-shaped slide sliding on one flange of said channel section and which straddles said rectangular transmission cam and engages at rest one side thereof, a pair of outwardly projecting tubes secured on one flange of said U-shaped slide, a L-shaped slide sliding on said one flange of the channel section and the flange of which engages at rest the side of said rectangular transmission cam which is opposite said one side, a third tube secured on the flange of said L-shaped slide and extending through one tube of said pair, an external yoke secured on the flange of said L-shaped slide in alignment with the other tube of said pair, a spring wound on said third tube and partially housed within said one tube of the pair, an adjustment screw threaded on the outer end of said other tube of the pair, a locknut engaging said screw, a spiral metal sheath interconnecting said adjustment screw and the lock of the automatic coupling, and a cable extending through said third tube and through said sheath and the ends of which are respectively secured to said yoke and to said lock, whereby a loose attachment for the cable is provided in the crowding direction thereof.

9. A mechanism according to claim 2, wherein the control cross member comprises two mutually perpendicular pairs of opposed arms located at different levels on the shaft common to said member and to the transmission cam, and wherein the actuating pawls are respectively disposed at the same different levels for engaging said pairs of opposed arms, said two different levels respectively corresponding to the cocked and uncocked states of the automatic coupling lock.

10. A mechanism according to claim 2, wherein each arm of the pivotal control cross member is provided with laterally extending terminal lobes thereon.

References Cited by the Examiner

UNITED STATES PATENTS

1,433,924	10/1922	Averill	213—75
2,677,916	5/1954	Hamnopel	213—212
2,897,982	8/1959	Larson	213—100
3,150,609	9/1964	Bradt	104—172
3,157,289	11/1964	Penti	213—1

FOREIGN PATENTS

1,302,099	9/1961	France.

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