J. THIEM & G. F. HEHMAN.

COMBINED CAR AND PIPE COUPLING.

APPLICATION FILED MAY 18, 1918.

1,296,230.

Patented Mar. 4, 1919.

3 SHEETS—SHEET 1.

Fig. 1.

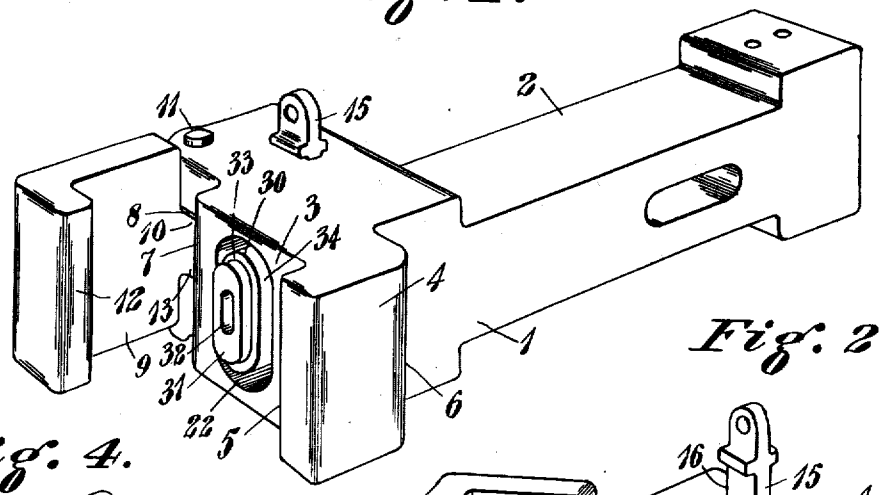


Fig. 2.

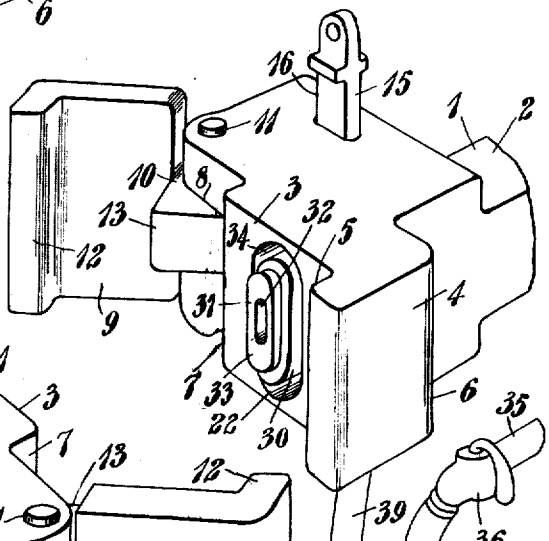


Fig. 4.

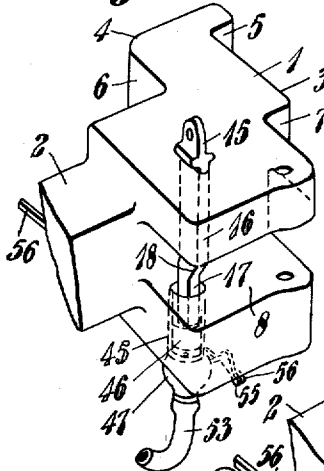
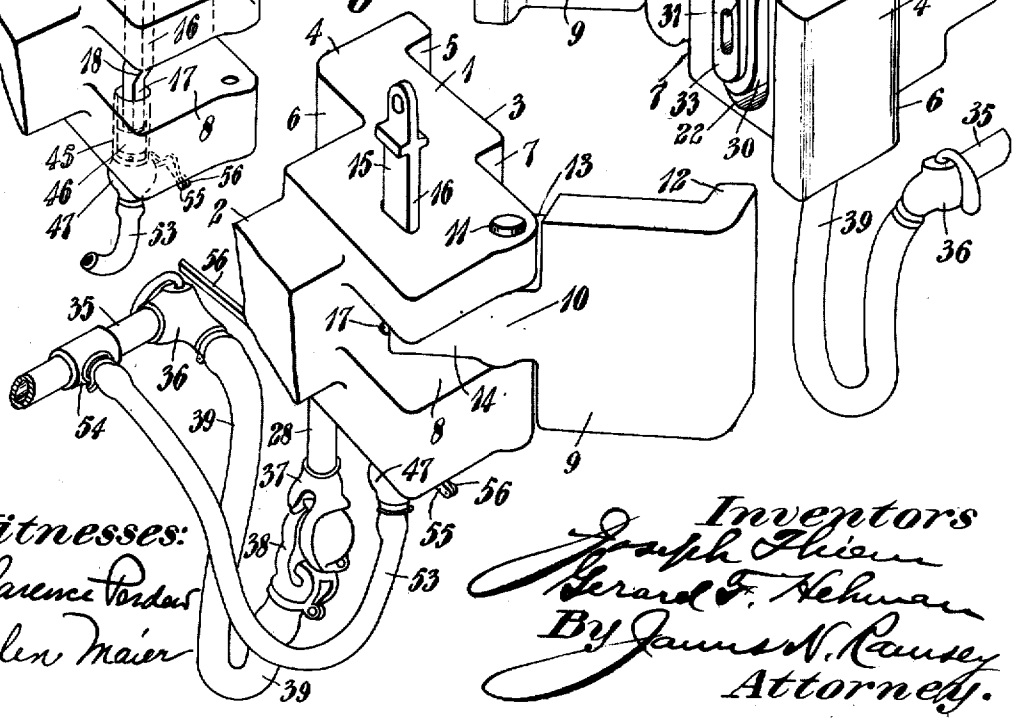


Fig. 3.



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3 SHEETS—SHEET 2.

Fig. 5.

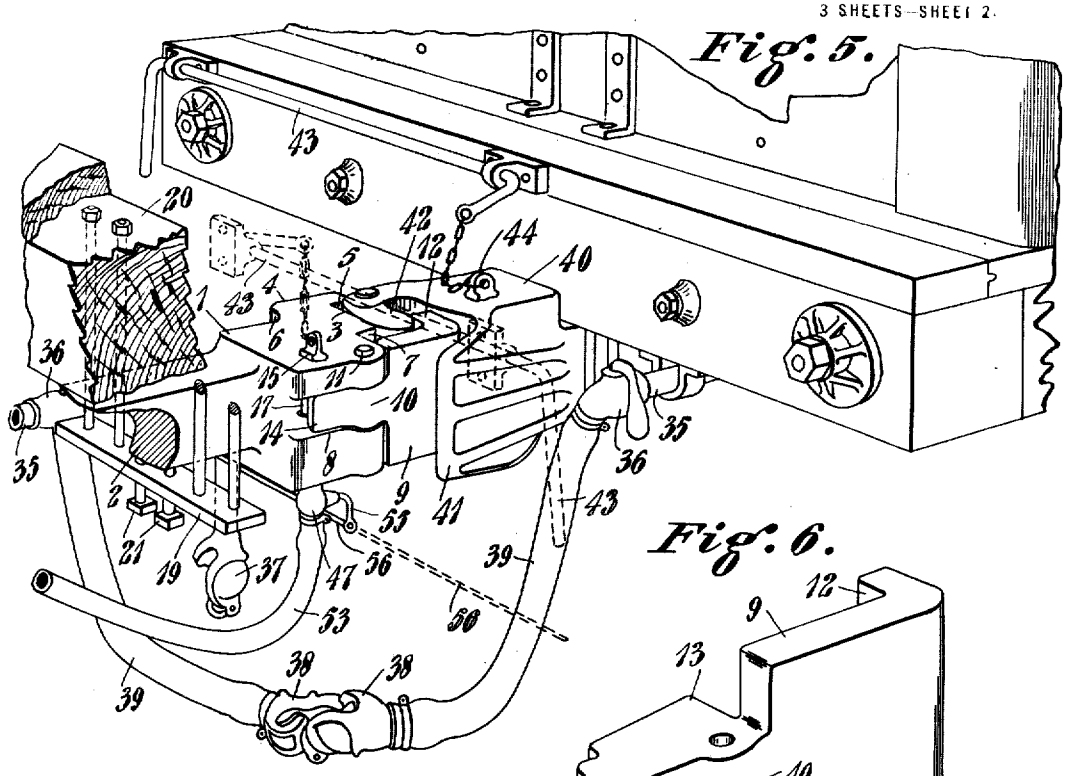


Fig. 6.

Fig. 7.

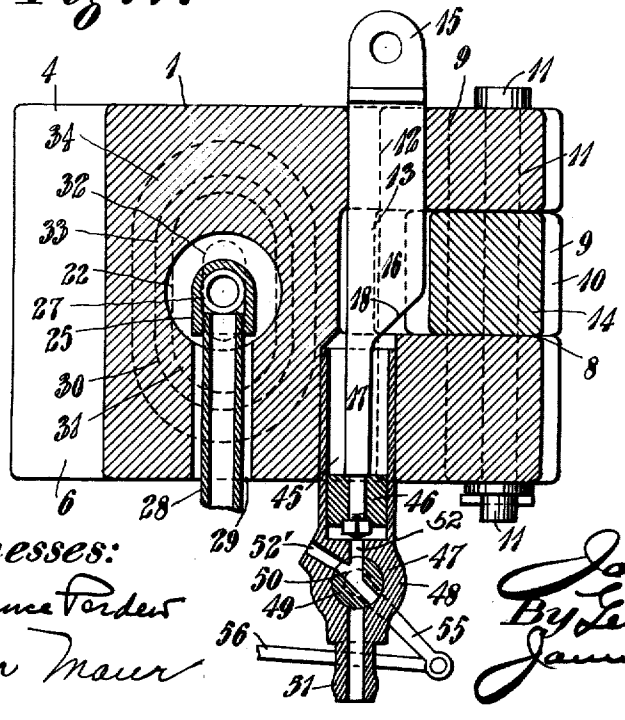


Fig. 8.



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3 SHEETS—SHEET 3.

Fig. 9.

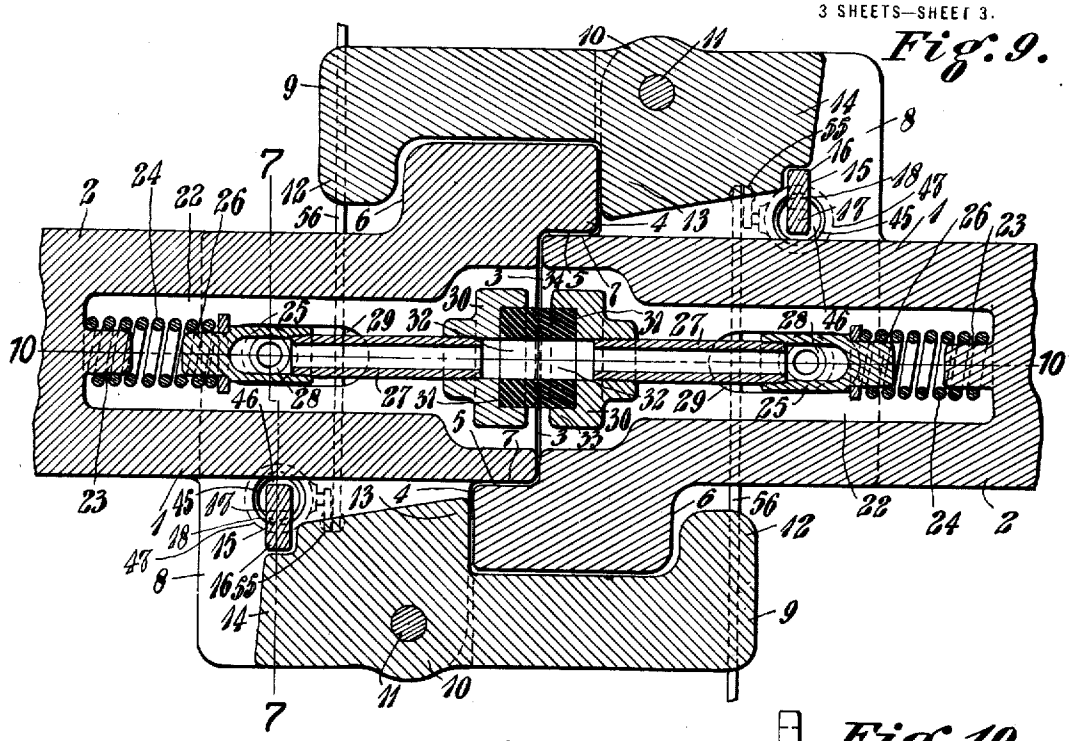


Fig. 10.

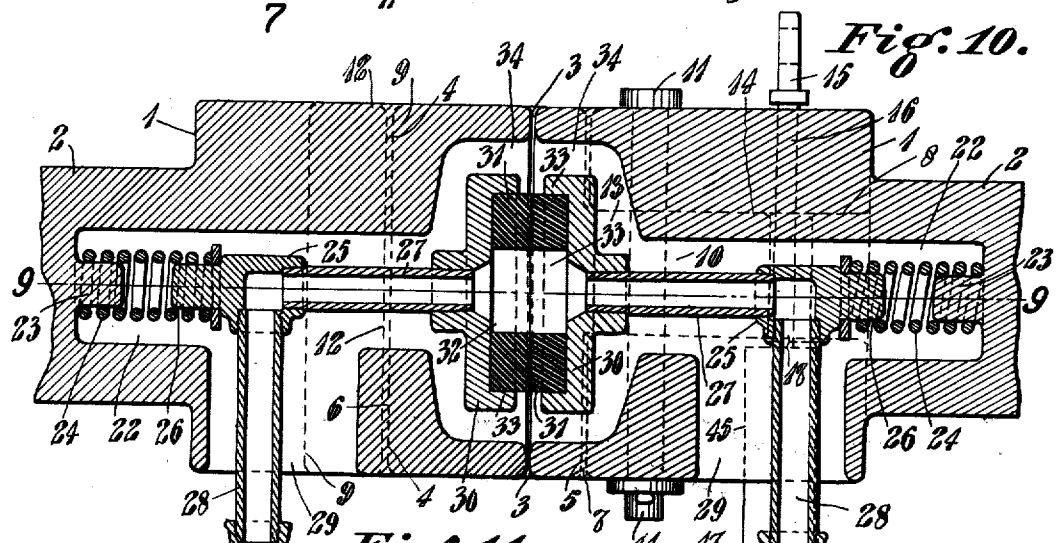
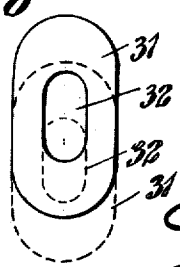


Fig. 11.



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UNITED STATES PATENT OFFICE.

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COMBINED CAR AND PIPE COUPLING.

1,296,230. Specification of Letters Patent. Patented Mar. 4, 1919.

Application filed May 18, 1918. Serial No. 235,322.

To all whom it may concern:

Be it known that we, JOSEPH THIEM and GERARD F. HEHMAN, citizens of the United States, and residents of Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Combined Car and Pipe Couplings, of which the following is a specification.

Our invention relates to car couplings and pipe couplings, and its object is to automatically couple and uncouple pipes, and especially the air pipes of railway cars when the cars are coupled together.

A further object is to provide a device of this character which may be made to cooperate practically with the Janney type of car couplers now in universal use on railways in this country, as well as with the standard type of hose couplings which are also in almost universal use. Such provision is necessary for the gradual change of equipment; and such a gradual change is the only kind that is practicable.

Our invention consists in the combination of parts and in the details of construction and arrangement of parts as will hereinafter be more fully described and claimed.

In the drawings:

Figure 1 is a perspective view of a device embodying our invention, the coupler being in closed condition;

Fig. 2 is a similar view showing only the front part of the coupler, and showing it open ready for coupling, and showing how it is connected to the train-pipe;

Fig. 3 is a similar view but taken from the rear and opposite side, and showing more clearly the connections to the train-pipe;

Fig. 4 is a view similar to Fig. 3, but the knuckle being removed to more clearly show the locking means;

Fig. 5 is a perspective view showing parts of the ends of two cars, one of which is provided with our improved coupling, and the other with an ordinary automatic coupler coupled to our coupling and showing how the pipe connections are made in such a case;

Fig. 6 is a detail perspective view of the knuckle;

Fig. 7 is a vertical cross-section on planes corresponding to the line 7—7 of Fig. 9;

Fig. 8 is a detail perspective view of the locking pin and its plunger;

Fig. 9 is a horizontal cross-section on a plane corresponding to the line 9—9 of Fig. 10;

Fig. 10 is a vertical longitudinal section on a plane corresponding to the line 10—10 of Fig. 9; and

Fig. 11 is a detail front elevation of one of the gaskets showing by dotted lines how another such gasket under certain conditions coöperates therewith.

As our invention is herein exemplified, each coupler comprises the car-coupling head 1 with the usual shank 2 at the rear suitably securing it to the car in any well-known manner. At the middle of its front end this head 1 has the transverse face 3. At its left side, as here shown, it has the fixed knuckle 4 which extends vertically from top to bottom of the head alongside of and projecting forwardly of the face 3, so that it has an inwardly facing vertical cheek 5 next to the face 3. This fixed knuckle 4 has a suitable extent rearwardly along this left side of the head 1 and terminates in a rearwardly facing vertical shoulder 6 next to the outside of the head at this side.

At its right side, the front part of the head is offset backwardly, so that a laterally outwardly facing vertical cheek 7 is left at this side of the transverse face 3. This right-hand offset part of the head is provided with a horizontal recess 8 intermediate of its top and bottom, opening laterally outwardly and forwardly alongside the cheek 7, and preferably being also open at the rear. The swinging knuckle 9 comprises the main upright part of about the full height of the coupler-head 1, and the reduced pivot part 10 extending back from its rear end intermediate of its top and bottom to fit into the horizontal recess 8. A suitable pivot pin 11 extends down through the right-hand part of the head and through this pivoting part 10 of the swinging knuckle and forms the pivot for the knuckle to swing laterally inwardly and outwardly upon. The parts are so proportioned, and this pin 11 is so located, that when the knuckle 9 is swung inward with its main part extending forward substantially at right angles to the transverse face 3, the inner side of this main part is spaced away from the vertical cheek 7 at this side a little farther than the transverse width of the front part of the fixed knuckle 4 just before described as being at

the left-hand side of the coupler. This leaves a recess between the cheek 7 and the swinging knuckle 9 into which enters the projecting part of the fixed knuckle on a similar coupler-head inversely applied to this one.

The forward or free end part of the swinging knuckle 9 is provided with a lug or hook part 12 that extends inward and vertically substantially from top to bottom of the knuckle 9. This lug 12 is located such a distance from the front surfaces of the head 1 that when the fixed knuckle of the other coupler is projected into the recess, as just described, and the swinging knuckle 9 is swung inward, this lug 12 of the swinging knuckle engages behind the shoulder 6 of such other coupler. At the same time, of course, the front part of the fixed knuckle of this coupler enters the recess of the other coupler, and the swinging knuckle 9 of the other coupler swings its lug 12 behind the shoulder 6 of this coupler. This coupled position of two such couplers is well illustrated in Fig. 9.

When the swinging knuckles are swung outward, the couplers may be separated or uncoupled, as shown in Figs. 2 and 3. The couplers also have their swinging knuckles 9 in such position when they are about to be coupled together, as is also shown by Figs. 2 and 3. To cause each coupler to automatically close or swing inward the swinging knuckle 9 of the other coupler, the pivoting part 10 of the knuckle 9 on each coupler is provided with an inwardly extending lug 13, which, when the knuckle 9 is swung outward projects forward into the recess which the fixed knuckle 5 of the other coupler must enter. The entering of this fixed knuckle 5 and engagement with the lug 13 pushing the lug backward into the recess 8 swings the knuckle 9 inward and effects the coupling.

The pivoting part 10 of the swinging knuckle 9 also has a rearward projection 14 in the horizontal recess 8, which, when the knuckle 9 is in inward or closed position, is out next to the extreme right-hand side of the coupler. A pin 15 slides vertically up and down in suitable openings in the top and bottom of the coupling-head 1 above and below the recess 8 near the inner termination thereof. This pin 15 has an upper wider part 16 and a lower narrower part 17; the upper wider part 16 fitting the opening in the upper part of the coupling-head in such a way that the pin 15 is sufficiently accurately guided in its upper part when moving up and down. When the pin 15 is raised, as shown in Figs. 2 and 3, it brings its narrower part 17 within the recess 8 and the parts are so proportioned that the lug 14 of the knuckle 9 may swing past this narrower part as the knuckle 9 swings outward or opens; but when the pin 15 is slid down in the head, its wider part 16 occupies the recess 8 and the lug 14 cannot pass in from its outwardly swung position, when the knuckle 9 is swung outward to assume its uncoupled position, as is necessary for the knuckle 9 to swing outward. The result is that the knuckle 9 is locked in its inwardly swung position when the pin 15 is down; but if the pin 15 is pulled up the tension on the couplers as one car is being pulled by the other will throw the knuckles 9 open and the couplers will uncouple automatically. The pin 15 will then be held up by the engagement of an offset or shoulder 18 which it has between the wide part 16 and the narrow part 17 with the upper edge of the lug 14; and as soon as the knuckle 9 is swung inward again by the engagement of the fixed knuckle 4 of the other coupler, the lug 14 will be swung out from under the shoulder 18 and the pin 15 will fall into locking position again. Thus the coupler is locked automatically at the same time that it is coupled automatically.

Some of the details of construction and principles of operation just described will be recognized as similar to those of the almost universally used Janney type of coupler. We do not assert that all of these details of construction and principles of operation are novel in themselves; but have incorporated them and adapted them to the purpose of coupling the train pipes at the same time the cars are coupled in a way that is not permitted with the ordinary Janney type couplers.

One of these differences consists in the middle transverse face 3; the corresponding part of the Janney type coupler being concavely curved transversely of the coupler and not being transverse of the coupler at any substantial part of its surface. The other more important difference is the outwardly facing cheek 7 at the right in addition to the inwardly facing cheek 5 at the left of this transverse face 3 in conjunction with the proper relation of the swinging knuckle 9 thereto. This latter detail is a distinct addition to any coupler of the Janney type that we are aware of. It is, according to the conception of our invention, a necessary concomitant of the transverse face 3; since it permits these transverse faces 3, which correspond to the parts of the Janney type coupler that are engaged by the fronts of the knuckles, to come close to each other. These fixed knuckles engaging their cheeks 5 and 7 with each other at opposite sides of the face 3 prevent transverse relative displacement of the couplers in one direction; and the swinging knuckles perform this function as to the other transverse direction. In this respect these swinging knuckles act similarly to those in the Janney type coupler. But it will be recognized readily upon in-

spection of the Janney type coupler that prevention of transverse displacement in the other direction depends upon the entrance of each swinging knuckle behind the other where it is flanked by a fixed knuckle or lug at that side; with the result that only the front faces of the swinging knuckles engage with the parts of the couplers that correspond to the transverse faces 3 in our couplers.

It is by having these transverse faces 3 adapted to come together and at the same time providing against transverse relative displacement of the couplers by means not so radically different from the details of the Janney coupler as to interfere with free upward and downward relative movement of the coupler as is necessary in practice, that we are enabled to provide for automatic pipe-coupling without so seriously disorganizing the car coupler as to make its use impracticable. Car couplers must permit relative upward and downward movement of each other, because the cars on their springs, as well as due to irregularities in the road, have a great deal of relative vertical movement when traveling. Also a considerable amount of play is desirable between the engaging parts of the couplers to permit relative swinging in a transverse plane, as when the cars are rounding curves; which movement, however, is principally provided for by mounting the couplers laterally movably in the cars, as by the stirrup 19 (Fig. 5) which comes under the shank 2 of the coupler and is secured in the end of the car-frame 20 thereabove. Also, some vertical adjustment of the entire coupler may be made by suitable means such as the screws 21 threaded up through the stirrup 19 against the bottom of the coupler shank 2. But whatever vertical adjustment may thus be provided and whatever lateral relative swinging may be permitted, the maintenance of coupling, yet at the same time free relative vertical movement of the cars thus coupled, must be provided for in any practicable coupling means.

It will be seen, therefore, that we have provided for this by adhering closely enough to the Janney type principles of construction, yet departing sufficiently therefrom to leave a means for mounting and bringing together suitable pipe-coupling means. An example of such means will now be described.

Thus, the coupling-head 1 has running longitudinally forwardly and rearwardly inside of it, a recess 22 opening forwardly out through the transverse face 3, and preferably being somewhat enlarged for some distance back from its forward opening. This recess 22 extends a considerable distance back into the shank 2 and has at its rear end a forwardly extending lug 23 which is embraced by the rear end part of a helical spring 24. A connection-head 25 has a rear lug 26 embraced by the front end part of said spring 24. This connection-head 25 forms the connection between a forwardly extending horizontal pipe 27 and a downwardly extending pipe 28; the head having an opening 29 from the recess 22 down through its bottom about midway of the length of the recess and extending for some distance therealong. It will thus be seen that these pipes are supported by the helical spring 24 in such a manner that they may yield longitudinally of the coupler by a simple compression of the spring or may swing in any direction radially from normal position by slight lateral bendings of the helical spring. But they will always be brought back to normal position by the spring when the displacing pressure is removed.

The funnel 30 is mounted on the front end part of the horizontal pipe 27 in the enlarged forward part of the recess 22 with the pipe 27 opening forwardly through it. Within the rim of this funnel 30 is mounted the gasket 31 with an aperture 32 communicating with the inside of the pipe 27 and having a flat forward face, which, in the position which the just described mounting has when not in any way subjected to pressure, is projected a short distance past the transverse face 3 of the coupling-head. This gasket 31 is preferably made of rubber, as gaskets usually are.

It will thus be seen that when the couplers are brought together, as hereinbefore described, the gasket 31 of each one of them brings its face against the face of the gasket 31 of the other one. The spring 24 of each one allows it to move backward the required distance for the couplers to complete their coupling approach and then these springs continue to hold the gaskets 31 together with the required degree of pressure to prevent leakage of air or other fluid where they are in contact. At the same time the apertures 32 of the two gaskets being substantially registered, there is free communication between the sets of pipes 27 and 28 in both couplers.

As before stated, there is in practice considerable variation in the relative height of the couplers on the cars above the rail level. This may be due to the adjustment of the coupler on the car which may be in some measure compensated for by such means as the screws 21 before described; but with any precaution, considerable relative vertical displacement of the couplers from each other as they approach must be expected. Any pipe-coupling means that is to be automatically brought together upon such approach, therefore, must provide for compensating for this variation in such a way as to effect free communication between the two

pipes without opening from them at the joint thus formed, even though one coupler may be considerably higher than the other.

We provide for this by making the apertures 32 of such vertical dimension that even at the maximum vertical displacement as indicating Fig. 11, the apertures will overlap near their ends to an extent about equal to the area of cross-section of the pipes to be connected. Provision for transverse relative displacement is not necessary, for the couplers guide each other into correct relative position as they couple. Therefore, the apertures are preferably made only about the width of the pipe cross-section. It is also necessary to provide against any extension of this elongated aperture in either gasket past the upper or lower edge, as the case may be, of the other gasket. Therefore, these gaskets 31 are elongated vertically to the extent required for this, both above and below their apertures 32. The funnels 30 are correspondingly shaped to hold these gaskets 31 within their rims 33; and the recesses 32 in their enlargements at the fronts of the heads, as before alluded to, are made considerably higher than wide; and in each case considerably higher and wider than the inclosed funnel 30, leaving empty space 34 around each funnel 30 so that it, along with its pipe 27, may play freely in any direction up and down or transversely or intermediate of these directions, as permitted by their mounting on the spring 24 in the manner before described.

The gaskets 31 thus coming together will at once effect a practicable coupling of the pipes. But if there is any abnormal relative displacement of the couplers which is only temporary to the coupling occasion, and the couplers are adjusting themselves into better alinement under the movements caused in the travel of the cars, the yieldableness of the mountings of the gaskets 31 in conjunction with their freely relatively movable contacting faces will result in a better adjustment of the gaskets to each other by the gaskets sliding over each other slightly at each slight reduction of pressure between them under the action of the couplers; while at the same time the pressure will always be such as to prevent leakage. Even where these gaskets are initially properly alined, or if they do not materially change their adjustment to a better one, as just described, the yieldable mountings permit them, in conjunction with their own elasticity, to maintain effective contact, whatever the relative movements of the couplers when the train is in motion. The openings 29 in the lower parts of the couplers being elongated from front to rear, the free play of the pipes 28 in their movements caused by these displacements are freely permitted.

Were our improvement universally in use, a practicable equipment would be completed by simply permanently connecting the lower end of the pipe 28 to the train-pipe 35 of the car on which the coupling is mounted; with the interposition of the usual cock 36 for closing the train-pipe before uncoupling when it is desired that the car shall travel after it is uncoupled in certain switching operations. However, as hereinbefore alluded to, a change from one kind of couplers to another requires several years, during which time there will be many cars with one kind and many with the other kind of coupler. This is also true as to train-pipe couplings. It is, therefore, necessary that the new couplings for either purpose be capable of conveniently and effectively coupling with the old ones.

We provide for this in respect to the pipe coupling by connecting to the lower end of the pipe 28 one of the standard hose connections 37 of a pair, the other one 38 of which pair is connected to the ordinary hose 39, which in turn connects to the train-pipe 35 through the valve 36 in the well-known manner. Thus, if two cars with our improved couplings on them are to be coupled their hose connections 39 are coupled to their pipes 28 before the cars are brought together, as shown in Fig. 3, and thus without as much danger to the trainman as when he must couple these connections after the cars are coupled, as is the case where two cars with the present equipment are brought together. If only one of the cars is provided with our improvement, its hose connection 39 must be uncoupled from its pipe 28 and connected directly to the hose connection 38 of the other car, as shown in Fig. 5; in which case, of course, our improvement, at that end of the car at least, is eliminated from the operation except as a car-coupler.

In such a case, our improved car coupler will couple with the ordinary Janney type coupler 40 of the other car, as shown in Fig. 5. The swinging knuckle 9 of our coupler engages with the flaring fixed knuckle or cheek 41 of the coupler 40 and its forwardly projecting lug 13 is engaged by the open swinging knuckle 42 of the coupler 40 so that it is thrown in so as to engage with the forward projection of the open swinging knuckle 42 of the coupler 40 and swing this knuckle 42 to closed position behind the also closing swinging knuckle of our coupler. When this operation is completed, the fixed knuckle 4 of our coupler will project laterally outside the part of the coupler 40 in which the knuckle 42 is provided, providing additional security against lateral relative displacement of the two kinds of couplers thus coupled, in addition to the main provision against this by the part 41 of the coupler 40. It will be seen that our coupler couples with the ordinary Janney

type coupler upon practically the same principle that two such Janney type couplers are coupled, *i. e.*, by the interlocking of their swinging knuckles; and the flat face 3 and outwardly facing cheek 7 merely do not function in this coupling and do not interfere with the completion thereof. The coupling of the cars in such case being practically in the same maner as if both cars were provided with Janney type couplers; and the train-pipe coupling be identical, the assurance of practical coöperation of the two kinds of equipments during the time of change from one to the other is manifest.

Of course, the maximum degree of convenience and safety to the operatives is afforded when all of the cars have been provided with the new equipment, so that the hose connections 39 may be left connected to the pipes 28 and even permanently connected thereto, thus eliminating the connections 37 and making it unnecessary for the trainman to give any attention to the train-pipe couplings when preparing for coupling two cars.

Another source of danger to the trainman is the frequent necessity of going in between the rails to release some part of the locking means of a coupler which will not yield to the manipulation by the long bent rod 43 that is connected to the pin 44 of the Janney type coupler, or to the pin 15 of our coupler, and runs out to the side of the car end supposedly to avoid necessity of such entrance by the trainman. In order to loosen these parts of the coupler, it often requires careful and strenuous exertion on the part of the trainman with the help of some prying instrument; these uncoupling operations often must be done while the cars are moving and the danger to the trainman thus walking between moving cars or insecurely supported on the end of the car while absorbed in this operation, will be apparent. We provide for obviating this danger by employing fluid pressure, preferably the air from the air-brake system, to raise the locking pin 15 and permit the knuckles 9 to open as hereinbefore described.

As exemplified herein, a fluid-pressure chamber, in the form of a cylinder 45 vertically mounted in a suitable recess (Fig. 7) in the lower part of the coupler-head below the pin 15, receives the reduced lower part 17 of the pin upon which is mounted a suitable plunger 46 fitting in the cylinder 45 and sliding up and down with the pin 15. The upper end of the cylinder 45 and the recess in which the cylinder is mounted are wide open at the top into the recess 8 to avoid any clogging of the upper part of the cylinder by permitting any obstruction which falls therein to be thrown out by the rising plunger into the recess 8. Also, it is unnecessary that the plunger 46 fit snugly, as some slight leakage of air is permissible; and this leaking air will serve to keep the upper part of this cylinder clean. The lower ends of the cylinder 45 is provided with a valve 47 which comprises a body 48 connected to the lower end of the cylinder and having a plug 49 transversely journaled in it, which plug has a Y-shaped slot 50 approximately radially through it. The valve body 48 has a downwardly extending nipple 51 opening against the lower side of the plug 49 and there is a passage 52 from the upper side of the plug 49 through the valve body into the lower end of the cylinder 45. A third passage 52′ leads upward and outward a short distance to one side of the passage 49 and opens to the outer air. A hose 53 is connected to the nipple 51 and to the train-pipe 35 by a suitable T-connection 54 interposed in said pipe a short distance inward from the cock 36 of the main train-pipe connection before described (Fig. 3). The plug 49 has the crank-arm 55 outside the valve body 48, and a rod 56 is pivoted to this arm 55 and extends over to one side of the car in any suitable manner so that the valve 47 may be manipulated by the trainman while outside the track in a safe position.

As shown in Fig. 7, the valve 47 is in its normal closed condition in which the branches of the Y-slot 50 form communication between the upper passage 49 and the outlet 52 of the valve body 48. Thus, the space in the lower end of the cylinder 45 is in communication with the outer air. A pull on the rod 56 rotates the plug 49 until the lower end of the Y-slot 50 communicates with the passages of the nipples 51, by which time the upper end of the Y-slot has passed away from the outlet 52 but is still communicating with the upper passage 49 into the cylinder 45. Thus, the fluid under pressure from the train-pipe 35 passes into the lower end of the cylinder and forces the pin 15 up, which permits the uncoupling operation. This, it will be understood, is effected very quickly under the heavy fluid pressure; and the practical manipulation of the device consists in a mere outward pull and then a very closely followed inward push on the rod 56 by the trainman, leaving the valve 47 only momentarily open during which time enough air will escape to raise the pin 15. Then the push on the rod closing the valve 47 and again opening communication between the cylinder 45 and the outlet 52, the air that was under the plunger 46 will escape and the pin 15 will be free to fall to locking position again as soon as the coupler knuckle 9 is swung in in the next coupling operation.

By thus providing for overcoming any obstructions to the uncoupling operation by heavy air pressure, not only is the safety of

the workman increased and his time saved, but he is relieved of considerable physical exertion as compared with the manipulation of any of the ordinary devices where he must provide all of the motive force by sheer bodily exertion.

While certain constructional details are deemed preferable in connection with our invention, and we have shown and described these rather specifically in elucidating the construction and use of our invention, as is required, we do not wish to be understood as being limited to such precise showing and description, but having thus fully described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A pair of car-coupling heads, engaging means on the respective heads to prevent longitudinal and transverse separation of said heads but permitting relative vertical movement of said heads without separation thereof, and pipe-coupling means on the respective heads substantially within the upper and lower limits of said engaging means, and having apertured transverse faces mutually contacting whereby said apertures communicate with each other.

2. A pair of car-coupling heads, engaging means on the respective heads to prevent longitudinal and transverse separation of said heads but permitting relative vertical movement of said heads without separation thereof, said heads, respectively, having proximate transverse faces substantially within the upper and lower limits of said engaging means, and pipe-coupling means in the respective faces having transverse apertured faces mutually contacting whereby said apertures communicate with each other.

3. A pair of car-coupling heads, engaging means on the respective heads to prevent longitudinal and transverse separation of said heads but permitting relative vertical movement of said heads without separation thereof, and pipe-coupling means on the respective heads having apertured transverse faces mutually contacting whereby said apertures communicate with each other, and mountings for the respective pipe-coupling means permitting said means to yield in any direction substantially in their plane of contact.

4. A pair of car-coupling heads, engaging means on the respective heads to prevent longitudinal and transverse separation of said heads but permitting relative vertical movement of said heads without separation thereof, and pipe-coupling means on the respective heads having apertured transverse faces mutually contacting whereby said apertures communicate with each other, and mountings for the respective pipe-coupling means permitting said means to yield in any direction substantially in their plane of contact, and yieldably holding said pipe-coupling means in contact.

5. A car-coupler comprising engaging means to prevent longitudinal and transverse separation of said head from another similar head, but permitting relative vertical movement of such heads without separation thereof, said head having a transverse face substantially within the upper and lower limits of said engaging means, and having a recess opening through said face and extending backwardly and downwardly and opening through the bottom of said head, and pipe-coupling means comprising a pipe extending backwardly and downwardly through said recess, gasket means on the front end of said pipe and projecting from said recess past said face of said head, and a mounting for said pipe.

6. A car-coupler comprising engaging means to prevent longitudinal and transverse separation of said head from another similar head, but permitting relative vertical movement of such heads without separation thereof, said head having a transverse face substantially within the upper and lower limits of said engaging means, and having a recess opening through said face and extending backwardly and downwardly and opening through the bottom of said head, and pipe-coupling means comprising a pipe extending backwardly and downwardly through said recess, gasket means on the front end of said pipe and projecting from said recess past said face of said head, and a yieldable mounting for said pipe in said recess.

7. A car-coupler comprising engaging means to prevent longitudinal and transverse separation of said head from another similar head, but permitting relative vertical movement of such heads without separation thereof, said head having a transverse face substantially within the upper and lower limits of said engaging means, and having a recess opening through said face and extending backwardly and downwardly and opening through the bottom of said head, and pipe-coupling means comprising a pipe extending backwardly and downwardly through said recess, gasket means on the front end of said pipe and projecting from said recess past said face of said head, a lug projecting backwardly from said pipe, a lug projecting forwardly from a wall of said recess, and a helical spring embracing said lugs.

8. A car-coupler comprising a head having a transverse face and a laterally outwardly facing vertical cheek at one side of said face, a fixed knuckle at the other side of said face, having an inwardly facing vertical cheek next to said face and a rearwardly facing vertical shoulder at the outside of the head, a swinging knuckle pivoted

in said head to swing transversely at the other side of said head at a distance from said outwardly facing cheek greater than the transverse width of said fixed knuckle, whereby a recess is left, and having a lug swinging forwardly into said recess when said knuckle swings outwardly, and having an inwardly projecting lug near its free end at a distance from said lug greater than the front-to-rear depth of said fixed knuckle, and means for locking said swinging knuckle in inwardly-swung position.

9. A car-coupler comprising a head having a transverse face and a laterally outwardly facing vertical cheek at one side of said face, a fixed knuckle at the other side of said face, having an inwardly facing vertical cheek next to said face and a rearwardly facing vertical shoulder at the outside of said head, a swinging knuckle pivoted in said head to swing transversely at the other side of said head at a distance from said outwardly facing cheek greater than the transverse width of said fixed knuckle, whereby a recess is left, and having a lug swinging forwardly into said recess when said knuckle swings outwardly, and having an inwardly propecting lug near its free end at a distance from said lug greater than the front-to-rear depth of said fixed knuckle, means for locking said swinging knuckle in inwardly-swung position, and pipe-coupling means in said transverse face of said head.

10. A car-coupler comprising a head having a transverse face and a laterally outwardly facing vertical cheek at one side of said face, a fixed knuckle at the other side of said face, having an inwardly facing vertical cheek next to said face and a rearwardly facing vertical shoulder at the outside of the head, a swinging knuckle pivoted in said head to swing transversely at the other side of said head at a distance from said outwardly facing cheek greater than the transverse width of said fixed knuckle, whereby a recess is left, and having a lug swinging forwardly into said recess when said knuckle swings outwardly, and having an inwardly projecting lug near its free end at a distance from said lug greater than the front-to-rear depth of said fixed knuckle, means for locking said swinging knuckle in inwardly swung position, said head having a recess in said transverse face, and pipe-coupling means movably mounted in said recess.

11. A car-coupler comprising a head having a transverse face and a laterally outwardly facing vertical check at one side of said face, a fixed knuckle at the other side of said face, having an inwardly facing vertical cheek next to said face, and a rearwardly facing vertical shoulder at the outside of said head, a swinging knuckle pivoted in said head to swing transversely at the other side of said head at a distance from said outwardly facing cheek greater than the transverse width of said fixed knuckle, whereby a recess is left, and having a lug swinging forwardly into said recess when said knuckle swings outwardly, and having an inwardly projecting lug near its free end at a distance from said lug greater than the front-to-rear depth of said fixed knuckle, means for locking said swinging knuckle in inwardly-swung position, and pipe-coupling means in said transverse face of said head with a transverse face.

12. A car-coupler comprising a head having a transverse face and a laterally outwardly facing vertical cheek at one side of said face, a fixed knuckle at the other side of said face, having an inwardly facing vertical cheek next to said face and a rearwardly facing vertical shoulder at the outside of the head, a swinging knuckle pivoted in said head to swing transversely at the other side of said head at a distance from said outwardly facing cheek greater than the transverse width of said fixed knuckle, whereby a recess is left, and having a lug swinging forwardly into said recess when said knuckle swings outwardly, and having an inwardly projecting lug near its free end at a distance from said lug greater than the front-to-rear depth of said fixed knuckle, means for locking said swinging knuckle in inwardly-swung position, said head having a recess in said transverse face, and pipe-coupling means movably mounted in said recess, with a transverse face projected forwardly from said recess, and means yieldably holding said pipe-coupling means forward.

13. A car-coupler comprising a head having a transverse face and a laterally outwardly facing vertical cheek at one side of said face, a fixed knuckle at the other side of said face, having an inwardly facing vertical cheek next to said face, and a rearwardly facing vertical shoulder at the outside of the head, a swinging knuckle pivoted in said head to swing transversely at the other side of said head at a distance from said outwardly facing cheek greater than the transverse width of said fixed knuckle, whereby a recess is left, and having a lug swinging forwardly into said recess when said knuckle swings outwardly, and having an inwardly projecting lug near its free end at a distance from said lug greater than the front-to-rear depth of said fixed knuckle, said head and said swinging knuckle having projections behind where said knuckle is pivoted, and a pin sliding in said projection of the head to engage with said knuckle projection and lock said knuckle in inwardly-swung position, or to disengage and permit said knuckle to swing outwardly.

14. A car-coupler comprising a head having a transverse face and a laterally outwardly facing vertical cheek at one side of said face, a fixed knuckle at the other side of said face, having an inwardly facing vertical cheek next to said face, and a rearwardly facing vertical shoulder at the outside of the head, a swinging knuckle pivoted in said head to swing transversely at the other side of said head at a distance from said outwardly facing cheek greater than the transverse width of said fixed knuckle, whereby a recess is left, and having a lug swinging forwardly into said recess when said knuckle swings outwardly, and having an inwardly projecting lug near its free end at a distance from said lug greater than the front-to-rear depth of said fixed knuckle, said head and said swinging knuckle having projections behind where said knuckle is pivoted, and a pin sliding in said projection of the head to engage with said knuckle projection and lock said knuckle in inwardly-swung position, or to disengage and permit said knuckle to swing outwardly, a fluid-pressure chamber in said head, a plunger in said chamber and connected to said pin, and means to admit fluid pressure to said chamber to disengage said pin.

15. A car-coupler comprising engaging means to couple with a Janney type car-coupler, and comprising a pipe-coupling means within the upper and lower limits of said engaging means adapted to couple with similar means in a similar coupler.

16. A car-coupler head having vertical cheeks at opposite sides of its center, both facing toward one side of the coupler, a rearwardly facing shoulder on one of its outer sides and a forwardly projected inwardly-hooking swinging knuckle at its outer side, spaced away from its cheek at that side and adapted to hook over the shoulder of another similar coupler-head or to interlock with the swinging knuckle of a Janney type coupler.

17. A car-coupler head comprising a fixed forwardly projecting knuckle at one side with a rear vertical shoulder, and a vertical recess at its other side, and a transverse face at the middle between said knuckle and said recess, and a knuckle pivoted in said head out from said recess, to swing inwardly and outwardly, and a vertical lug near the free end of said knuckle to hook over the shoulder of another similar coupler while the fixed knuckle of said other coupler enters said recess, and a lug on said pivoted knuckle, projected into said recess when the knuckle is swung out, whereby the knuckle is swung in by engagement of the fixed knuckle of the other coupler.

18. A car-coupler head comprising a fixed forwardly projecting knuckle at one side with a rear vertical shoulder, and a vertical recess at its other side, and a transverse face at the middle between said knuckle and said recess, and a knuckle pivoted in said head out from said recess, to swing inwardly and outwardly, and a vertical lug near the free end of said knuckle to hook over the shoulder of another similar coupler while the fixed knuckle of said other coupler enters said recess, and a lug on said pivoted knuckle, projected into said recess when the knuckle is swung out, whereby the knuckle is swung in by engagement of the fixed knuckle of the other coupler, said swinging knuckle also being adapted to hook behind the swinging knuckle of a coupler of the Janney type while said fixed knuckle projects outside the Janney type coupler.

19. A car-coupler head comprising a fixed forwardly projecting knuckle at one side with a rear vertical shoulder, and a vertical recess at its other side, and a transverse face at the middle between said knuckle and said recess, to swing inwardly and outwardly, and a vertical lug near the free end of said knuckle to hook over the shoulder of another similar coupler while the fixed knuckle of said other coupler enters said recess, and a lug on said pivoted knuckle, projected into said recess when the knuckle is swung out, whereby the knuckle is swung in by engagement of the fixed knuckle of the other coupler, said swinging knuckle also being adapted to hook behind the swinging knuckle of a coupler of the Janney type while said fixed knuckle projects outside the Janney type coupler, and pipe-coupling means projecting from said transverse face to couple with similar pipe-coupling means on another similar coupler.

20. A car-coupler head comprising a fixed forwardly projecting knuckle at one side with a rear vertical shoulder, and a vertical recess at its other side, and a transverse face at the middle between said knuckle and said recess, to swing inwardly and outwardly, and a vertical lug near the free end of said knuckle to hook over the shoulder of another similar coupler while the fixed knuckle of said other coupler enters said recess, and a lug on said pivoted knuckle, projected into said recess when the knuckle is swung out, whereby the knuckle is swung in by engagement of the fixed knuckle of the other coupler, said swinging knuckle also being adapted to hook behind the swinging knuckle of a coupler of the Janney type, and pipe-coupling means projecting from said transverse face to couple with similar pipe-coupling means on another similar coupler, and a hose coupling of standard type on said pipe-coupling means, whereby the train-pipe hose of a car may be connected to said pipe-coupling means or to the train-pipe hose of another car.

21. A car-coupler comprising engaging

means to prevent longitudinal or transverse separation of said head from another similar head, but permitting relative vertical movement of such heads without separation thereof, or to couple with a car-coupler of the Janney type, a pipe-coupling means on said head, and a hose coupling of standard type on said pipe-coupling means, whereby the train-pipe hose of a car may be connected to said pipe-coupling means or to the train-pipe hose of another car.

22. A car-coupler comprising engaging means to prevent longitudinal or transverse separation of said head from another similar head, but permitting relative vertical movement of such heads without separation thereof, and a pipe-coupling means on said head, and a hose coupling of standard type on said pipe-coupling means, whereby the train-pipe hose of a car may be connected to said pipe-coupling means or to the train-pipe hose of another car.

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