

V. S. DURBIN.
 TRAIN PIPE COUPLING.
 APPLICATION FILED NOV. 6, 1911.

Patented Apr. 29, 1913.

3 SHEETS-SHEET 1.

1,060,562.

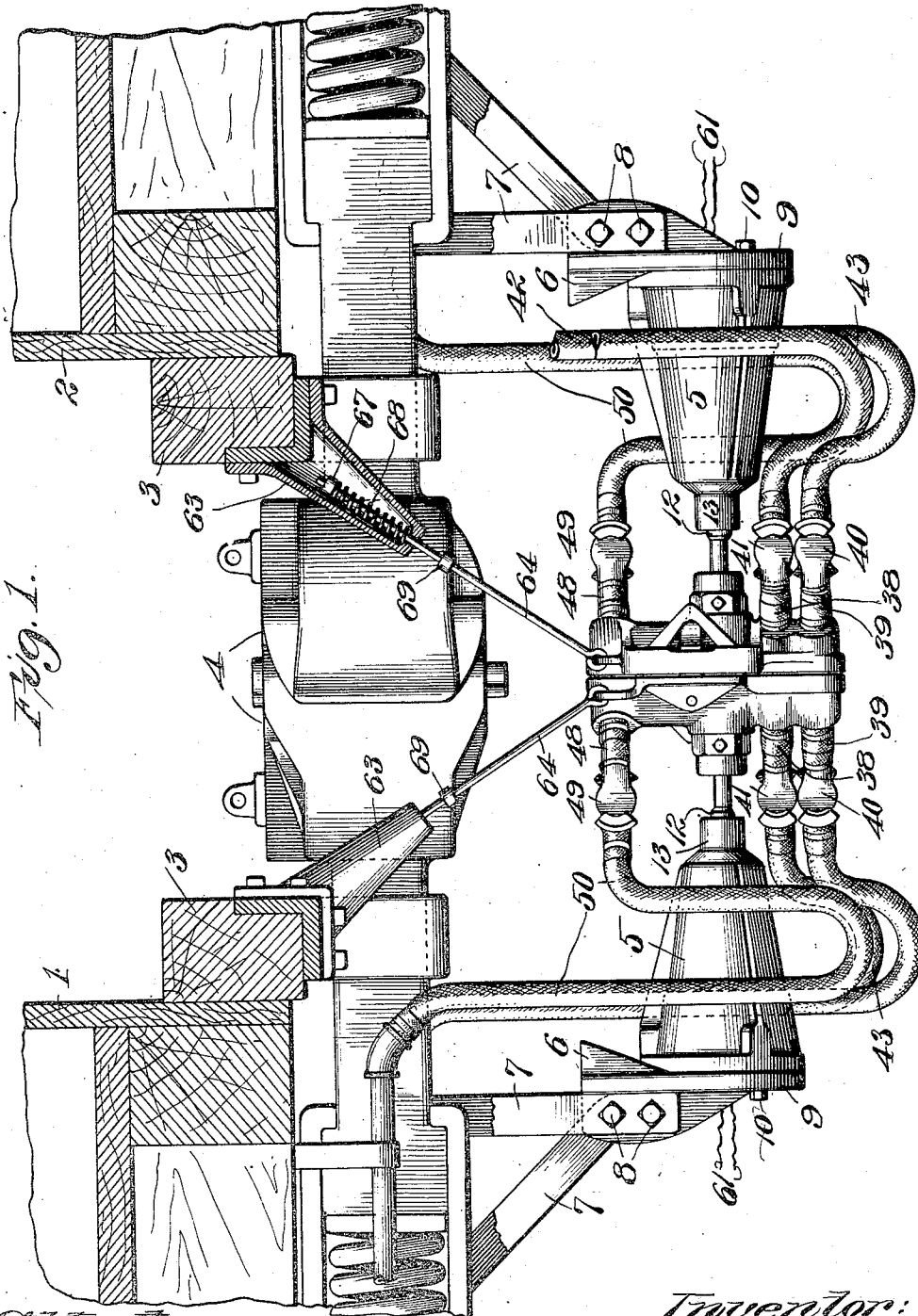


Fig. 1.

Attest:
 Wm. H. Scott.
 Stella Hill.

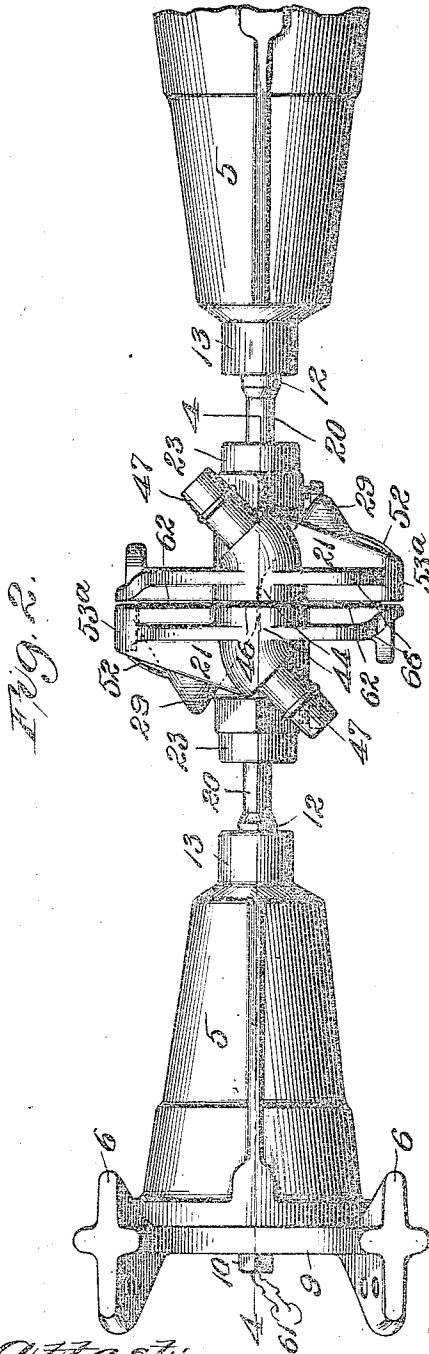
Inventor:
 Votaw S. Durbin,
 by Bruce S. Perrott
 Atty.

V. S. DURBIN.
 TRAIN PIPE COUPLING.
 APPLICATION FILED NOV. 6, 1911.

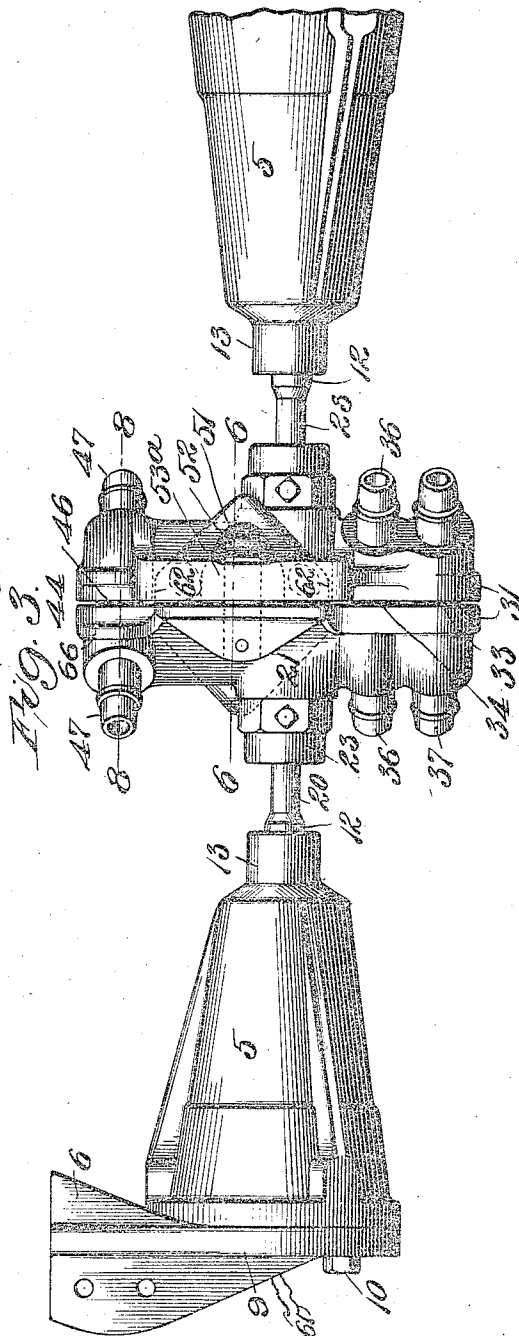
1,060,562.

Patented Apr. 29, 1913.

3 SHEETS—SHEET 2.



Attest:
M. H. Scott
 Stella Hill



Inventor:
 Volaw S. Durbin,
 by Bruce S. Elliott
att'y.

V. S. DURBIN.
 TRAIN PIPE COUPLING.
 APPLICATION FILED NOV. 6, 1911.

1,060,562.

Patented Apr. 29, 1913.

3 SHEETS—SHEET 3.

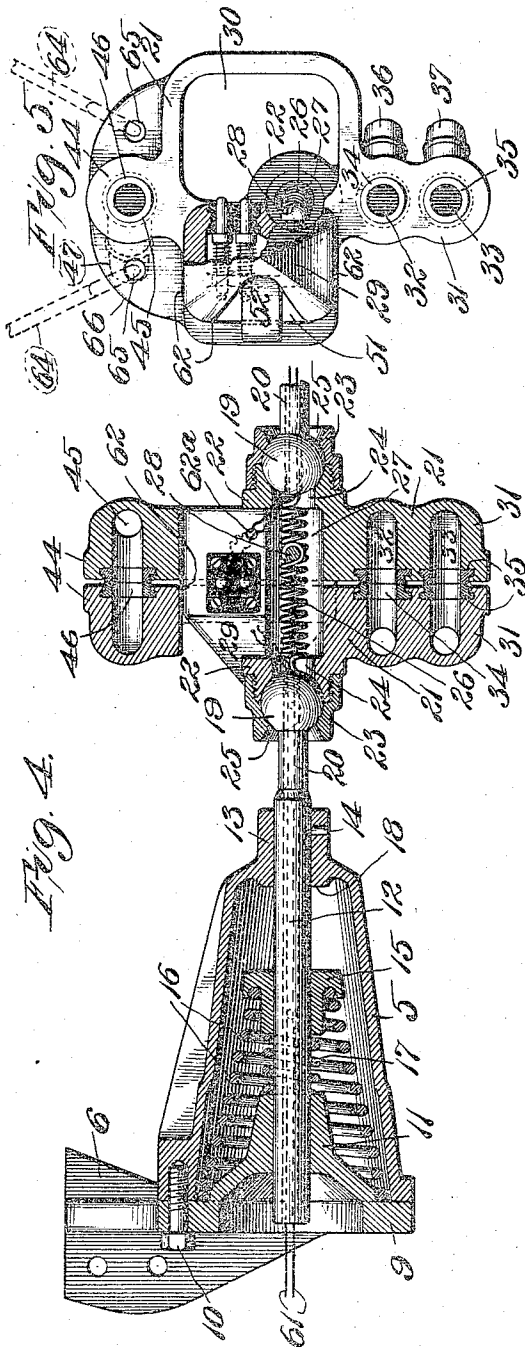


Fig. 4.

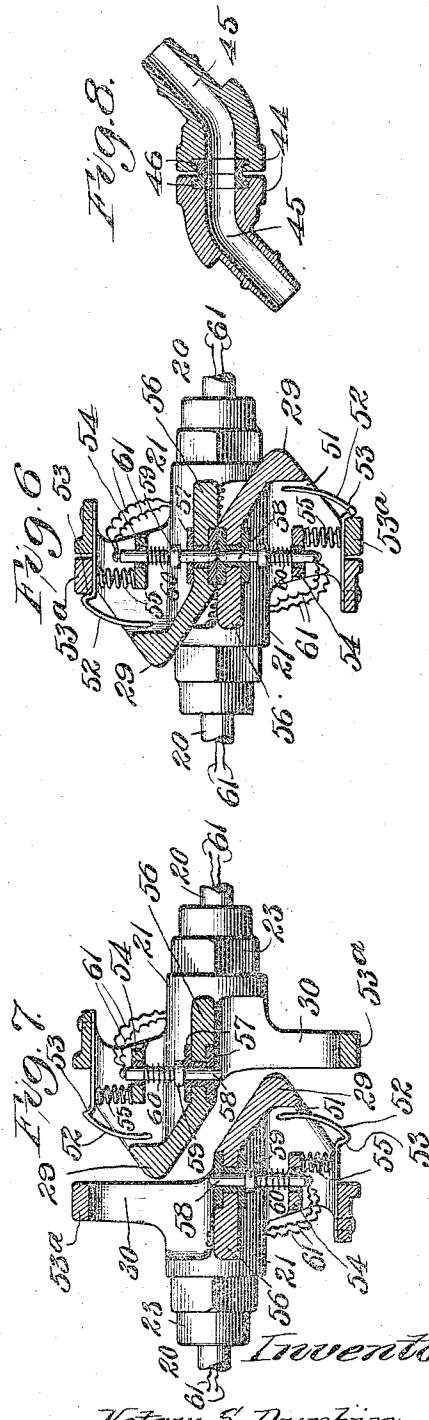


Fig. 5.

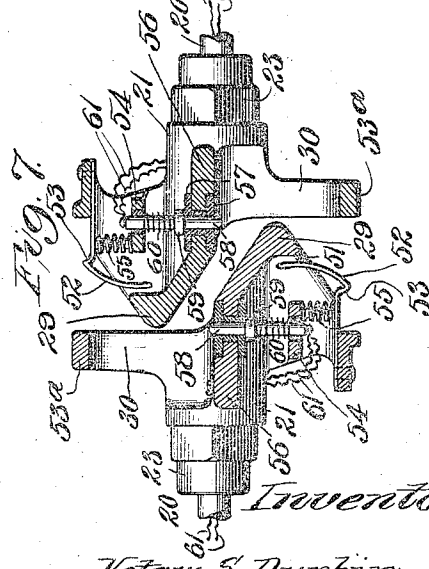


Fig. 6.

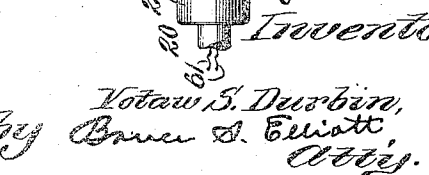


Fig. 7.



Fig. 8.

Attest:
 Wm. H. Ford
 Stella Hill.

Inventor:
 Votaw S. Durbin,
 by Bruce S. Elliott
 Atty.

UNITED STATES PATENT OFFICE.

VOTAW S. DURBIN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO DURBIN AUTOMATIC TRAIN PIPE CONNECTOR COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF ARIZONA.

TRAIN-PIPE COUPLING.

1,060,562.

Specification of Letters Patent. Patented Apr. 29, 1913.

Application filed November 8, 1911. Serial No. 658,667.

To all whom it may concern:

Be it known that I, VOTAW S. DURBIN, a citizen of the United States, residing in the city of St. Louis and State of Missouri, have invented new and useful Improvements in Train-Pipe Couplings, of which the following is a specification.

This invention relates to certain new and useful improvements in automatic coupling attachments for the signal, brake and steam pipes of railway cars, which coupling mechanism also involves means for automatically making connection between terminals of a telephone circuit.

The invention is, in effect, an improvement on a like device heretofore patented to Nelson Toy, October 6th, 1908, No. 900,132.

The present invention has for its objects to provide an improved form of yielding support for the coupler head; to provide means for maintaining the coupler heads in their interlocked relation under the ordinary conditions of service, thereby preventing relative movement between the two coupler heads; and to provide an improved means for mounting the coupler head upon its support.

Other objects of the invention reside in certain details of construction and combinations and arrangements of parts, all of which will be more clearly understood from the description and claims to follow.

In the accompanying drawings:—Figure 1 is a view in section of a portion of the meeting ends of two cars with draft couplers attached, and in coupled relation, and showing in elevation my improved automatic train pipe coupler and electrical connector in position on the respective cars and in coupled relation; Fig. 2 is an enlarged plan view of the two members of my device in coupled relation, the train pipes being detached; Fig. 3 is a view of the same parts in side elevation; Fig. 4 is a sectional view on the line 4—4 of Fig. 2; Fig. 5 is a view in front elevation of one of the coupler heads, a portion of the same being broken away to show the location of the contact pins; Fig. 6 is a sectional plan view on the line 6—6 of Fig. 3, showing the two coupler heads in interlocked relation; Fig. 7 is a similar view, but showing the two coupler heads separated; and Fig. 8 is a section on the line 8—8 of Fig. 3, illustrating the man-

ner in which a continuous conduit through the coupler head is formed when they are brought together.

Referring now to the drawings, the numerals 1 and 2 indicate, respectively, the meeting ends of two cars, each of which has extending across its end at the bottom a piece of timber 3, called the dead-wood.

4 indicates, generally, the draft couplers. The two members of my device being alike in all particulars, and being supported from each car in exactly the same manner, a description of one, and the manner of supporting it, will suffice for both.

5 indicates a conical housing having at its rear end apertured webs 6 by means of which it is supported from the car by bars 7 secured at their upper ends to the car, or to the draft rigging thereof, and at their lower ends being bolted to the webs 6, as indicated at 8. The webs 6 form an integral part of a plate 9 which is bolted to the rear end of the housing 5, as indicated at 10, and which is provided with an inwardly-extending, centrally-apertured projection 11, the aperture forming a snug bearing for a plunger 12. The outer end of the housing is provided with a circular projection 13 which is centrally bored to form a second bearing for the plunger 12. A pin 14 extends through the wall of the projection 13 and its inner end fits in a longitudinal groove (not shown) in the plunger 12 to prevent the same from turning. Secured on the plunger 12 within the housing 5 is a flanged collar 15, between which and the rear end of the housing is mounted a cone-shaped, coiled spring 16. Between the inner end of the collar 15 and the outer end of the projection 11 I also mount a small coiled spring 17. The plunger 12 is free to move in the bearings provided by the projections 11 and 13, its movement in the outward direction being controlled by the engagement of the forward end of the collar 15 with a shoulder 18 formed by the inner end of the projection 13. The coiled spring 17 does not come into play until the plunger 12 has been pushed inward almost to the limit of its movement in such direction, when the collar 15 engages the said spring, and the power of this spring is added to the power of the spring 16 in resisting further inward movement of the plunger. The forward end of the plunger 12 is provided with

a ball 19, and adjacent to such ball the plunger is preferably reduced in diameter, as indicated at 20, to allow a greater range of movement of the coupler head, as more clearly explained later on.

21 indicates the coupler head, which is provided on its rear side with a boss 22 which is exteriorly screw-threaded to receive a cap 23. The boss 22 is centrally apertured, as indicated at 24, the adjacent portions of the boss and cap being suitably enlarged to form a socket bearing for the ball 19. The cap 23 is centrally apertured, of course, the aperture being smaller than the ball 19 so as when the parts are assembled to securely hold the coupler head on the plunger, and the opening in the outer end of the cap is reamed out, as indicated at 25, to permit the requisite play of the coupler head about the ball.

It will be seen that the construction described forms a ball and socket joint permitting pivotal movement of the coupler head in all directions. It is necessary, however, that the head shall be maintained, although yieldingly, in a given normal position so as to be at all times in position to engage the mating coupler head on the other car. To this end I recess the ball 19, and secure in such recess one end of a coiled spring 26, the other end being firmly secured within a longitudinally-extending recess 27 by means of a screw 28. Each of the coupler heads has a hollow pyramidal projection 29 on its front face at one side thereof, and adjacent thereto an opening 30, the side of the projection 29 forming one side of the opening 30.

31 indicates an integral downwardly-extending portion of the coupler head which is provided with two openings 32 and 33, each of which has secured therein a rubber gasket 34 and 35, respectively. The openings 32 and 33 are continued through two short tubes 36 and 37 projecting inwardly from the rear side of the coupler head, and which are suitably fashioned to receive two short lengths of hose 38 and 39, each carrying one member of a hose coupling 40, 41, which is of the usual construction.

42 indicates the signal pipe and 43 the brake pipe, each of which carries at its end a coupling member designed to engage with the respective coupling members 40 and 41. At its upper end the coupling head is provided with an extension 44 which is provided with an opening 45 having secured therein a rubber gasket 46. The aperture 45 is continued through a short tube 47 projecting from the rear side of the coupler head which is fashioned to receive a short length tube 48 carrying one member of a hose coupling 49.

50 indicates a steam pipe which carries a coupling member designed to engage the

coupling member 49. By an inspection of Fig. 8 it will be seen that when the coupler heads are brought together the gaskets 46, which project slightly beyond the face of the coupler head, will be brought into contact to form an air-tight joint so that the two openings 45 combiné to form a continuous opening through the two coupler heads for the passage of steam. The same applies with reference to the apertures 32 and 33. The outer side of the pyramidal projection 29 is provided with an opening 51 through which projects a leaf-spring 52 having a shoulder 53, the said leaf-spring being secured to the inner side of the outer wall of the said pyramidal projection, as more clearly illustrated in Figs. 6 and 7. When the two coupler heads are brought together the pyramidal projection 29 of one enters the opening 30 of the other, and a spring 52 will engage behind the outer wall 53^a of said opening and thus hold the coupler heads in engagement under the ordinary strain or movement to which they would be subjected, although permitting the coupler heads to be separated as the cars are drawn apart. This position of the parts is shown in Fig. 6.

54 indicates a bridge-piece mounted in each of the said pyramidal projections, and between this bridge-piece and the leaf-spring 52 a coiled spring 55 is mounted to reinforce the leaf-spring 52. Mounted on opposite sides of the wall 56 of the pyramidal projection 29 adjacent to the opening 30 are insulating blocks 57 through which, and through insulated openings provided in the said wall, are mounted two contact pins 58, each of which is provided with a shoulder 59 to limit its inward movement. The outer ends of the contact pins extend through apertures in the bridge-piece 54 provided with suitable insulating material, and between such material and the shoulder 59 of each pin is mounted a coiled spring 60, which cushions the outer movement of said contact pins. The said spring 60 causes the contact pins to project normally beyond the inner face of the wall 56 in position to be engaged by the corresponding pins of the companion coupler head when the said heads are brought together. Connected with each of the contact pins is an electrical conductor 61 forming part of a metallic circuit.

As more clearly shown in Fig. 4 by dotted lines, the plunger 12 has a longitudinal aperture extending through it from end to end, and the electrical conductors 61, which are covered with insulating material, pass through an opening 62^a adjacent to the recess 27 and thence through the aperture in the plunger out through the rear end of the same, whence they lead up into the car, or underneath the same to the coupling member on the other end of the car. By conducting the wires 61 through the plungers as just de-

scribed, they are thus protected from injury and are only exposed, if at all, at the points beneath the car where they are least likely to meet with injury from accident or otherwise. It is necessary that there should be no relative movement between the two coupler heads in their interlocked relation, and to further this object each of the pyramidal projections 29 is provided near its base, with straight sides, as indicated at 62, shown more clearly by the dotted lines in Figs. 2 and 3, and the opening 30 is correspondingly shaped to receive the substantially rectangular portion thus formed on the projection so that when the coupler heads are interlocked there will be less tendency to relative movement between the coupler heads under lateral strain or leverage. This result is, of course, further aided by the provision of the springs 52 which tend to hold the coupler heads in fixed relation to each other.

As a further means of yieldingly maintaining the coupler head in its normal position I secure on the dead-wood on opposite sides of the draft coupling, respectively, two hollow casings 63, only one of which is shown in Fig. 1, the lower end of which casing is provided with an aperture through which extends a rod 64, each of the rods 64 being secured in apertures 65 formed in a web 66 on the upper side of the coupler head (see Fig. 5). The upper end of each rod 64 has secured thereon a collar 67, and between this collar and the lower end of the casing is mounted a coiled spring 68 which, bearing against the collar 67, tends normally to press the rod 64 upward. A second collar 69 may be secured on each rod 64 to limit its upward movement.

In operation the spring-controlled rods 64 and the coiled spring 26 maintain the coupler heads in such position that when two cars are brought together for coupling the pyramidal projection of one coupler head will enter the opening 30 of another. the plungers 12 yielding and being moved backward some distance in their housings against the resistance of their springs, and the coupling heads moving into their interlocked relation, in which position they are held by the power of the springs 16. The springs 52 likewise assist in holding the coupling heads in engagement with each other, and, as before stated, to prevent relative movement between them. As the coupling heads move into the interlocked position the two contact pins 58 of one head will engage the two contact pins 58 of the other head. the said pins mutually yielding and being held in contact by their springs, as clearly shown in Fig. 6. This sliding engagement of the pins is preferable to direct contact in a straight line, or head-on engagement, as the sliding contact of the pins keeps their meeting surfaces clean and insures perfect

contact. In Figs. 1 and 4 the parts are shown in the position they assume when the plungers have been pushed back in their housings as the coupling heads interlock. It will be understood, however, that the coupling heads normally project some distance beyond the draft coupler members immediately above it, so that when the coupling heads are brought together the respective plungers will be forced back in their housings a considerable distance before the draft couplings are engaged. This insures the coupling heads being held together under the power of the respective springs 16 at all times, and thus the play between the draft coupling members and the sidewise movement and sway of the cars will not interfere with the connection between the coupling heads. The ball and socket connection of the coupling head with the plunger also permits the coupling heads to be maintained in firm fixed relation to each other, as it will be readily seen that the housings 5 and the plungers may be subjected to movement in any conceivable direction without impairing the connection between the two coupling heads.

My invention presents a simple and reliable means, therefore, for automatically coupling the various pipes of a train of cars, and for effecting the electrical connection between the same, and insures the integrity of such coupling and connection as long as the cars are coupled.

I have employed the term "train pipe" in the claims to refer to the air and steam pipes.

It will be obvious that the invention may be employed for connecting a single pipe or any number of pipes.

I claim:

1. In combination with a car having train-pipes, a housing supported from said car and inclosing a spring, a plunger slidably mounted in said housing and normally pressed outward by said spring, and having at its outer end a ball, a coupling-head having a centrally-located, exteriorly screw-threaded boss containing a socket receiving said ball, a cap screwed on said boss and embracing said ball, means for maintaining the coupling-head normally in a coupling position, said coupling-head being provided with ports for the passage of fluid, and hose-attaching devices carried by said coupling-head and communicating with said ports.

2. In combination with a car having train-pipes, a cushioned plunger supported from the car, a coupling-head pivotally mounted on said plunger and provided with ports for the passage of fluid, hose-attaching devices carried by said coupling-head and communicating with said ports, housings mounted on the car, springs inclosed in said housings and rods mounted at their upper ends

in said housings, and normally held upward by said springs, and connected at their lower ends with said coupling-head for maintaining it normally in the coupling position.

5 3. In combination with a car having train-pipes, a housing supported from said car and inclosing a spring, a plunger slidably mounted in said housing and normally pressed outward by said spring and having
10 at its end a ball, a coupling-head mounted on the end of said plunger provided with a socket receiving said ball and with ports for the passage of fluid, hose-attaching devices carried by said coupling-head and commu-
15 nicating with said ports, and a coiled spring secured at its opposite ends to the ball of the plunger and to the interior of the coupling-head, respectively, for maintaining the coupling-head normally in the coupling position.
20

4. In combination with a car having train-pipes, a conical housing supported from said car and having an inwardly-extending, centrally-apertured projection at its larger
25 end and a projecting centrally-apertured portion at its smaller end, said apertured portions forming bearings, a conical spiral spring inclosed in said housing, a plunger

extending through said housing and slid- 30
ably mounted in said bearings, a collar se-
cured to said plunger and engaged by the
smaller end of said spring, a coupling-head
pivottally mounted on said plunger and pro-
vided with ports for the passage of fluid,
hose-attaching means carried by said cou- 35
pling-head and communicating with said
ports, and yieldable means for maintaining
said coupling-head normally in the cou-
pling position.

5. In a train-pipe coupling, a coupling- 40
head provided with a projecting member
for entering an opening in, and with an
opening for receiving a projection on, a
mating coupling-head, and a shouldered
leaf-spring mounted in said projection for 45
engaging behind the wall of the opening in
the mating coupling-head when the cou-
pling-heads are brought together.

In testimony whereof, I have hereunto set
my hand in presence of two subscribing wit- 50
nesses.

VOTAW S. DURBIN.

Witnesses:

BRUCE S. ELLIOTT,
STELLA HILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."