

(No Model.)

4 Sheets—Sheet 1.

N. F. NIEDERLANDER.
AUTOMATIC PIPE COUPLING.

No. 582,672.

Patented May 18, 1897.

FIG. 1.

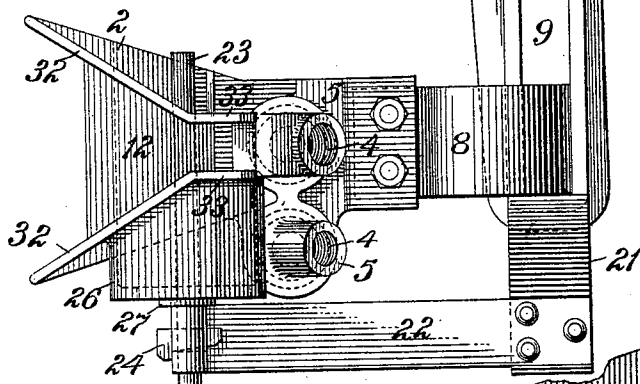
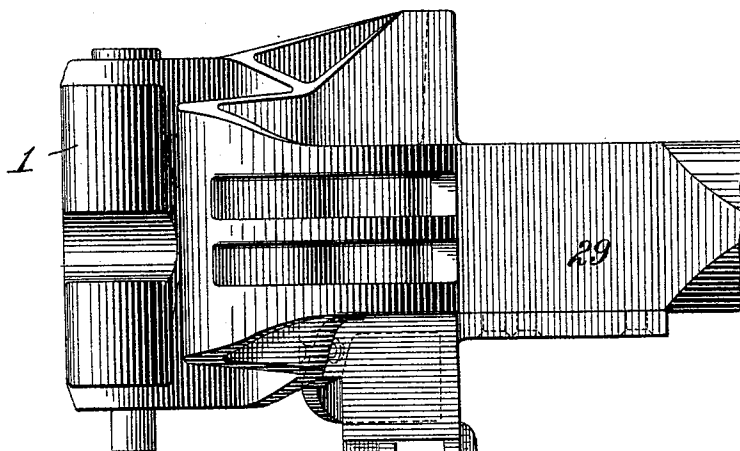
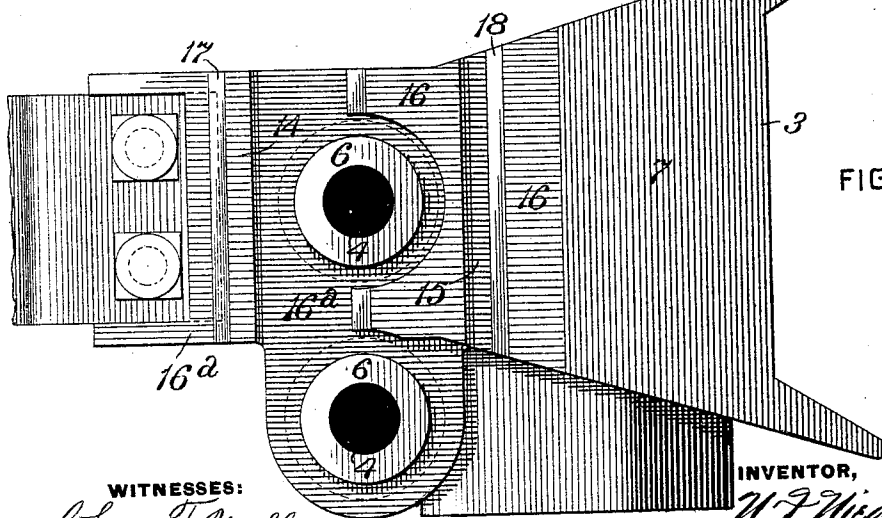


FIG. 2.



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N. F. Niederlander.
By J. S. Howden Bell,
Att'y.

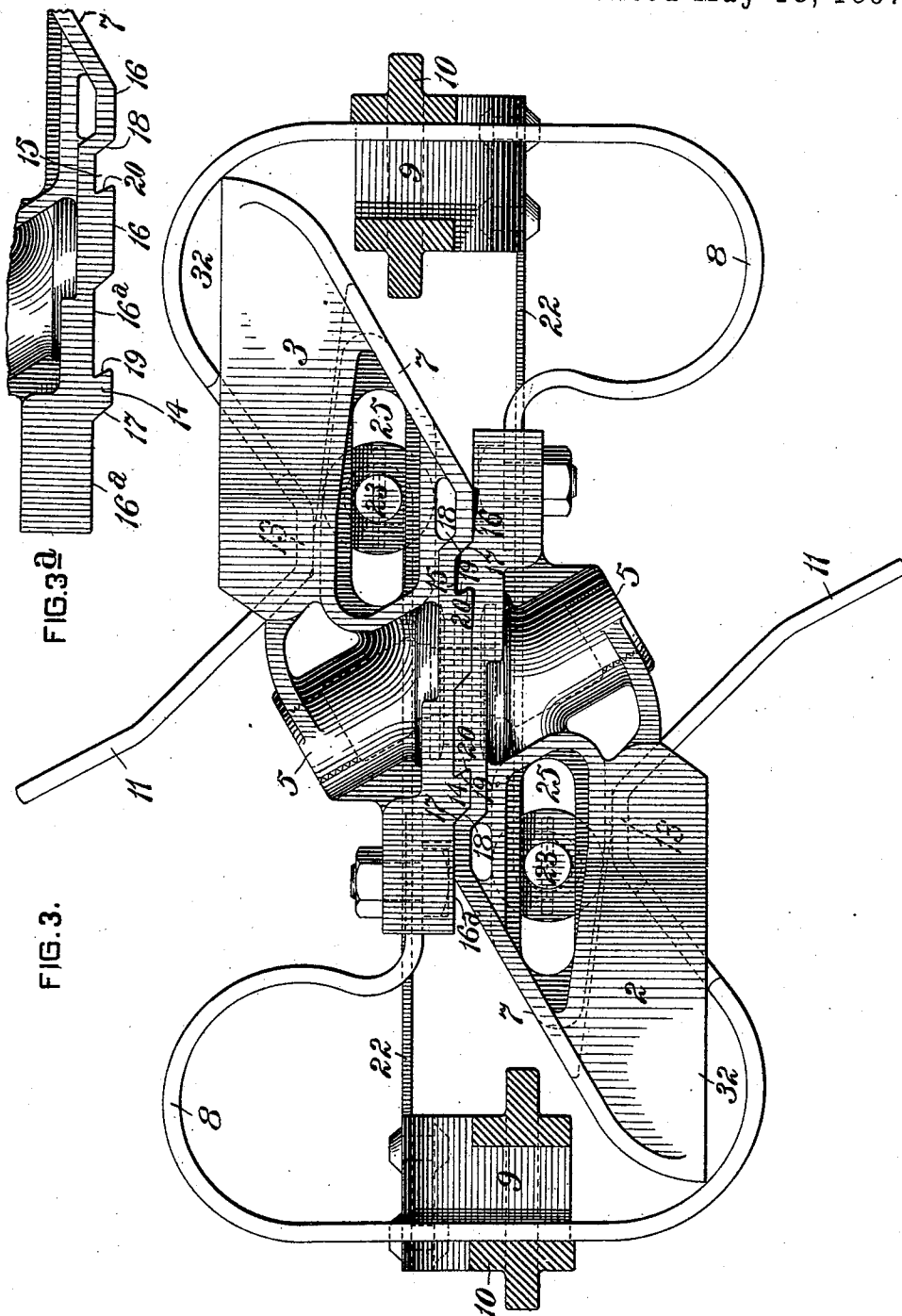
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4 Sheets—Sheet 2.

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4 Sheets—Sheet 3.

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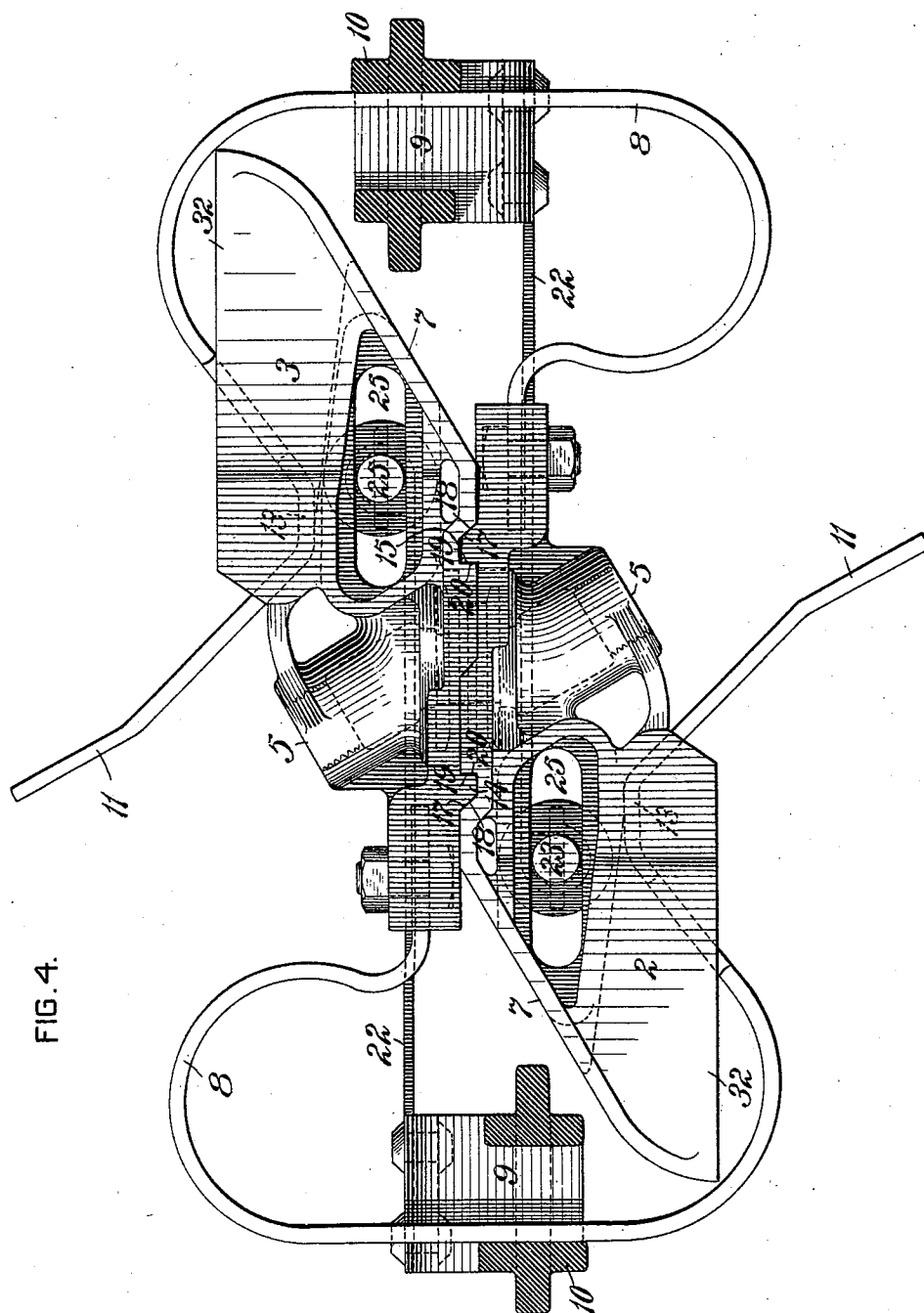


FIG. 4.

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AUTOMATIC PIPE COUPLING.

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FIG. 5.

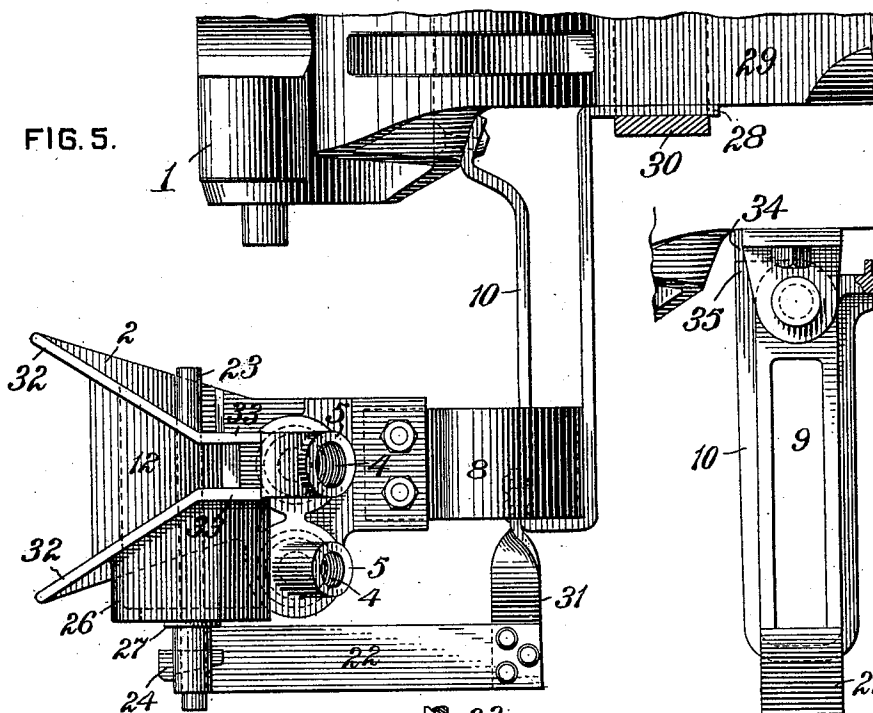


FIG. 6.

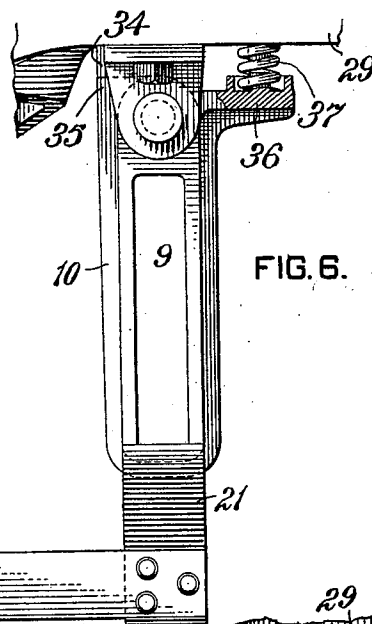


FIG. 7.

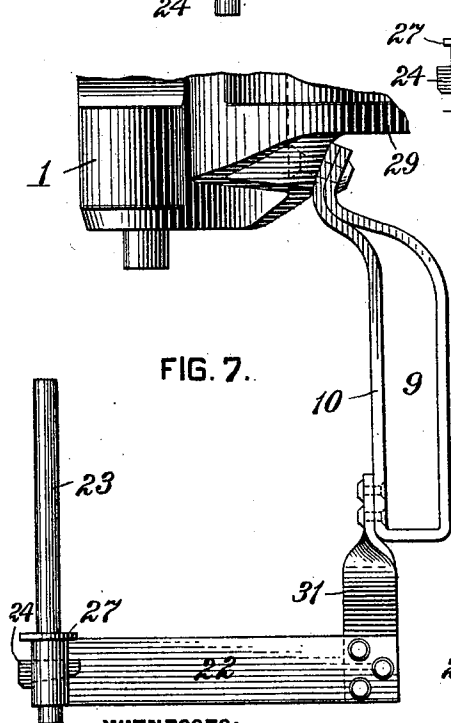
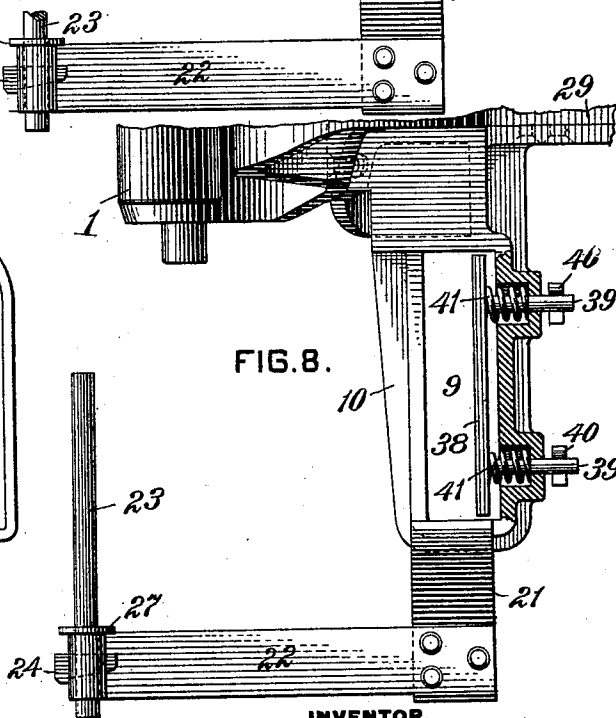


FIG. 8.



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UNITED STATES PATENT OFFICE.

NICHOLAS F. NIEDERLANDER; OF ST. LOUIS, MISSOURI.

AUTOMATIC PIPE-COUPLING.

SPECIFICATION forming part of Letters Patent No. 582,672, dated May 18, 1897.

Application filed December 10, 1895. Serial No. 571,622. (No model.)

To all whom it may concern:

Be it known that I, NICHOLAS F. NIEDERLANDER, a citizen of the United States, residing at St. Louis, in the State of Missouri, have
5 invented and discovered a certain new and useful Improvement in Automatic Pipe-Couplings, of which improvement the following is a specification.

The object of my invention is to provide
10 effective and desirable means for automatically coupling the ends of two or more sections of pipe located on adjacent cars in a railway-train; and to this end it consists, generally stated, in the combination, with the half-sections or shoes of an automatic pipe-coupling,
15 each of which is located on the end of a car, of means whereby the separation or relative movement of the half-sections when coupled is prevented, except by such a separation of
20 the cars as may occur when the cars are uncoupled or break apart.

It further consists in improved means for supporting, guiding, and permitting the necessary movements of the half-sections in the
25 act of coupling and of the coupling device as a whole when the two half-sections are coupled together and the train is in motion; and it still further consists in certain combinations and features of construction, all as
30 hereinafter fully set forth.

In the accompanying drawings, which illustrate applications of my invention, Figure 1 is a side elevation of a half-section of an automatic pipe-coupling provided with my improvement and shown in combination with
35 one form of my improved supporting and guiding device which is secured to the under side of an automatic car-coupling; Fig. 2, an elevation, on an enlarged scale, of the face of
40 one of the half-sections or shoes of an automatic pipe-coupling provided with my improvement; Fig. 3, a plan view of an automatic coupling device provided with my improvement, the two half-sections of the coupling
45 device being shown coupled together; Fig. 3^a, a plan view of a part of one of the shoes; Fig. 4, a plan view similar to Fig. 3, showing a modification of my improvement; Fig. 5, a side elevation of a half-section of an automatic pipe-coupling similar to that shown in
50 Fig. 1, but provided with a preferred form of

hanger or means for supporting and guiding the half-section or shoe of the coupling device; and Figs. 6, 7, and 8, side elevations showing modifications of the hanger or means
55 for guiding and supporting the half-section or shoe of the coupling device.

In Fig. 1 of the drawings is shown one member of an ordinary car-coupling 1, from which is supported one of the members or half-sections 2 of an automatic pipe-coupling provided with my improvement. Each of the half-sections 2 and 3 of the pipe-coupling, as shown in Figs. 2, 3, and 4, is a duplicate of the other and consists of a casting or shoe
65 with passages 4 formed through it, which are adapted to be connected with the sections of pipe on a car by means of the nozzles 5, and which are adapted to register with and open into one another when the two faces of the
70 half-sections are in engagement and the two parts are coupled together. In the drawings I have shown two such openings through each of the half-sections, one of which may connect with the train-pipe of the air-brake system and the other with the signal train-pipe or with the pipe of the steam-heating system; but, if desired, one only may be employed, or an opening may be provided for each of the train-pipes of the air-brake, signal, and
80 heating systems.

Each of the passages, where it opens through the face of the coupling, is provided with a gasket or packing 6, of suitable material, which when the half-sections are coupled together engages with and is pressed against a similar gasket on the other half-section, so as to form a tight joint around the opening.

The surface 7 on the outer end portion of each of the shoes is inclined laterally outward from the central longitudinal vertical plane of the coupling and is adapted to abut against in the act of coupling and form a guide for the corresponding part on the other shoe, and as the two half-sections approach each other
90 in the act of coupling the inclined surface 7 on each shoe directs the other into the proper position for coupling.

To the inner end of each of the shoes is secured a curved spring 8, which passes through
100 the loop, slot, or opening 9 of the hanger 10, and is curved backward and laterally out-

ward in such shape that its free end 11 may act as a guide to direct the other shoe into coupling position. The back of the outer end of each of the shoes is provided with an inclined surface 12, which is adapted to slide under the bend 13 of the spring 8, which is secured to the other shoe, and the pressure of the spring 8 tends to hold the shoes together during their approach to and after they have reached the coupling position. The oppositely-inclined flanges 32, which project from the surfaces 12 on the backs of the shoes, and the free end portions of the springs 8 act to guide the shoes into the proper vertical positions relative to one another, and when the shoes are coupled the bends 13 of the springs 8 bear on flat or comparatively flat portions of the backs of the shoes, and relative movement of the shoes and of the springs and shoes in a vertical direction is prevented by the parallel portions 33 of the flanges 32.

The face of each of the half-sections or shoes of the coupling is provided with a vertical or substantially vertical tongue 14, which projects from the surface 16^a, and a groove or slot 15, extending below the surface 16, the tongue and groove being so disposed that when the two half-sections or shoes are in engagement the tongue 14 on the face of one of the shoes fits into the groove or slot 15 on the other shoe.

When the two half-sections are coupled together, the projecting edges of the gaskets 6 are in contact and lie in the same vertical plane, which is herein referred to as the central vertical longitudinal plane of the coupling. The surfaces 16 and 16^a of each of the shoes lie on opposite sides of this central plane, and the gaskets 6 project beyond the surface 16^a, but not so far as the surface 16.

As the shoes approach the coupled position in the act of coupling, the surface 16 and the tongue 14 on each shoe come in contact with and slide on the surface 16 and tongue 14 on the other shoe, and the gaskets 6 are held apart and prevented from rubbing against one another. When the openings 4 through the shoes are opposite one another, the tongue 14 on one shoe slides into the groove 15 on the other shoe, and the opposite gaskets 6 are pressed into contact with one another.

Each of the tongues 14 is provided with an inclined or beveled side 17, which engages with and is adapted to slide on an inclined or beveled side 18 of the groove 15, into which it fits, so that when the shoes are being uncoupled by a longitudinal pull, as when the two adjacent cars to which they are connected are uncoupled and separated or are broken apart, the inclined sides 17 and 18 of the tongues and grooves slide on each other and cause the faces of the shoes to move laterally apart. The object and effect of this lateral movement of the shoes is to separate the gaskets 6 from one another, and thereby to prevent them from rubbing against one another

or against the face of the opposite coupling as the half-sections or shoes are being uncoupled.

I do not broadly claim means whereby the half-sections of the coupling are held laterally away from the coupled position until the portions of the coupling which are brought into contact to form the union or joint between the pipes are in position to register with one another, nor do I broadly claim an automatic pipe-coupling comprising two half-sections or shoes provided with tongues and grooves for the purpose already set forth; but a special feature of my invention consists in the means whereby when the two half-sections or shoes are coupled together the uncoupling or separation of the shoes is prevented except by such a movement as would be caused by the separation of the cars when uncoupled.

In accordance with my invention the tongues and grooves are formed with what may be termed "non-riding" abutting surfaces, which are engaged during the lateral movement of the half-sections in the act of coupling and while the half-sections are coupled.

By means of my improvement the shoes are prevented from overrunning one another or passing one another and going beyond the coupling position, and the lateral separation of the shoes which might be effected by the swinging or turning or lateral movement of the cars or other causes is prevented.

In order to prevent any undesirable movement of the shoes relative to one another after being coupled together, I provide tongues and grooves of the form shown in Figs. 3 and 3^a, in which the tongues 14 and the grooves 15 are undercut on the sides 19 and 20, respectively, and these sides overlap one another and lock the shoes together when in the coupled position. It will be seen that with this construction the shoes cannot be moved beyond the coupled position—that is, they can have no further movement in the act of coupling than is necessary to bring the openings through the shoes into position to register with one another—and the only relative longitudinal movement of the shoes which can be effected after the shoes are coupled together is such a movement as might be effected by the separation of the cars. Such a movement would cause the shoes to be uncoupled, and it is desirable that the shoes should be uncoupled by such movement when the coupling forms a part of an air-brake system.

The overlapping of the sides 19 and 20 of the tongues and grooves prevents lateral separation of the shoes except when the shoes are being uncoupled by a longitudinal movement such as that already referred to.

While the preferred forms of the tongues and grooves are shown in Figs. 3 and 3^a, I have shown in Fig. 4 a modification in which the sides 19 of the tongues 14 and the sides 20 of the grooves 15 are perpendicular to the

surfaces 16^a and 16 of the shoes. By means of this construction longitudinal movement of the shoes relative to one another beyond the coupling position is prevented, but the form of the tongues and grooves is such that they do not offer any resistance to lateral separation of the shoes.

As shown in Figs. 1, 2, and 3, the hanger 10 is formed of rigid material and bolted or riveted to the under side of the car-coupling or draw-bar head 1 and is provided with a slot or opening 9, through which the spring 8 passes, and which is of sufficient size to permit considerable upward and downward movement of the spring therein. To the lower end or downward extension 21 of the hanger 10 is secured one end of a flat plate-spring 22, which at its outer end is secured to a vertical guide, rod, or pin 23 by means of a key or pin 24. The pin 23 passes through an opening 25, formed through the back part of the shoe of the pipe-coupling and through an extension 26 thereon, and forms a guide which tends to hold the shoe in its normal position—that is, in the proper position to engage and couple with a corresponding shoe on the next car. The extension 26 of the shoe is adapted to rest on a collar or shoulder 27 on the pin 23, which serves as a support for the shoe. The length of the guide or pin 23 and of the extension 26 is such as to permit the full upward and downward movement of the shoe without permitting the shoe to be disengaged from the pin, and the size of the opening 25 is in a direction parallel to the face of the shoe is such as to permit the desired longitudinal movement of the shoe relative to the pin. The breadth of the opening 25 is, however, only slightly greater than the diameter of the pin 23, so that the shoe can have only a slight lateral movement relative to the pin 23, and any greater lateral movement of the shoe is permitted only by the yielding of the spring 22, which tends always to return the shoe to its central position. The connection of the shoe and pin is such as to permit whatever angular movement may be necessary in coupling the shoes.

The curved spring which is secured to each of the shoes and passes through the opening in the hanger has heretofore been employed only for the purpose of guiding the other shoe into position and pressing the two shoes together when in the act of coupling and when coupled together, and its form has been such that it permitted no backward yielding of the shoe to which it was secured when the spring was in contact with the back portion of the hanger. As shown in Figs. 3 and 4, I provide the spring 8 with a straight or comparatively straight portion of considerable length, which is adapted to bear against the back portion of the hanger when the shoe is moved inwardly, the formation of the back portion and side of the spring being such that inward pressure on the shoe when the spring bears

against the back of the hanger 10 will cause the spring to yield, and thereby prevent the shocks that might be caused by the sudden impact of the spring against the hanger. On account of the great force with which the cars sometimes come together it is important that the action of the spring or other connecting part on the hanger or support should not be such as to produce shocks or cause damage to any of the parts, and in order to avoid such shock or damage and to give greater flexibility and elasticity to the coupling device as a whole, in addition to the backwardly-yielding spring 8, I prefer to employ an elastic yielding hanger 10, such as is shown in Figs. 5, 6, 7, and 8 of the drawings.

The preferred form of hanger, which is shown in Fig. 5, consists of a flat spring which is bent to form a loop through which the spring 8 passes and which has one end fixed to the car-coupling and its other end 28 free to move. The end 28 is bent so as to fit under the draw-bar 29 and between the draw-bar and its stirrup or support 30. The flat straight spring 22, which carries the pin 23, is secured to the lower end of a suspension-piece 31, which at its upper end is secured to the hanger 10.

In Fig. 6 I have shown a construction in which the hanger 10 is made of rigid material with a slot or opening 9 through which the spring 8 passes and in which the spring 8 may move upward and downward. The hanger 10 is in this instance pivoted to a bracket 34, which is fixed to the car-coupling, and an extension 35 on the upper end of the hanger is adapted to bear on the bracket when the hanger is in a substantially vertical position and to limit the outward movement of the hanger. An arm 36 projects inwardly from the upper end of the hanger and forms a seat for a spring 37, which bears at its upper end against the draw-bar 29. The spring 37 offers a yielding resistance to the inward movement of the hanger 10 when it is acted on by the inward movement of the shoe and spring 8, and the spring 37 also tends to return the hanger to a vertical position. The flat spring 22, which carries the rod or pin 23, is secured to a downward extension 21 of the hanger 10.

In Fig. 7 I have shown a construction in which the hanger consists of a spring 10, which is doubled back so as to form the opening 9 for the spring 8 and which has both ends secured to the car-coupling. The suspension-piece 31, spring 22, and rod or pin 23 are secured as in Fig. 5.

The construction shown in Fig. 8 resembles that shown in Fig. 1 in that the hanger 10 is composed of rigid material, which is rigidly secured to the car-coupling and draw-bar, and the spring 22, which carries the rod or pin 23, is secured to an extension 21 of the hanger. In Fig. 8 I provide, in addition to the construction shown in Fig. 1, a yielding plate 38, located in the back part of the opening 9 and against which the spring 8 bears when the

coupling-shoe is moved inwardly. Rods or pins 39 are secured to the plate 38 and pass through openings in the back part of the rigid hanger, their outer ends being provided with keys 40 or other means for limiting their movement in one direction. Between the plate 38 and the back of the hanger and surrounding the rods or pins 39 are springs 41, which offer a yielding resistance when the plate 38 is pressed by the spring 8.

I claim as my invention and desire to secure by Letters Patent—

1. In an automatic pipe-coupling, the combination, with two half-sections, which are adapted to be coupled together by a longitudinal movement when the half-sections are engaged, and by a lateral movement relative to one another at the end of the longitudinal movement, of means for holding the half-sections laterally apart during the longitudinal movement until the openings through the half-sections are in position to register by a lateral movement, and non-riding abutting surfaces which are engaged when the half-sections are coupled for preventing relative movement of the half-sections beyond the coupling position, substantially as set forth.

2. In a pipe-coupling, the combination, with two half-sections, which are adapted to be coupled together by a longitudinal movement, and a lateral movement relative to one another at the end of the longitudinal movement, of means for holding the half-sections laterally apart until the longitudinal movement is completed, and non-riding abutting surfaces which are adapted to be engaged when the half-sections are coupled for locking the half-sections together to prevent longitudinal movement of the half-sections, relative to one another, beyond the coupling position, substantially as set forth.

3. In a pipe-coupling, the combination, with two half-sections, which are adapted to be coupled together by a longitudinal movement, and a lateral movement relative to one another at the end of the longitudinal movement, of means for holding the half-sections laterally apart in the act of coupling, and means for locking the half-sections together when in the coupled position to prevent lateral movement of the half-sections, substantially as set forth.

4. In a pipe-coupling, the combination, with two half-sections, which are adapted to be coupled together by a longitudinal and lateral movement relative to one another, of a tongue and groove on the face of each half-section which is adapted to engage with a similar tongue and groove on the other half-section, the tongues and grooves being so formed as to overlap one another and lock the two half-sections together as they approach one another by a lateral movement and to prevent relative movement of the half-sections beyond the coupling position, substantially as set forth.

5. In an automatic pipe-coupling, the combination, with two half-sections which are adapted to be coupled together, of a tongue formed on the face of each half-section which is adapted to engage with a groove on the other half-section, the tongues and grooves being so formed that their sides overlap when the sections are brought together into the coupled position by a longitudinal and lateral movement only and thereby lock the two half-sections together so as to prevent lateral movement apart of the half-sections, substantially as set forth.

6. In a pipe-coupling, the combination, with two half-sections, which are adapted to be coupled together by a longitudinal and lateral movement relative to one another, of a tongue on each half-section which is adapted to bear on the face of the other half-section for holding the two half-sections laterally apart until the longitudinal movement is completed, and a groove formed in each half-section into which the tongue on the other half-section is adapted to fit, the tongues and grooves being formed with overlapping portions so as to interlock with one another by a longitudinal and lateral movement and prevent lateral or longitudinal movement of the half-sections relatively to one another except when they are moved longitudinally in the proper direction for uncoupling, substantially as set forth.

7. In an automatic pipe-coupling, the combination, with a half-section, or shoe, of a hanger, or support, a spring secured to the hanger and forming a support for the half-section, or shoe, and a rod, or pin, on the outer end of the spring which passes through the hanger, or shoe, and forms a guide therefor, substantially as set forth.

8. In an automatic pipe-coupling, the combination, with a half-section, or shoe, of a spring secured to the shoe and adapted to engage with a similar half-section, or shoe, a hanger, or support, an opening in the hanger through which the spring on the shoe passes, and a spring secured at one end to the hanger and at its other end loosely connected to the half-section or shoe, substantially as set forth.

9. In an automatic pipe-coupling, the combination, with a half-section, or shoe, of a hanger, or support, a spring secured to the hanger which is adapted to support, and to offer an elastic yielding resistance to lateral movement of the half-section, or shoe, and a guide, rod, or pin, secured to the spring and passing through an opening in the half-section, or shoe, the opening through the shoe being so formed as to permit longitudinal or angular movement of the shoe relative to the spring and guide, substantially as set forth.

10. In an automatic pipe-coupling device, the combination, with a half-section of the coupling device, of a vertical elastic hanger with which the half-section is loosely connected in such a manner as to permit a free

vertical and longitudinal movement of the connecting portion of the half-section relative to the hanger within certain limits, and which is adapted to yield longitudinally, when
5 acted on by a movement of the half-section beyond the limit of the free movement, substantially as set forth.

11. In an automatic pipe-coupling device, the combination, with a half-section of the
10 coupling device, of a spring attached to the half-section, and a vertical elastic hanger, to which the half-section is loosely connected by means of the spring, and which is adapted to yield when acted on by a longitudinal
15 movement of the half-section, substantially as set forth.

12. In an automatic pipe-coupling device, the combination, with a half-section, or shoe,
20 of a spring secured to the shoe and adapted to engage with a similar half-section, or shoe, a

vertical elastic hanger, and an opening in the hanger through which the spring passes, the hanger being adapted to yield and offer an elastic resistance to inward movement of the shoe and spring, substantially as set forth. 25

13. In an automatic pipe-coupling device, the combination, with a half-section, or shoe, of a vertical elastic or spring hanger, a spring secured to the shoe and passing through an opening in the hanger, and a spring secured
30 to the hanger and provided with a guide, rod, or pin, which is loosely connected with the shoe, substantially as set forth.

In testimony whereof I have hereunto set my hand.

NICHOLAS F. NIEDERLANDER.

Witnesses:

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T. J. HOGAN.