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PATENTED JULY 10, 1906.

W. W. CARPENTER.
CONDUIT COUPLING.

APPLICATION FILED NOV. 28, 1905.

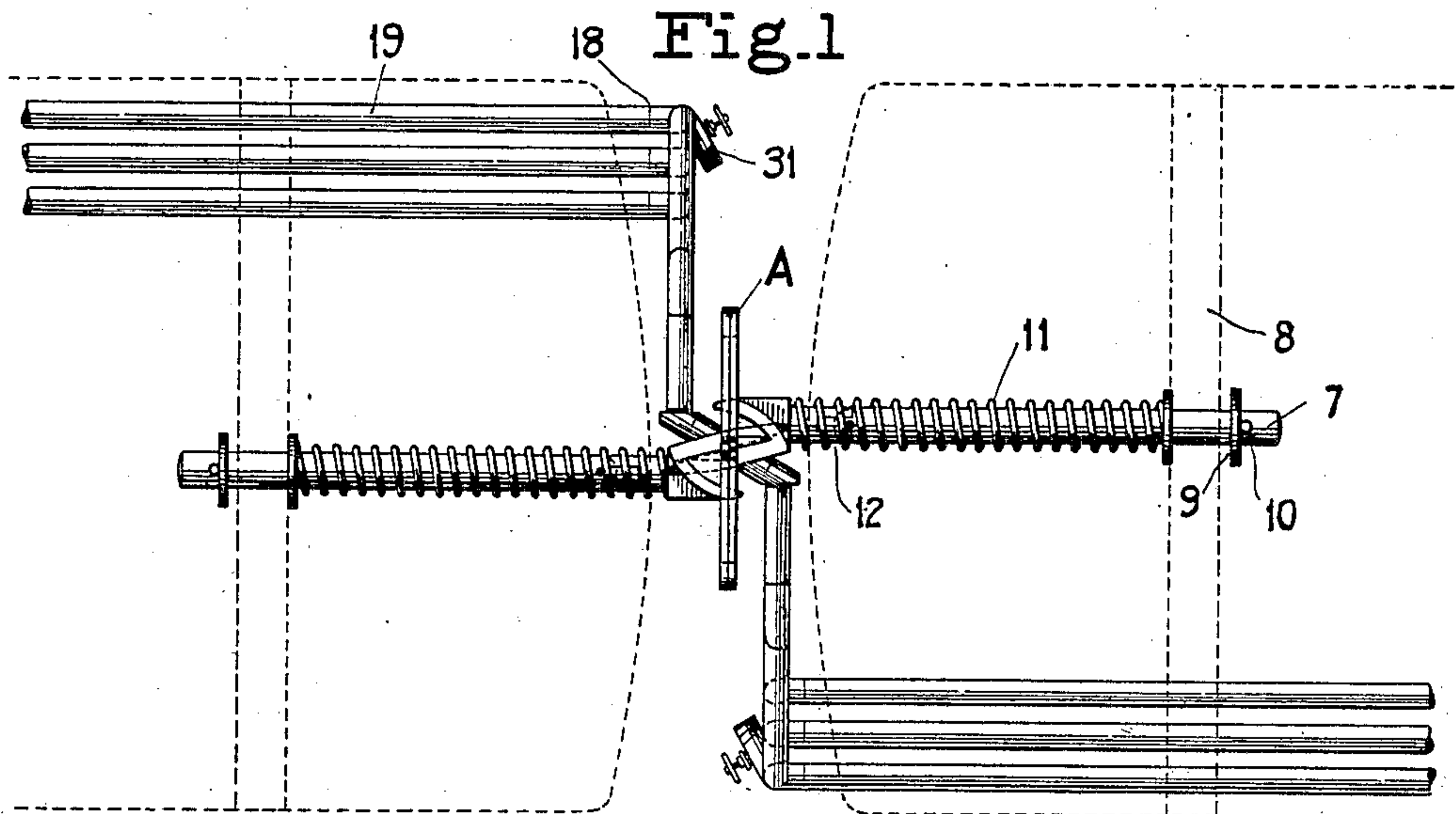


Fig. 2

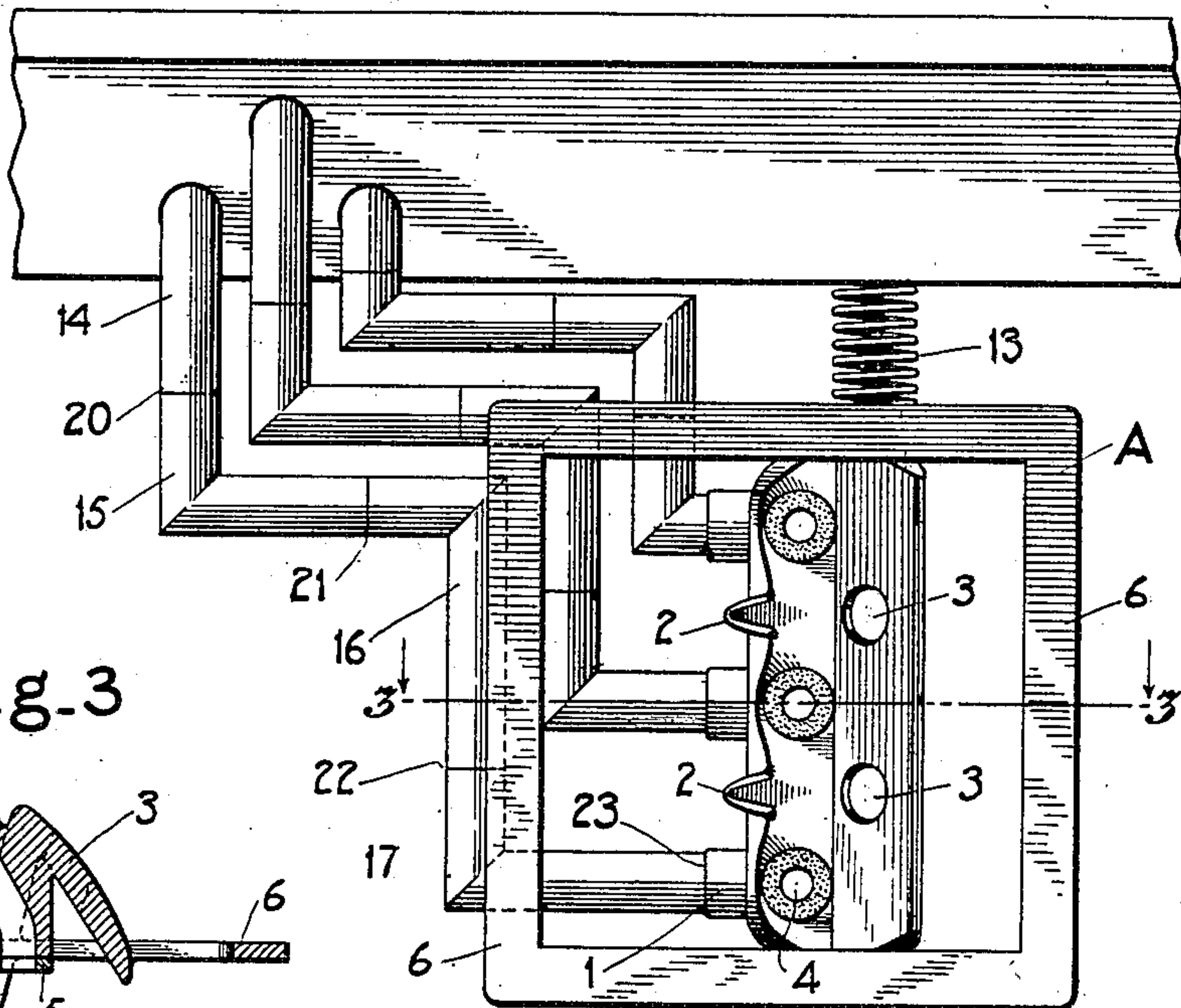


Fig. 3

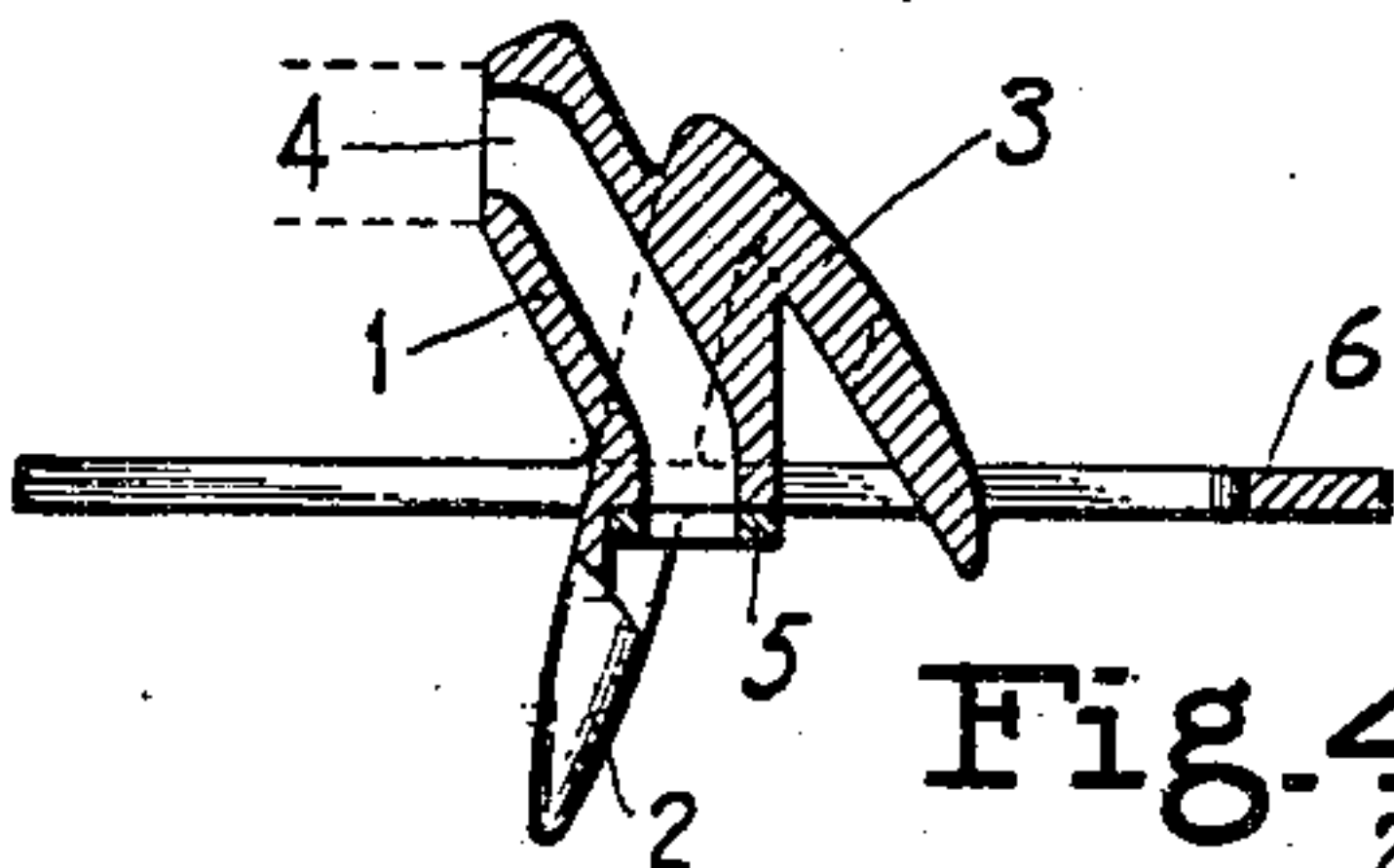


Fig. 4

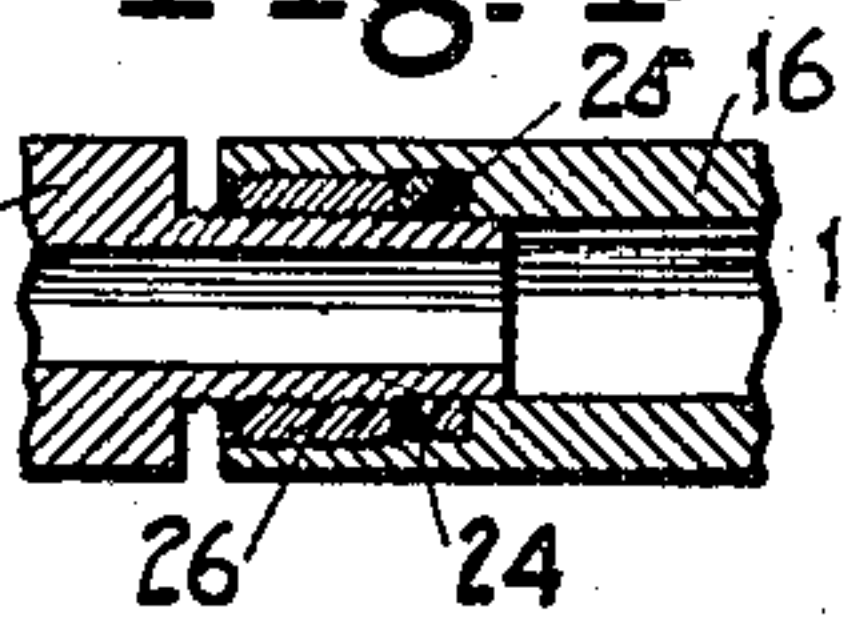


Fig. 5

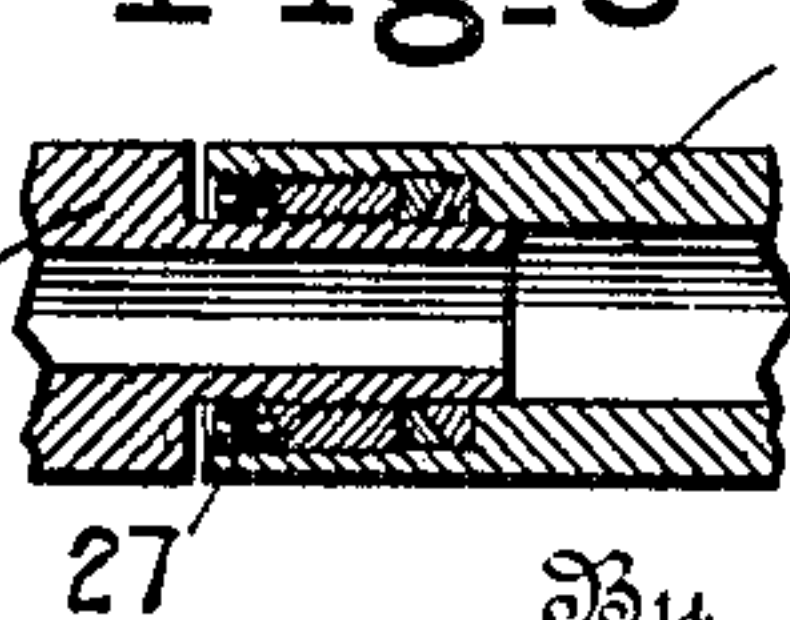
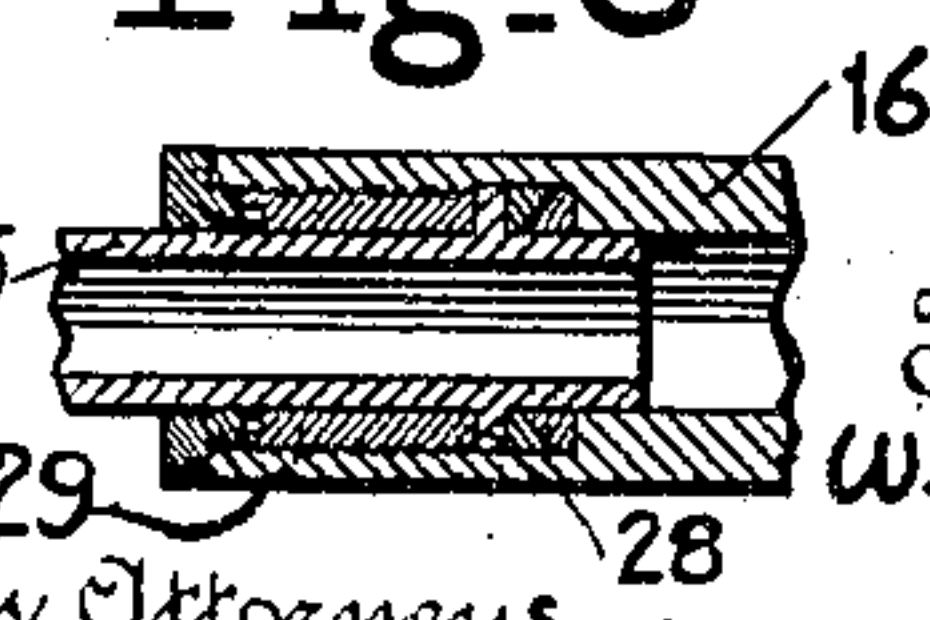


Fig. 6



Witnesses
Chas. Clagett
J. C. Ripley

By his Attorneys

Inventor
W. W. Carpenter
Warfield & Duell

UNITED STATES PATENT OFFICE.

WALLACE WICKHAM CARPENTER, OF PORT JERVIS, NEW YORK.

CONDUIT-COUPLING.

No. 825,583.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed November 28, 1905. Serial No. 289,398.

To all whom it may concern:

Be it known that I, WALLACE WICKHAM CARPENTER, residing at Port Jervis, in the county of Orange and State of New York, have invented certain new and useful Improvements in Conduit-Couplers, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in means for connecting conduits—such as for fluids, gases, electric currents, and the like—but more particularly it concerns an automatic connection between the various units of a train or other vehicle of transportation.

Heretofore resort has been had to connections comprising tubular lengths of highly-elastic material, such as india-rubber or the like; but in usage such expedients have occasioned much trouble and annoyance, inasmuch as they rapidly deteriorate and become unfit for service. Furthermore such tubular lengths have been provided with manually-operable unions, and as a result the coupling of cars is necessarily attended with delays incident to the time required in manually making such connection. Moreover, this operation is fraught with no little danger to the trainmen, and as a result accidents are not infrequent.

This invention has in view, among other objects, the provision of a means which will automatically establish a continuity of flow between the train-pipes of coupled cars by the mere act of so connecting the same.

Another object of this invention is to eliminate rubber connectors and the like and substitute in lieu thereof a peculiar flexible connection which will possess a great permanency in service.

Another object of this invention is to provide a means for suitably positioning upon cars the aforesaid construction, whereby the abutting parts are always in a corresponding registry with those upon an adjacent car.

Other objects and advantages of this invention will be in part obvious and in part pointed out.

With these and other ends in view this invention accordingly consists in the features of construction, combinations of parts, and arrangement of elements hereinafter disclosed in detail as one exemplification of the underlying principles involved in the invention.

That this invention may be more fully understood and made comprehensible to others skilled in its relating arts, there is appended as a part of this specification drawings illustrating one embodiment of the same, and while it will be apparent that the invention may readily be otherwise applied by modifications falling within the scope of the claims the herein-stated form is that which it is preferable to employ in practice and which is regarded as an improvement over such implied variations of the same as aforesaid.

Upon now making reference to such drawings through the instrumentality of suitable characters designating features thereof it will be noted that like characters denote corresponding parts throughout all of the figures, of which—

Figure 1 is a bottom plan view of the invention, showing the position occupied by the parts when adjacent cars embodying the same are coupled in the usual manner. Fig. 2 is an end view, in vertical elevation, showing the staggered arrangement of the flexible connection and also certain details of the terminal or union for the conduits. Fig. 3 is a cross-section taken on a horizontal plane intersecting along line 3 3 and looking in the direction of the arrows shown adjacent the ends of such line. Fig. 4 is a section of one form of union between the short sections of piping which may be resorted to. Fig. 5 is a section showing a slight modification over that illustrated by Fig. 4. Fig. 6 is a similar section of another form of union.

In carrying out this invention a self-registering union for the conduits is employed. The herein-shown embodiment of this feature is set forth in Figs. 1 to 3, inclusive, and lettered A. Such union comprises two peculiarly-constructed conduit-terminals carried by respective cars. The body portion of such terminal is designated by 1 and comprises a number of projecting prongs 2 and corresponding recesses 3 for the reception of the prongs on the companion terminal. Such body portion may also be of a V shape, as shown, in order that guiding-surfaces may be provided for assisting in preliminarily bringing the interfitting prongs and recesses together. An orifice 4 provides for the passage of fluid in the conduit, and such orifice preferably terminates in a suitably-bushed seat 5, which preferably is parallel with the end of the car in order that corresponding seats will be in normal contact and the full

pressure therebetween efficiently exerted to maintain a complete closure of the joint.

The aforesaid body portion and the features thereof will insure a perfect alinement and registry with a mate; but as the union is
5 subject to bending forces—as, for example, when the cars carrying the same are rounding a curve—it is advisable that some provision be made to maintain the normal relation be-
10 tween the united terminals of the union. To this end I provide abutting plates 6, which laterally extend a sufficient distance to the sides of the terminals. It will be understood in this connection that flexible connections
15 are provided between the stationary conduits carried upon the cars and the union in order that the latter may have a free movement with respect to the cars, and thereby accommodate itself to the shifting of such
20 cars while in transit.

The means whereby each terminal of the union is carried by an appropriate car in such a manner that a tight union will be insured between coupled cars without inter-
25 fering with the relative movement therebetween may now be considered. A rod 7 extends through a suitable beam or other car member 8 and has its forward movement limited by means of a suitable stop, which may
30 consist of a washer 9, held in place by a pin or other member 10, although it will be of course understood that various known equivalents may be resorted to for the same purpose. Such rod is normally retained in a
35 forward position with said stop in tight abutment by means of a spring 11, which is here shown as being expansile and bearing at its ends, respectively, upon the aforesaid car
40 member 8 and the outer end of rod 7. A convenient arrangement is that shown in Fig. 1, in which the spring convolutes directly around the rod itself and is positioned there-
by. It will be seen that such rod 7 may be retreated by a pressure upon the end thereof
45 which carries a terminal for the conduit, such motion being elastically opposed by said spring. It may here be mentioned that the normal position of such rod is in a forward direction and slightly beyond that occupied
50 by the same when pressed back through the abutment of the terminals in coupled cars. This supporting member or yielding rod is not too tightly mounted in the car member 8 to prevent the outer end of such rod from
55 swinging a distance corresponding to the lateral displacement of cars while in transit; but it may be stated that the extent of such play does not in practice exceed more than a few inches and is caused mainly by the shifting
60 of cars within the limits restricted by the tread of the wheels.

The terminal-supporting member 11 is also preferably hinged at a short distance to the rear of its end, as shown by 12, to provide for
65 a bending of the same within a horizontal

plane, so that the union may freely take up a median position when the cars are rounding curves. It will be clear that because of the wings 6, hereinbefore referred to, such union
will not open during this movement, being 70 maintained in a closed position by the pressure of the springs. In order that a suitable vertical position of the terminals may be normally preserved, a yielding member 13, which is here shown as a spring, may be provided. 75
Such spring 13 is affixed at its ends to the car-body and the terminal, respectively, and while normally maintaining the latter in a predetermined position also permits the same to have a vertical shift either up or down 80 within definite limits. This construction thus accommodates for any unevenness of track or slight variations in the height of the terminals on diverse cars.

It is obvious that a flexible connection 85 must be provided between the fixed conduits which are mounted securely upon the cars and the aforesaid union. This invention contemplates a means for this purpose which while allowing movement of the union in any 90 direction affords a durable, efficient, and inexpensive substitute for the heretofore-employed rubber pipes. This feature of the invention broadly consists in the use of a plu- 95
rality of short pipe-sections, which are pivotally joined to one another in a fluid-tight manner, such sections being numbered 14, 15, 16, and 17, respectively. Each section is preferably in the form of a bend or elbow with the ends parallel to planes perpendicu- 100
lar to one another. Section 14 is thus shown pivoted at 18 in a vertical plane to the corresponding stationary conduit 19, which is stationarily mounted upon and carried by the car. Accordingly such section 14 is free 105
to swing in a vertical plane. Section 15 is joined in a horizontal plane at 20 to section 14 and with respect to said section may freely swing in a horizontal plane and with respect to conduit 19 may swing in a vertical 110
plane, section 14 swinging therewith in the latter case. The other end of section 15 is pivoted in a plane normal to each of the aforesaid planes at a point 21, which joins it to the companion section 16, and similarly 115
16 is pivoted at 22 to section 17, which at a point 23 is pivotally joined to the body portion 1 of the terminal. It will thus be seen that through the instrumentality of these various joints and sections the terminal has a 120
perfectly free range of movement. The sections may be, if desired, relatively positioned by means of yielding supports comprising springs, and other incidentals of this nature might be resorted to. 125

In order that the joints between the various sections will be fluid-tight, it is desirable to provide them with a packing means which may be adjusted from time to time to take up wear and looseness in the same. I have 130

devised for this purpose an expedient which is broadly shown by Fig. 4 and in which sections, such as 15 and 16, are provided to telescope the one within the other. A channel is provided in the outer section, and within such channel is placed packing-rings 24 and 25, such packing-rings being conical in contour and overlapping one another, so that when pressed together they will be expanded in cross-section and brought to bear with any desired degree of tightness upon the telescoping portion of pipe 15. While I have shown such telescoping portion as being a reduction of a pipe-section 15 corresponding in external diameter to section 16, nevertheless it will be apparent that a pipe of lesser external diameter may be employed, and such pipe may without any reduction extend telescopically into section 16, if so desired. I have shown several modes of expanding the packing-rings to tighten the joint. Thus in Fig. 4 a nut 26 is screw-threaded similarly to each of the telescoping sections and serves not only to retain such sections against withdrawal, but also may be screwed home against the packing-ring by means of a suitable spanner or other wrench. In the modification shown in Fig. 5 I have illustrated an auxiliary lock-nut 27, which may be employed to keep nut 26 from working loose. In Fig. 6 section 15 is shown provided with a shoulder 28, which directly bears against said packing-ring, such shoulder being either integral with said section 15 or affixed to the same in any suitable manner. A nut 29 is screw-threaded externally to section 15 and may be turned to abut the aforesaid shoulder and press the same against the expansible packing-ring, and to securely position such nut a lock-nut 30, which may have its periphery lying flush with the exterior of the joined sections, may be introduced. It will be appreciated that any one of these joints will afford a free turning yet fluid-tight connection between the sections.

From the foregoing it will be seen that this invention is one well adapted to attain the objects and ends set forth and that the resultant structure may be applied to transportation units in divers ways, with the result that the conduits carried by such units are automatically coupled in a fluid-tight connection by the mere act of mechanically connecting such units together for traction purposes. The necessity of resorting to manual adjustments is entirely obviated, and as the parts may all be made of metal the utmost durability in service is had as a necessary consequence. In some cases it will be found that a car embodying my invention might be required to be coupled to a car still fitted up in the old manner, and to this end and until the present system has been universally adopted it may be expedient to provide a cock 31, to which may be attached the hose or other

connection heretofore employed. This matter of convenience may be dispensed with, according to circumstances. While I have described the invention as applicable to a single conduit, I have shown on the drawings a plurality of such conduits in order that separate courses may be provided for air, to operate brakes, gas for lighting purposes, and, if also wished, an additional pipe for operating the whistle usually located upon a train unit.

In carrying out this invention some parts might be employed without others, and new features thereof might be combined with elements old to the art without affecting a departure from the underlying principles involved in the same, although the herein-described type is regarded as being a substantial improvement over such obvious or implied variations or rearrangements.

Since many changes, such as might appear to be widely different from this invention upon a cursory inspection, could be made in the above construction and many embodiments other than shown might be made without departing either from the spirit or the scope thereof, I propose that all matter contained in the foregoing description or illustrated in the accompanying drawings shall be interpreted merely in an illustrative and not in a limiting sense. Furthermore, I desire it to be understood that the language in the following claims is intended to cover all the generic and specific features of this invention and all statements of the scope thereof which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a car construction, a self-registering union for fluid-pressure conduits comprising coacting terminals of like construction each having projections and corresponding recesses and having transversely-extending wings, rods mounted upon a car and carrying a terminal, said rods being hinged adjacent their ends whereby they may yield horizontally, and a spring normally maintaining said rods and terminals carried thereby in an advanced position whereby, upon coupling cars, corresponding terminals will abut and elastically yield and be maintained in fluid-tight union.

2. In a car construction, companion conduit-terminals symmetrically disposed upon car ends, said terminals consisting each of a V-shaped body portion having similarly-disposed projections and depressions and provided with a transversely-extending abutment-plate for maintaining said terminals in a normal relation, a retractile member extending to the rear from said terminals and slidably carried by said cars and hinged intermediate its ends to provide for motion be-

tween said cars, and contractile springs normally advancing said members and terminals carried thereby to effect a closure between said conduits.

5 3. In a car construction, a pair of coupled cars, conduits stationarily mounted thereon, a self-registering union therefor comprising terminals consisting of a V-shaped body portion having similar depressions and projec-
10 tions and provided with a transversely-extending abutment-plate for maintaining said terminals in registry, a flexible connection for establishing continuity of flow from said conduits through said union comprising a
15 plurality of tubular sections interlinked in fluid-tight, movable jointure whereby said union may be translated with predetermined limits and may be rotated about a vertical axis, and expansile means carried by said
20 cars and adapted to longitudinally yield and laterally bind end means of said cars.

4. In a car construction, a pair of coupled cars, conduits stationarily mounted thereon, a self-registering union for said conduits com-
25 prising terminals provided with matching faces having projections adapted to interfit with corresponding recesses to insure registry and having transversely-extending wings to preserve alinement, a flexible connection

establishing continuity of flow between said 30 conduits through said union, said connection comprising a plurality of tubular elbow-sections revolubly jointed to rotate about axes lying perpendicularly to each other whereby said union may be translated within prede- 35 termined limits and may be rotated about a vertical axis, and members carried by said cars and supporting said terminals, said members being hinged adjacent said terminals and having a spring means for normally 40 maintaining them in fluid-tight contact.

5. In a car construction, the combination of conduit-terminals symmetrically disposed upon cars, each of said terminals being provided with a body portion having a pair of 45 plates disposed in angular relation thereon, one of said plates being provided with projections and the other thereof with depressions which coact with similarly-disposed projections and depressions upon the angularly- 50 disposed plates of the other terminal.

In testimony whereof I affix my signature in the presence of two witnesses.

WALLACE WICKHAM CARPENTER.

Witnesses:

ALBERT F. NATHAN,
J. CLYDE RIPLEY.