

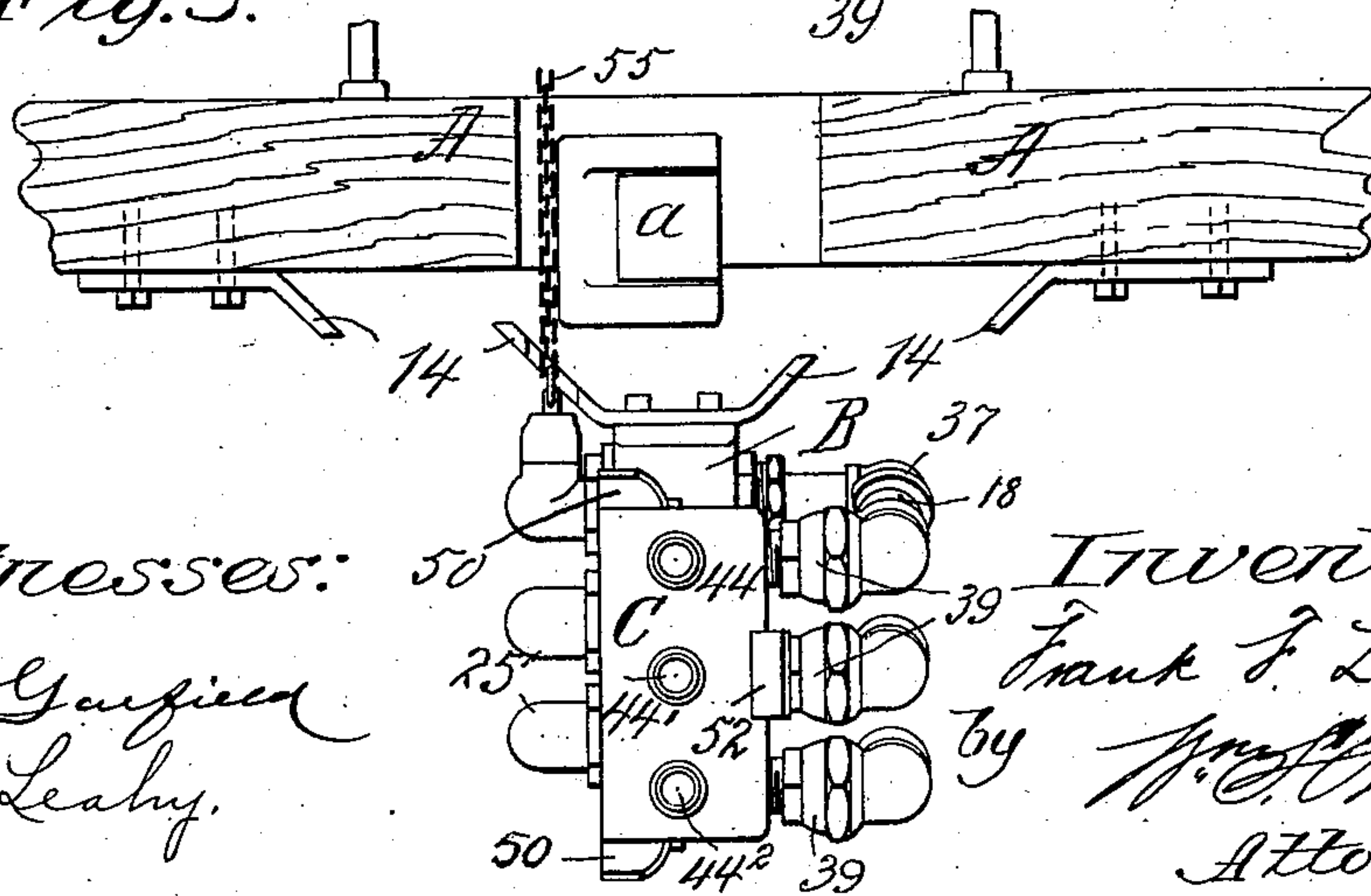
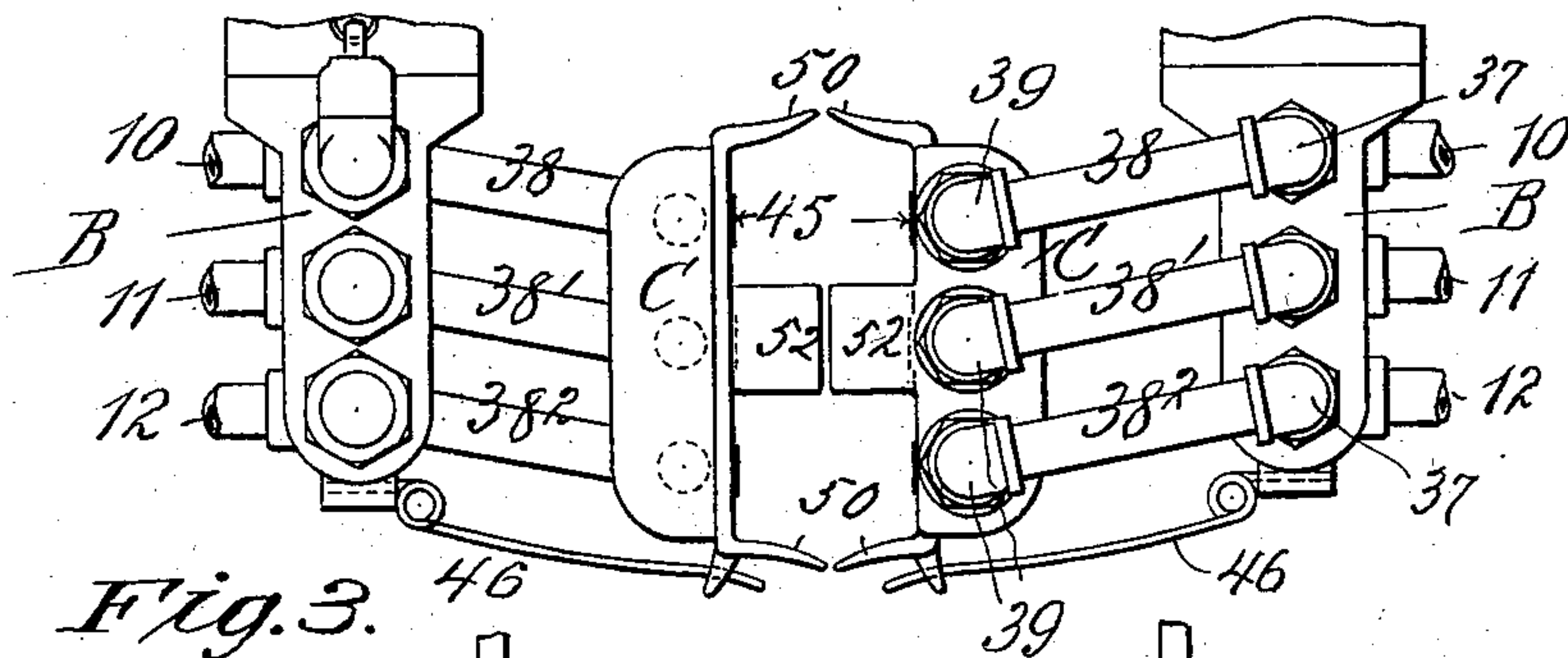
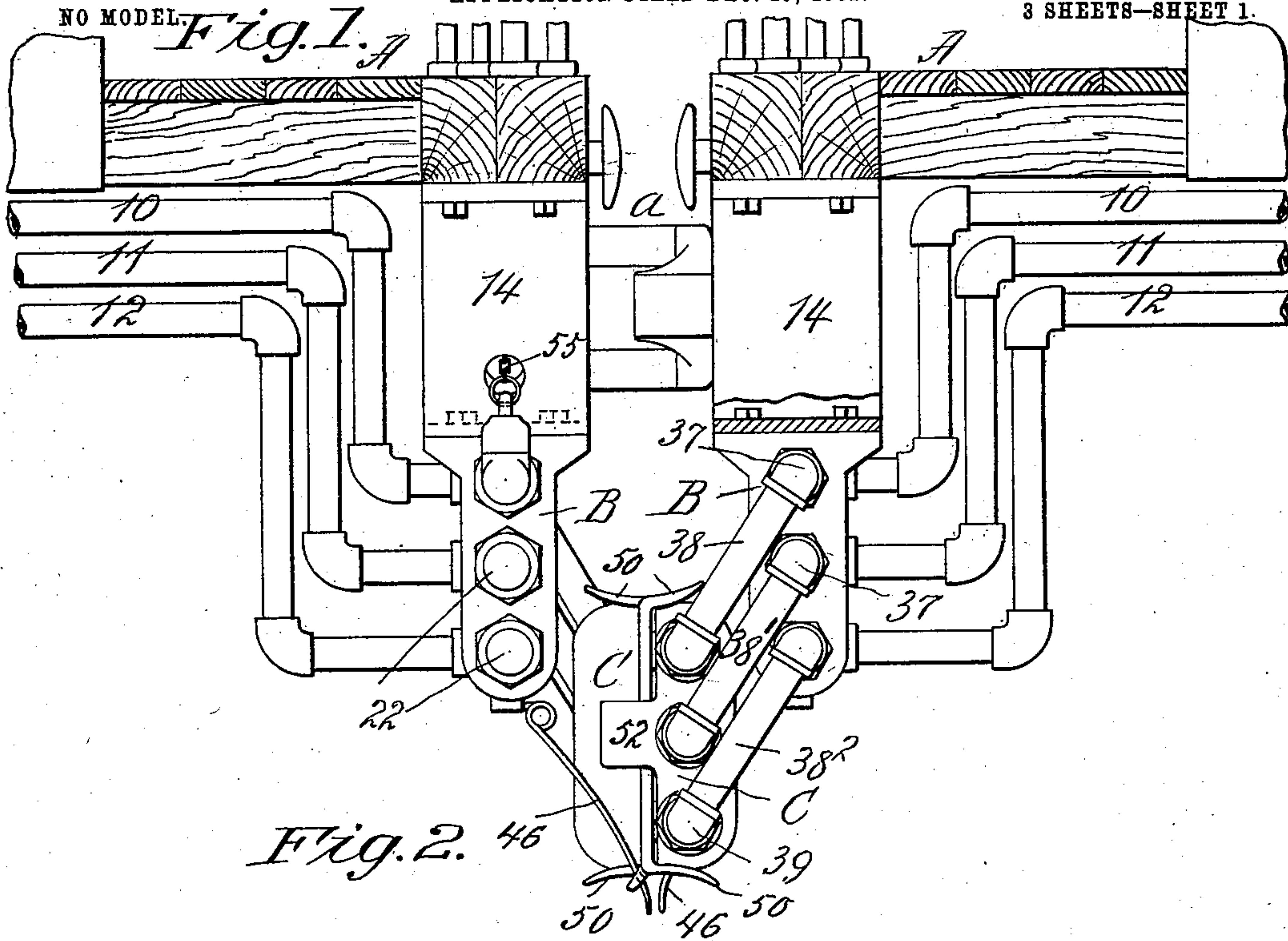
F. F. LIPPS.

AUTOMATIC COUPLING FOR STEAM, AIR, OR OTHER PIPES OF RAILWAY CARS.

APPLICATION FILED DEC. 19, 1902.

3 SHEETS—SHEET 1.

NO MODEL.



Witnesses:

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A. V. Leahy.

Inventor:

Frank F. Lipps
by J. C. Bellm
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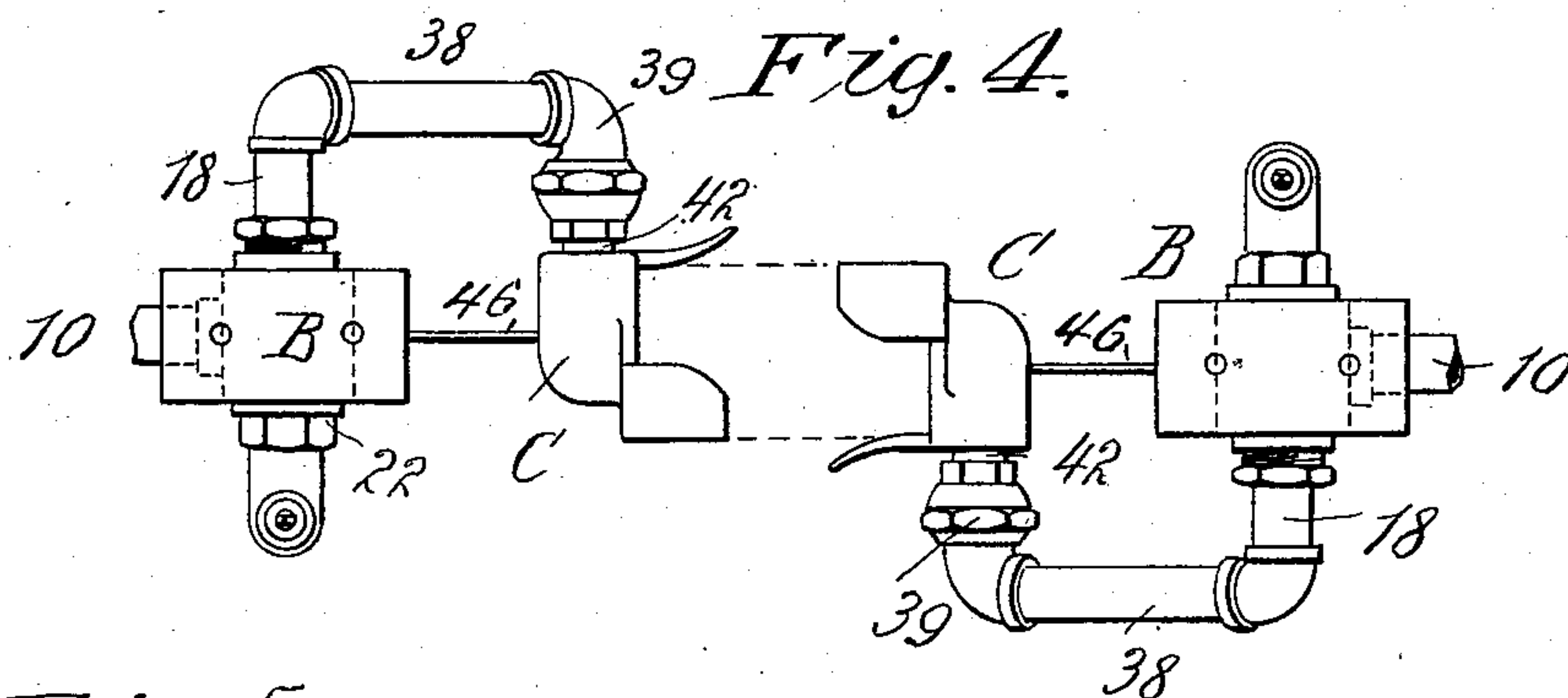
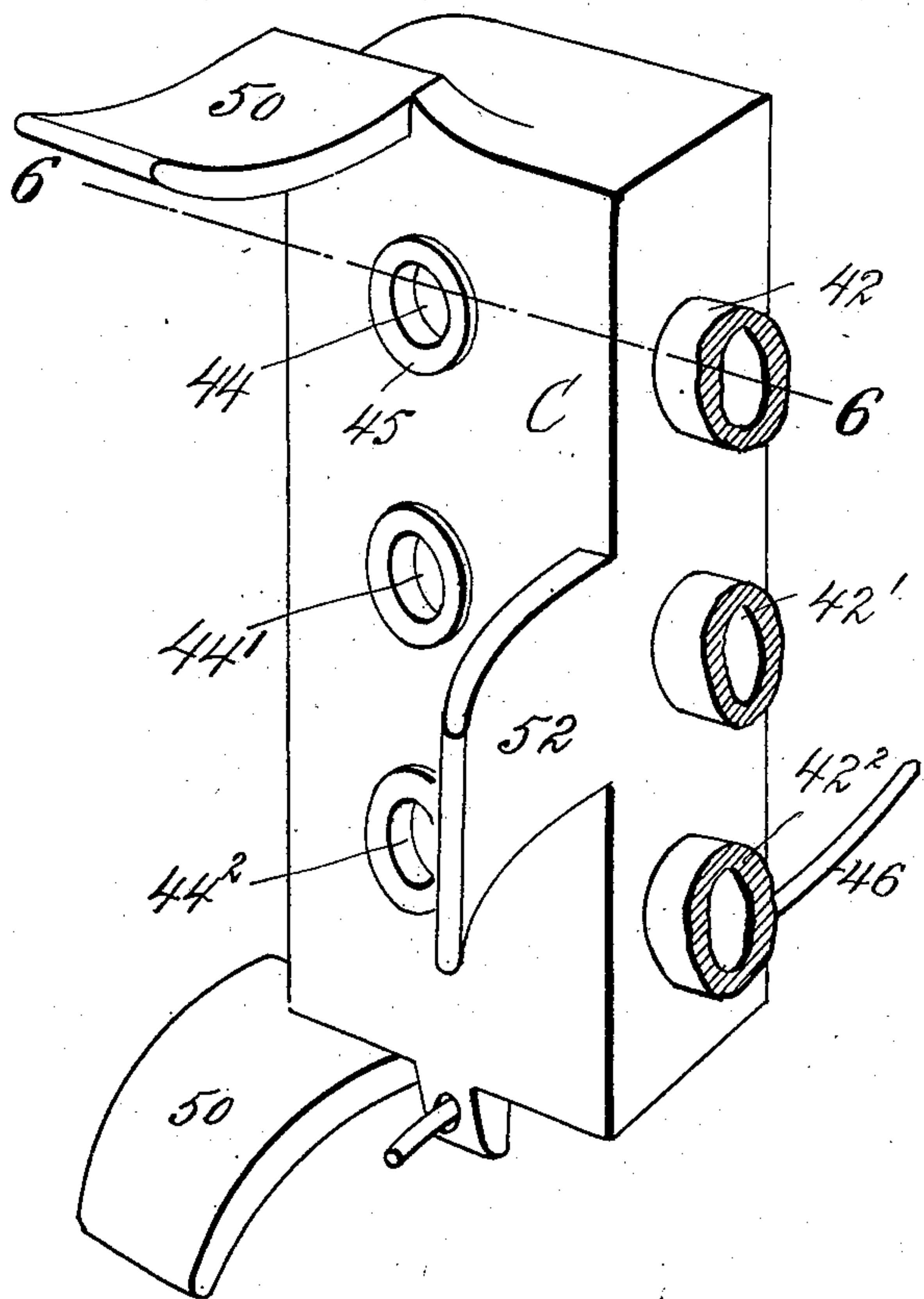
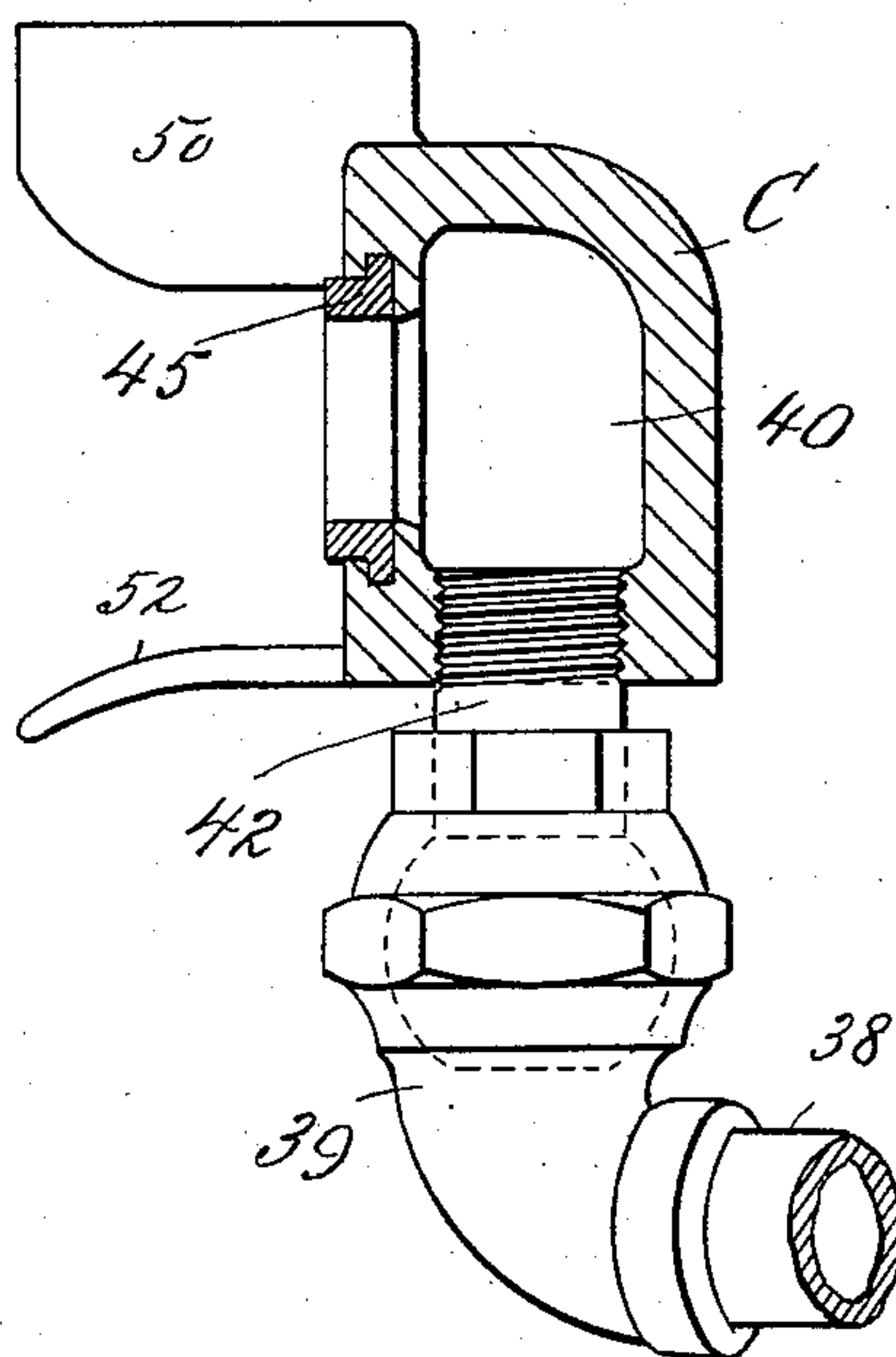
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RAILWAY CARS.

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NO MODEL.

3 SHEETS—SHEET 2.

*Fig. 5.**Fig. 6.*

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No. 724,720.

PATENTED APR. 7, 1903.

F. F. LIPPS.

AUTOMATIC COUPLING FOR STEAM, AIR, OR OTHER PIPES OF
RAILWAY CARS.

APPLICATION FILED DEC. 19, 1902.

3 SHEETS—SHEET 3.

NO MODEL.

Fig 7.

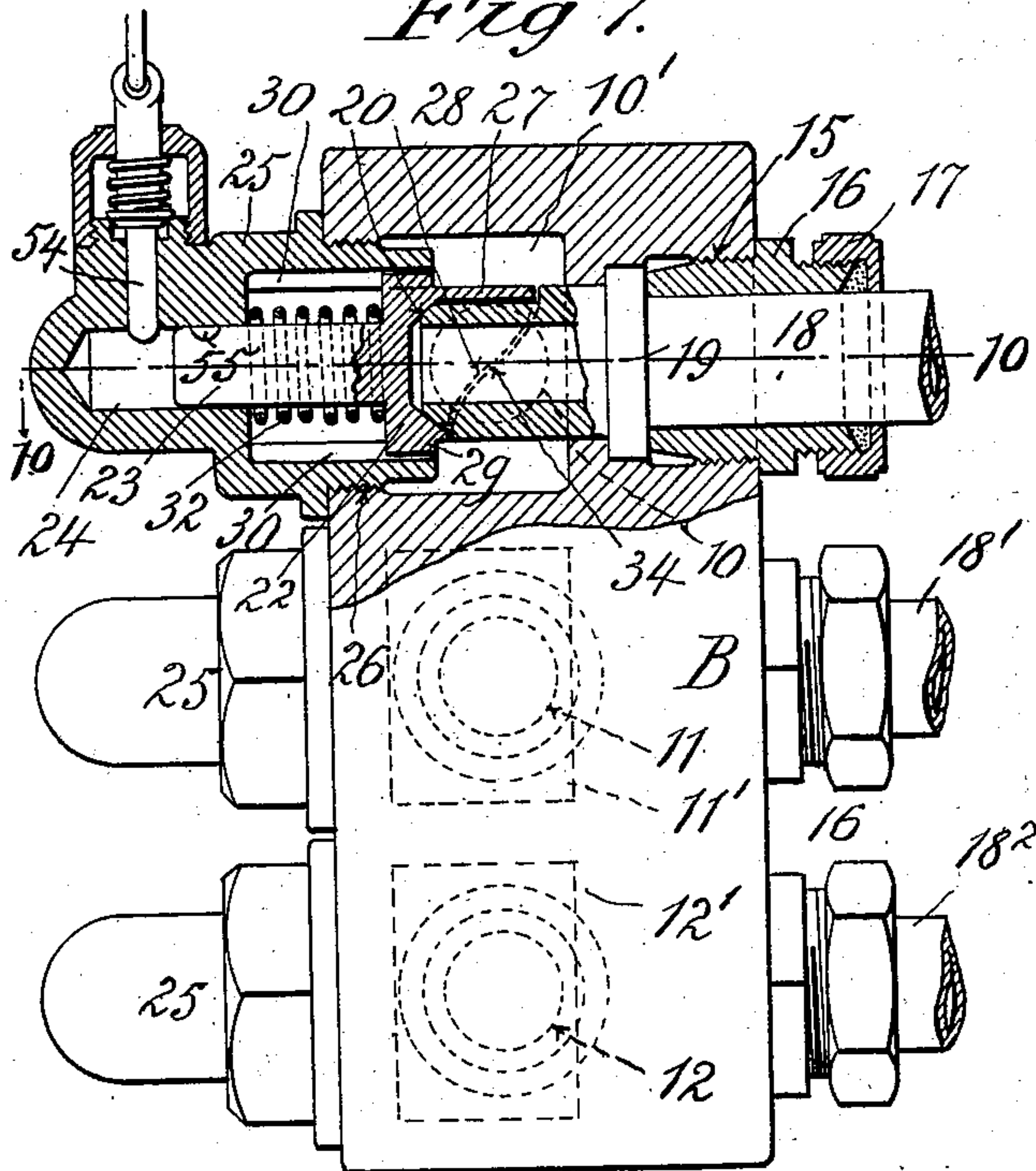


Fig. 8.

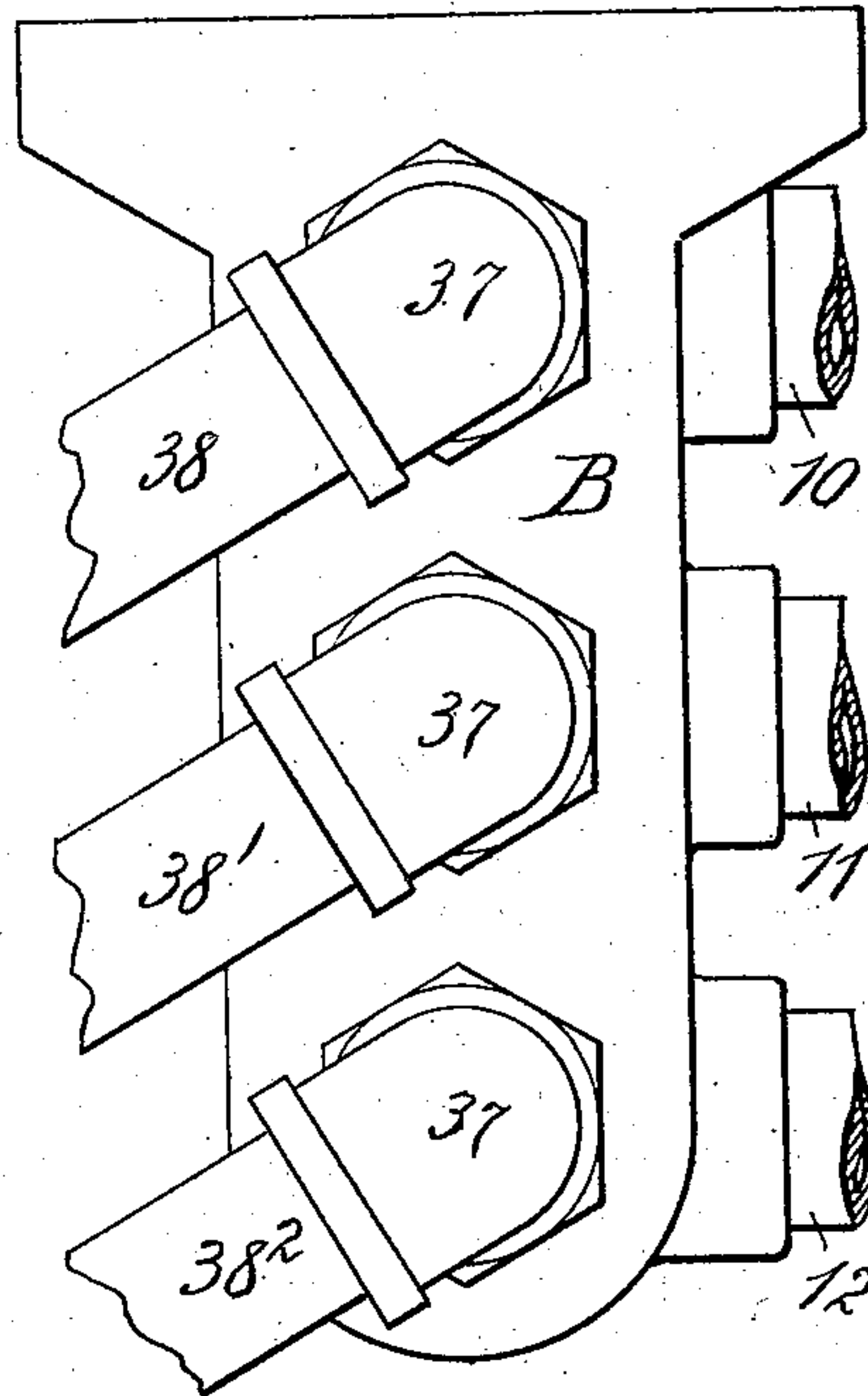


Fig. 9.

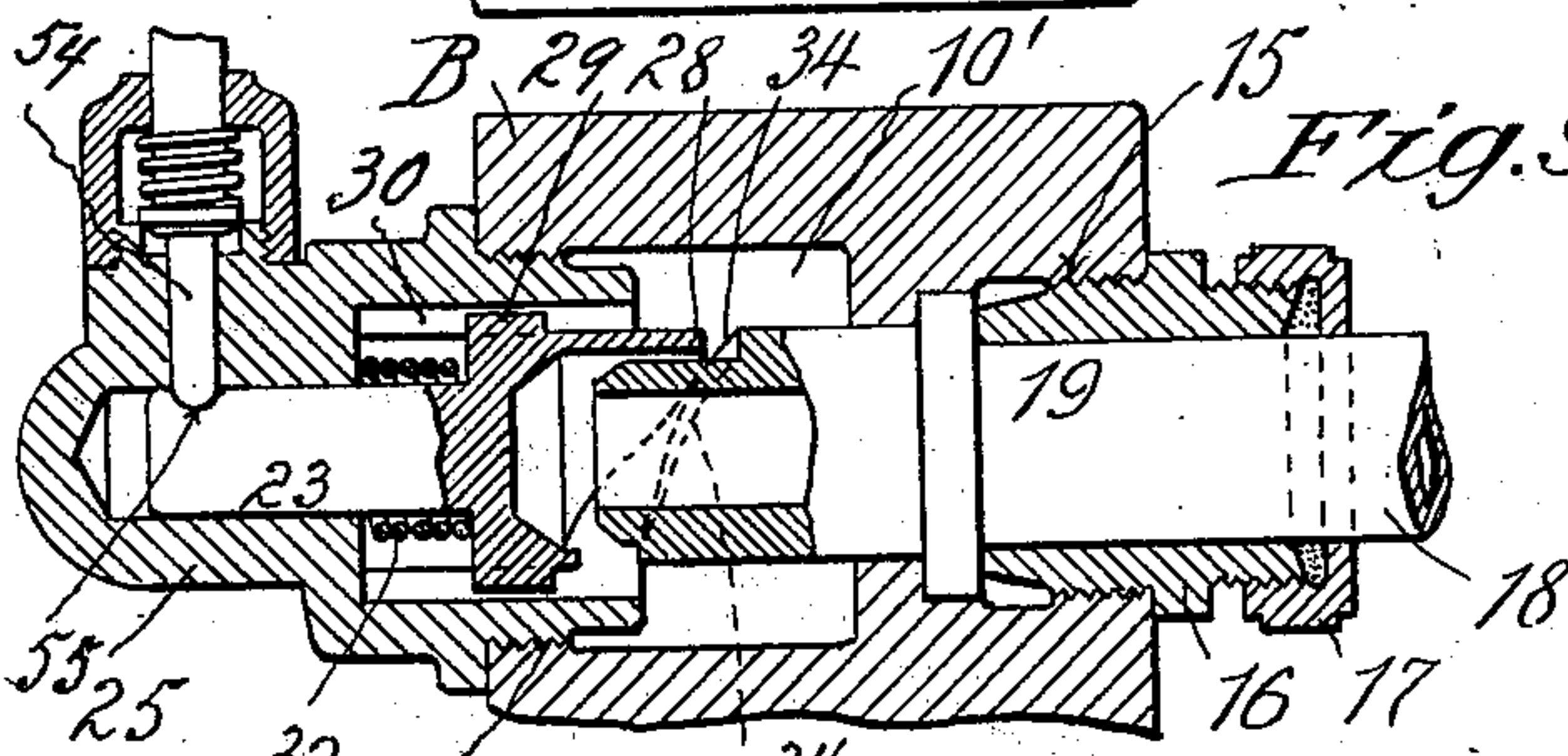


Fig. 11.

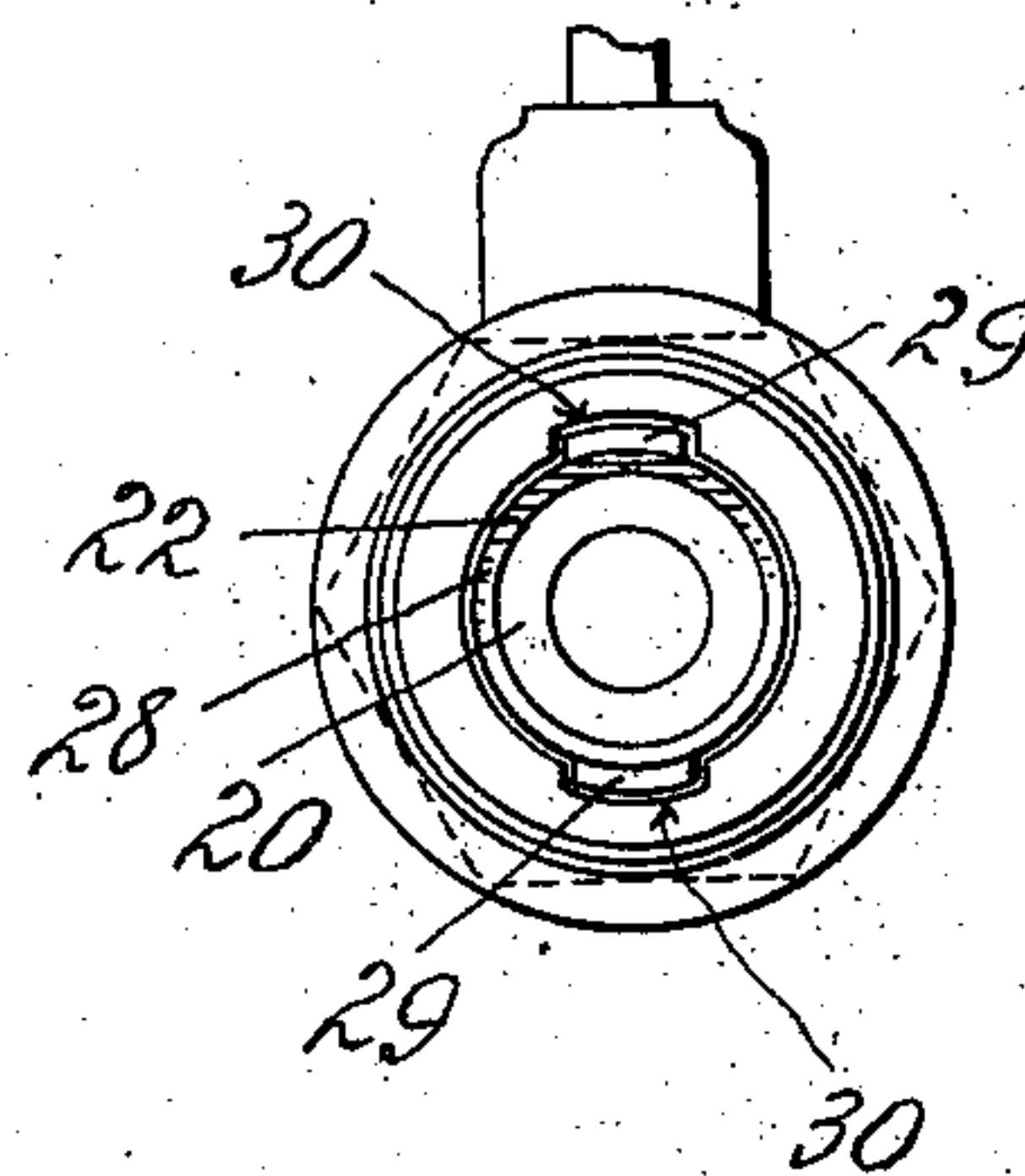
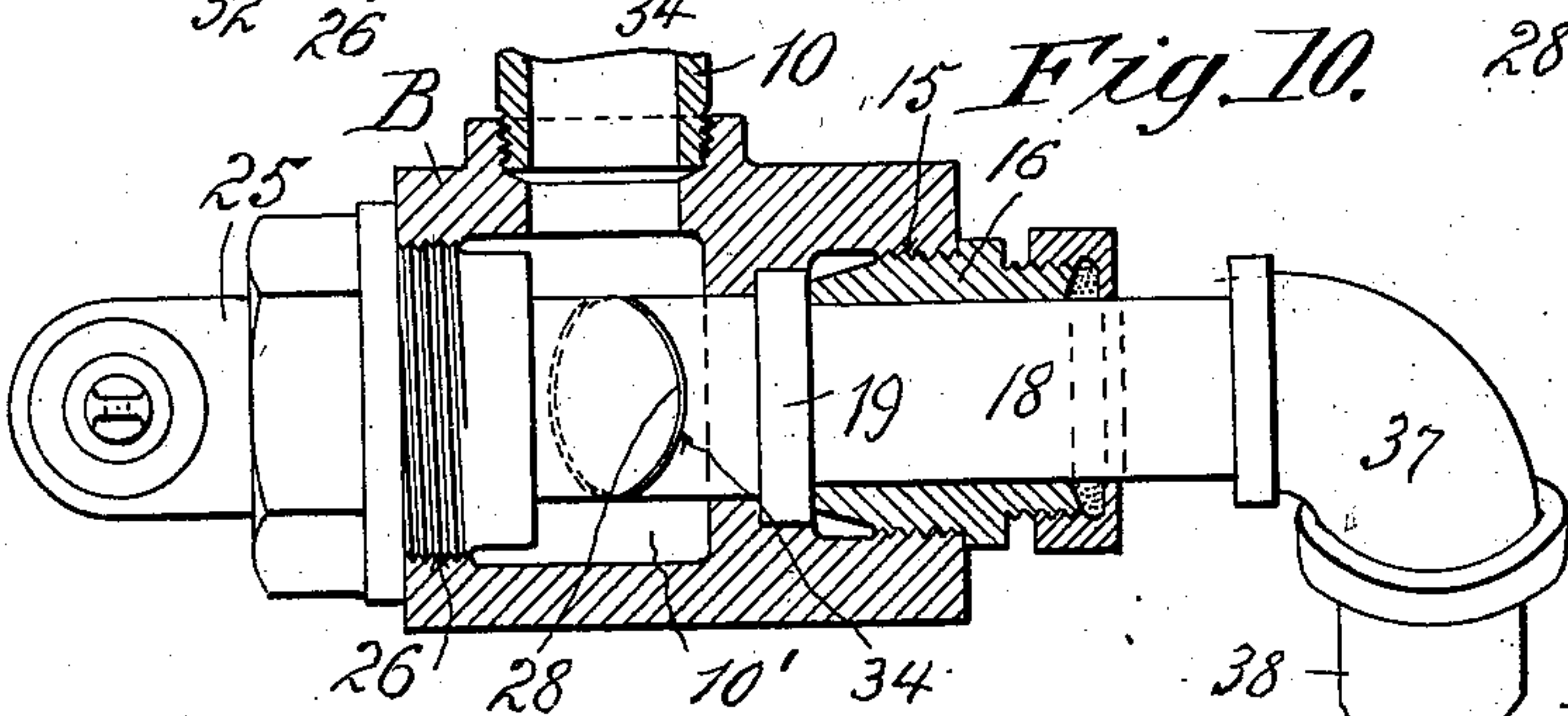


Fig. 10.



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UNITED STATES PATENT OFFICE.

FRANK F. LIPPS, OF HOLYOKE, MASSACHUSETTS.

AUTOMATIC COUPLING FOR STEAM, AIR, OR OTHER PIPES OF RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 724,720, dated April 7, 1903.

Application filed December 19, 1902. Serial No. 135,904. (No model.)

To all whom it may concern:

Be it known that I, FRANK F. LIPPS, a citizen of the United States of America, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Automatic Couplings for the Steam, Air, or other Pipes of Railway-Cars, of which the following is a full, clear, and exact description.

This invention relates to automatic couplings for the steam and air pipes of railway-cars, the object being to provide properly mounted and connected coupler-heads each having one or several openings in its front, those of the one head adapted to match with and form continuations of the other when one car is coupled to another and the openings of said heads being peculiarly pipe-connected with respect of chambers in a fixed casing mounted on the end of the car under the platform, so that each coupler-head may have a swinging movement into a lowered position in consequence of the cars being coupled and the pipe coupler-heads brought facewise forcibly one against the other, such swinging movement of the head through a corresponding movement of the pipe connecting it with the stationary casing being operable to automatically open the passage-way through the said casing corresponding to the pipe connection, whereby the steam or air, or both, may run through the longitudinal pipes of the one car, through the fixed casing and coupler-head thereof to the coupler-head and fixed casing of the next car, and thence to and through the longitudinal pipe or pipes of the latter.

Other objects of the invention are shown as capable of being carried out in the means and mechanisms shown and hereinafter more fully described; and the invention consists in the constructions, arrangements, and combinations of parts, all substantially as hereinafter fully described, and set forth in the claims.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a side elevation of the steam and air conduits, casings, and automatic coupler-heads shown as applied on and in relation to two cars, the platform portions of which are indicated as coupled by the ordi-

nary car-couplings. Fig. 2 is a side elevation of the novel parts which are shown in Fig. 1, but as in their approached but not in their closed or coupled relations. Fig. 3 is a front elevation of the coupling device shown as in its position of application adjacent and under the platform at one end of the car. Fig. 4 is substantially a plan view of the devices in the corresponding arrangement of the elevation, Fig. 2. Fig. 5 is a perspective view of one of the coupler-heads. Fig. 6 is a horizontal cross-section through one of the coupler-heads as taken substantially on the line 6 6, Fig. 5, and showing the swivel-joint connection provided for and between the head and one of the supporting pipe connections therefor. Fig. 7 is an elevation view as taken at the front (or as looking at the end of the car) of one of the fixed casings, the upper portion of the figure being in vertical section, showing one of the chambers therein and the pipe connection therewith, such connecting-pipe being shown as closed from communication with the chamber. Fig. 8 is an elevation as seen at the right-hand side or edge of the casing shown in Fig. 7, this view showing the connection at this side of the swinging pipes. Fig. 9 is a sectional view corresponding to the upper sectional portion, Fig. 7, but showing the pipe connection as open to communication with the chamber in the casing corresponding to such pipe as insured by a partial rotary movement imparted to the pipe. Fig. 10 is a horizontal sectional view as taken on the line 10 10. Fig. 11 is an end view of a fitting applied in connection with the aforementioned chambered casing and which is shown in Figs. 7, 9, and 10.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A A represent the platform portions; 12, passenger or other cars having the usual car-coupling α and showing the usual longitudinal pipes 10, 11, and 12, 10 10 being, for instance, the air-brake pipes of the car 11 11 the pipes for conducting air to operate the whistle, and 12 12 pipes for the steam heating apparatus. These pipes by elbow-couplings and short vertical and horizontal continuations have connections with chambers 10', 11', and 12', formed within

the casing B, one of which casings is shown as provided for each car, being supported at and under the front of the platform thereof by the stable metallic strap-like bracket or hanger 14. An opening 15 (shown in Figs. 7, 9, and 10) is formed through the comparatively thick wall at one of the lateral sides of the said casing, having the bushing 16 screw-engaged therein, said bushing being provided with the gland 17, and through this gland and bushing is entered the short horizontal pipe-section 18, an inner portion thereof having the shoulder 19 to engage the inner end of the bushing within the chamber 10' and arranged normally to have its open end closed by being in yielding pressure, bearing against the tapered portion 20 of the part 22, which is practically a valve for closing the end of the pipe-section 18 and preventing the passage of steam from the pipe 10 through the chamber 10' to the pipe-section 18. The said part 22 has a stem 23 playing in the bore 24 of the fitting 25, which is of a general cylindrical form, screw-threading into the opening 26, formed in the wall of the casing opposite to that through which the aforementioned pipe-section 18 is entered. The enlarged forward portion of the part 22 has the annular wall 27, which surrounds the seat portion, formed with different portions of its inwardly-protruding end more or less prominent, constituting the cam-surface 28, and the said enlargement of the part 22 has the opposite radial lugs 29 29, engaging in opposite longitudinal ways 30 in the inner end portion of the cylindrical-shaped opening of the fitting 25. A spiral spring 32, located in said cylindrical opening of the fitting in bearing against the end wall thereof, encircling the stem 23 of the part 22 and reacting inwardly against the enlargement of said part 22, exerts normally the pressure against the latter to keep it seated against the adjacent end of the pipe-section 18. The inner end portion of said pipe-section 18, located within the chamber 10', has the encircling endwise-acting cam 34, arranged to cooperate, when said pipe-section is partially turned, with the aforementioned cam 28, thereby crowding the seat and pipe closing part 22 against the spiral spring 32, leaving the connection open from the pipe 10 through the chamber 10' to and through the pipe-section 18.

The formations of the inner end portions of the pipe-sections 18' and 18² are the same in and relative to the chambers 11' and 12' corresponding to the conduits for operating the whistle and the steam-pipes 11 and 12 as described for the pipe-section 18 in connection with the casing-chamber 10 pertaining to the conveyance of the air for operating the air-brake mechanism as well as also the valve-seat part 22, cam formations 28 and 34, and other devices which have been described in detail and particularly pointed out in the sectional views 7 to 11—that is to say, a complete section through Fig. 7 would show ex-

act duplications of all that has thus far been pointed out as provided and arranged in the upper part of said view.

The two or more of the pipe-sections 18, 18', and 18² extended out through the lateral side of the chambered casing have, by rigid elbow-couplings 37, the pipe-sections 38, 38', and 38² therewith connected and arranged for swinging movements in the manner of the links of a parallel rule in a common vertical plane at right angles to the axes of the pipe-sections 18, 18', and 18², the opposite end connections of these pipe-sections 38, 38', and 38² being by swivel elbow-joints 39 (arranged as particularly indicated in Fig. 6) connected with and into the coupler-head C, having separate chambers 40 therein, in number corresponding to the number of pipes of each car to be coupled with a like number of another car.

The pipe continuation to make communication from the chamber 10' in the casing B into the corresponding chamber 40 in the coupling-head C at the entrance into the latter is accomplished by the short pipe-section 42, the axis of which is parallel with that of the pipe-section 18, and so also the other short pipe-sections 42' and 42² are axially parallel with the corresponding pipe-sections 18' and 18², and leading from each one of the inclosed chambers in the coupler-head C forwardly through the wall of said head and in a line at right angles to the pipe connection 42, &c., is the opening 44, these openings being duplicated, as shown at 44' and 44², and each opening is provided with a rubber annular section 45, flanged for engagement back of a shoulder formed in the seat therefor in the front wall of the coupler-head, such annular section forwardly protruding, so that when the corresponding sections 45 of the two coupler-heads come together there may be more or less compression between these sections to make a tight joint.

The coupler-head C for each car, mounted, as described, at the forward lower extremities of two or more of the pipe-sections 38, 38', or 38², &c., is capable of a rising-and-falling movement, but without any material lateral movement in any direction, and each of the coupling-heads is when the cars are separated supported in the upper position, (shown in Fig. 2,) the inclination of the pipe-sections 38' 38², &c., being considerably less than when the cars are brought together. The springs 46, mounted on the casings B, have supporting engagements with the coupler-heads C.

When the cars are brought together and the coupler-heads come into face-to-face contact forcibly, they are pushed in directions longitudinally of the car, causing, as they swing downwardly as constrained by the pipes 38, 38', and 38² and the exertions through the lever action of said downwardly-swinging pipes, rotational movements of the pipe-sections 18, 18', and 18² to cause by the cam portions at the inner ends of the latter the

crowding away of the seat-constituting parts 22, so as to leave the inner end of each of said pipe-sections 18, 18', and 18² open to connection with the respective air, whistle, or steam pipes 10, 11, and 12, whereby those of the one car become as continuations of those of the other car.

Each of the coupler-heads C is shown as being provided with upper and lower divergent and forwardly-projecting horns 50 and with one horn 52, forwardly projecting from the side of the head outwardly divergent from the true longitudinal line, the one side horn 52 for one head being arranged opposite from the side of the location of the corresponding horn for the other head. The upper and lower horns 50 of the one head are both located at or near one side of the head opposite to the side of the location of the corresponding horn on the head of another car to be brought into coupled relations therewith, and the heads are to be mounted as nearly at the same height on the cars as possible and centrally in the same vertical longitudinal plane, so that the openings 44, 44', and 44² may be brought to match one set with another, the horns 50 and 52 of the one head by engagement at the top and bottom and at one side of the other head rectifying any slight inequality which may exist as between the positions of the heads preparatory to being brought forcibly into contact one with the other.

While the coupler-heads C C are constructed, designed, and arranged for coöperation with three different conduits for each car and have coöperative connections with the respective valve devices in the casings B, pertaining to the respective conduits, the head for each car may operate to couple and automatically open and close, for instance, the air-conduits or any one set or two sets of the conduits, it being appreciated that the pipe-sections 38 38' 38², &c., perform the triple duties of fluid-conductors, of constraining means for the yielding movements of the coupler-heads, and of operating means for the valve appliances pertaining to the conduits terminating in the coupler-heads.

It is to be stated that the apparatus is susceptible of considerable modification and changes in respect of details of construction without departing from the invention as comprised in the general idea of means to the ends to be attained.

Inasmuch as it is desirable after the cars have been coupled to open the passage through the air-pipe for the brake mechanism to retain such passage open after the cars have been uncoupled and separated, provision is made for automatically holding the valve-seat part 22 in its receded position away from the end of the pipe-section 18 in the casing-chamber 10' by providing a spring-depressed latching-bolt 54 in suitable supporting and guiding formations which are constructed in and in connection with the fitting 25, which

bolt 54 is adapted to have a snap-catch engagement in a notch 55 in the stem of the valve-seat part 22.

The cars being coupled and the air-brake pipe opened through from one car to the other, separation of the cars will leave the air-brake pipes open, because of the retention of the valve part 22 in its receded position by the engagement therewith of the bolt 54; but after the cars have been fully separated and whenever it is desirable to close the air-brake conduit from connection with the coupling the valve pertaining to this conduit may be permitted to close by the reaction of its spring by manually releasing the bolt 54 through the chain 55 or otherwise.

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

1. The combination with a conduit of a railway-car, of a rotatably-mounted pipe continuation of said conduit having an angularly-turned pipe-section, a coupler-head having an opening through its front, a pipe-section arranged parallel with the said rotatable pipe continuation having an angular swivel connection with the aforesaid angularly-turned pipe-section, and in communication with said front opening, and another section parallel with said angularly-turned pipe-section, which at one end is angularly swivel-connected to the coupler-head and which has at its opposite end a pivotal engagement with a fixture of the car.

2. The combination with a conduit of a railway-car, of a rotatably-mounted pipe continuation of said conduit having an angularly-turned pipe-section, a coupler-head having an opening through its front, and having upper and lower forwardly-extending, and respectively upwardly and downwardly inclined horns at one side of the opposite end portions thereof and having a forwardly-extending and laterally-divergent horn projecting from its side portion between its ends and opposite from the location of the upper and lower horns, the pipe-section arranged parallel with said rotatable pipe continuation having an angular swivel connection with the aforesaid angularly-turned pipe-section and in communication with said front opening of the head, and another section parallel with said angularly-turned pipe-section which at one end is angularly swivel-connected to the coupler-head and which has at its opposite end a pivotal engagement with a fixture of the car.

3. The combination with a conduit of a railway-car, of a rotatably-mounted pipe continuation of said conduit having an angularly-turned and downwardly-inclined pipe-section, a coupler-head having an opening through its front, a pipe-section arranged parallel with the said rotatable pipe continuation having an angular swivel connection with the aforesaid angularly-turned pipe-section, and in communication with said front

opening, another section arranged downwardly-inclined parallel with said angularly-turned pipe-section which at one end is angularly swivel-connected to the coupler-head, and which has at its opposite end a pivotal engagement with a fixture of the car, and a spring having a supporting engagement with the coupler-head.

4. The combination with a plurality of separate conduits of a railway-car, a plurality of rotatably-mounted pipe continuations of said conduits having angularly-turned pipe-sections, a coupler-head having separated openings, through its front, pipe-sections arranged parallel with the said rotatable pipe continuations, having angular swivel connections with the aforesaid angularly-turned pipe-sections, and in communication with said openings through the front of the heads, and a spring on which the head has a supporting engagement.

5. The combination with a conduit of a railway-car, of a rotatably-mounted pipe continuation of said conduit having an angularly-turned pipe-section, a coupler-head having an opening through its front, provided with a forwardly-protruding annular section of compressible material and having upper and lower forwardly-extending and respectively upwardly and downwardly inclined horns at one side of the opposite end portions thereof and having a forwardly-extending and laterally-divergent horn projecting from its side between its ends and opposite from the location of the upper and lower horns, the pipe-section arranged parallel with said rotatable pipe continuation having an angular swivel connection with the aforesaid angularly-turned pipe-section and in communication with said front opening of the head and another section parallel with said angularly-turned pipe-section which at one end is angularly swivel-connected to the coupler-head and which has at its opposite end a pivotal engagement with a fixture of the car.

6. The combination with a conduit of a railway-car, and a casing having a chamber into which said conduit leads having its open end within said chamber and mounted for rotational movement and extended beyond said casing, and having an angularly-turned pipe-section, a valve appliance adapted to close the end of said pipe in said chamber, a cam mounted on the rotatable pipe, a coupler-head having an opening through its front, a pipe-section arranged parallel with the said rotatable pipe having an angular swivel connection with the aforesaid angularly-turned pipe-section, and in communication with said front opening, and another section parallel with said angularly-turned pipe-section which at one end is angularly swivel-connected to the coupler-head, and which has at its opposite end a pivotal engagement with a fixture of the car.

7. The combination with a conduit of a railway-car, and a casing mounted and stationary

on the car, having a chamber into which said conduit leads, of a rotatably-mounted pipe having its open end within said chamber and mounted for rotational movement and extended outwardly beyond the casing and having an angularly-turned pipe-section, a valve-constituting part 22 mounted for a reciprocatory movement in line with, and against and away from the end of, said pipe, and having a closing-spring, cam devices between the rotatable pipe and the valve-constituting part, a coupler-head having an opening through its front, a pipe-section arranged parallel with the said rotatable pipe continuation having an angular swivel connection with the aforesaid angularly-turned pipe-section, and a communication with said front opening, and another section parallel with said angularly-turned pipe-section which at one end is angularly swivel-connected to the coupler-head, and which has at its opposite end a pivotal engagement with said casing.

8. In a pipe-coupling apparatus for a railway-car, the combination with the conduit and a casing fixed on the car having a chamber into which the conduit opens, an opening through the side wall of the casing, extending into said chamber in which the screw-bushing 16 is fitted, the pipe-section 18 having its inner extremity located within said chamber and having the annular shoulder engaging the inner end of the bushing, a coupler-head movably mounted and having an opening therein, a pipe-section angularly arranged in relation to the pipe-section 18 and rigidly connected thereto, and having an angular swivel connection with the coupler-head and in communication with the opening in the latter, a spring-closed valve device within the said chamber normally closing the end of the pipe-section 18, and cam devices arranged between the section 18 and said valve device, operable to open the latter upon the rotational movement of the pipe-section.

9. In a pipe-coupling apparatus for a railway-car, the combination with the conduit and a casing fixed on the car having a chamber into which the conduit opens, an opening through the side wall of the casing, extending to said chamber in which the fitting 25 is screw-engaged which fitting has the bore 24 and the longitudinal way 30, the pipe-section 18 rotatable through the wall of the casing opposite the fitting 25, and having its inner extremity located within said chamber, the valve-constituting part 22 having the lug 29 and the stem 23, the spiral spring 32, a coupler-head movably mounted and having an opening therein, a pipe-section angularly arranged in relation to the pipe-section 18 and rigidly connected thereto and having an angular swivel connection with the coupler-head and in communication with the opening in the latter, devices arranged between the pipe-section 18 and said valve part 22, operable to open the latter upon the rotational movement of the said pipe-section.

10. In a pipe-coupling apparatus for a rail-
way-car, the combination with a casing B sup-
ported in a fixed position on the car and hav-
ing a chamber 10' therein and having open-
ings 15 and 26 at opposite sides of the casing
5 leading to said chamber; the bushing 16 screw-
engaged in the opening 15, and the fitting 25
screw-engaged in the opening 26 and having
the cylindrical inner end opening therein
10 formed with opposite longitudinal ways 30 30
and provided with the extension-bore 24, the
pipe-section 18 extending through said bush-
ing, having the annular shoulder 19 engag-
ing the end of the latter, and having its in-
ner extremity located within the chamber
15 and provided with the encircling cam-face 34,
the part 22 having the stem 23 guided in said
bore 24 and having its inner end portion ar-
ranged for a closing bearing against the end
20 of the pipe-section 18, and provided with the
opposite lugs 29 and the encircling cam-face
28, and the spiral spring 32 seated within said
fitting 25 and exerting a force against the
said part 22 in a direction toward the end of
25 the pipe-section 18, substantially as described.

11. The combination with a conduit of a
railway-car, and a casing having a chamber
into which said conduit leads, of a pipe hav-
ing its open end within said chamber and
30 mounted for rotational movement and ex-
tended beyond said casing, and having an an-
gularly-turned pipe-section, a valve appli-
ance adapted to close the end of said pipe in
said chamber, a cam mounted on the rotata-
35 ble pipe coöperating with said valve, a coup-
ler-head having an opening through its front,
a pipe-section arranged parallel with the said
rotatable pipe having an angular swivel con-
nection with the aforesaid angularly-turned
40 pipe-section, and in communication with said

front opening, another section parallel with
said angularly-turned pipe-section which at
one end is angularly swivel-connected to the
coupler-head, and which has at its opposite
end a pivotal engagement with a fixture of 45
the car and an automatically-operable latch
to engage and hold said valve open, substan-
tially as described.

12. An apparatus for coupling the steam
and air pipes of a railway-car, consisting of 50
parts in combination, and arrangement, viz:
the casing B supported by the car, having
the separate chambers 10' 11' 12', the con-
duits 10 11 and 12 leading to said chambers,
the pipe-sections 18 18' and 18² rotatably 55
mounted through the wall of said casing, and
having their extremities located in the re-
spective chambers and having cams 34, a
valve-constituting part provided and spring-
closed against the end of each said pipe-sec- 60
tion and having a portion to be acted against
by the pipe-section cam, the coupler-head
having the openings 44 44' and 44² and the
pipe-sections 42 42' 42² in communication with
said openings and parallel with the pipe-sec- 65
tions 18 18' and 18² the parallel pipe-sections
38 38' 38² rigidly connected angularly to the
pipe-sections 18 18' 18² and having angular
swivel connections with the pipe-sections 42
42' 42², and springs for supporting the coup- 70
ler-head and said pipe-sections in downward
inclinations, substantially as described.

Signed by me at Springfield, Massachu-
setts, in presence of two subscribing wit-
nesses.

FRANK F. LIPPS.

Witnesses:

WM. S. BELLOWS,
A. V. LEAHY.