

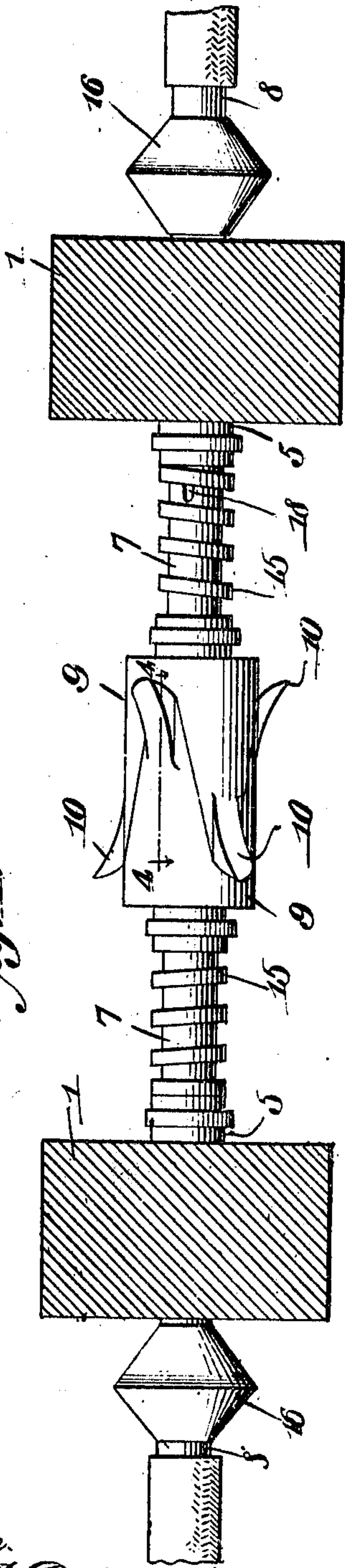
H S. MILLER.
AUTOMATIC AIR COUPLING.
APPLICATION FILED MAR. 15, 1910.

993,702.

Patented May 30, 1911.

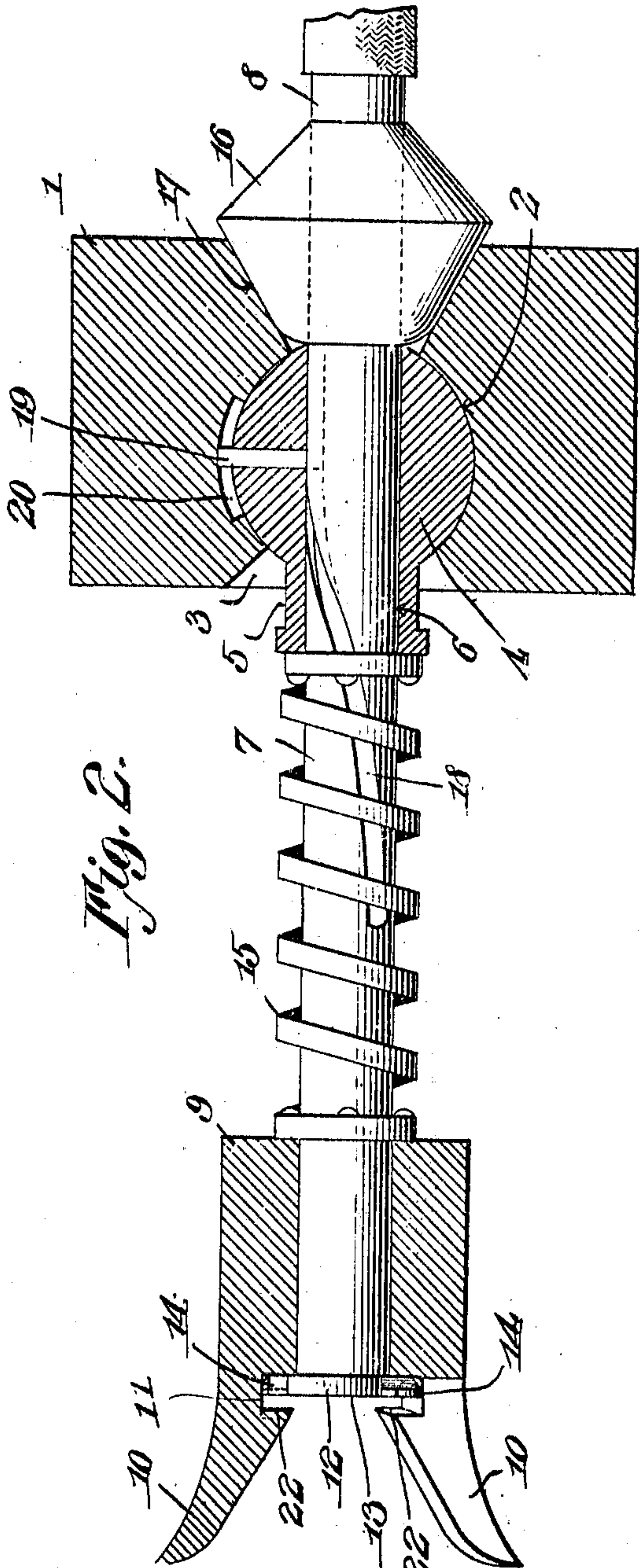
2 SHEETS—SHEET 1.

Fig. 1.



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Fig. 2.



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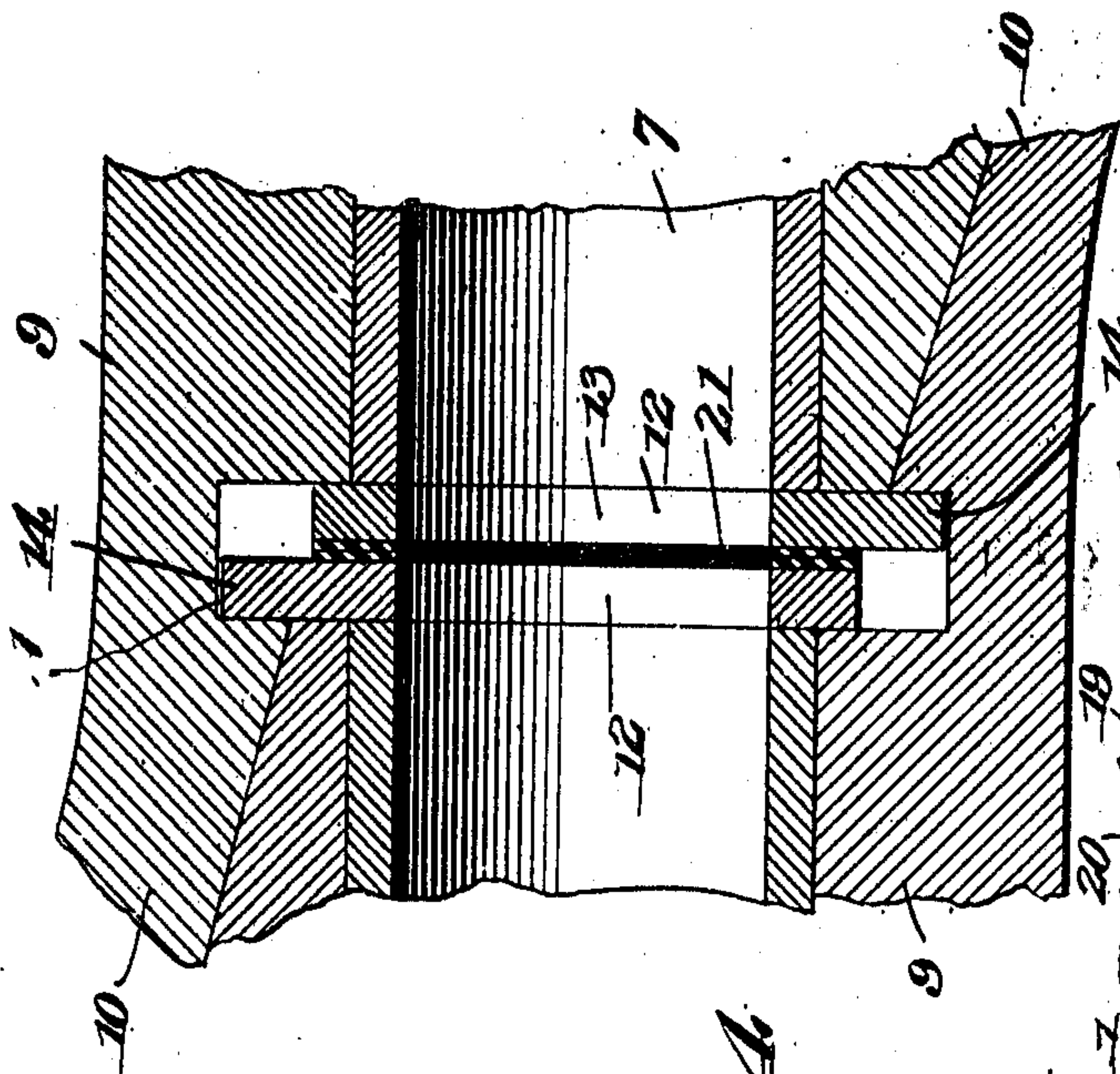


Fig. 4.

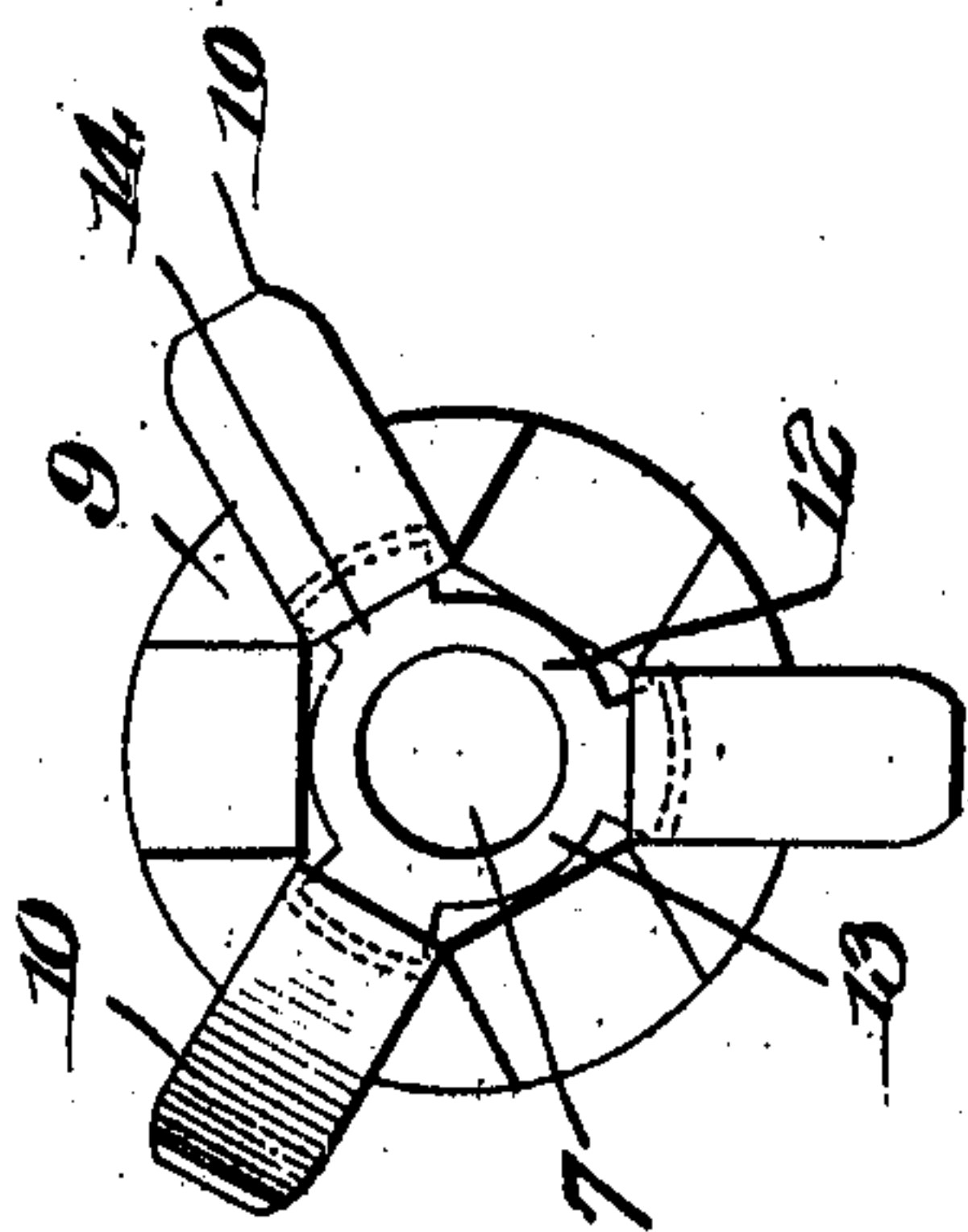


Fig. 3.

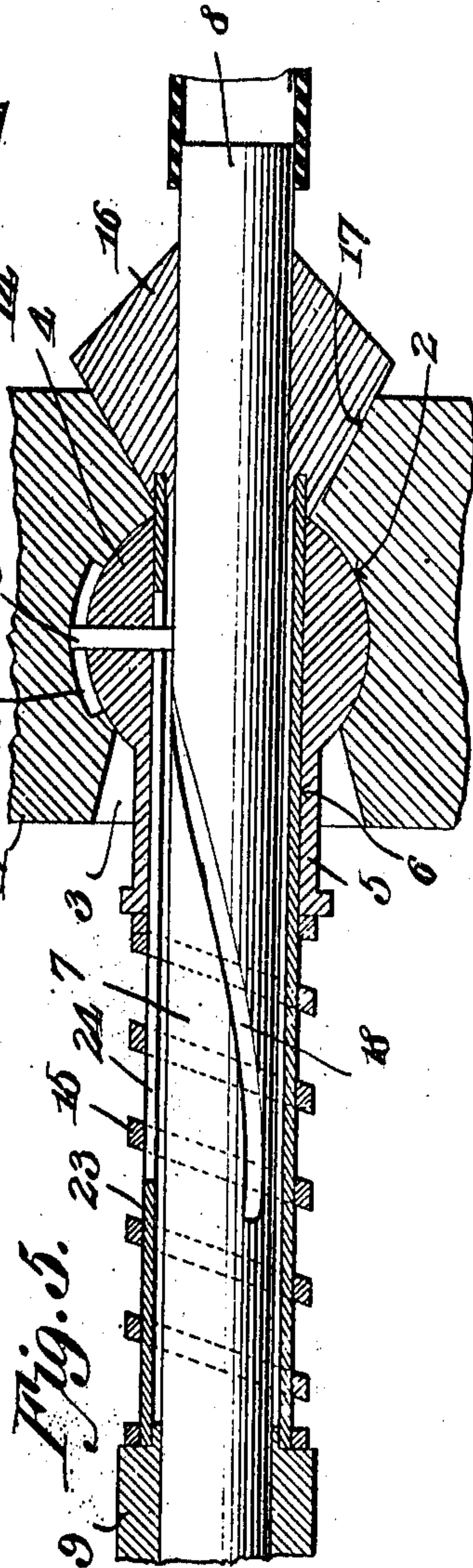


Fig. 5.

Witnesses
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UNITED STATES PATENT OFFICE.

H. STANLEY MILLER, OF JOHNSON CITY, TENNESSEE.

AUTOMATIC AIR-COUPLING.

993,702.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed March 15, 1910. Serial No. 549,451.

To all whom it may concern:

Be it known that I, H. STANLEY MILLER, a citizen of the United States, residing at Johnson City, in the county of Washington and State of Tennessee, have invented new and useful Improvements in Automatic Air-Couplers, of which the following is a specification.

The invention relates to a hose coupling designed for use in connection with railway cars and adapted for the automatic coupling and uncoupling of the air, steam and signal pipes.

The main object of the present invention is the provision of hose coupling members including inter-connecting heads and pipe sections mounted in the heads and supported for relative endwise movement in the hanger, each head being formed to interlock with the pipe section of the opposing coupler under a rotary movement of said pipe section, the hanger and pipe section being formed with co-acting means to induce a rotary movement in the pipe sections during its endwise movement.

The invention in its preferred details of construction will be described in the following specification, reference being had particularly to the accompanying drawings, in which:—

Figure 1 is a view in elevation illustrating the improved couplers and showing them in interlocked relation. Fig. 2 is a longitudinal section through one of the couplers. Fig. 3 is a front elevation of one of the coupling heads. Fig. 4 is a section on line 4—4 of Fig. 1. Fig. 5 is a vertical sectional view of a slightly modified connection between the head and bearing member.

Referring particularly to the accompanying drawings, wherein is shown the preferred details of construction, my improved coupler comprises a hanger block 1 secured in any appropriate or desired manner to the car body to support the coupler in proper position. The hanger is formed with a spherical recess 2 opening by means of a restricted entrance 3 through the forward side of the hanger, and in the recess 2 is mounted a spherical body 4 arranged for independent movement therein to provide in effect a universal joint. The spherical body is formed with a sleeve like extension 5 projecting through the entrance opening 3, and serving to limit the up and down movement of the bearing member 4.

The body 4 and the sleeve 5 are formed with an opening 6 extending therethrough for a comparatively loose reception of a pipe section 7. The pipe section extends normally beyond the body 4 and at its inner end, as at 8, is adapted to be connected by any type of flexible connection with the particular service pipe on the car which it is desired to connect or couple with the similar pipe on the adjacent car. The pipe 7 extends some distance in advance of the hanger 1 and on its forward end has rotatably mounted a head including a sleeve like member 9 formed with forwardly projecting divergent guide arms 10 whereby the respective heads are, through the coöperation of the guiding action of their arms, caused to come together in properly aligned position. Adjacent the juncture of the arms with the sleeve proper, the inner surface of each arm is formed with a recess 11, so that the outer end of the sleeve is provided with three or more undercut recesses and a similar number of intervening clear spaces. The end of the pipe section 7 at the forward or free end of the sleeve is provided with a locking member 12, including an annular section 13 and a series of radial locking projections 14. The diameter of the interior opening of the member 13 corresponds to the bore of the pipe section 7, while the maximum or exterior diameter of the annular member exceeds the diameter of the pipe. Therefore, when in place, the locking member prevents an endwise movement of the head beyond the pipe section, as the excess diameter of the locking member provides a projecting portion to bear upon the end of the sleeve 9 of said member. The locking projections 14 are of such size and so positioned as to freely rotate in the head, said projections riding during part of said rotation in the recesses 11.

A spring 15 is coiled about the pipe section 7 with its ends exerting endwise pressure between the section 5 of the bearing body and the head, said spring being secured to the head to prevent independent movement of the latter with respect to the bearing member 4, so that while the pipe section 7 is free to rotate within the head and bearing member said parts are held against similar movement. The spring 15 acts to maintain the section 7 projected its maximum distance beyond the hanger 1, which distance is materially in excess of that necessary when the couplers are connected.

It being desirable to sustain the forward end of the coupler in approximately horizontal position, I secure upon the rear end of the pipe section 7 what may be termed a positioning block 16, preferably of angular contour and designed, when the section 7 is projected its maximum distance under the influence of the spring 15, to seat in a correspondingly angular recess 17 formed in the rear surface of the hanger 1. By this means the coupler when projected is supported in horizontal position, but when the parts are coupled with the adjacent member the section 7 will have moved a sufficient distance inward beyond the recess 17 to permit that movement of the coupler, independent of their hanger, which is necessary and incident to the independent movement of the cars in the travel of the train.

To secure the necessary rotating movement of section 7 during the coupling operation, I form in said section 7 a longitudinally extending groove or channel 18 designed to receive a pin 19 secured in the body 4. The channel is so formed that during the inward movement of section 7, under the pressure of the opposing coupler, said section 7 will be partially rotated with the effect to turn the locking member 12 on the end of the same to dispose the locking projections 14 thereof within the recesses 11 of the opposing head. To prevent twisting of the bearing member 4 in its socket, I prefer that the pin 19 project through said bearing member and take into a groove 20 formed in the wall of the recess 2, the groove being so arranged as to permit a movement of the bearing member in practically all directions except a twisting movement.

The locking member 12 is formed on its outer or contacting surface with a gasket 21, and the inner surfaces of the locking projections 14 and the engaging surfaces of the outer walls of the slots 11 are beveled or inclined, as at 22, so that in the coupling action the riding of the projections beneath said walls will cause a binding action which will force the contacting gaskets together with such power as to insure an airtight juncture, while at the same time providing a comparatively rigid connection between the parts.

The operation of the improved coupler will be readily understood from the above description, taken in connection with the drawings, it being noted that in normal position the couplers are supported in an approximately horizontal relation and that as the cars come together the arms 10 will guide the respective heads into the proper relation. As the locking members on the respective sections 7 engage, which occurs prior to the car coupling position of the respective cars, the continued approaching movement of the cars will force the respec-

tive sections 7 rearwardly through the respective hangers 1. This movement first frees the positioning members 16 from the recesses 17 and then, by the cooperation of the pin 19 and the channel 18, causes a rotary movement of the respective sections 7 to turn their locking members and force the respective projections 14 of each section 7 beneath the locking walls of the recesses 11 of the opposing head. A reverse movement of the parts is induced on the separation of the cars for any reason, permitting the ready and convenient uncoupling.

In Fig. 5 I have shown a slightly modified form of connection between the bearing member and head, whereby to prevent independent rotary movement of the latter. This connection comprises a sleeve or pipe section 23 secured to the head and encircling the section 7, said sleeve 23 passes loosely through the bearing member 4 and is rigidly secured to the positioning member 16, the pin 19 passing loosely through a longitudinally disposed slot 24 in said sleeve 23. By this means the head is prevented from an independent rotary movement.

Having thus described the invention, what I claim as new, is:—

1. A coupler including a hanger formed with a spherical recess, a spherical bearing mounted in said recess, a pipe section arranged for free longitudinal movement through the bearing, a head carried by the forward end of the pipe section, a locking member secured on the pipe section beyond the head and formed to provide locking projections, diverging fingers projecting forwardly from the head, each of said fingers adjacent its juncture with the head being formed on the inner surface with a channel to receive one of the locking projections of the locking member of the opposing head, and means for inducing an independent rotary movement of the pipe section to force the locking projections thereof in the recesses of the opposing head.

2. A coupler including a hanger formed with a spherical recess, a spherical bearing mounted in said recess, a pipe section arranged for free longitudinal movement through the bearing, a head carried by the forward end of the pipe section, a locking member secured on the pipe section beyond the head and formed to provide locking projections, diverging fingers projecting forwardly from the head, each of said fingers adjacent its juncture with the head being formed on the inner surface with a channel to receive one of the locking projections of the locking member of the opposing head, and means for inducing an independent rotary movement of the pipe section to force the locking projections thereof in the recesses of the opposing head, the cooperating surface of the recesses and locking pro-

jections being of beveled formation to induce a wedging action in the locking operation.

3. A coupler including a hanger formed with a spherical recess, a spherical bearing mounted in said recess, a pipe section arranged for free longitudinal movement through the bearing, a head carried by the forward end of the pipe section, a locking member secured on the pipe section beyond the head and formed to provide locking projections, diverging fingers projecting forwardly from the head, each of said fingers adjacent its juncture with the head being formed on the inner surface with a channel to receive one of the locking projections of the locking member of the opposing head, means for inducing an independent rotary movement of the pipe section to force the locking projections thereof in the recesses of the head, the cooperating surfaces of the recesses and locking projections being of beveled formation to induce a wedging action in the locking operation, and a spring secured to the bearing and to the head to normally separate these parts their maximum distance.

4. A coupler including a hanger formed with a spherical recess, a spherical bearing mounted in said recess, a pipe section arranged for free longitudinal movement

through the bearings, a head carried by the forward end of the pipe section, a locking member secured on the pipe section beyond the head and formed to provide locking projections, diverging fingers projecting forwardly from the head, each of said fingers adjacent its juncture with the head being formed on the inner surface with a channel to receive one of the locking projections of the locking member of the opposing head, means for inducing an independent rotary movement of the pipe section to force the locking projections thereof in the recesses of the head, the cooperating surfaces of the recesses and locking projections being of beveled formation to induce a wedging action in the locking operation, a spring secured to the bearing and to the head to normally separate these parts their maximum distance, and a position member of angular contour carried by the pipe section, said hanger being formed with a correspondingly shaped recess to receive the positioning member when the parts are in their normal position.

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

H. STANLEY MILLER.

Witnesses:

GEO. W. KEYS,
JOHN C. PRICE.