

No. 696,839.

Patented Apr. 1, 1902.

A. PAUL.  
THILL COUPLING.

(Application filed Oct. 7, 1901.)

(No Model.)

Fig. 1.

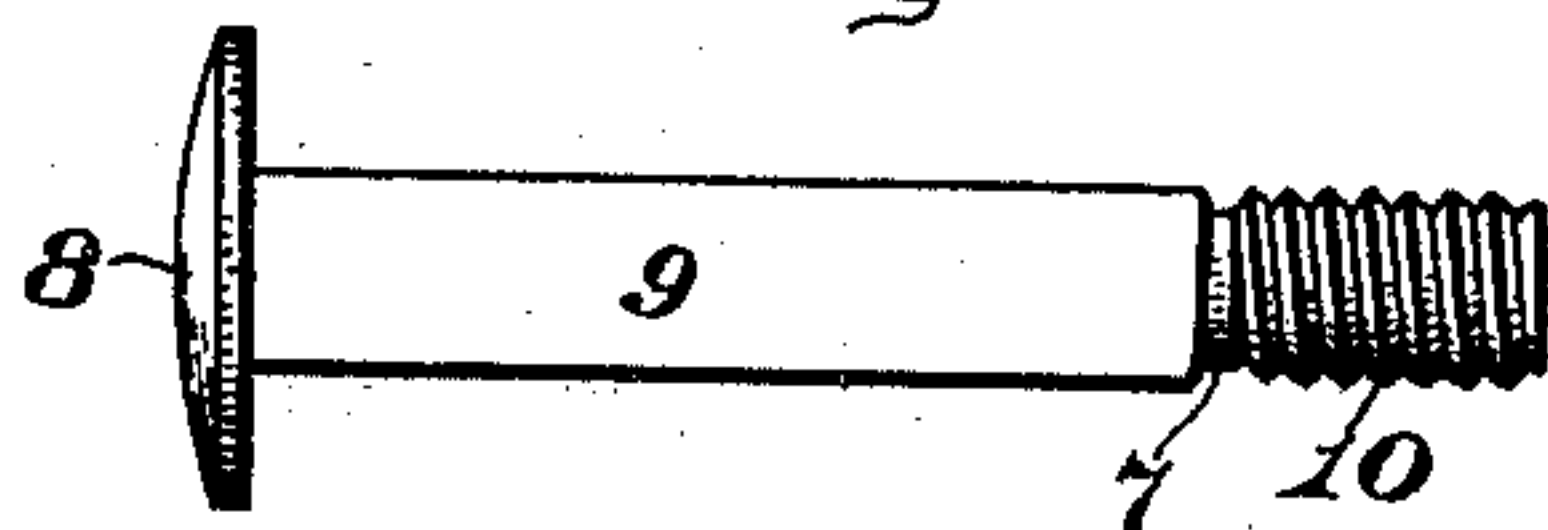


Fig. 2.

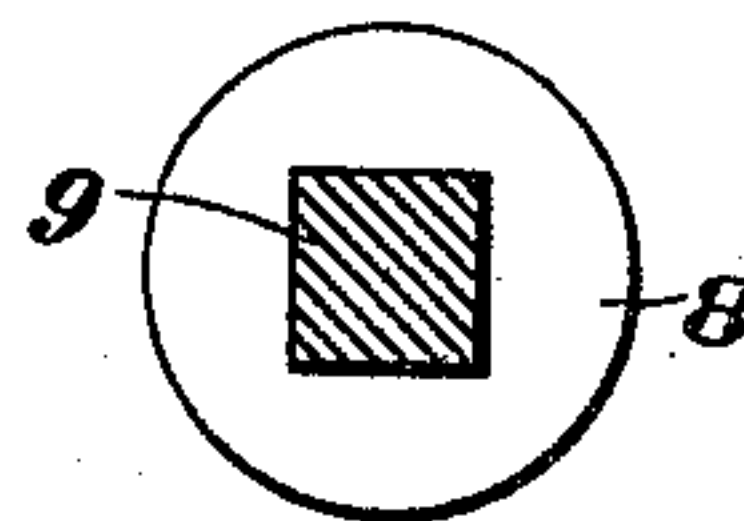


Fig. 3.

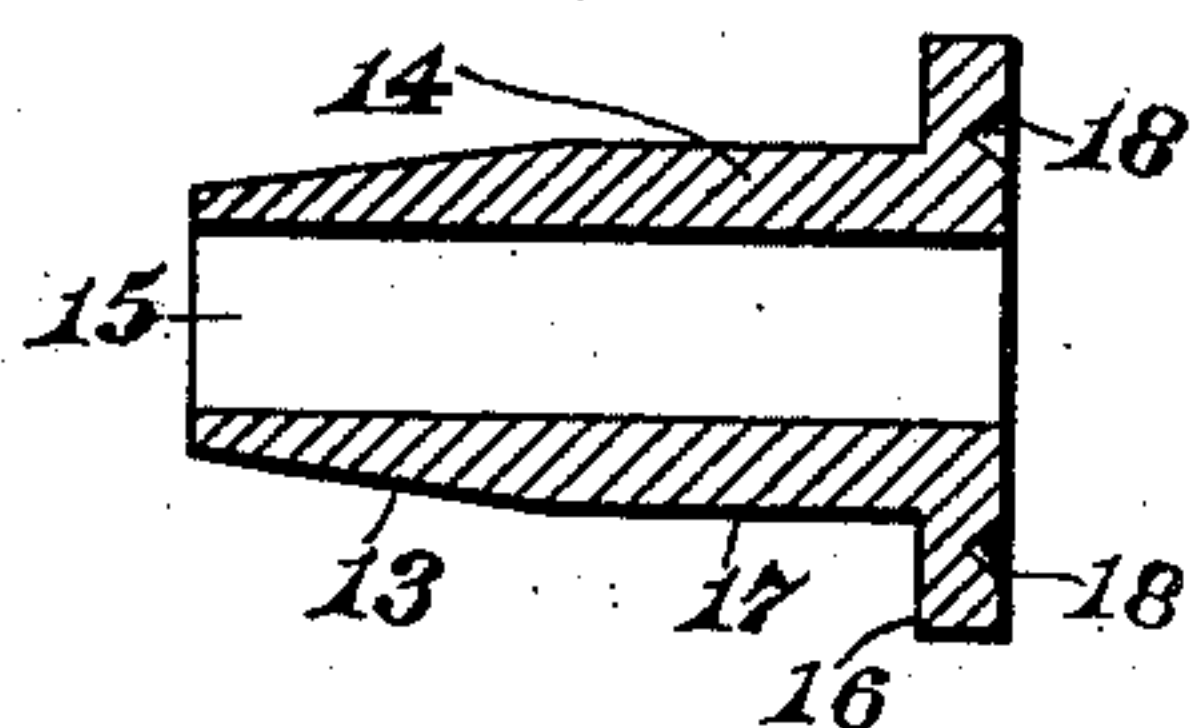


Fig. 4.

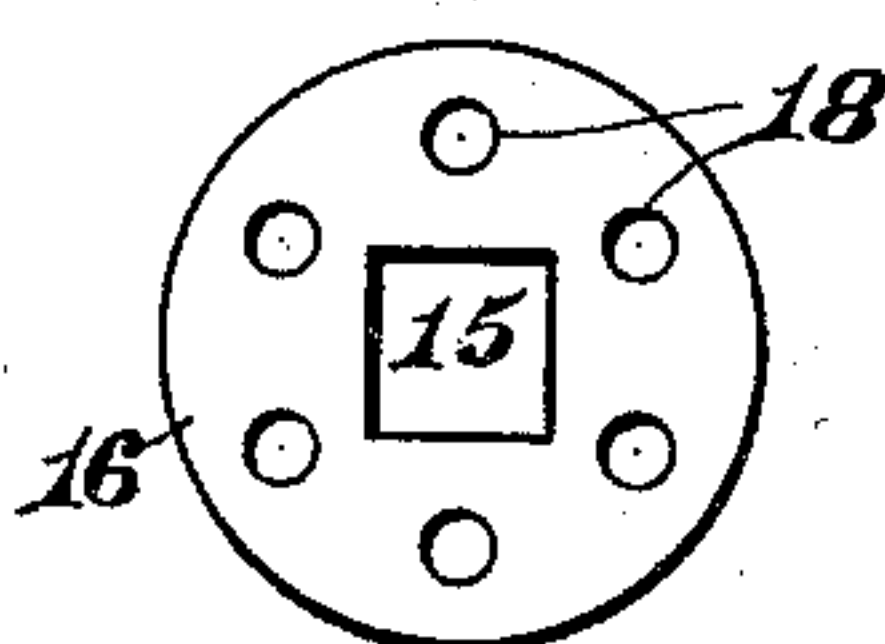


Fig. 5.

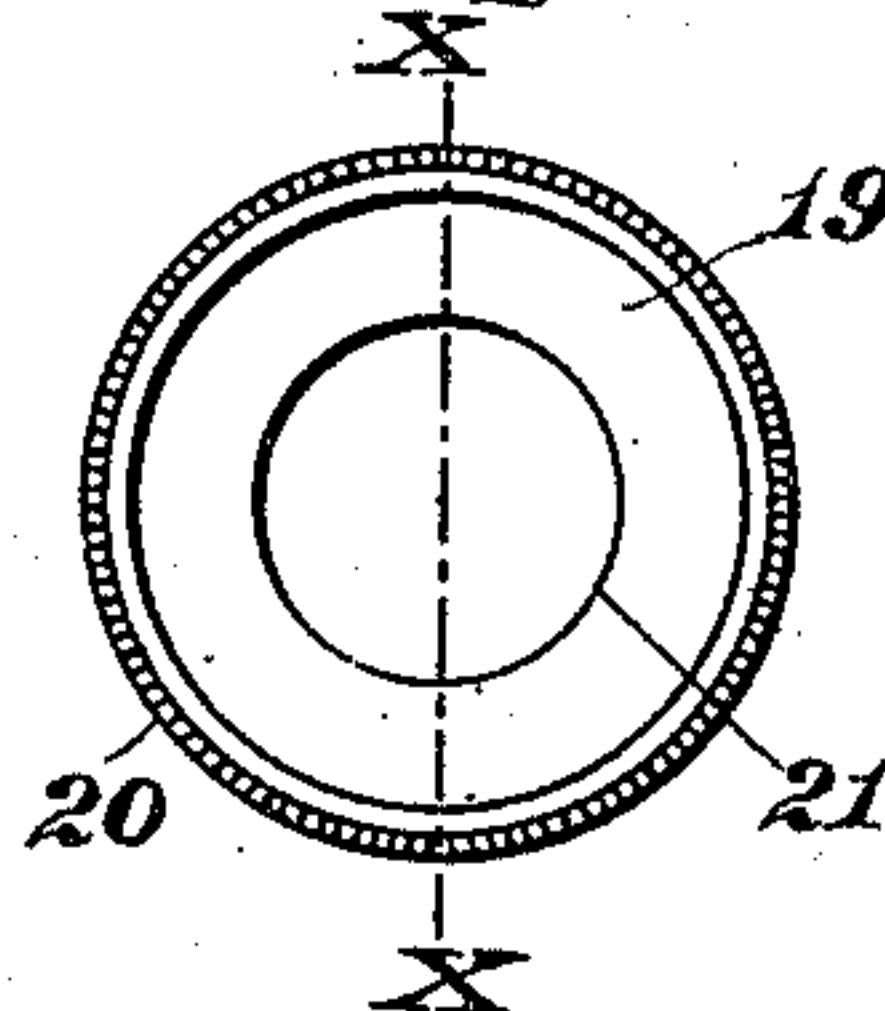


Fig. 6.

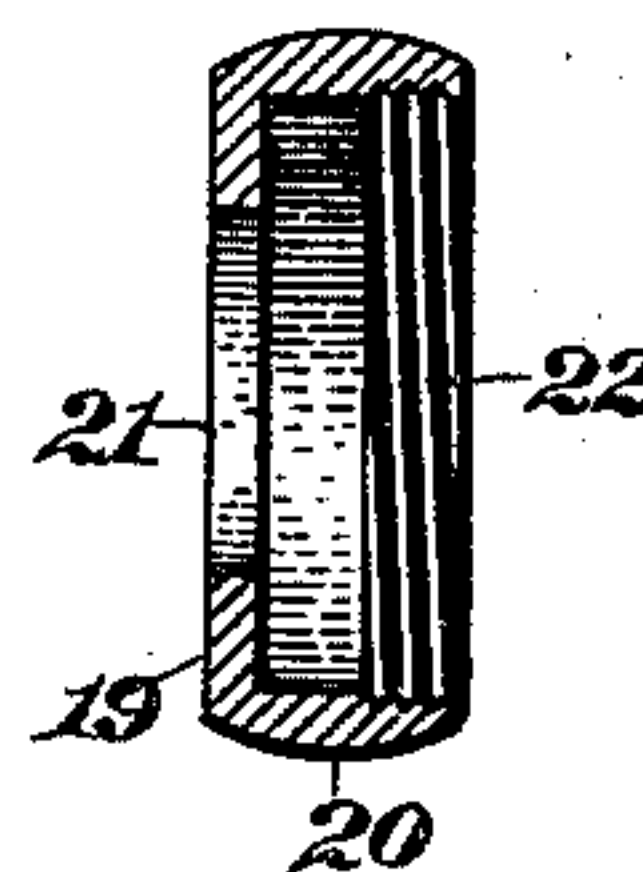


Fig. 7.

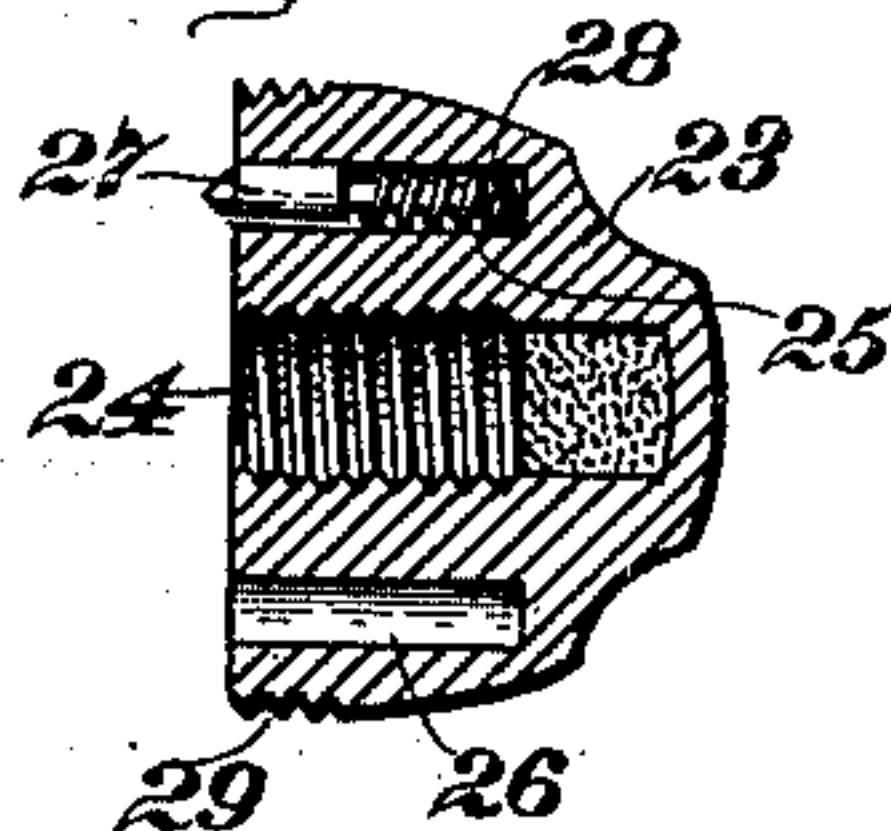


Fig. 8.

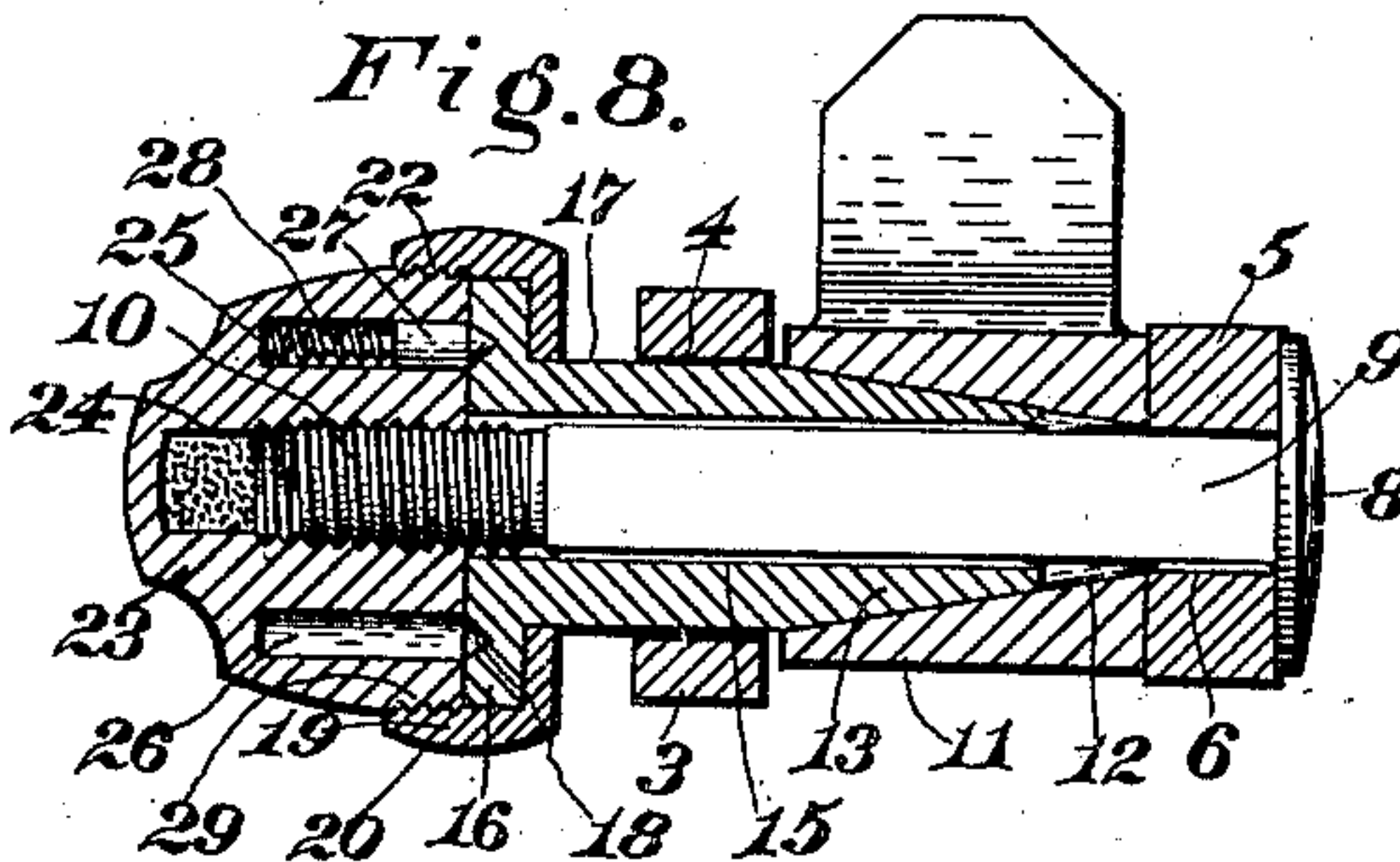
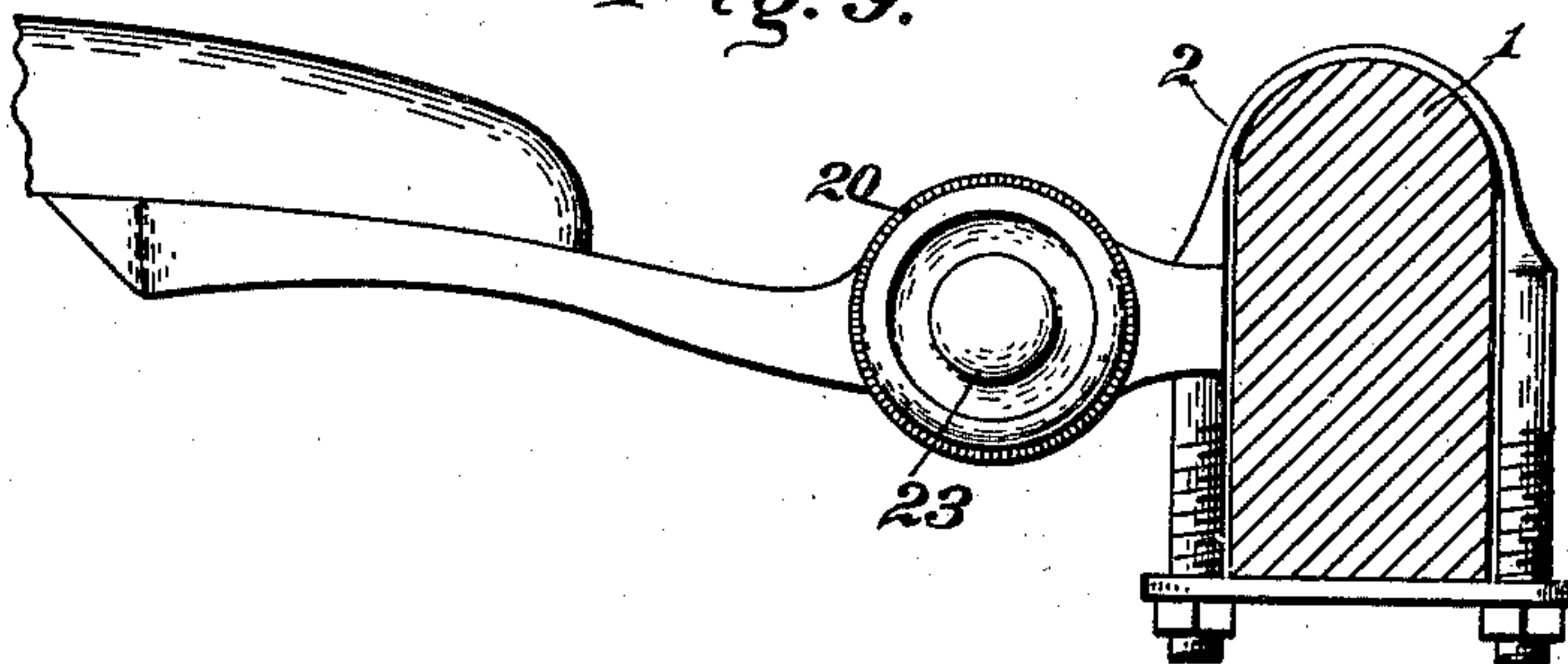


Fig. 9.



Witnesses  
James D. Smith.  
William B. Thomas.

Inventor  
Archibald Paul,  
By Harvey Spalding and Sons.  
Attorneys



# UNITED STATES PATENT OFFICE.

ARCHIBALD PAUL, OF COHOES, NEW YORK.

## THILL-COUPLING.

SPECIFICATION forming part of Letters Patent No. 696,839, dated April 1, 1902.

Application filed October 7, 1901. Serial No. 77,847. (No model.)

*To all whom it may concern:*

Be it known that I, ARCHIBALD PAUL, a citizen of the United States, residing at Cohoes, in the county of Albany and State of New York, have invented certain new and useful Improvements in Thill-Couplings; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to thill-couplings, and has for its object the production of an improved device for the purpose, comprising means for taking up all lost motion, rattle, and wear quickly and that will permit the shafts to be readily removed with the fingers without the aid of a wrench.

My present invention is a further development and improvement of the coupling for which United States Letters Patent numbered 446,005, dated February 16, 1891, were granted to me.

Each constituent element of my present invention is described in detail and its individual office, together with the mode of operation of the whole, fully explained hereinbelow.

Of the accompanying drawings, throughout which like numbers refer to like parts, Figure 1 is a side view, and Fig. 2 a cross-section, of the squared bolt. Fig. 3 is a longitudinal section of the hardened conical sleeve; and Fig. 4 is an end view of the sleeve, showing the squared passage through the sleeve to receive the bolt and the circular series of conical depressions adapted to engage the spring-pin nut-lock. Fig. 5 is a plan view of the annular lock-nut, and Fig. 6 is a vertical section of this nut cut on the line  $xx$  of Fig. 5. Fig. 7 is a section midway lengthwise of the cap-nut; and Fig. 8 is a longitudinal section of all the parts in position, showing their engagement with the thill-iron and the pierced ears of an axle-clip. Fig. 9 is a side view of my invention secured to an axle.

Considering the drawings, numeral 1 marks an axle, and 2 an axle-clip of any form, with the right ear 3 pierced by a circular hole 4

and a left ear 5 having the square bolt-hole 6. (See Fig. 8.)

Numeral 7 designates the bolt by means of which the whole is clamped together. It possesses a head, 8 of any form, a squared or rectangular shank 9, and a threaded end 10. (See Figs. 1 and 2.) Shank 9 of the bolt fits removably the square hole 6 in the right ear of the clip.

Number 11 refers to the head of the thill-iron, provided with the conical bore 12 to partially receive the correspondingly-formed end 13 of the hardened sleeve 14. This sleeve (see Figs. 3 and 4) is given a squared passage 15 lengthwise, and in this passage the shank 9 of the bolt 7 is located when all parts are assembled.

Number 16 marks the head or larger end of the sleeve, and this head projects all around like a collar from the barrel or cylindrical surface 17 of the sleeve. On the face of the head 16, as shown in Fig. 4, will be found the conical depressions 18, located near the edge. These depressions will be again mentioned.

Number 19 denotes the annular lock-nut, which has a milled rim 20, enabling it to be grasped by the thumb and fingers, a central orifice 21, fitting the barrel 17 of the sleeve, and an interiorly-threaded portion 22. This element is illustrated in Figs. 5 and 6.

The cap-nut 23 is set out in Fig. 7. It possesses a central bore 24, threaded for part of its length and smooth for part way near the bottom of the bore, the smooth bore constituting a storage-reservoir for oil, which can be kept filled. I usually place some absorbent substance, such as a piece of sponge or waste, in the oil-reservoir to prevent the oil from flowing too freely along the bolt to the working parts of the thill-iron. The cap-nut has also, ordinarily, two twin bores 25 and 26, one on each side of the central bore. In either of two twin bores—for example, in bore 25—is placed the reciprocating locking spring-pin 27. A coil-spring 28 is confined between the shoulder of the spring-pin and the bottom of the hole, as shown, and presses the pin normally outward. The extra twin bore 25 is provided for use when the first becomes worn and it is available as an auxiliary oil-reservoir. Number 29 marks a threaded



exterior portion of the cap-nut 23, which engages the threads of the lock-nut 19.

Considering Fig. 8, which shows all the parts assembled, it will be understood that the  
 5 hardened sleeve 14 and the cap-nut 23, containing the spring-pin, are held together by the lock-nut 19, which is firmly screwed in place. Now the cap and the sleeve may be  
 10 turned with respect to each other and the spring-pin is alternately raised out of and shot into the depressions 18 18 and locks the nut in one or the other of the set positions. Any number of depressions may be provided. In further assembling the parts the barrel of  
 15 the sleeve is passed through the round hole in the right ear 3 of the axle-clip and then the conical part of the sleeve enters the thill-iron between the ears. The square-bolt is passed through all from the left and its  
 20 threaded end engages the central bore and threads of the cap-nut. The squared formation of bolt-shank 9, ear-hole 6, and passage 15 of sleeve 14 prevents any of the parts turning, except the cap and milled lock-nut at-  
 25 tached to it. As the bore of the thill-iron wears the hardened cone of the sleeve is advanced by the cap-nut, which is itself locked by the spring-pin, as described, and all looseness or rattling is in this way prevented. As  
 30 the cap-nut is locked in its various positions, it need not be jammed, and it can always be readily turned by hand without employing a wrench.

Having thus described my invention, what  
 35 I claim, and desire to secure by Letters Patent of the United States, is—

1. In a thill-coupling, the combination of a conical sleeve, a cap-nut and means securing said cap-nut and sleeve together in revoluble  
 40 relation to each other, devices adapted to lock the said cap-nut yieldingly upon the sleeve against accidental revolution with respect to the said sleeve, a thill-iron having a head bored conically, an axle-clip, and means  
 45 for clamping the whole together and for preventing rotation of the sleeve relative to the axle-clip, substantially as described.

2. In a thill-coupling, a cap-nut having an exterior threaded portion and a central bore,  
 50 a part of the bore being threaded and a part toward the bottom of the bore smooth and constituting an oil-chamber, and the cap-nut being provided with a spring-pin operating

parallel with the axis of the nut, substantially as described. 55

3. In a thill-coupling, the combination of a cap-nut having an exterior threaded portion, a central threaded bore and a spring-pin operating parallel with the axis of the nut, a  
 60 hardened sleeve having a head projecting like a collar from one end of the sleeve and the outer face of the said head being provided with a circular series of depressions adapted to receive the point of the said spring-pin, and an annular lock-nut having an interior  
 65 threaded portion engaging the exterior threads of the cap-nut and a central orifice encircling the sleeve, the bottom of the lock-nut meeting the rear of the head and holding the sleeve and cap-nut together in revo-  
 70 luble relation to each other, substantially as described.

4. In a thill-coupling, the combination of a cap-nut having an exterior threaded portion, a central threaded bore and a spring-pin op-  
 75 erating parallel with the axis of the nut, a hardened conical sleeve having a head projecting like a collar from one end of the sleeve and the outer face of the said head being provided with a circular series of depressions  
 80 adapted to receive the point of the said spring-pin, the said sleeve having a squared central passage lengthwise, an annular lock-nut having an interior threaded portion engaging the threads of the cap-nut and a central orifice  
 85 encircling the sleeve, the bottom of the lock-nut meeting the rear of the head and holding the sleeve and cap-nut together in revoluble relation to each other, an axle-clip having one  
 90 ear provided with a circular orifice fitting the sleeve and a second ear pierced by a square hole, and a clamping-bolt having a squared shank and threaded end, the shank fitting the square hole in the clip and passage of the  
 95 sleeve thereby permitting the cap-nut only to be turned, and the threaded end of the bolt engaging the central threads of the cap-nut and clamping the whole together, substantially as described.

In testimony whereof I affix my signature 100  
 in presence of two witnesses.

ARCHIBALD PAUL.

Witnesses:

F. W. KAVANAUGH,  
 WM. W. SNYDER.