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Patented Jan. 28, 1902.

P. E. WIRT.

SPRING ATTACHMENT FOR ARTICLES OF WEAR, &c.

(Application filed May 9, 1901.)

(No Model.)

2 Sheets—Sheet 1.

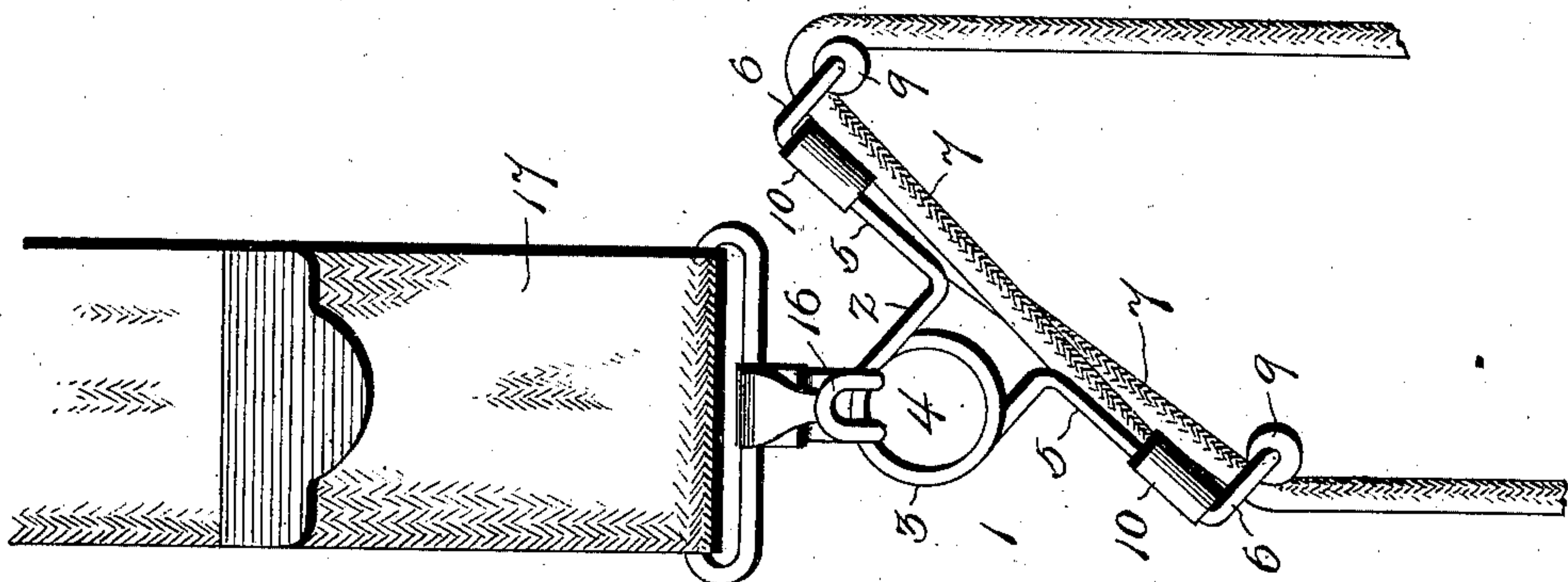


Fig. 1.

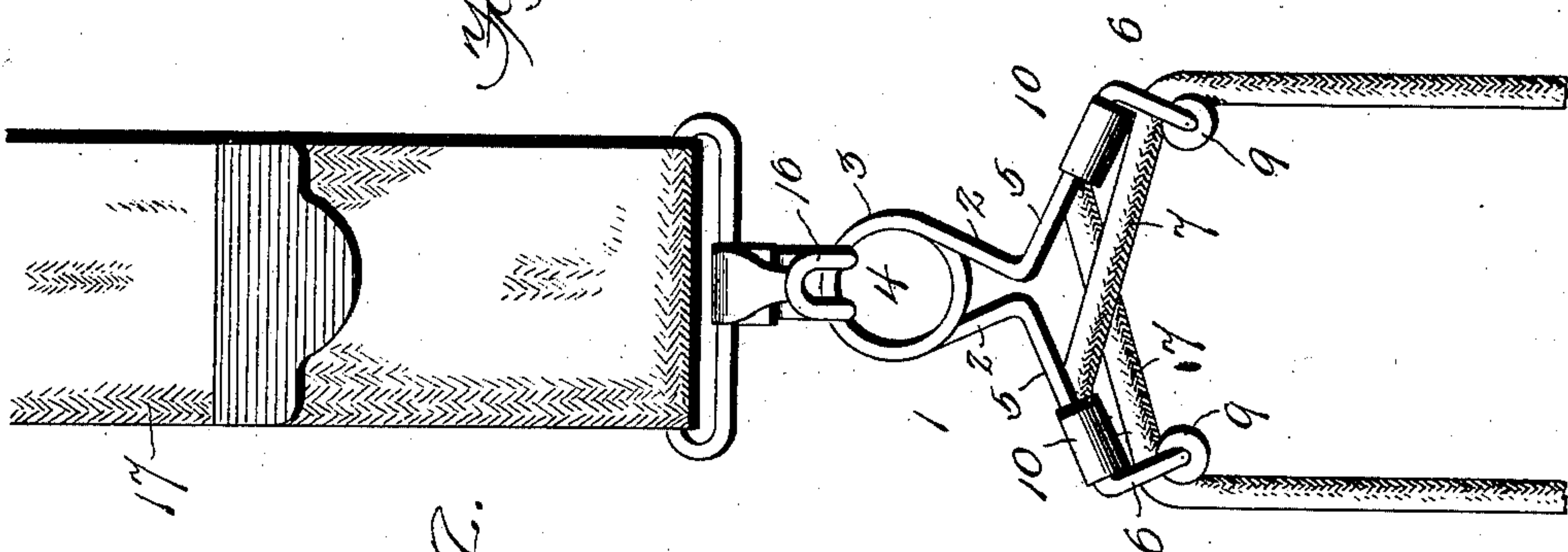


Fig. 2.

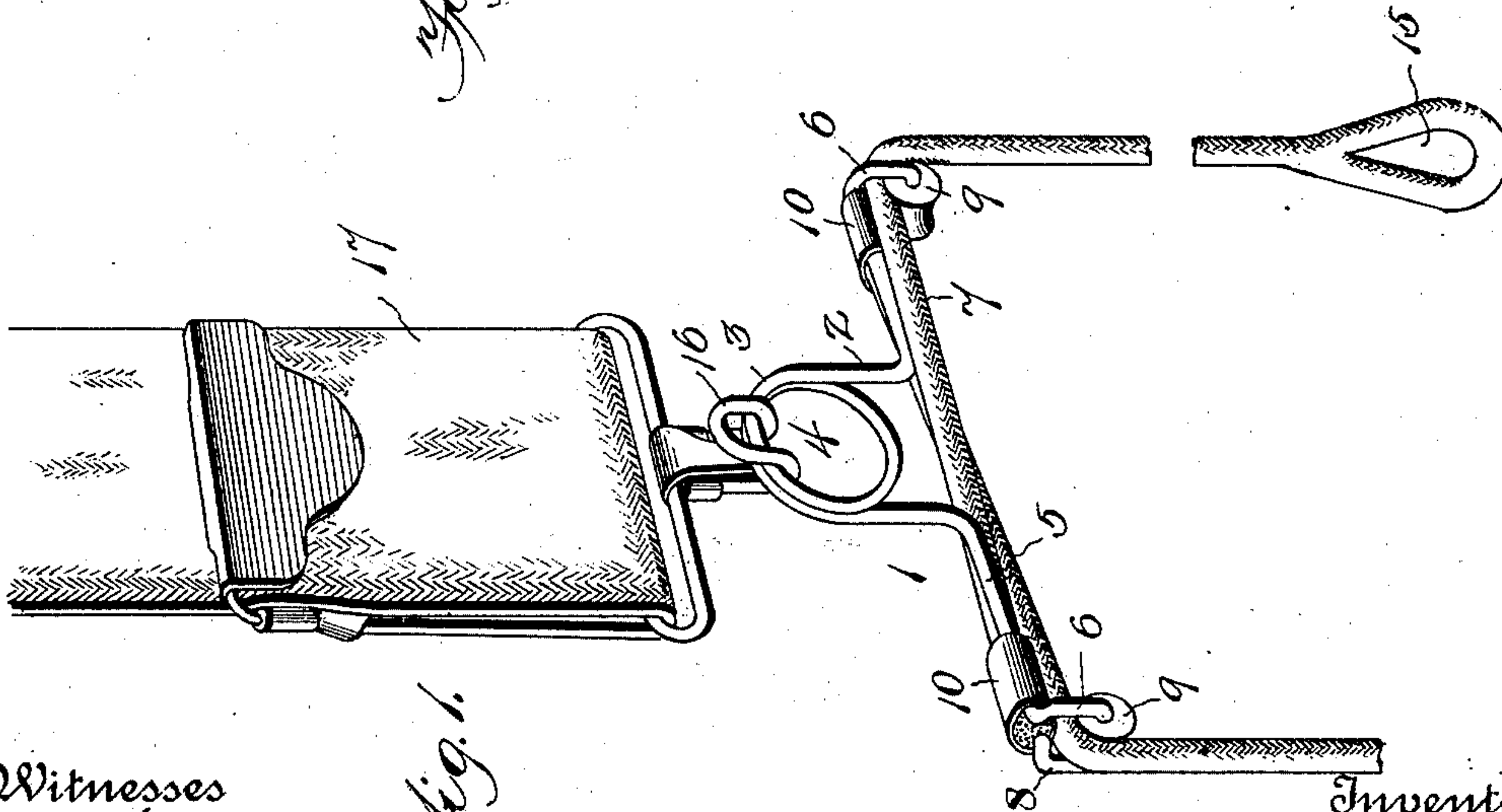


Fig. 3.

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2 Sheets—Sheet 2.

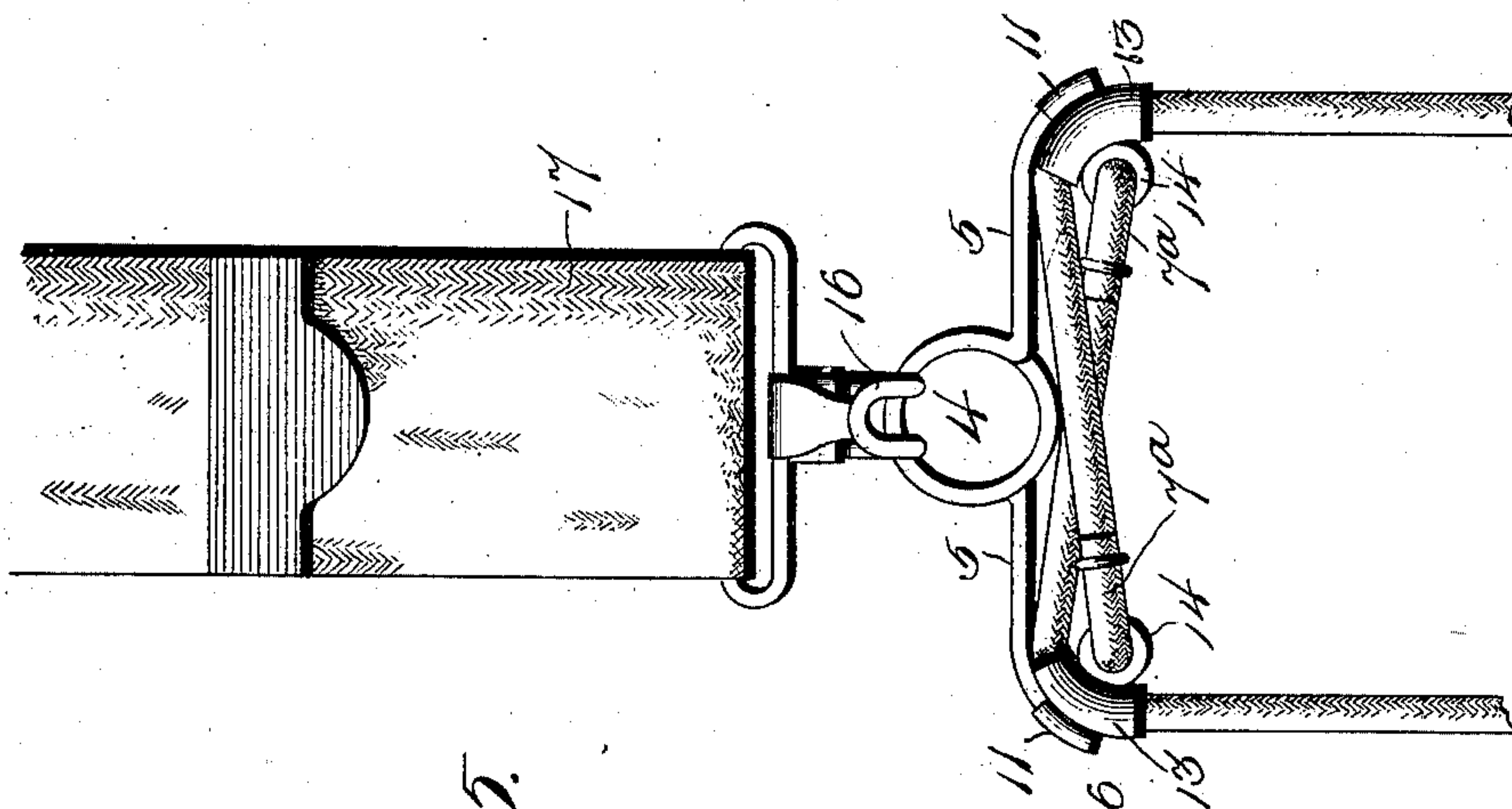


Fig. 5.

Fig. 6.

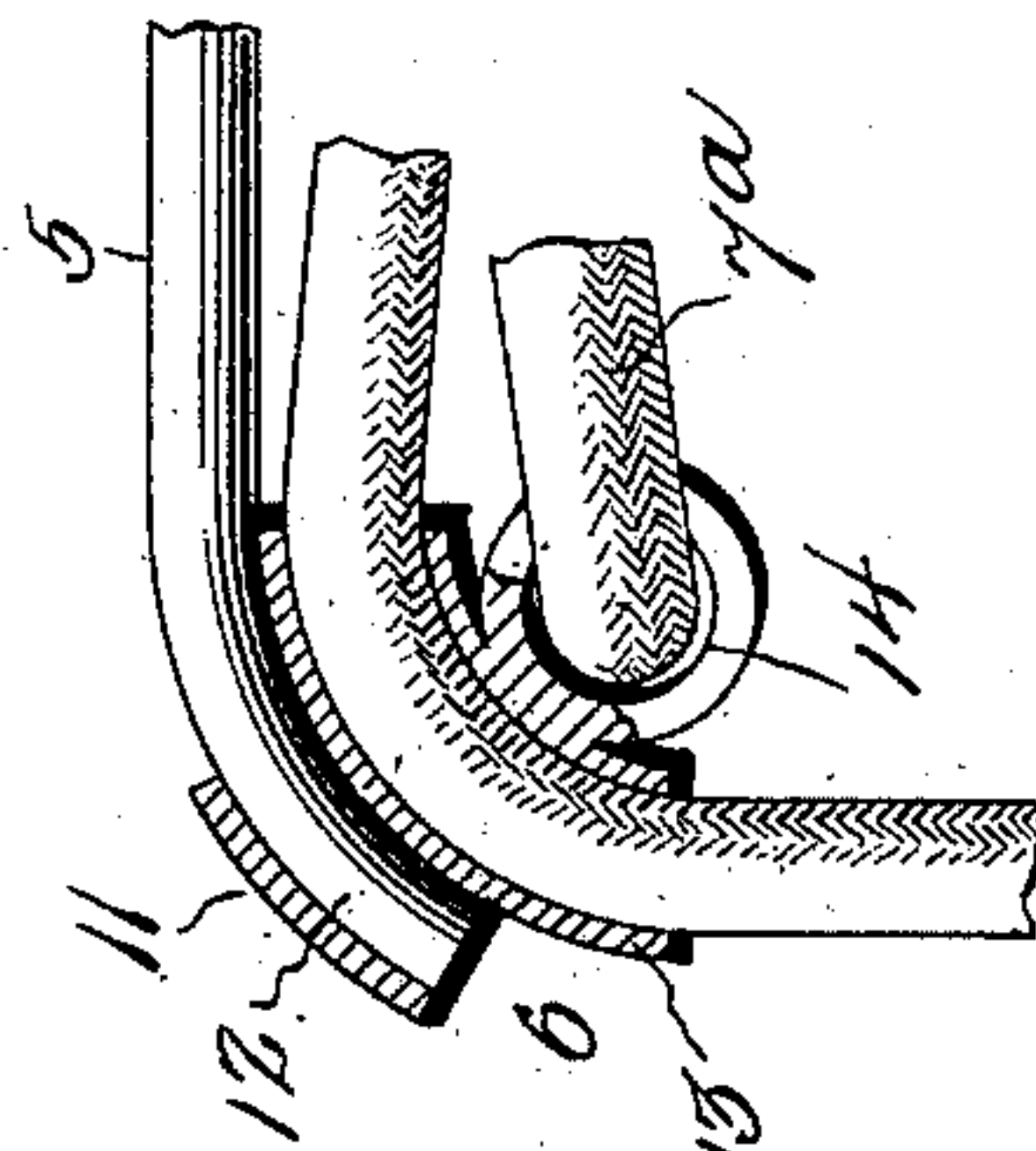
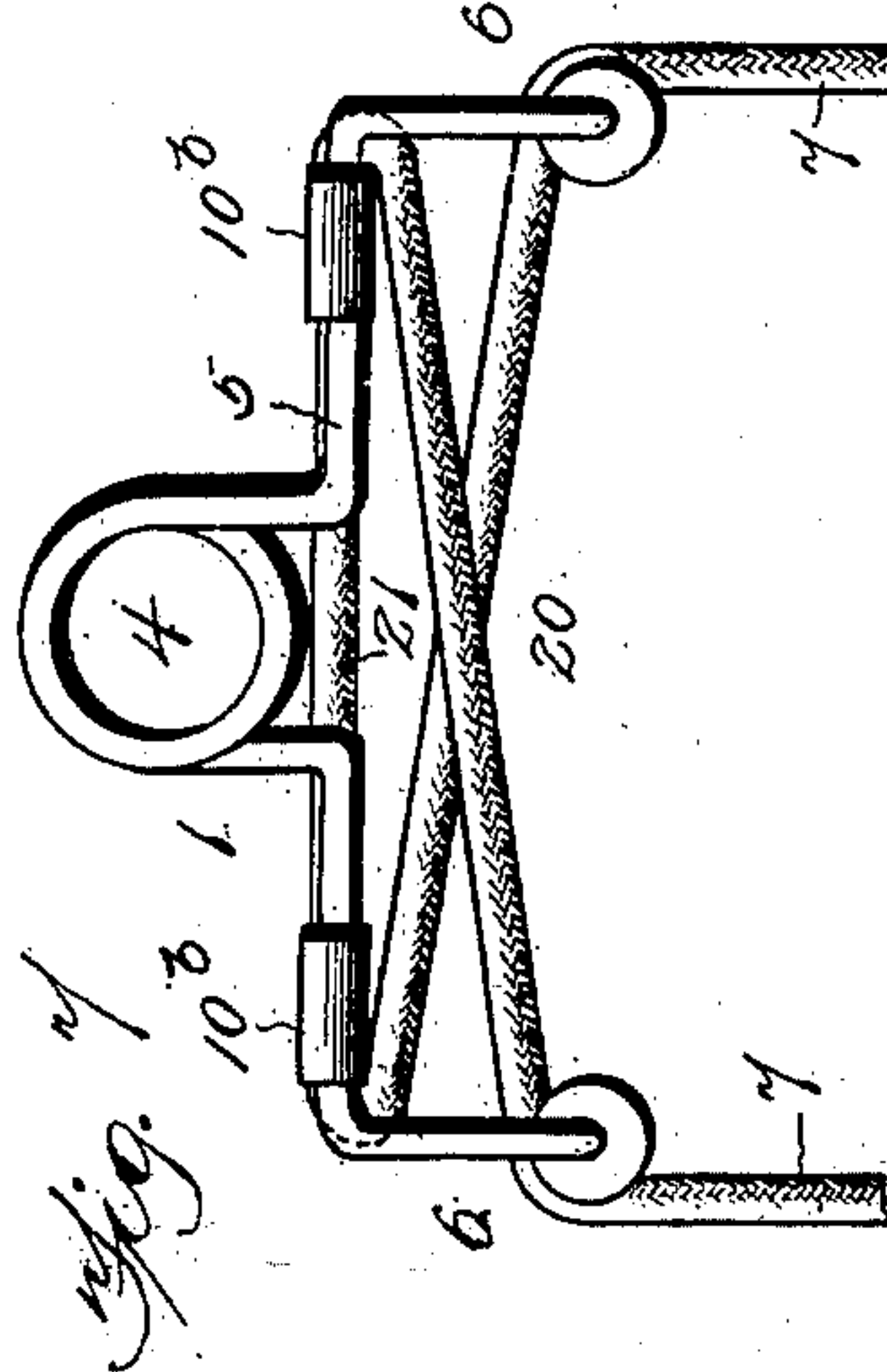
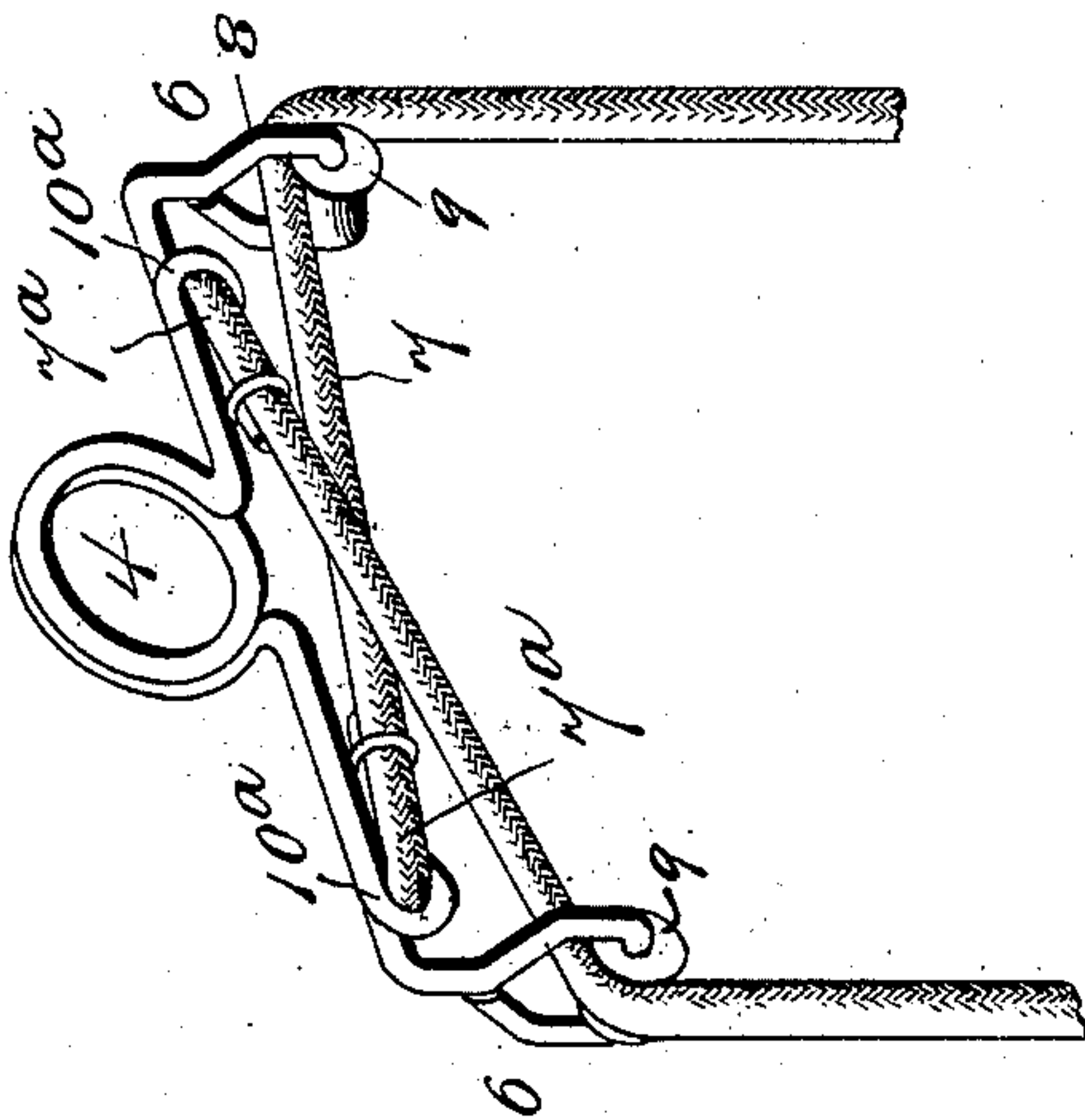


Fig. 4.



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## SPRING ATTACHMENT FOR ARTICLES OF WEAR, &c.

SPECIFICATION forming part of Letters Patent No. 692,096, dated January 28, 1902.

Application filed May 9, 1901. Serial No 59,453. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL E. WIRT, a citizen of the United States, residing at Bloomsburg, in the county of Columbia and State of Pennsylvania, have invented certain new and useful Improvements in Spring Attachments for Articles of Wear and Analogous Uses, of which the following is a specification.

This invention relates to that class of devices providing a spring or elastic action for articles of wear, such as suspenders and the like, and has special reference to an improved device of this character in the form of a simple and practical spring attachment intended to be employed as a substitute for the elastic medium usually embodied in wearing-apparel and analogous articles.

The main and primary object of the invention is the provision of a spring attachment of the character specified which shall entirely obviate the use of rubber strands, rubber webbing, or rubber in any form as applied to such objects as suspenders, belts, garters, bands, shields, and the like. It is well known that by constant use and also by reason of disintegrating influences rubber quickly loses its elasticity and therefore becomes useless for the purpose for which it is intended.

To this end the present invention obviates the objections to the use of rubber as the elastic medium in wearing-apparel and analogous articles by providing a spring attachment comprising means for giving a perfectly free and lively spring action, so as to afford ease to the user of any article embodying the attachment, while at the same time being constructed in an exceedingly-simple and thoroughly-practical manner, besides being for ordinary purposes indestructible as well as economical to make and use.

With these and many other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

The essential features of the invention, consisting of the spring-wire body and novel manner of associating the flexible attaching elements therewith, are necessarily suscepti-

ble to a wide range of modification without departing from the spirit or scope of invention, and the attachment may also be applied in various ways to different kinds of articles; but for illustrative purposes the attachment or device is shown in a few of its preferred embodiments in the drawings, in which—

Figure 1 is a perspective view of one form of spring attachment embodying the invention and shown as applied to an inelastic suspender-strap. Fig. 2 is an elevation of the attachment shown under stress. Fig. 3 is a similar view illustrating the ready adaptability or self-adjustment of the attachment to different positions or angles, indicating its accommodation to change in position of the wearer. Fig. 4 is a perspective view of another form of the invention, illustrating different means for providing anti-friction-guides for the attaching cords or elements, as well as different means for connecting the ends of said cords or elements to the yielding side arms of the spring-wire body. Fig. 5 is an elevation illustrating another form of the attachment embodying still another way of providing anti-friction guiding means for the cords as well as fixed points of attachment therefor. Fig. 6 is an enlarged detail sectional view showing the above form of anti-friction-guide and holding member for the cords or flexible attaching elements. Fig. 7 is an elevation of another modification of the attachment, illustrating the flexible attaching element or cord as being formed of a single continuous length, but made fast to the yielding side arms contiguous to the anti-friction-guides.

Like numerals of reference designate corresponding parts in the several figures of the drawings.

In carrying out the invention the same may necessarily assume different shapes or forms, and the separate elements or members thereof may be differently constructed and differently arranged without affecting the general combination of parts which are essential to secure a maximum resiliency and effectiveness. Also the spring attachment may be utilized in many ways, according to the particular article with which it is associated; but for illustrative purposes the few embodi-



ments shown in the drawings are deemed sufficient for a comprehensive understanding of the invention.

In all the forms of the attachment the same primarily embraces a spring-wire body 1. This spring-wire body is preferably formed of a single length of spring-wire of sufficient strength for the purpose intended, and yet of any degree of lightness desired, according to the character of the article in connection with which it is employed. The said spring-wire body 1 is provided at a point centrally between its ends with a lateral offset loop 2, which is preferably provided with a plurality of coils 3, forming a coiled spring-eye 4, which not only increases the resiliency of the wire body as an entirety, but also affords a point of connection with the suspender or other article in a manner to be presently explained. At opposite sides of the plane of the central spring-eye 4 the body 1 is provided with oppositely-extending yielding side arms 5, which in their normal condition may be straight or approximately horizontal at right angles to the loop 2 or slightly curved or bent, as may be found desirable or best adapted to a particular use; but in all forms of the invention these yielding side arms 5 of the spring-wire body are provided at their terminals with antifriction-guides 6 of some form for loosely and freely guiding the flexible attaching elements 7, which are utilized to provide a connection between the spring-wire body and the pantaloons or other object to be yieldingly held or fastened through the medium of the spring attachment.

The antifriction terminal guides 6 may necessarily be formed in a variety of ways—as, for instance, in the construction shown in Figs. 1 to 3, inclusive, the said antifriction-guides are formed by bending the end portions of the yielding side arms 5 into the form of pendent loops 8, disposed at an angle, preferably right angles, to the plane of the side arms 5, said loops having mounted thereon the antifriction guiding-rollers 9, which may be either fixed or stationary and grooved or ungrooved, according largely to the form of the flexible attaching elements 7, which are associated with the spring-wire body. In the construction being described the extreme ends of the yielding side arms 5, which are bent into the loops 8, are bent inward and received within the holding members 10 for the flexible attaching elements 7. The said holding members 10, as shown in Figs. 1 to 3 of the drawings, are illustrated as being in the form of ferrules or clips embracing the side arms 5, contiguous to the terminal antifriction-guides 6, and also being clenched or otherwise securely fastened upon the attaching elements 7.

Various expedients may necessarily be resorted to for holding the flexible attaching elements 7 permanently fixed or fixedly connected to the spring-wire body contiguous to

the antifriction-guides 6. For instance, as shown in Fig. 4 of the drawings, the modification shown therein preserves the general form of antifriction-guides 6, as shown in Fig. 1; but instead of the employment of the ferrules or clips 10 the side arms 5 may be formed with coiled eyes 10<sup>a</sup>, constituting holding members in which are secured in any suitable manner the fixed portions 7<sup>a</sup> of the flexible attaching elements 7. Again, in the modification illustrated in Figs. 5 and 6 of the drawings a single fitting is shown as embodying both guiding and fixing means for the flexible attaching element 7. The said fitting (shown in the modifications of Figs. 5 and 6 of the drawings) essentially consists of a metal or equivalent body provided with a collar member 11, secured fast upon the curved terminals 12 of the yielding side arms 5, the body of each fitting also having a curved and smoothly-finished guiding-eye 13, constituting the antifriction-guide 6 for the running portion of the cord or attaching element therewith, and at the inner side of the guide-eye 13 the body from which said eye is formed is also provided with a ring or eye 14, constituting the holding member for the fixed portion of the attaching element or cord connected with that end of the spring-wire body. It will thus be seen that the antifriction-guides, as well as the holding member or means for the fixed portions of the flexible attaching elements, may assume different forms without disturbing the general combination already indicated, and in the use of the attachment as an elastic medium or buckle for suspenders the flexible attaching elements 7 are similar to the ordinary suspender-ends made of cord, webbing, or any of the materials ordinarily used for this purpose, and at their ends opposite the fastened connection with the spring-wire body the same are provided with the usual tabs or loops 15. Also in the use of the attachment for suspenders the central spring-eye 4 may afford a convenient connection with the suspender-strap—such, for instance, as being loosely engaged with the connecting-hook 16, carried by the suspender-strap 17 in any suitable manner.

In the arrangement of the parts described it will also be observed that the flexible attaching elements or cords 7 are reeved in opposite directions—that is, each element or cord is permanently and fixedly engaged with the holding member contiguous to the antifriction-guide 6 at one end of the spring-body and loosely passes through and engages the antifriction-guide at the opposite end of the spring-wire body, thus providing for a direct and positive stress upon the spring-wire body, thus securing a maximum spring action. Also by reason of the loose engagement of the spring-eye 4 the entire attachment will freely adjust itself to any angle without affecting the spring action thereof in the slightest degree.



In the forms of the invention already described the flexible attaching elements 7 are illustrated as consisting of separate pieces; but it will be obvious that this is not essential, as the said elements may consist of a single continuous cord or the like, such as designated by the reference-number 20 in Fig. 7 of the drawings. In this modification the continuous attaching element of the cord 20 is reeved through the antifriction-guides in precisely the same way as previously described to provide the terminal portions 7, and also has a portion 21 extending longitudinally across the spring-wire body; but this portion is made fast or fixed to the yielding side arms 5 through the medium of the holding members 10<sup>b</sup>, located contiguous to the terminal antifriction-guides and illustrated as being of substantially the same construction as the holding members 10. (Shown in Fig. 1 of the drawings.) With the exception of the continuous attaching element or cord 20 the construction shown in Fig. 7 embodies all of the essential features of the invention previously set forth.

From the foregoing it should be understood that one of the essential features of the invention resides in having such an arrangement of the separate members of the attaching element or elements that the same will have a fixed engagement or connection at opposite points upon the yielding side arms contiguous to the antifriction-guides, so that when the attaching element is drawn or pulled upon it acts directly and positively without slipping and rubbing upon the side arms at what might be properly termed "stress-points," thus securing an easier and livelier spring action than is possible with any arrangement wherein slip or equivalent connections may be provided at stress-points for the attaching element or elements. In my construction, as already indicated, the fixed connection for the attaching elements may be provided in a variety of ways by different kinds of holding members arranged at or contiguous to the terminal antifriction-guides or, in fact, by any form of connection whereby the attaching element or elements may have a permanent and fixed non-slipping engagement with the yielding side arms at stress-points contiguous to the terminal guides. Hence there is provided in the present invention a fixed point of attachment or stress for the cord on the opposite arms of the spring-body, thus compelling the arms to come together easily and move or lengthen the cord without friction, except at two points of contact—viz., at the terminal antifriction-guides or guide-eye. This feature of the invention is necessarily observed irrespective of whether the attaching elements consist of separate cords or of a single length, as suggested in the modification of Fig. 7 of the drawings, and in all embodiments of the invention the fixity or positiveness of attachment of the crossing elements at or near the ends of the side arms

of the spring-body or near the terminal guides contributes very largely to the efficiency and action of the spring and renders the same very effective for the special purposes pointed out.

Divers ways of applying the invention to use in connection with different forms of articles will readily suggest themselves without further description, and it will also be understood that the various changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention.

The forms of attachment herein described embody a novel combination of parts which provide a thoroughly efficient and lively spring action besides a maximum lengthening of the suspender within the most limited space and also with the least possible friction upon the adjacent clothing. This combination resides in associating together a spring-wire body having a spring-coil and oppositely-projecting yielding side arms extended from the terminals of the coil at opposite sides thereof and normally lying substantially in alignment, antifriction-guides located at the outer terminals of the side arms, and an attaching element arranged to exert a direct cross stress or pull between the guides upon the terminals of the side arms, the portion of said element between the guides being approximately co-extensive in length with the body in its normal extended condition. This generic combination is not claimed herein, but is made the subject-matter of a claim in application Serial No. 73,665, filed August 29, 1901.

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

1. A spring attachment of the class described comprising a spring-wire body having oppositely-extending yielding side arms provided at their terminals with antifriction-guides, and oppositely-reeved crossing attaching elements having a loose running engagement with the guides, and a fixed engagement with the side arms at stress-points contiguous to the guides.

2. A spring attachment of the class described comprising a spring-wire body having oppositely-extending yielding side arms provided at their terminals with antifriction-guides, and contiguous to such guides with holding members forming stress-points, and flexible attaching elements having fixed engagement with said holding members.

3. A spring attachment of the class described comprising a spring-wire body having a central spring-eye and yielding side arms provided at their terminals with antifriction-guides and contiguous to such terminals with holding members constituting stress-points for the side arms, and oppositely-reeved crossing flexible attaching elements, each element having a running engagement with the antifriction-guide at one end of the body, and having a permanent fixed engagement with



the holding member at the stress-point for the opposite side arm.

4. A spring attachment of the class described comprising a spring-wire body having  
5 a central spring-eye and yielding side arms provided at their terminals with antifriction-guide eyes, the latter being disposed at right angles to the plane of the arms, and oppositely-reeved crossing flexible attaching elements having a loose running engagement

with the guides, and fixed engagement with the side arms at stress-points contiguous to the guides.

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

PAUL E. WIRT.

Witnesses:

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KARL F. WIRT.