

No. 686,218.

Patented Nov. 5, 1901.

M. E. H. FORST.
INCANDESCENT ELECTRIC LAMP.
(Application filed Mar. 29, 1901.)

(No Model.)

Fig. 1.

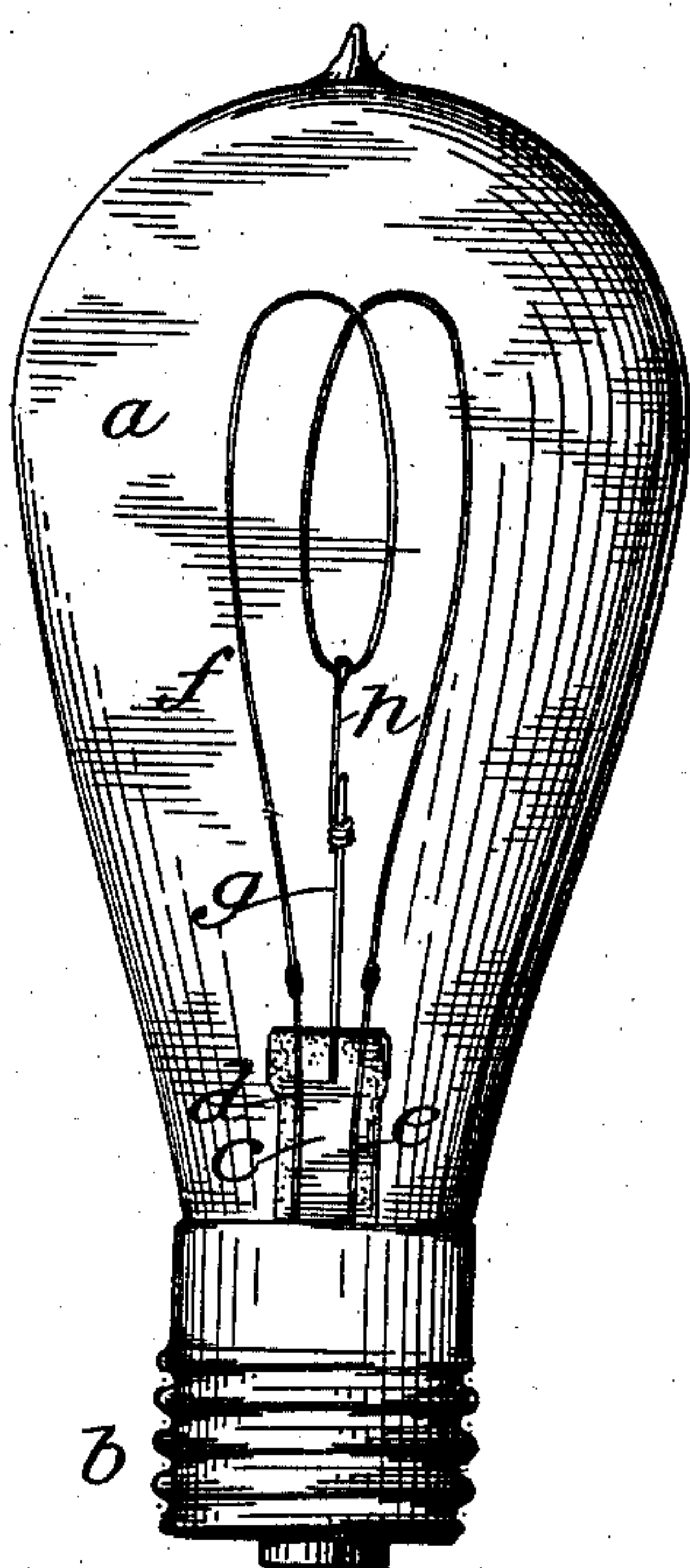


Fig. 3.

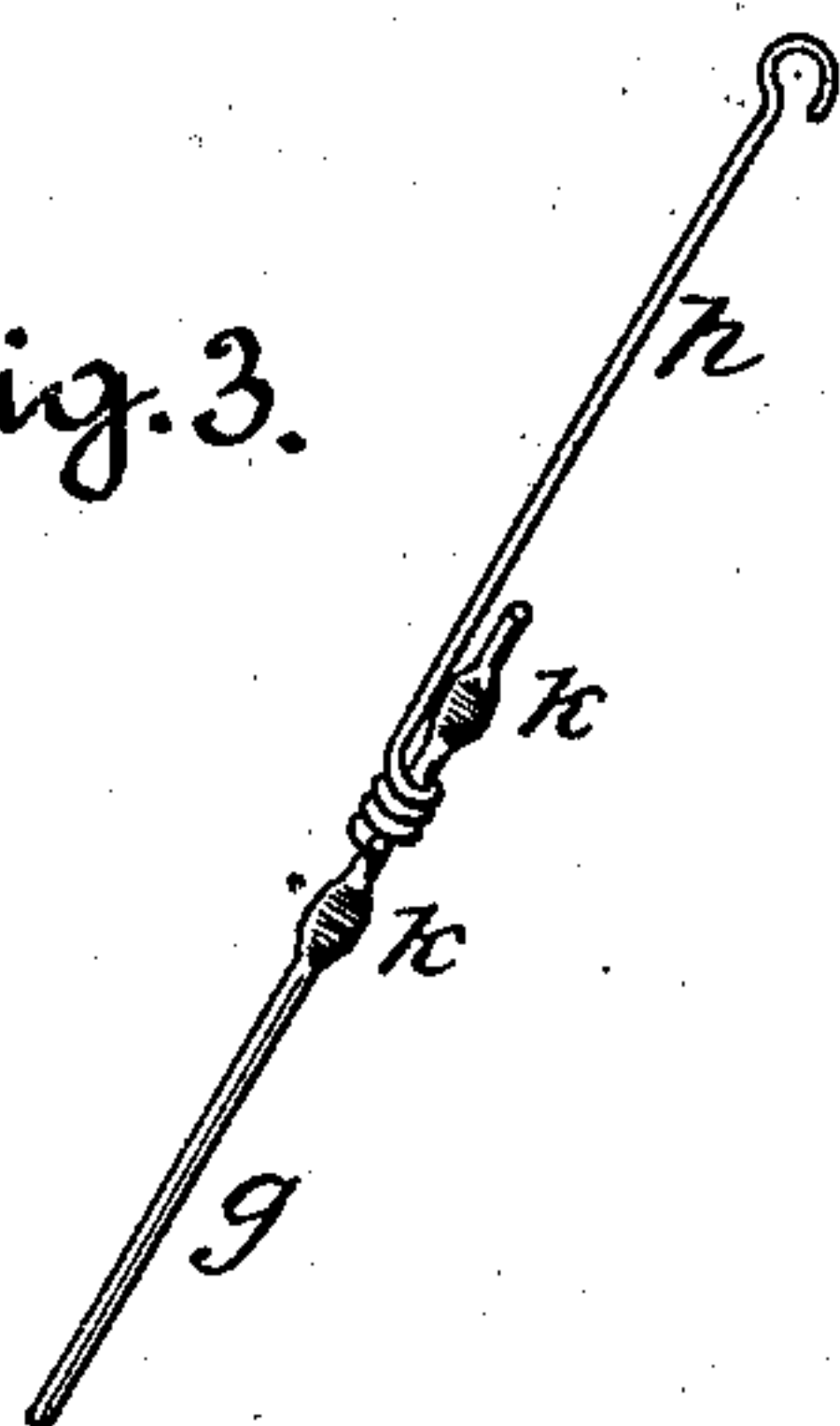
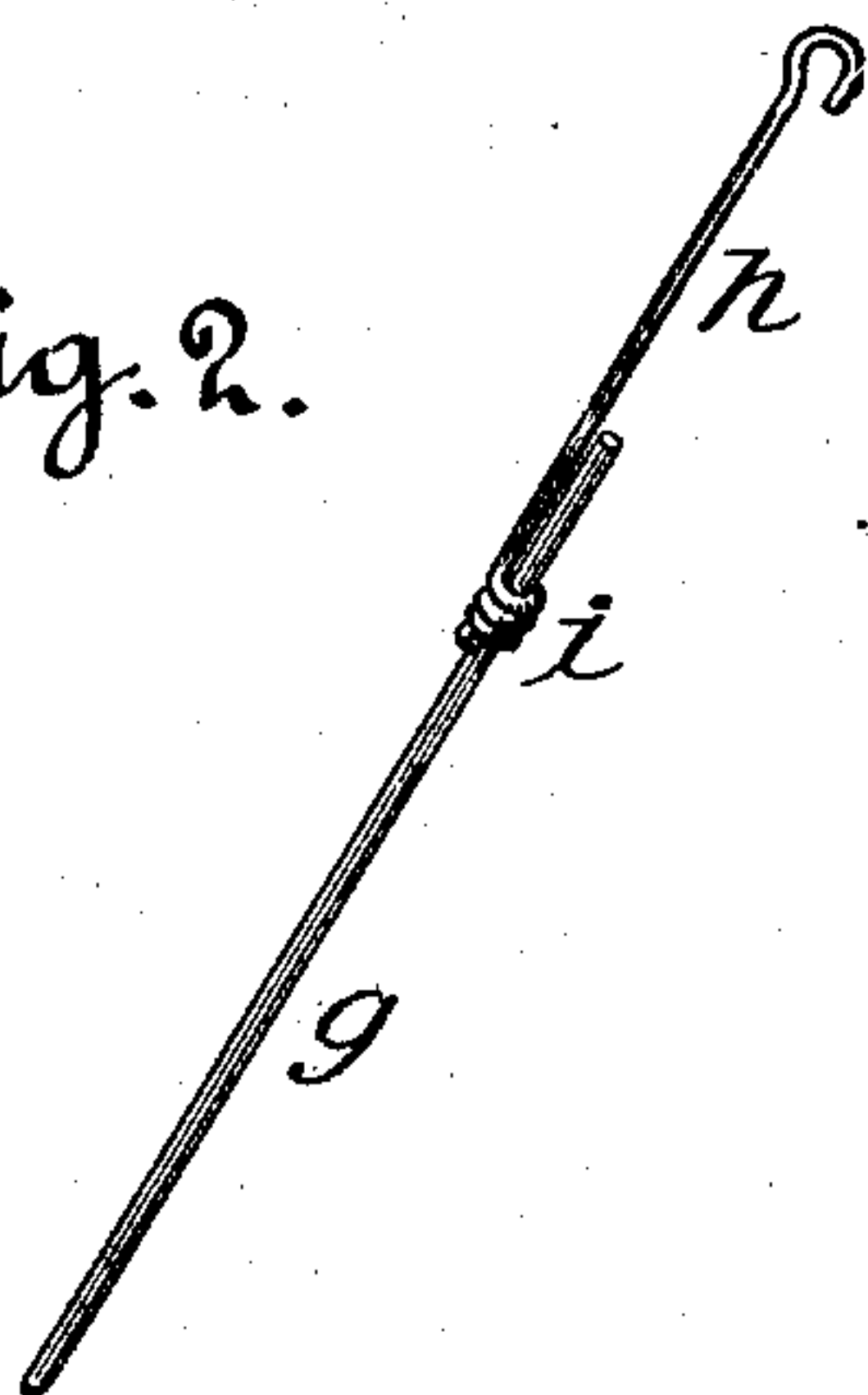


Fig. 2.



Witnesses.

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MARTIN ERNST H. FORST, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF
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INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 686,218, dated November 5, 1901.

Application filed March 29, 1901. Serial No. 53,470. (No model.)

To all whom it may concern:

Be it known that I, MARTIN ERNST H. FORST, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Incandescent Electric Lamps, of which the following is a specification.

My invention relates to electric lamps of the incandescent type, and more particularly to what are known as "anchored" lamps, in which the filament is partly supported and is steadied by an anchor or auxiliary connection with the glass. Such anchors as now constructed are usually composed of a single length of wire, one end of which is connected to the glass tube through which the leading-in wires enter. The other end is connected to a loop or coil of the filament and for that purpose is formed with a hook which engages the filament and is then cemented to it. There are definite objections to this construction, and disadvantages in operation result from it. The parts being very small and the filament exceedingly delicate and flexible, it is difficult to form the hooks so that the single piece of wire shall be of exactly the right length. Whether it be too long or too short, the filament is compelled to conform to the length, and is hence put under some strain instead of being perfectly free. Further, even the most expert workmen can turn out only a small number of the completed anchor connections because of the care required in their attempts to form the anchors of the right length. The work is therefore slow, and consequently expensive. When the lamp is in service, there is unequal expansion and contraction between the metal wire and the carbon filament, producing varying strains upon the latter and causing frequent breakage.

The objects of my invention are to overcome these disadvantages, to enable the assembling and securing of the anchor and filament to be performed much more rapidly by eliminating the extreme care in construction before referred to, and to make the parts self-adjusting to differentials in expansion and contraction. I accomplish these objects by forming a movable joint in the anchor.

I have described in this specification and

have shown in the accompanying drawings a practical embodiment of my invention, which is not its only embodiment, but is the one I prefer to use and affords a sufficient illustration of a practical operative device.

Figure 1 is an elevation of an incandescent lamp, showing my invention. Fig. 2 is a detail view of the anchor. Fig. 3 is a similar view of an anchor having stops for the movable joint.

a is the ordinary glass bulb, having the screw-cap *b*.

c is the closed glass tube, through which the leading-in wires *d* and *e* are passed and connected to the filament *f* in any suitable way. The anchor comprises a member *g*, usually a piece of wire secured to the tube *c* and extending toward the filament, and a separate member *h*, connected to the filament and having a movable joint with the member *g*. For making this joint I prefer to form the end of one member, as *h*, into a coil *i*, through which the end of the other member is passed, the engagement being close enough to form the desired support for the filament and loose enough to comprise a self-adjusting slip-joint. The member *h* is formed with a hook to engage the filament, which is afterward cemented to it. It is evident that the parts composing the filament can be turned out much more rapidly and with a regard only to approximate accuracy in length instead of the extreme care hitherto required, since the joint allows a considerable range in adjustment. In service such a slip-joint is self-adjusting to differential expansion and contraction and permits the filament to assume its proper normal position at all times. A telescopic joint such as described and shown is also axially self-adjusting to any lateral vibration of the filament and is hence especially adapted for use in cars, boats, and other localities subject to vibration.

In making anchors for new lamps it may be desirable to form stops on the member *g* in order to prevent the weight of the movable member from acting on the filament in vertically-set lamps. This can be done in several ways, one of which is shown in Fig. 3. After the two members are engaged the member *g* can be slightly flattened, as shown, on

one or both sides of the joint, producing a stop or stops *k*.

One especial advantage of my construction will be apparent, which is the facility with which old anchors of the single-rod type can be renewed with my attachment. It is only necessary to clip off the hook end of the old rod, the part attached to the glass being left of the proper length so that it forms the member *g*, and then complete the anchor with the member *h* or some equivalent member constructed according to my invention.

I do not limit myself to the construction described and claimed, as other movable joints which in structure and operation are equivalents for the one shown can be substituted for it, and I desire to avail myself of such modifications and equivalents as fall properly within the spirit of my invention.

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

1. An anchor for a lamp filament, composed of a plurality of members loosely connected together for relative longitudinal movement.

2. An anchor for a lamp filament, comprising a member secured to the filament-support, another member secured to the filament, and a loose connection between the two members for permitting their relative longitudinal movement.

3. An anchor for a lamp filament composed of two members connected by a longitudinal slip-joint.

4. In combination with an electric lamp, a two-part anchor connected by a slip-joint, its parts being attached respectively to the filament-support, and to the filament.

5. An anchor for a lamp filament compris-

ing a plain rod connected to the filament-support, a hooked rod connected to the filament, and a slip-joint between the two rods.

6. An anchor for a lamp filament comprising two members secured respectively to the filament-support and the filament, and a joint between said members capable of both longitudinal and axial motion.

7. An anchor for a lamp filament comprising two members secured respectively to the filament-support and to the filament, one member having a straight end, and the other having a coil which incloses such straight end.

8. In an electric lamp, the combination with the support and the filament, of a straight rod connected to the support and extending toward the filament, and a second rod, having a hook at one end for engagement with the filament, and a coil at the other end for engagement with said straight rod.

9. As a new article of manufacture, for the purpose described, an anchor member composed of a single piece of wire formed into a hook at one end, and into a coil at the other whereby it is adapted to form a slip-joint with another member.

10. An anchor for the described purpose comprising two members connected by a movable joint, one member being provided with means for limiting the movement of the other.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 1st day of March, 1901.

M. ERNST H. FORST.

Witnesses:

GEO. F. LOW,
F. M. BURT.