A. V. ABBOTT.
Rod Coupling.

No. 197,509. Patented Nov. 27, 1877.

Fig. 1.

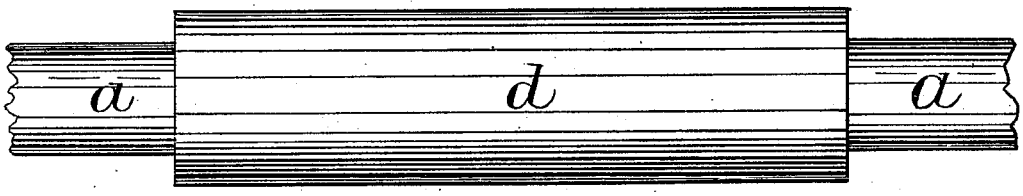
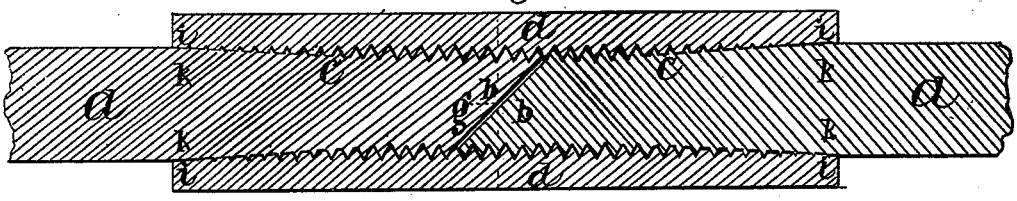


Fig. 2.



Witnesses.

Phillips Abbott

Benn. D. Vetterlein

Inventor.

Arthur V. Abbott

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Fig. 3.

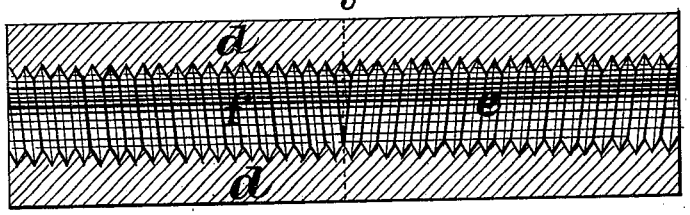


Fig. 4.

Fig. 5.

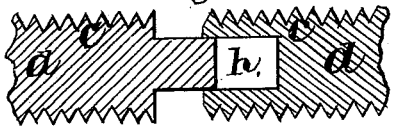
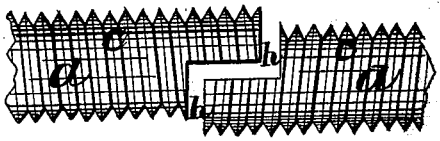


Fig. 6.



Witnesses.
Phillips Abbott.
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Inventor.
Arthur V. Abbott.

UNITED STATES PATENT OFFICE.

ARTHUR V. ABBOTT, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN ROD-COUPLINGS.

Specification forming part of Letters Patent No. **197,509**, dated November 27, 1877; application filed October 12, 1877.

To all whom it may concern:

Be it known that I, ARTHUR V. ABBOTT, of the city of Brooklyn, State of New York, have invented a new and useful Means of Uniting and Locking together Tubing, Rods, Shafting, Wires, and the like; and to enable those skilled in the art to make and use the same, I now fully and particularly describe my said invention, having reference to the accompanying drawings, in which—

Figure 1 shows my coupling as in use. Fig. 2 shows a vertical section of the same. Fig. 3 shows a vertical section of the sleeve. Fig. 4 shows the ends of the rods to be united, and Figs. 5 and 6 show rod ends of different form.

Like letters designate like parts in all the figures.

Prior to my invention it has been customary to unite the ends of rods, tubes, wires, shafting, &c., by cutting a right-hand screw-thread on the end of one rod, and a left-hand screw-thread on the end of the other rod, and then to run them into a sleeve or collar having a right-hand thread at one end, and a left-hand thread at the other, made to correspond with the thread on the rods, until the two ends of the rods met at or near the center of the sleeve. It has also been customary to so cut the thread upon the ends of the rods that it should run from one onto the other in a continuous right or left hand thread, and then the sleeve, with its thread made to correspond, was made to ride over the two ends when held together as though they were an unbroken rod. It has also been customary, when this last method has been used, to lock the ends of the rods together by dovetailing them into each other, and then, when the sleeve was run over them, they could not turn independently or separate so long as the sleeve remained firmly in its place.

In all of the above methods it has been customary, in order to keep the sleeve in position, to tap in a set-screw, running through the sleeve, and impinging upon the ends of the rods within the sleeve, or to use a locking-nut.

When set-screws or other similar devices have not been used, it has been found that either the sleeve or rod would work one way or the other until one of them became loose. This was very frequently the case in the instance of shafting, particularly when placed in a vertical position; and, in fact, this difficulty was met with whenever the rods were subjected to any jar or action which tended to loosen the sleeve. The set-screws and nuts were partially successful in overcoming this defect; but they add materially to the expense of the joint, to weaken the sleeve, and mar its appearance.

My invention does away with all the above defects, and is as follows:

I take the two ends of my rods, tubes, shafting, wire, &c., *a a*, which are to be joined together, and bevel off each end in any known manner, at any angle, but preferably about forty-five degrees, as at *b b*. I then cut on one of them a right-hand screw-thread, and on the other a left-hand screw-thread, as at *c c*. I then take a sleeve or collar, *d*, of suitable caliber relatively to the size of the rod, and of sufficient length to lap over the ends of the two rods when joined together a sufficient distance to make the joint strong and secure. I then cut a right-handed female screw-thread from one end of the sleeve to beyond the middle thereof, as at *e*, and a left-handed female screw-thread from the other end of the sleeve to beyond the middle thereof, as at *f*. The distance beyond the center of the sleeve to which the right and left hand threads, respectively, are to be cut will depend upon the length of the interlocking faces or portions of the rods. This thread is made to fit the thread on the rods to be joined. I then place the two rods in such position that the plane of the bevel on the end of each (which bevels should be of the same degree) shall be parallel, and I hold them there, so that they shall not turn or rotate. I do this by holding the rods firmly in the hands, or by clamping them in any suitable device; but they must be capable of longitudinal motion.

The method used by me in making many thousands of connections on the Brooklyn and New York suspension-bridge is to have two clamps or vises, the one stationary and the other capable of movement toward and from the other on ways of sufficient length to allow the necessary movement. Each clamp holds one of the rods. I then place the threaded

sleeve between the two ends, and bring them together until the thread on the ends of the rods shall engage with their respective female thread in the sleeve, and then, by rotating the sleeve, the ends are made to approach each other within the sleeve by the action of the right and left hand threads on the rods, until, finally, the faces of the bevels are brought into close contact with each other. The bevels will then jam against each other at or near the center of the sleeve, as at *g;* the sleeve cannot any longer be rotated, and the joint is made.

It will now be found that the sleeve is locked and cannot move either way, because of the right and left hand thread on the ends of the rods, respectively, and the rods themselves cannot rotate independently of each other by reason of the impact of the beveled faces.

To avoid the necessity of very accurate measurement and very careful workmanship, I usually do not thread the immediate center of my sleeve, nor the extreme ends of my rods, and I reduce the size of my rods at their extreme ends, so that they shall not engage with any screw-thread.

When I use my invention to couple shafting, and whenever I desire to use as light a sleeve as possible, and, therefore, wish to avoid any tensile strain, I prefer not to use beveled ends on my shafting-rods; but, instead, I cut a square section out of the end of each rod, as seen at *h* in Figs. 5 and 6, and when this is done the strain of their impact is at right angles to the line of shafting, and there is no tensile strain or tendency to push away from each other longitudinally.

I do not limit myself to any particular form of locking ends. It is only essential that the ends should be so formed that they may pass by one another and lock each other, when the rotation of the sleeve causes them to approach each other.

In practice, especially in joining tubing, as well as rods, &c., it is sometimes desirable that the tubes should not be weakened at or near the end of the sleeve by cutting away that portion of the tube necessary to form the screw-thread. To prevent this I ream out, either before or after cutting the thread, the inside of my sleeve, from the center to each end, in such manner that it shall be of greater inside diameter at the ends than in the center, and so that the thread in its inside shall almost or entirely run out or disappear at the end of the sleeve, as at *i*, Fig. 2. The thread on the tube, in this instance, is also gradually decreased from or near the very end thereof backward until, at the point contiguous to the end of the sleeve, when the joint is perfected, it almost or entirely disappears. This is shown in Fig. 2, at *k*. Thus I am enabled to retain almost the entire strength of the tube or rod, it not being appreciably weakened by the screw-thread cut in it.

I do not lay claim to this gradually-decreasing thread, except in combination as hereinafter claimed.

I do not limit myself to any particular size of rod or sleeve, nor to any particular material. My coupling can be used in making connections in timber-work as well as in the metals.

I claim as my invention and desire to secure by Letters Patent—

1. A sleeve with right and left hand threads, in combination with the locking and threaded ends of rods, substantially as and for the purpose described.

2. A sleeve having a conical bore from each end, diminishing toward the center, and right and left hand screw-threads, in combination with the rods having locking, tapered, and threaded ends, substantially as and for the purpose specified.

ARTHUR V. ABBOTT.

Witnesses:

B. V. ABBOTT,

PHILLIPS ABBOTT.