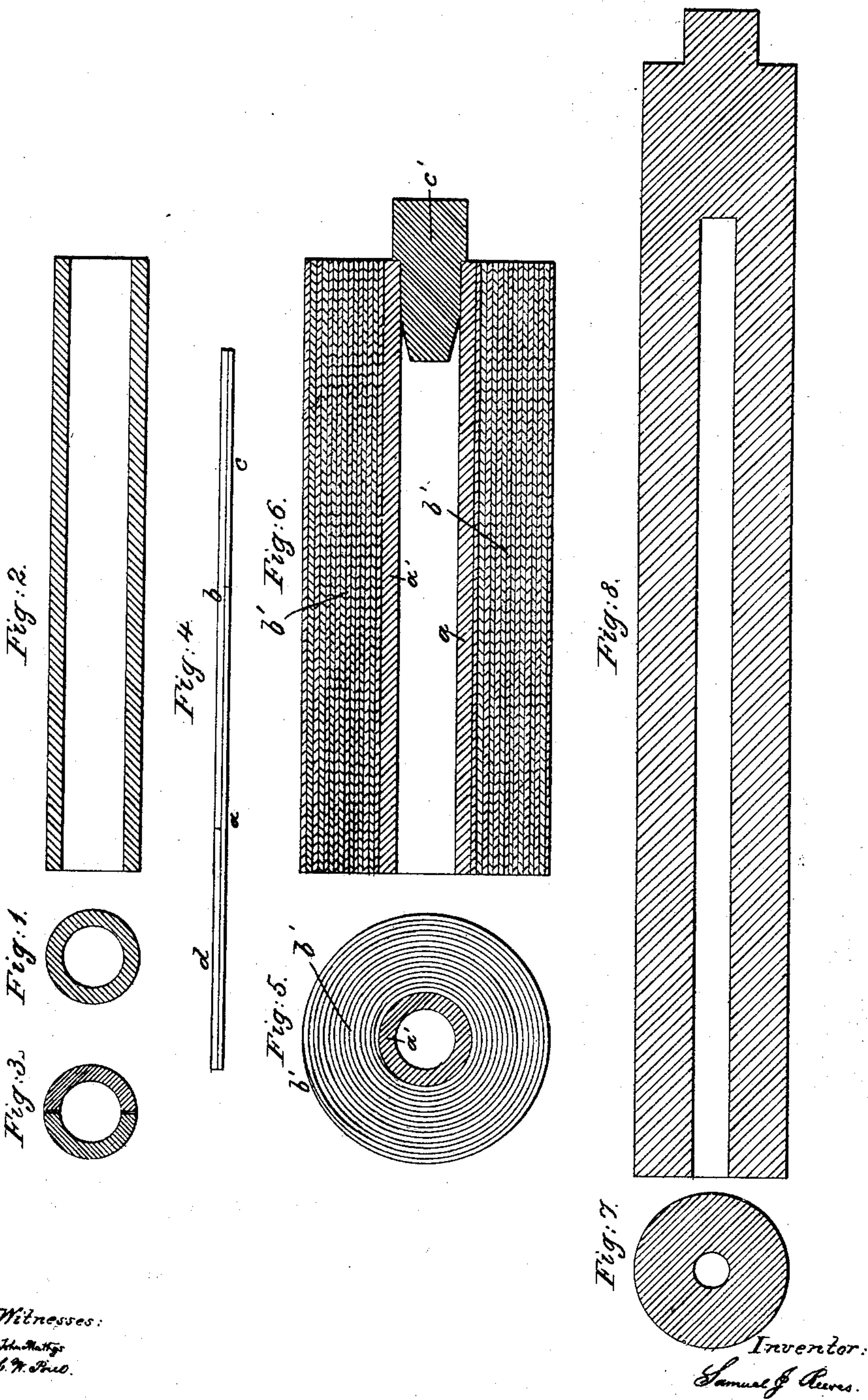


S. J. REEVES.

Fagots for Wrought Metal Cannons.

No. 37,108.

Patented Dec. 9, 1862.



Witnesses:
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UNITED STATES PATENT OFFICE.

SAMUEL J. REEVES, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN FAGOTS FOR WROUGHT-METAL CANNONS, HYDRAULIC PUMPS, &c.

Specification forming part of Letters Patent No. **37,108**, dated December 9, 1862.

To all whom it may concern:

Be it known that I, SAMUEL J. REEVES, of the city and county of Philadelphia, and State of Pennsylvania, have invented a certain new and useful manner of constructing piles or fagots of wrought-iron for the purpose of rolling or hammering them into masses, which, when finished, shall have the fibers of the iron surrounding the axis of the piece, as in guns and cylinders for hydraulic presses, in which form the metal is subjected to a great tangential strain; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a transverse, and Fig. 2 a longitudinal, section through the mandrel or center piece around which the plates are wound. Fig. 3 represents a transverse section through a mandrel or center piece made of two parts. Fig. 4 represents a mode of uniting plates so as to break joint when single plates cannot be procured of the full width of the length of the pile. Fig. 5 represents a transverse, and Fig. 6 a longitudinal, section through the pile when it is wound and ready to be heated, the latter figure showing the plug inserted which is to form the breech-pin of the gun. Fig. 7 is a transverse, and Fig. 8 a longitudinal, section through the same pile after it has been reduced by rolling into a gun-block.

My invention consists in the making of a pile or fagot of wrought-iron, or of steel and wrought-iron, by wrapping one or more sheets of iron or steel around a hollow tube or solid bar of iron or steel until it becomes of the diameter required, said tube or bar constituting a part and parcel of the pile or fagot when drawn down by rolling or hammering, and constitutes the part or portion out of which the bore of the finished gun is formed.

I have been cognizant of the fact that various attempts have been made to construct piles or fagots of wrought-iron for the purpose of rolling or hammering the same into masses, which, when finished, should have the fibers of the iron surrounding the axis of the piece—as in guns and cylinders for hydraulic presses—in which form the metal is subjected to a great tangential strain; but while success has partially attended these efforts, many very

important defects have manifested themselves in methods heretofore practiced, which make it extremely difficult to attain soundness and uniformity in its finished state.

Experiments have been made of wrapping wire helically backward and forward around a central shaft, in which the desired strength was readily obtained to resist a force exerted centrifugally in a plane at right angles with the axis, but which, from want of ability to resist longitudinal strains, failed to be of any practical utility.

Another mode has also been practiced, which consists in wrapping narrow bars of iron spirally around a series of longitudinal bars, each layer breaking joints with that which preceded it in winding. Thus made, the pile, after being heated to a welding-heat, was passed between rollers and reduced to a smaller diameter. From experience in making several hundred guns in this manner I have found this plan very expensive and inseparable from serious defects. In piles thus made the rollers have an uncontrollable tendency to pull the bars forward and away from the mandrel, causing the joints to open frequently as much as three-eighths to a half inch apart, thus preventing the edges, from want of contact, to be welded together, and leaving deep channels from one end of the finished pile to the other under each series of the surrounding bars composing it for the deposit of cinder and dirt. The defects of this plan are so great that scarcely one pile in three will finish soundly enough for a gun-block, and certainly not one in a dozen for hydraulic cylinders. An attempt has been made to rectify the evil of this plan by placing longitudinal bars, like staves, around the coiled bars and banding them; but, notwithstanding the adoption of this expedient, at least forty per cent. finish too imperfect to be used, and of the remainder scarcely one is entirely free from superficial or concealed defects.

A pile or fagot of iron has also been made by winding sheets of iron around a core or mandrel, and afterward withdrawing the core or mandrel; but when a gun is to be made and bored out from such a pile or block it is found that the lap will always be rough or cut to a fin or feather edge, and cannot be made smooth. This unfits such a pile or fagot for the making of guns, as the bore can never be perfect, while by my plan no such difficulty

is encountered, as the bore may be made in solid metal.

Encountering these practical difficulties, and desiring to overcome them, I have invented a process which, by actual experiment, I have ascertained effectually disposes of them, and by which I am able to obtain a sound and homogeneous finished article out of every pile.

To enable others skilled in working iron to use my plan, I will proceed to describe it.

I form a pile or fagot in a cylindrical shape, composed as follows: The center is a solid or hollow bar of iron or steel. It may be a welded tube, as shown in sections, Figs. 1 and 2 in the accompanying drawings, to which reference is to be had, or of two half-tubes, as in Fig. 3. The center piece is made of any required length suitable to the purpose. Upon this tube or bar I fasten plates or sheets of iron, the width of which is the length of the desired pile. If the pile should be required to be so long that plates cannot be obtained of full width, I use, instead of one, four plates arranged in widths so as to break joints, as shown in Fig. 4, where *a* of the bottom course and *b* of the top are of the same width, and, similarly, *c* of the bottom, and *d* of the top course, the plates *d* and *b* or *a* and *c* thus placed, respectively, determining the width of the wrapper. If desired, the edges of the plates *a* and *c* or *d* and *b* may be scarfed and riveted with countersunk rivets. I prefer to have the plates sufficiently long that each plate may make a pile; but if that be impracticable, two or more may be spliced together by scarfing the edges of their ends and riveting them, or by fastening them in any other suitable manner. If the plates to be used are thin, they

may be wrapped cold; but if thick, then I heat them in any suitable furnace warm enough to be readily bent, but not so hot as to raise a scale on the surface. When the plates require to be heated, they are not fastened upon the tube until drawn from the fire, as it is not necessary to heat the tube for that purpose. The plate thus prepared and fastened to the center piece is readily wrapped upon it by applying sufficient power to the ends of the bar to make it revolve. This being accomplished, the pile is ready to be heated to a welding-heat in the reverberatory furnace, whence it is taken to the rolling-mill or hammer and drawn into cylinders, solid or hollow, to any required size.

Fig. 5 shows a cross-section, and Fig. 6 a longitudinal vertical section, of a pile prepared for finishing into a gun-block.

a' is the hollow tube; *b'*, the wrapping-plate surrounding the tube *a'*; *c'*, the plug intended to be welded into one end of the pile to form the breech-pin of the gun.

Figs. 7 and 8 are sections of the same pile after being reduced by rolling into a gun-block.

I do not claim the making of a pile or fagot by the winding of sheets of iron in coils one upon the other, as this has been done; but

What I do claim in piles or fagots so made is—

The making of the bar on which the sheets are wound and welded of sufficient size to margin the bore of the gun when finished, substantially as and for the purpose described.

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Witnesses:

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