(No Model.)

S. R. WILMOT.

METHOD OF ATTACHING PLATES TO TUBES.

No. 407,982. Patented July 30, 1889.

Fig. 1.

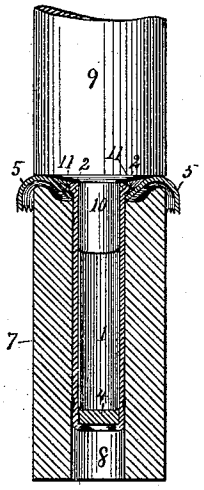


Fig. 2.



Fig. 3.

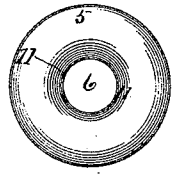
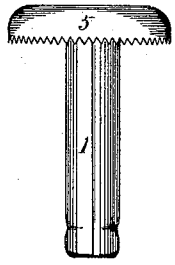


Fig. 4.



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UNITED STATES PATENT OFFICE.

SAMUEL R. WILMOT, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE WILMOT & HOBBS MANUFACTURING COMPANY, OF SAME PLACE.

METHOD OF ATTACHING PLATES TO TUBES.

SPECIFICATION forming part of Letters Patent No. 407,982, dated July 30, 1889.

Application filed January 28, 1889. Serial No. 297,760. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL R. WILMOT, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented an Improved Method of Attaching Plates to Tubes; and I do hereby 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.

My invention has for its object to devise a novel method of attaching plates to tubes, in which the plate shall be closed inward upon the tube instead of the tube being opened outward to engage the plate. This is of especial importance where the tube is rolled from a sheet of metal, the result of my novel method being to close the seam in the tube firmly together and to prevent the possibility of its being opened in use, the tube and plate being for all practical purposes the same as if drawn integral.

It will of course be understood that my invention is applicable in all places where it may be required to attach a plate to a tube—as, for example, in caster plates and tubes, which I have selected as a means of illustrating my present invention. Heretofore the tubes and plates of furniture-casters of this class have been made in two ways. In one form the tube and plate are formed separately, and are shipped to the furniture-manufacturer in this condition, the parts being assembled at the time the casters are placed in the articles of furniture in which they are to be used. This form is open to the objection of there being so many different parts and the necessity for handling and assembling these different parts by the furniture-manufacturer when they are used, it being of course understood that it is always preferable that the parts of manufactured articles should be assembled by the original manufacturer and that the user of the completed article should having nothing to do but to attach it in place. Another form which avoids the objection specified has been to draw both plate and tube from a single disk of metal. This form is open to the objection of the great expense of production, it being of course necessary in drawing the tube from the original disk to anneal and pickle the blank a number of times, the operation as a whole requiring expensive machinery and skilled labor, thereby, as so many operations are required, greatly increasing the cost of production.

By the use of my novel method, which I have developed by a series of experiments, I am enabled to take ordinary tubes rolled from sheets of metal and plates as they are received from the punches and attach them together at a single operation in such a manner that the seam in the tube is closed firmly together and retained there against the possibility of opening in ordinary use. I thus produce a combined plate and tube as solid as if drawn from a disk of metal, which overcomes the objection of separated parts, while at the same time I avoid the various operations of drawing, annealing, pickling, &c., which makes the integral plates and tubes so expensive to produce.

In the drawings forming part of this specification, Figure 1 is a view, partly in elevation and partly in section, which fully illustrates the means by which my novel method may be carried into effect; Fig. 2, an elevation of the tube detached, showing the manner in which it is formed and the way the top is closed; Fig. 3, a view of the plate detached, and Fig. 4 is an elevation of the combined tube and plate as secured together by my novel method.

1 denotes a caster-tube formed in any suitable manner, ordinarily by rolling up a sheet or strip of metal. This tube is usually provided with a bead 2, which is formed in the sheet in the operation of rolling, or after the rolling, if preferred, that being wholly immaterial so far as my present invention is concerned.

3 is the ordinary spring-tongue, by which the caster-shank is held in place, and 4 a disk of metal closed in at the top of the tube, so as to form a solid head.

5 is a caster-plate, which is struck out and formed to the shape shown by a single operation. The outer edge is ordinarily depressed and notched, as shown in Fig. 2, so that when inverted it may be readily driven into the

wood of the furniture-leg in which it is used and will hold firmly thereto. The center of the disk is punched out, leaving an opening 6, the edges of which are depressed more or less, as may be required, ordinarily about as indicated at 11 in Figs. 1 and 3. It should be understood that these details of construction have nothing whatever to do with the principle of my invention. I have merely referred to these details in order to illustrate the principle of my invention and to explain its application. The parts are assembled by passing the closed end of the tube through the opening in the plate, bead 2 resting on the depressed portion in the center of the plate when the parts are inverted, as in Fig. 1. The plate and tube are then locked firmly together by closing the depressed portion of the plate against the tube. This is preferably accomplished by suitable dies, as illustrated in Fig. 1.

7 denotes the lower die, which is provided with a central opening 8, which just receives the tube, and is countersunk at the top to receive the depressed portion of the plate.

9 denotes the upper die, the under side of which inclines outward slightly toward the center, and is provided with a central hub 10, which passes freely within the tube, but does not expand it in the slightest.

Fig. 1 shows the exact position the tube and plate assume when placed in the lower die. It will be seen that both parts rest entirely upon the depressed portion at the center of the plate. The upper portion is shown in the act of descending at just the position in which the operation of closing the plate inward upon the tube commences. It will be seen that as the upper die descends the outwardly-curved portion of the plate will be pressed down into contact with the lower die, while at the same time the tube will be forced downward. The tube, however, will be prevented from expanding in the slightest by its engagement with the sides of opening 8, so that the compression can only be exerted upon the depressed portion of the plate. This depressed portion is closed upward and inward tightly against the tube, so that when the upper die is raised and the article removed from the lower die the plate and tube will be found to be rigidly and firmly attached together, the attachment being as solid for all practical purposes as if they were made in a single piece.

Having thus described my invention, I claim—

The method of attaching plates to tubes, which consists in forming a bead at the end of a tube and a central opening in a plate, the metal around said opening being depressed, substantially as shown and described, then passing the tube through the opening in the plate until the bead rests upon the depressed portion thereof, and then closing the metal of said depressed portion inward upon the tube, substantially as described.

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

SAMUEL R. WILMOT.

Witnesses:

A. M. WOOSTER,

ETTA F. PETTIT.