(No Model.)

J. B. RATHBUN.

THILL COUPLING.

No. 370,210. Patented Sept. 20, 1887.

Fig. 1

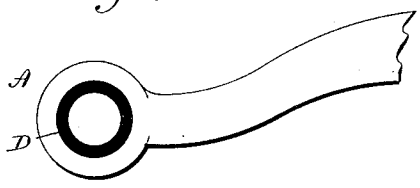


Fig. 2

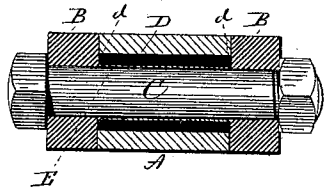


Fig. 3

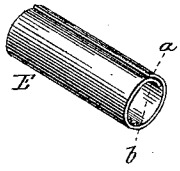


Fig. 4



Fig. 5

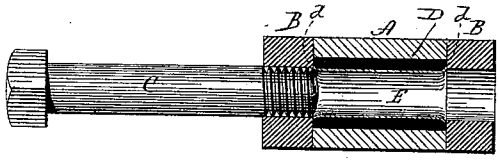
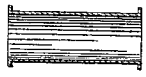


Fig. 6



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UNITED STATES PATENT OFFICE.

JAMES B. RATHBUN, OF NEW HAVEN, CONNECTICUT.

THILL-COUPLING.

SPECIFICATION forming part of Letters Patent No. 370,210, dated September 20, 1887.

Application filed June 27, 1887. Serial No. 242,596. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. RATHBUN, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Thill-Couplings; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view of a shaft-eye detached from the shackle; Fig. 2, a longitudinal central section through the shaft-eye in the shackle; Fig. 3, a perspective view of the internal sheet-metal lapped tube; Fig. 4, a longitudinal section of the said sheet-metal tube; Fig. 5, a longitudinal section through the shaft-eye and shackle, illustrating the advantage of the enlargement of the end of the metal tube in the introduction of the bolt. Fig. 6 is a longitudinal section of the sheet-metal tube in a modified form.

This invention relates to an improvement in the attachment of the shafts or thills of a carriage to the axle, and particularly to that class in which the shackle consists of two projecting ears made fast to the axle, and between which ears the shaft-eye is introduced and the bolt placed through the ears and shaft-eye as a pivot upon which the shaft or pole, as the case may be, may turn. In use it is found impracticable to make the bolt and shaft-eye fit so closely as to prevent rattling of the shafts in their connection with the axle. Various devices have been applied to prevent this rattling in the shaft-connections. Generally such devices have been introduced back of the shaft-eye and against the base of the shackle; but these devices are inconvenient for introduction, unless special instruments be employed for this purpose, so that changing—say as from shafts to a pole—is a difficult work, because the anti-rattling device requires a very considerable compression before the bolt can be introduced through the ears and shaft-eye. To overcome these difficulties the shaft-eye has been bored out for a larger diameter than the bolt, with an elastic material—as india-rubber—introduced into the enlarged opening, and so that the bearing of the bolt would be upon the rubber or flexible material. Again, to prevent the wear of the bolt upon the elastic or flexible material, a metal facing has been made for the elastic material, and so as to surround the bolt; but in so doing the elastic facing was made from sheet metal, its two edges brought together and turned outward through a slit cut in the elastic material into a corresponding groove in the shaft-eye. This necessitated so great a change in the shaft-eye that it was impracticable to apply to shafts already in use—that is to say, the shaft-eye required a groove to be formed upon its inner surface parallel with the axis, into which the turned-out edges or flanges from the metal facing could stand. Again, the metal facing terminates at the end of the flexible material and is of an equal diameter throughout. From this fact a difficulty arises in the introduction of the bolt, as it is liable to strike the exposed end of the metal facing and jam the facing or otherwise interfere with the introduction of the bolt. Again, with the facing having its edges brought together, the contraction of the facing is limited to the point where the edges meet.

The object of my invention is to provide an anti-rattling device within the shaft-eye and with a metal facing adapted to be introduced into the shaft-eye, with slight alterations of the eye, and so as to generally overcome the difficulties which have been experienced in the use of this class of anti-rattling devices; and it consists in a tube of elastic or flexible material introduced within the shaft-eye, combined with a metal tubular facing, the tube being slit longitudinally, one edge overlapping the other, so that it may contract to a degree considerably less than the normal diameter of the tube, and also in constructing this lapped tube with its ends turned outward, so as to enlarge the entrance to the tube and prevent the bolt from interfering with the tube in its introduction.

The shaft-eye A is of the usual form, and adapted to be introduced between the ears B B of a common carriage-shackle. C represents the bolt, which is introduced through the ears and through the shaft-eye, headed at one end, and with a nut upon the opposite end to secure it in place. The shaft-eye is bored out in di-

ameter considerably larger than the bolt, and into the enlarged opening in the eye a tube of india-rubber or other flexible or elastic material is introduced, its internal diameter, say, substantially the same as the diameter of the body of the bolt.

From thin sheet metal, preferably hard spring-brass, I form a tube, E. This tube is open upon one side, and its two edges *a b* overlap, as seen in Fig. 3. The length of this tube should substantially correspond to the length of the shaft-eye or distance between the two ears of the shackle. At its two ends the tube is turned outward to form a flange-like projection, *d*. (See Fig. 4.) Because of the overlapping of the two edges of the tube, it may be contracted to a very considerable extent.

After the elastic material or non-metallic material D has been introduced into the shaft-eye, the tube E is contracted to an extent to permit it to pass through the elastic tube already in the shaft-eye, and as indicated in Fig. 5. When so introduced, the tube E expands against the inner surface of the elastic material D. Then the shaft I is introduced between the ears in the usual manner; but because the ends of the tube E have been turned outward or expanded such ends will take a bearing against the inner faces of the respective ears and form a funnel-like opening at each end, the maximum diameter of which is larger than the diameter of the bolt, and so that when the bolt is introduced it cannot come in contact with the end of the tube, but will readily enter the tube and pass freely through it, expanding the tube to correspond to the body of the bolt. This expansion of the metal tube causes a corresponding contraction or compression of the elastic material surrounding it, and which compression, through the metallic contractible tube, produces a yielding bearing upon the bolt sufficient to prevent any rattling of the eye upon the bolt.

This device makes a simple construction, and is adapted to be applied to a shaft-eye already in use by simply boring out the shaft-eye to the required diameter.

The anti-rattling device, consisting of the elastic-material tube and the inner lapped metal tube, may be made as an article of manufacture and sold in the market to be applied.

The enlargement of the lapped internal sheet-metal tube may be made in the form of a radially-projecting flange, as seen in Fig. 6; but I prefer the funnel-like shape for the enlargement, as producing the best result.

I claim—

1. As an article of manufacture, the elastic-material tube D, combined with the internal lapped metallic tube, E, the said tube open at one side and its two edges lapped within the elastic-material tube, so as to permit the contraction of the tube, the ends of the metallic tube expanded, substantially as described, the said device adapted to be introduced into an opening through a shaft-eye.

2. In a thill-coupling, the combination of a shackle forming two ears, B B, the shaft-eye A between said ears, the bolt C through the ears and shaft-eye, combined with an elastic-material tube, D, within said shaft-eye around the bolt, and a thin metal tube, E, between said elastic-material tube D and the bolt, the said tube longitudinally divided upon one side and the two edges lapping each other, the said tube by such overlapping made contractible upon the bolt under the pressure of the elastic-material tube, substantially as described.

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