

(No Model.)

3 Sheets—Sheet 1.

E. E. GOLD.
HOSE FASTENING.

No. 591,468.

Patented Oct. 12, 1897.

FIG. 1

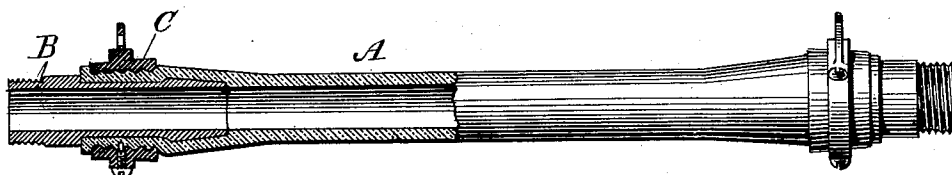


FIG. 2.

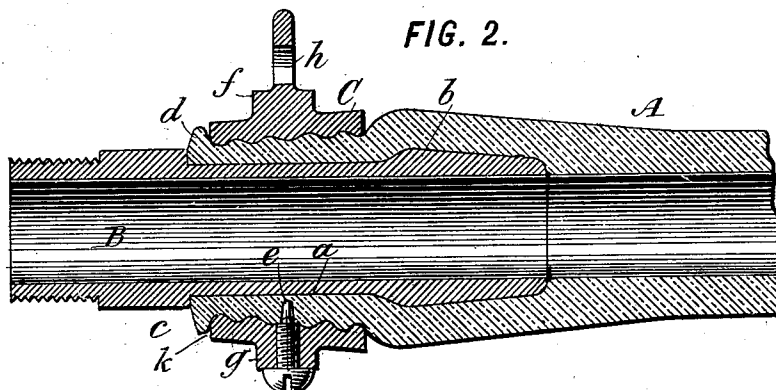


FIG. 4.

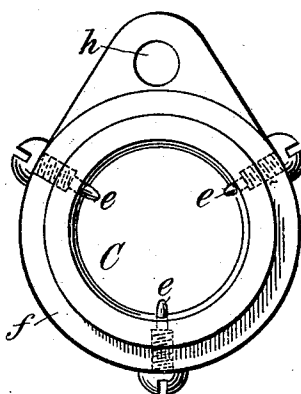
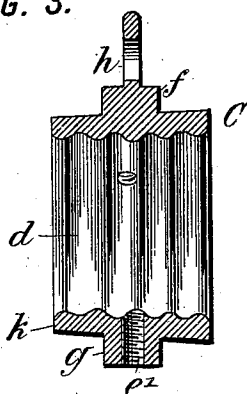


FIG. 3.



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FIG. 5.

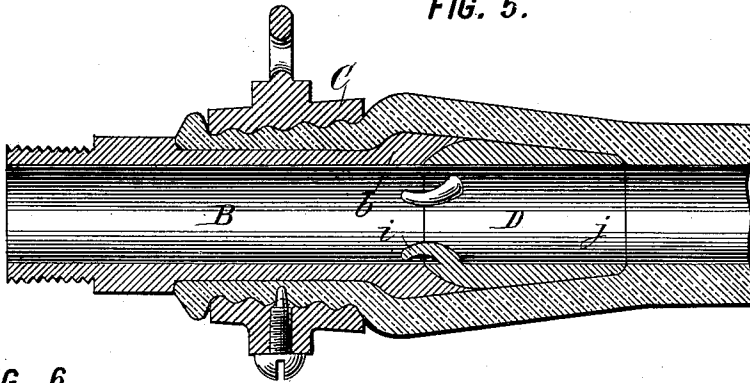


FIG. 6.

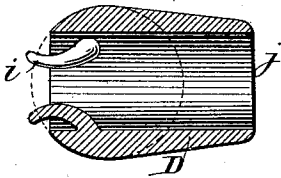


FIG. 7.

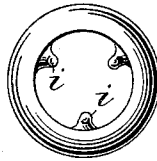


FIG. 8.

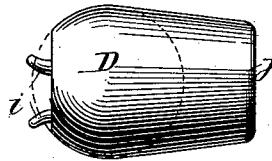


FIG. 9.

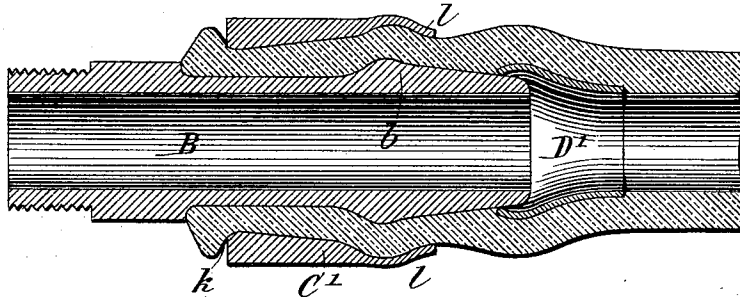


FIG. 10.



FIG. 11.

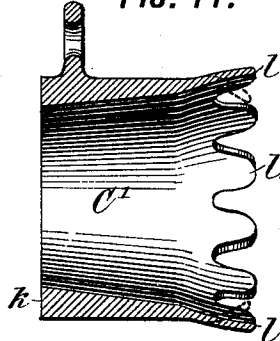
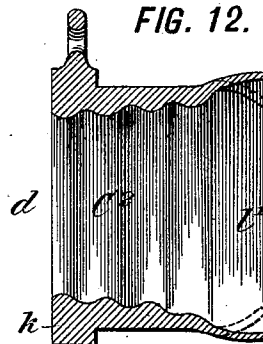


FIG. 12.



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FIG. 13.

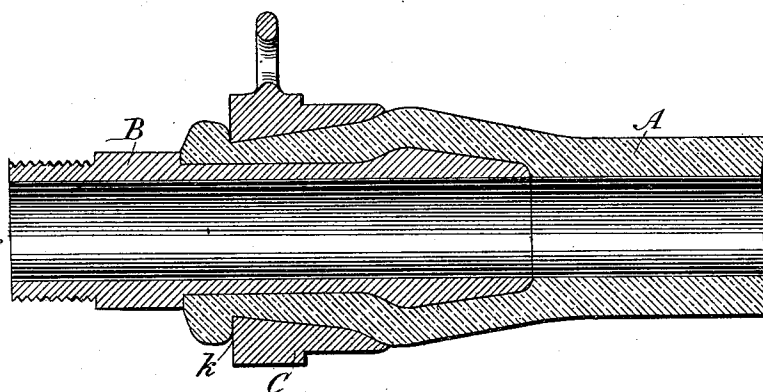


FIG. 14.

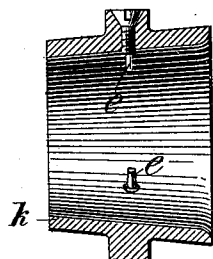
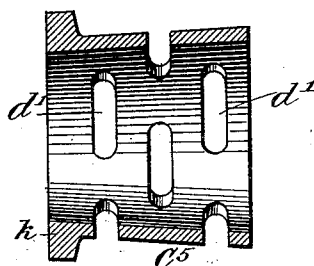


FIG. 15.



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UNITED STATES PATENT OFFICE.

EDWARD E. GOLD, OF NEW YORK, N. Y.

HOSE-FASTENING.

SPECIFICATION forming part of Letters Patent No. 591,468, dated October 12, 1897.

Application filed November 23, 1893. Serial No. 491,730. (No model.)

To all whom it may concern:

Be it known that I, EDWARD E. GOLD, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Hose-Fastenings, of which the following is a specification.

This invention relates to means for attaching flexible hose to metal pipes or nipples. It is particularly applicable to such heavy hose as is used for connecting steam-heating and air-brake pipes on railway-cars.

My invention constitutes an improvement upon that class of fastenings having a nipple which is thrust within the hose and a collar which is forced tightly over the hose to clamp it to said nipple. I construct the nipple with a long parallel neck, forming a seat for the hose and having a tapered enlargement or head at one end and a shoulder to abut against the end of the hose at the other. The collar is not screwed onto either the nipple or the hose, as heretofore, but is devoid of internal screw-threads and is made internally smooth and tapered to be forced over the hose and small enough to compress it against said parallel neck, preventing its expanding to pull off over the head.

My invention also provides a further improvement designed to overcome the difficulty heretofore experienced in the abrasion and eventual cracking and rupture of the hose by flexure where it bears against the end of the nipple within it.

According to my invention I provide the end of the nipple with a short tubular piece or section, which I will call a "thimble," and which projects beyond the nipple inside the hose and has a free or rocking connection with the nipple, preferably after the manner of a ball-and-socket joint, so that as the hose is flexed this inner thimble will move with it and thereby reduce the wear upon the hose.

Figure 1 of the accompanying drawings is a sectional elevation of a hose and its fastening devices embodying part of my invention. Fig. 2 is a longitudinal mid-section of the left part of Fig. 1, on a larger scale. Fig. 3 is a section, and Fig. 4 an end view, of the collar, removed. Fig. 5 is a longitudinal mid-section showing the application of my complete

invention. Fig. 6 is a longitudinal mid-section of the thimble shown in Fig. 5. Figs. 7 and 8 are end and side elevations of this thimble. Fig. 9 is a longitudinal mid-section showing a modification of my invention. Figs. 10 and 11 are respectively sections of the thimble and collar in Fig. 9. Fig. 12 is a section of a slight modification of the collar shown in Fig. 11. Fig. 13 is a longitudinal mid-section showing a further modification of the hose-fastening. Figs. 14 and 15 are sections of two modified forms of the collar.

In all the figures of the drawings the hose is designated by A, the nipple by B, and the collar by C, or its modified forms by C' C², &c. In those figures which show the thimble it is lettered D or D'.

Referring to Figs. 1 to 4, the nipple B is formed with a tapering head or enlargement *b*, terminating in a rounded shoulder, back of which is a long parallel neck *a*. This enlarged head is forced into the hose, so that the end portion of the hose embraces the neck *a*, the end of the hose coming, preferably, against a shoulder *c* at the opposite end of neck *a*. The collar C is of a length sufficient to embrace and compress that portion of the hose which lies around the neck *a* of the nipple and is of smaller diameter than the hose when the latter is seated on the neck, so that when placed over the hose the latter is so tightly embraced that it cannot expand over the enlargement *b*. The collar consists, essentially, of a short undivided tube of such size and shape that it is capable of being passed over the end of the hose—that is, from left to right, in Fig. 2—and of such size that in being passed onto the hose it will compress it, as shown. To facilitate the putting on of the collar, it is preferably made conical, as shown in Figs. 2 and 3. The collar is put in place by holding the hose with its inserted nipple firmly in a clamp or support and passing the collar over the end of the hose and forcing it onto the hose by pressure applied in line with the axis of the nipple and hose. The collar is thus applied without any twisting or screwing motion, and consequently without distorting the hose or forcing it out of a straight line on the nipple. The end of the hose should be brought against the shoulder *c*, and

as this is smaller than the opening through the collar the latter is easily passed over the shoulder in forcing it onto the hose. It is preferable to provide some means for retaining the collar in place on the hose other than the mere frictional contact of its inner surface with the hose. To this end I prefer to corrugate it, as shown in Figs. 2 and 3, by forming rounded concentric annular corrugations d on its inner surface, into the hollows of which corrugations the hose expands, so that it strongly grasps them in the manner shown in Fig. 2. These corrugations are to be distinguished from screw-threads, being annular and concentric instead of spiral. The rear wall k of the collar is made abrupt, so that the hose by expanding against it also tends to hold the collar in place. As a further means of preventing displacement of the collar relatively to the hose I may provide it with three or more screw-spurs e , consisting each of a screw with a spur-point passed through the body of the collar, preferably at equidistant points, and all projecting radially toward the center, as shown in Fig. 4. These screws are applied after the collar is in place and are screwed up tight against the collar, so that their spurs indent and penetrate the material of the hose and thoroughly lock the collar to the hose, so that no pull upon the hose tending to draw it off over the enlarged end of the nipple can draw the hose out of the collar, but must carry the collar along with the hose, so that the collar serves to compress the hose against the enlargement b , and thereby to more firmly fasten the hose to the nipple the greater is the strain to pull it off. The screw-spurs are passed through holes e' made in a flange f , formed around the exterior of the collar, and which flange presents a flat and extended face g on its outer side, against which may be exerted the pressure required to force the collar into place. To enable the hose to be suspended, an eye h may be cast on this flange or otherwise on the collar.

In Figs. 1 to 4 that part of my invention consisting of the thimble D is omitted, being shown in Fig. 5. Here the end of the nipple B is shortened and hollowed out to receive the rounded base of the thimble D . Thus a sort of ball-and-socket connection is established between the nipple and the thimble which admits of a slight angular play of the thimble relatively to the nipple, so as to bring their axes slightly out of coincidence. To limit the extent of this motion, it is preferable to provide stops of some sort, which may conveniently be done by forming stop fingers or spurs i within the end of the thimble and projecting beyond its end within the bore of the nipple and so as to strike the latter when the thimble is deflected to the required extent. The thimble D consists, essentially, of a short tube adapted to be inserted within the hose and to extend beyond the end of the nipple and having a sufficiently-free connection

with the nipple to enable it to participate somewhat in the movements of flexure of the hose. The thimble is preferably tapered to a thin edge at its outer end j , in order to support the hose in its gradual reduction of diameter from the point where it is stretched over the enlargement b to where it assumes its normal size. As the hose is bent to either side out of line with the axis of the nipple the thimble moves with it to some extent, or as far as the stops i will permit, and supports the hose in its flexure and reduces the extent of flexure of the hose where it bends against the end of the thimble compared to what its flexure would be in bending against the end of a rigid nipple, such as is shown in Figs. 1 and 2. The abrasion and wear of the hose is thus greatly reduced and its life is prolonged, since it is found in practice that the hose will almost invariably wear out and give way first where it bends against the end of the nipple.

The means for providing a loose connection or joint between the thimble and nipple may be considerably varied, although the ball-and-socket construction shown in Figs. 5 to 8 is considered preferable. As an example of a modification I have shown in Fig. 9 a thimble D' , consisting simply of a sheet-metal tube thrust into the hose and the larger end of which bears upon the exterior of the conical nose of the nipple B . As the thimble makes a loose fit with the nipple it is free to move thereon, participating in the flexure of the hose. It is shown detached in Fig. 10. Fig. 9 also shows a modification of the collar, the modified form of collar lettered C' being also shown removed in Fig. 11. The collar has a smooth conical inner surface to cause it to slide as freely as possible over the hose in applying it, and is held in place when applied by the friction of the hose against its inner surface and by the expansion of the hose back of its abrupt rear face k , and by the pressing down upon the hose and beyond the enlargement b of ears l , the construction of which is best shown in Fig. 11, where these ears are shown in full lines flaring outwardly, as they are before being applied, and in dotted lines when bent down to compress the hose, which is done after the collar has been brought to its place. A very tight and firm union is thus maintained between the collar and hose.

Fig. 12 shows a further modification of the collar, which is here lettered C^2 , its inner surface being corrugated, as first described, while its outer end l' is made of thin metal flaring outwardly in order to pass over the enlargement b , Fig. 9, after which this thin portion is compressed to bend it down to embrace the hose against this enlargement, in the manner indicated in dotted lines. The collars C' and C^2 should be made of malleable iron, or of soft brass or other metal which will admit of thus bending down the ears after the collar is applied.

Fig. 13 shows a further modification of the collar, which is here lettered C^3 . Its inner

surface is made conical and smooth and is held in place solely by the expansion of the rubber hose against its rear face *k*.

Fig. 14 shows another modification of the collar, which is here lettered *C*⁴. The collar is here a plain conical tube and is held in place by spurs *ee*, formed by means of screws, as in the construction first described.

As an equivalent for the corrugations *d* in Figs. 2, 3, and 12 I have shown in Fig. 15 a collar lettered *C*⁵, having elongated slots *d'* *d'*, which serve the same purpose as the corrugations, inasmuch as the hose may expand partially into these slots and thereby create a cling against the collar, which will serve to hold the collar in place.

I claim as my invention the following-defined novel features, substantially as herein-before specified, namely:

1. The nipple for a compressible hose having an elongated cylindrical neck and an enlarged head adapted to enter a hose, in combination with an internally-tapering collar surrounding said hose when on the nipple, the largest diameter of said collar being toward said head, and the smallest diameter of said collar being smaller than that of the hose when surrounding said neck, whereby the hose is compressed between said collar and neck, and expands beyond the inner end of said collar, substantially as set forth.

2. The nipple for a compressible hose hav-

ing an enlarged head, a square shoulder, and an elongated contracted cylindrical neck between said head and shoulder, the end of the compressible hose passing over said head and neck and abutting against said shoulder, in combination with an internally-tapering collar adapted to surround said neck with the hose between it and said neck, the smallest internal diameter of said collar being at or near its inner end when in place and from whence it enlarges toward said head, said smallest diameter being greater than that of said shoulder and smaller than that of the hose when surrounding said neck, whereby the hose is compressed between said collar and neck and expands between the inner end of said collar and said shoulder, substantially as set forth.

3. The combination with the hose and the nipple on which it is fastened, of a thimble projecting within the hose beyond the end of the nipple, and connected thereto so as to be capable of deflection out of axial line thereof, with, and stops for limiting the extent of such deflection substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EDWARD E. GOLD.

Witnesses:

GEORGE H. FRASER,
THOMAS F. WALLACE.