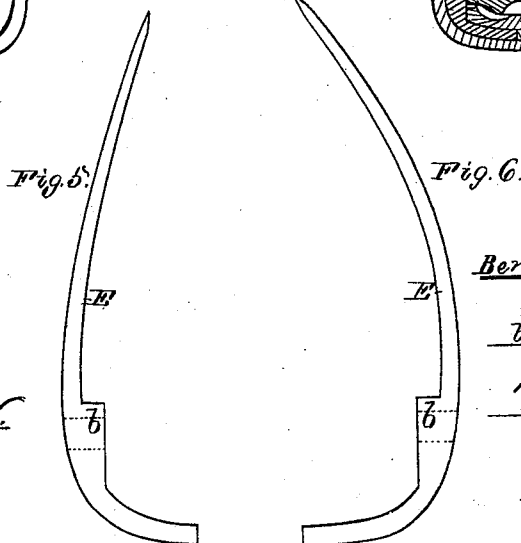
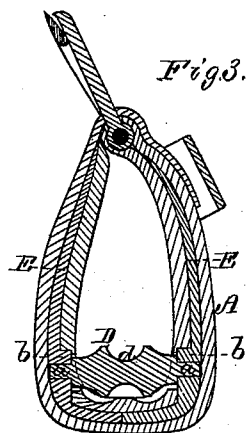
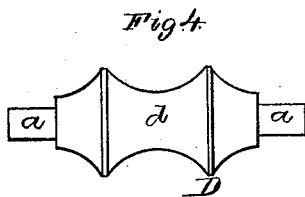
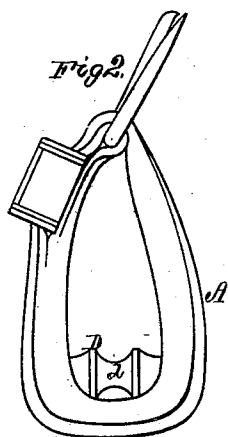
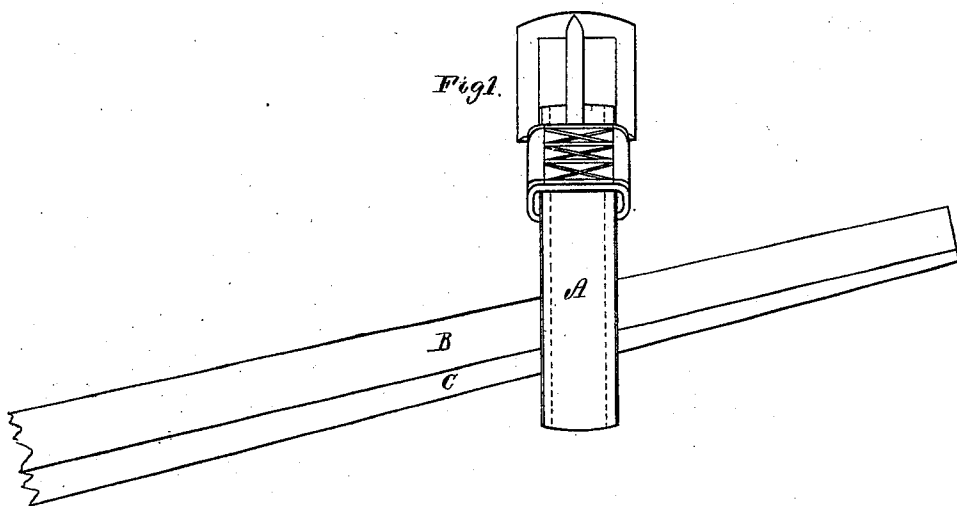


B. S. LEONARD.

HARNESS-TUG.

No. 170,382.

Patented Nov. 23, 1875.



Witnesses.

S. W. Piper

L. W. McLean.

Benjamin S. Leonard

by his attorney

R. W. Eddy

UNITED STATES PATENT OFFICE.

BENJAMIN S. LEONARD, OF SHARON, MASSACHUSETTS.

IMPROVEMENT IN HARNESS-TUGS.

Specification forming part of Letters Patent No. **170,382**, dated November 23, 1875; application filed October 5, 1875.

To all whom it may concern:

Be it known that I, BENJAMIN S. LEONARD, of Sharon, of the county of Norfolk and State of Massachusetts, have made a new and useful invention relating to Carriage-Shafts and Harness-Tugs therefor; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a side view of a tug and part of a shaft or thill, to which my improvement is applied. Fig. 2 is a front elevation, and Fig. 3 a vertical section, of the tug. Fig. 4 is a side view of the bearing-roller, and Figs. 5 and 6 edge views of the two tug and roller supporters or ribs.

My invention consists in the combination of two separate metallic ribs or supporters with the harness or shaft tug and a bearing-roller, arranged as set forth.

The object of my invention is to protect the inner surface of the tug and the lower surface of the shaft from wear, and to enable the shaft to readily play in or through the tug.

In the drawings, A represents the tug, and B part of a thill or carriage shaft, the latter being provided with a metallic rail, shield, or guard, C, fixed to its under side, and curved transversely to fit it thereto. This rail or guard rests on a friction or bearing roller, D, whose periphery is curved or hollow, in manner as shown at *d*, to fit to the rail, the roller being extended across the lower part of the tug, and having its journals *a a* supported in bearings *b b* in two metallic ribs or tug-supporters, E E, formed and arranged within the tug in manner as shown. These ribs, by being disconnected at their upper as well as at their lower ends, enable the tug, (made of leather) before being closed at top, to be spread apart to receive the journals of the roller. Besides, they sustain the roller independently of the tug, and operate to keep the latter from elongating and contracting upon the shaft while the tug may be in use.

I am aware that harness-tugs have had cylindrical rollers arranged in them, and that the journals of such rollers have been supported by a yoke or bow of metal introduced into the body of the tug, in which case such tug becomes closed at top and open at bottom, such being as shown in the United States Patent No. 95,748.

My tug is open at top and closed at bottom, so that it cannot at its lower part separate so as to cause the roller to escape or pull out of its bearings; and, by being open at top and provided with the two separate ribs E E, it can be spread open after being finished to receive the roller, or for its removal and the substitution of another.

Furthermore, the guard or rail C rests and runs in the groove of the roller, such groove and guard serving to keep the shaft out of contact with the inner surface of the tug, and thereby saving the latter from wear.

I would further remark that I do not claim a tubular shaft or thill, nor do I claim a shaft having a metallic socket provided with a wooden filling. In my shaft the guard-rail, while it strengthens the shaft, extends from it and fits to the groove of the bearing-roller, and with it keeps the shaft out of contact with the inner side or surface or leather of the tug.

I claim—

1. In combination, with the harness-tug A and the friction-roller D, arranged therein as set forth, the two separate or disconnected metallic ribs or collar and tug supporters E E, arranged with the said roller and in the tug, substantially as specified.

2. The combination of the curved guard or shield C, and the grooved friction-roller D, with the tug A and the thill or shaft B, all being arranged and to operate as specified.

BENJAMIN S. LEONARD.

Witnesses:

R. H. EDDY,
J. R. SNOW.