(No Model.) 2 Sheets—Sheet 1.

T. C. ROBINSON.

METHOD OF MAKING CARTRIDGE CASES.

No. 260,897. Patented July 11, 1882.

Fig. 1.



Fig. 2.

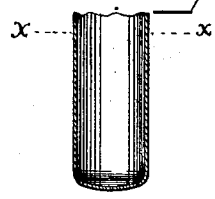


Fig. 3.



Fig. 4.



Fig. 5.

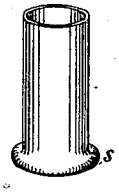
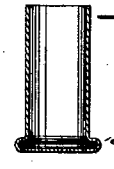


Fig. 6.



Attest.
Gustavus A. Cooper.
W. G. Ransmann

J. C. Robinson
By his attorney
Charles E. Foster

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

OSMORE O. ROBERTS, OF NORTHAMPTON, MASSACHUSETTS.

HAME AND TRACE ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 260,896, dated July 11, 1882.

Application filed March 9, 1882. (No model.)

To all whom it may concern:

Be it known that I, OSMORE O. ROBERTS, a citizen of the United States, residing at Northampton, in the county of Hampshire and State of Massachusetts, have invented certain new and useful Improvements in Attaching Tugs or Traces to Hames in Light Harness; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in attaching hame-tugs to hames in harness.

It consists in forming the clip with an undivided shank provided with an open loop to receive the eye of a hame-hook, and in slotting the latter on the under side obliquely to reduce the thickness of the metal sufficiently to allow said loop to be linked to said hook or readily detached therefrom after the tug is secured, as will be hereinafter set forth.

In my drawings, Figure 1 is an outside view of the tug, loop, and hook and a portion of a hame. Fig. 2 is an inside view, or elevation, of the same. Fig. 3 is a top view of the same. Similar reference-letters indicate like parts in all of the figures.

Referring to the drawings, A is the loop or ring, formed open radially and provided with a long shank, to which is permanently secured the breast end of a hame-tug by means of stitching, rivets, or any ordinary method.

B is the hame-hook, provided with an eye, *a*, secured permanently to one of the hames C by brazing or welding.

Inside of said hook is cut or formed a slot, *b*, of a width about equal to the diameter of the metal forming the loop A of the clip, to reduce the metal of the said hook at that point to a thickness about equal to the cut or opening *c* of the ring or loop A.

The ordinary method of forming the combined loop and shank of a tug-clip is by making it of a single continuous piece of material, so that when completed it has a bifurcated appearance, which bifurcations, after the loop has been placed in the eye of the hook attached to the hame, are placed over the end of the tug and secured to the same by rivets or other suitable means.

By this arrangement and method there is found to be an inconvenience in the handling of the united parts, as while fastening the tug to the shank of the clip, the hame being already attached to the hook, said hame falls in the way of the operator and retards the progress of his work.

In my device I form the shank of the clip of a single piece, undivided, with an open loop on its end, which, being adapted to coincide with the oblique slot in the hook of the hame, enables me to economize the construction of my device, and at the same time render the tug-clip and hame-hook easy of attachment with each other in the process of manufacture.

By my improvement the hame may be independent of the loop until after the latter and the tug have been completely united.

In uniting the tug-clip to the hame-hook by my improved arrangement I place the loop A against the hook B, with the opening of the former against the reduced metal of the latter, and press one toward the other until the said loop finds its way into the eye of the said hook. I now revolve the clip and hook, either or both, until the slot in the hook B comes diagonally opposite the opening in the loop A to make the one perfectly secure in the other.

It is obvious and apparent that by no possibility can the loop A be detached from the hame-hook while the hames are in place upon the collar of the horse, as it would be quite impossible to place the said loop A in the position it occupied with reference to the hook B immediately before it was revolved, as previously described.

I am aware that in chains and other analogous articles, and in tug and single-tree attachments, the material in one piece has been reduced to facilitate the union of a second piece having an opening to correspond with the reduced portion, and to such therefore, broadly, I make no claim.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination, with a harness-tug and a clip formed with an undivided shank and an

UNITED STATES PATENT OFFICE.

THOMAS C. ROBINSON, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR OF FIVE-EIGHTHS TO E. BAKER WELCH, OF SAME PLACE, AND LEMUEL P. JENKS, OF BOSTON, MASSACHUSETTS.

METHOD OF MAKING CARTRIDGE-CASES.

SPECIFICATION forming part of Letters Patent No. 260,897, dated July 11, 1882.

Application filed February 28, 1881. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CROCKER ROBINSON, a citizen of the United States, residing at Cambridge, Middlesex county, State of Massachusetts, have invented a new and Improved Process of and Machine for Making Cartridge-Cases, of which the following is a specification.

The object of my invention is to produce a cartridge-case less expensive and less liable to affect injuriously its contents than those made in the usual manner; and my invention consists of the mode hereinafter described of making such cases of tinned sheet-iron.

In the drawings, Figures 1 to 4 illustrate in elevation and in section my improved cartridge-case in different stages of manufacture; Figs. 5 and 6, the same formed with a rim; Fig. 7, an elevation of the rim-forming apparatus; Fig. 8, a plan of Fig. 7; Fig. 9, a sectional plan on the line 1 2, Fig. 7, and Fig. 10 a vertical section through the upper part of the closed jaws of the rim-forming apparatus.

Heretofore metallic cartridge-cases have been made of soft metal or alloys, as brass and copper, which permit of ready manufacture, but are objectionable in part from the expense of the material, the cases, except for sporting-cases, seldom being used a second time, and partly from the effect of water and the contents upon the metal, which corrodes and deteriorates the powder and fouls the pieces from which the cartridges are fired.

The object of my invention is to produce a cartridge-case cheaper than those made of the metals named, less liable to deteriorate under the influences to which it is necessarily subjected, and of such a character that the contents will not become impaired by chemical action upon the case itself. This I attain by discarding the soft metals and alloys heretofore used and employing in place thereof tinned iron, which is cut into plates of the proper shape and drawn or spun up or otherwise formed into the usual close-ended tube, and, if desired, with a hollow flange or rim to contain fulminate for rim-firing.

In actual manufacture I take a disk of tinned metal and draw it up by means of ordinary dies to the forms shown in Figs. 1 and 2, and I have found that the presence of the tin coating facilitates this operation, rendering the metal less liable to tear under the action of the dies. I then cut off the open end on the line *x x*, Fig. 2, to form a straight edge, as shown in Figs. 3 and 4.

The case thus constructed, with any of the ordinary inside anvils or indented at the end, may be used for a center-fire cartridge; but for a rim-fire cartridge the tube must be brought to the shape shown in Figs. 5 and 6. For this purpose I may use the apparatus shown in Figs. 7, 8, and 9. This apparatus consists of a base-plate, A, supporting two guides, B C, on which slide two jaws, F G, recessed at the inner edges to conform to the shape of an upright mandrel, T, somewhat less in diameter than the recess inclosed by the jaws when their ends are together. At the side of each jaw is a lug, H, having a threaded opening to receive the threaded end of a screw, K, each of which may be turned by a crank-handle, L, in a standard, N, supported on the base-plate.

Upon the mandrel T, below the jaws F G, is a sleeve, S, which may be moved vertically by a lever, P, turning on a pivot projecting from a standard, Q, and slotted at the end to receive a pin, R, projecting from the side of the sleeve. Above the mandrel is a plunger, *u*, with any suitable contrivance for forcing it downward with a powerful pressure and for raising it, and in the lower face of said plunger is a shallow recess, corresponding in diameter to that of the flanged end of the cartridge-case to be produced. The mandrel T is of such a height that when the partly-finished cartridge-case, in the form of a closed-ended tube or shell, is placed thereon, the lower end resting on the sleeve S, the closed end of the shell will project to a certain determined extent above the end of said mandrel, as shown in Fig. 7. After so placing the shell, the clamps F G are brought upon the shell so as to grip the same tightly against the mandrel, as illustrated by Fig. 10, thereby preventing any slipping or crushing of the shell while the plunger