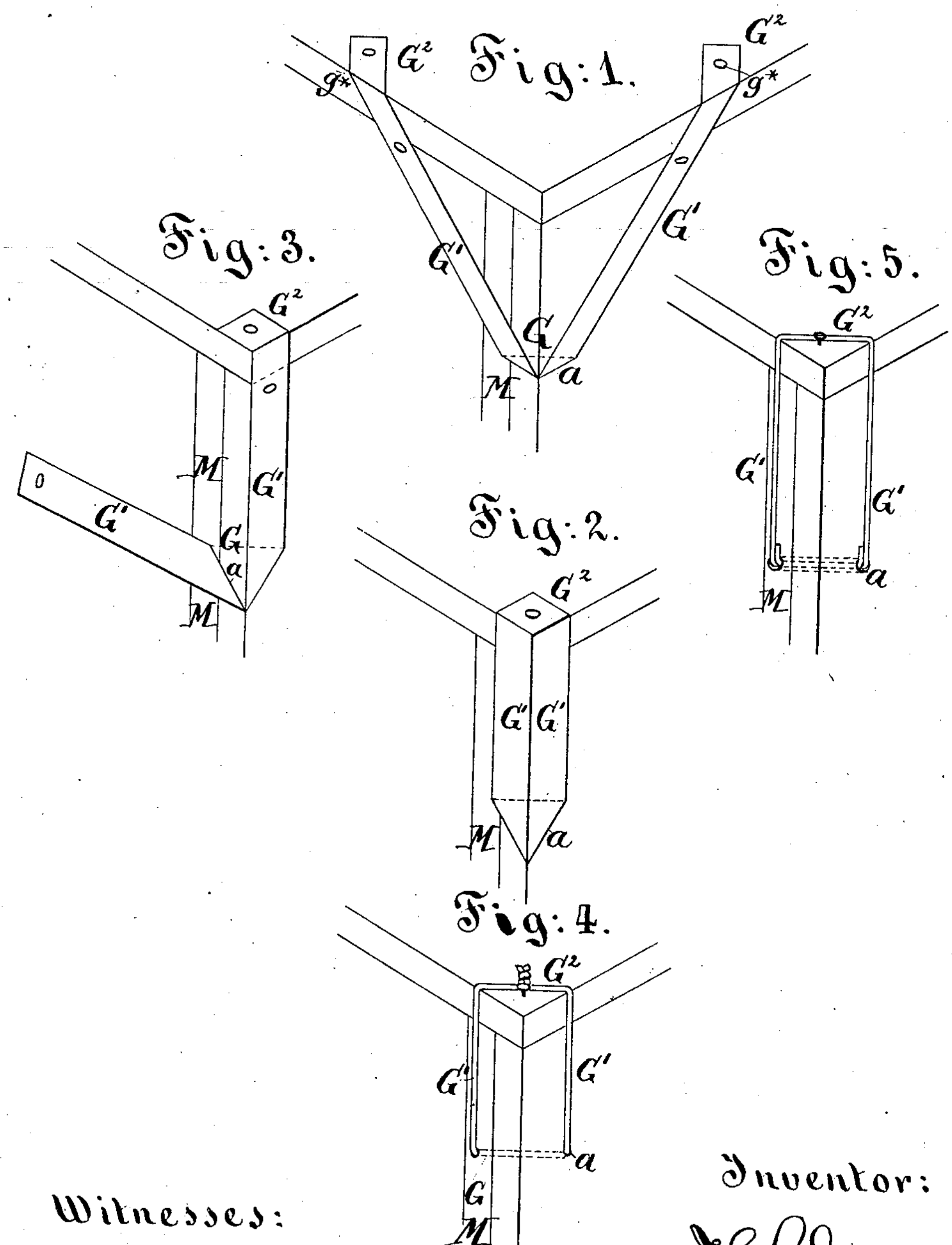
H. C. STONE.
Box.

No. 199,876. Patented Jan. 29, 1878.



Witnesses:

A. Henry Gentner
H. A. Johnstone

Inventor:

H. C. Stone
by his atty
Thomas D. Stetson

UNITED STATES PATENT OFFICE.

HENRY C. STONE, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN BOXES.

Specification forming part of Letters Patent No. **199,876**, dated January 29, 1878; application filed December 4, 1877.

To all whom it may concern:

Be it known that I, HENRY C. STONE, of Brooklyn, Kings county, State of New York, have invented certain new and useful Improvements relating to Boxes and analogous structures, of which the following is a specification:

I have devised peculiar means of strengthening the angles, and especially the corners, of boxes with metallic straps or ties.

My invention may take the place of the ordinary strapping, or of the mode of strapping which I have shown in another application for patent filed November 22, 1877; or it may be used additional to either of those methods.

The present improvement relates, mainly, to the strengthening of corners, but may be further extended, as will be explained below.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is a perspective view of a corner of a box, showing my strap applied so as to extend diagonally across the side and end to the cover. Fig. 2 represents the same, except that the parts are so proportioned that the strap extends vertically up. Fig. 3 shows the strap similarly let into the edge of the box, but so folded that only one end applies to the cover, and the other end serves to connect one side of the box to the end.

These figures represent my strap as formed of sheet metal. The remaining figures show the strap formed of wire, but with the same general results.

Fig. 4 represents one way, and Fig. 5 represents another way, of applying my wire strap.

Similar letters of reference indicate corresponding parts in all the figures.

I will indicate the whole body of my strap by the single letter G, further marks, G^1, &c., being employed to denominate parts thereof.

To apply my strap, I make a saw-cut into the edge of the box, as indicated by *a*, of sufficient depth to receive the strap G, extending diagonally through the wood, and to hold its whole breadth inserted. A triangular portion of the strap is thus embedded in the wood. Beyond this the parts at each side are turned upward, as indicated by G^1 G^1, and extended along the respective faces of the box to the top or bottom, respectively, where they are each bent again and extended inward on the top or bottom, as indicated by G^2. The strap in this position is secured by nails.

The length of the strap, and consequently the height of the saw-cut *a*, may be varied within wide limits. So, also, the extent to which the ends of the straps extend past the angle at *g* may be varied.

The ends of the straps may be made pointed and bent down; or one corner of the end may be bent down and forced into the wood by a blow of a hammer or otherwise, to aid in holding it. The bottom corners may be similarly secured. All the bottom corners may be thus secured before the cover is applied.

I can make a good packing-box by securing the lower corners in this manner and securing the upper corners by other and substantially different means; but it is better that the whole be secured in this manner, the straps for the upper corners being, of course, applied after the cover is put on.

In cases where it may be desired, the straps for the upper corners may be let into the main body of the box, and the parts G^1 G^1 fastened to the respective sides and ends.

The boxes may be sent from the manufactory in this state, and remain in that condition until the cover is put in place and secured by the ordinary nailing, after which the parts G^2 G^2 may be bent down by blows of the hammer or other means and secured.

Instead of sawing the cut *a*, it may be produced by a cut with any suitable sharp instrument. I believe that in most cases where the boxes are made of soft wood the edge of the band will of itself be sufficiently thin and sharp to allow of being driven by one or more blows of a mallet or hammer directly into the corner of the box without any previous cutting, and without much danger of splitting the wood; but where the wood is hard, and generally where good work is desired, the box should be cut by a saw.

In Figs. 2 and 3 I have shown the seat *a*, which allows the strap to be inserted diagonally into the corner of the box, made itself oblique. Here the cut is inclined to just a suf-

ficient extent to cause the straps to hug closely to the angles of the box. They thus extend vertically up to the corner, where they fold upon each other and are secured by a nail.

The obliquity of the cut may vary from the horizontal cut shown in Fig. 1 to the angle shown in Figs. 2 and 3, and it will, of course, induce a corresponding change in the angle at which the strap will reach down or up, as the case may be, to the corner.

The form of folding the strap shown in Fig. 3 may be used either with the inclined form of the cut *a* or with the level form. In this figure one end, G^1, is extended up and folded upon the top, as above explained, while the other end is extended the other way, reaching outward and downward, so as to only hold the side to the end.

The depth of the recess or seat *a* for the strap is not necessarily confined to a correspondence with the width of the strap. The depth may be much greater with a narrow strap. The recesses *a* may be made of any depth which will not allow the strap to encroach on the interior of the box. With some kinds of contents, as wine in bottles, it may be permissible even to allow the diagonal strap to so encroach considerably. In many instances it may be desirable to make the recess *a* deep enough to allow the strap to get a firm hold not only of the side piece C, but also of the vertical piece M, which is shown in all drawings, and for which I have made a separate application for Letters Patent, filed November 22, 1877.

Straps may be used of so little width that they may be considered, and may actually be, merely flat wires. I can use round wires, care being taken to attach them firmly by staples, or the like, embracing the wire, or by bending down the ends and driving them into the wood, or by both these means, or by other means of strongly fixing them.

When a very narrow band is employed, and especially when a round wire is employed as the fastener, it is not essential to apply the strap into the seat *a* by a lateral movement. It may be introduced and caused to stand in the same diagonal position in the corner by being simply inserted endwise through a suitable diagonal hole. For example, bore by machinery or otherwise round holes running across through the corner, the same as the seat *a;* then thrust in each a proper length of wire, and bend and secure the projecting ends, as shown in Fig. 4. In this the wire, after being thrust through a hole in the place of the seat *a*, and which I will similarly designate *a*, is bent up each side, and joined by twisting the ends together on the top of the box.

Another plan may be to use wire previously formed by machinery with the short bends or angles required, and applying it as shown in Fig. 5, so as to cause the ends to pass each other in the hole *a*. The projecting ends may finally be clinched and secured by bending them where they emerge from the wood.

One advantage of using wire instead of sheet metal is that it will allow the strap to be thrown back out of the way by turning in the seat *a* as a center to allow the removal of the cover. This form of the strap may be made and engaged in the respective holes *a* in advance of the application of the cover.

The strap in either of these forms of round wire may be held in place on the cover or bottom, as the case may be, by a staple or nail. In case it is desired, a suitable nail may be inserted diagonally so as to draw—that is to say, so that as it is driven home it brings an increased tension on the strap, and makes all fit tight. My invention will allow the use of other modes of strengthening in connection therewith.

The ordinary metal straps, embracing the entire box, may obviously be applied after the application of my straps. What are known as "common outside battens," being stout strips of wood nailed on the ends so as to extend along the edges, may be applied after my straps are in place. What are known as "inside battens," which perform a corresponding function on the interior of the angles, may be used, and that style of box is eminently adapted to my invention.

The pieces M perform an important function in relation to the strapping, because, by reason of their preserving the dimensions of the box, they prevent the straps from becoming slacked by any shrinkage of the lumber. But I do not confine my invention to the use of the straps with the pieces M. The straps applied as here shown are of great use with ordinary boxes.

In cases where, by reason of the absence of the pieces M, or for other cause, the box shall need a longer hold than is shown in the figures, I can carry the recesses *a* farther from the corner, and consequently employ longer straps, until they shall pass each other, and the diagonal straps from one corner shall overlap the diagonal straps from another corner.

What I claim as my invention is—

The strap G G^1 G^2 inserted through the corner of a rectangular box, and extended upon three of the contiguous faces thereof, as and for the purposes specified.

In testimony whereof I have hereunto set my name in presence of two subscribing witnesses.

H. C. STONE. [L. S.]

Witnesses:

A. HENRY GENTNER,

CHAS. C. STETSON.