To all whom it may concern:

Be it known that I, TIMOTHY V. THOMALL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Boxes and Crates, of which the following is a specification.

This invention relates to novel improvements in the construction of boxes and crates. It has for its object to provide a strong and substantial construction and to reinforce transversely and strengthen the sides and ends of the crate against the rough usage to which these articles are often subjected. A further object of the invention is to tightly bind the sides and ends of the crate or box transversely to prevent them from cracking and splitting and to hold them securely together in the event that they do crack or split.

In the accompanying drawings I have illustrated the invention embodied in simple forms and referring thereto—

Fig. 1 is a perspective view of one corner formed by an end and a side of a box or crate.

Fig. 2 is a transverse sectional view showing the manner of assembling the clamp with a side or end frame of two sections.

Fig. 3 is a view similar to Fig. 2 showing the parts completely assembled.

Fig. 4 is a detail perspective view of a portion of a side or end.

Fig. 5 is a sectional view showing a side or end of another form embodying the invention.

Referring to the drawings, 5—6 designate the two sections of a side and 7—7 designate the two sections of an end of a box or crate, the side and end being secured together at the corner in any suitable manner common in the art. These sections are provided with registering grooves 8 to receive the clamping wires 9 which are seated in the grooves and are engaged at the ends with the top and bottom of the side or end. The sections are provided at the top and at the bottom with bores 10 and the clamping wires are bent over to form hooks 11 which are seated in the bores. I prefer to connect the groove 8 with each bore 10 by transverse groove 11 so that when the parts are assembled the clamping wire will be completely seated in the grooves 8 and 11 and in the bores 10 and lie substan-

The sections of the sides and ends and the clamping wires are so proportioned that when they are completely assembled as shown in Figs. 1 and 3 the wires will tightly clamp the two sections of the side or end rigidly in aligned position. In assembling the parts the sections are arranged on the hook ends of the clamping wires in or about the position shown in Fig. 2 and then the two sections are forced to aligned position, whereupon the clamping wires will hold the two sections tightly together. It is desirable that the parts be so proportioned that the clamping wires may exert a constant clamping tension on the sections to hold them snugly together. This will tend to prevent the sections from cracking or splitting but in the event they should crack or split the clamping wires will still hold the parts snugly together and prevent the box or crate from being damaged in the customary use thereof.

In Fig. 5 I have shown a box or crate side or end 12 in one piece and a strip 13 fastened to the lower edge thereof by nails 14 which also secures bottles supporting wires 15 or the bottom for the box or crate between the strip and the side or end. In this form of construction the clamping wire 16 has a hooked engagement with the upper edge of the side or end 12 and is bent transversely at 17 across the lower edge of the side or end and then downward at 18 in a groove 18' in the face of the strip 13. Thus the major operation of the clamping wire is seated in a groove 16' on one side of the side or end while its down turned end 18 is seated in a groove 18' on the opposite side of the strip 13. In this form as well as in the form illustrated in the other figures of the drawing the ends of the clamping wires are rigidly and securely interlocked with the side or end of the box or crate so that they will be held constantly under tension to clamp the side or end transversely for the purposes set forth.

It is preferred that the clamping wires be located on the inside faces of the sides and ends as shown in Fig. 1, but this is not absolutely essential and they may be located on the outer face. In some cases it will be found sufficient to provide the clamping wires only on the ends of the box or crate.
and in other cases it will be desirable to provide the clamping wires on both ends and sides. For some purposes it may be sufficient to use one clamping wire but any number may be used as will be found desirable for the purpose.

I am aware that changes in the form, proportion and arrangement of parts of my invention may be made without departing from the spirit or sacrificing the advantages thereof and I therefore reserve the right to make all such changes as fairly fall within the scope of the following claims.

I claim:

1. A box or crate side or end comprising a plurality of sections, and a clamping wire engaged at its ends with the top and bottom edges of the side or end, said wire being of a length which will permit the sections and wire to be assembled with the sections tilted relative to each other and their adjacent edges engaging, and said wire adapted to clamp and hold the sections rigidly with their edges abutting when the sections are sprung into alignment.

2. A box or crate side or end provided with a bore in one edge thereof, and a wire having a bent end engaged with said bore and its other end engaged with the side or end at or adjacent its opposite edge.

3. A box or crate side or end having oppositely disposed bores in its opposite edges, and a clamping wire adapted to lie closely adjacent one face of the side or end and having hook ends engaged with said bores.

4. A box or crate side or end having a bore in one edge thereof and a transverse groove in said edge extending from said bore to one face of the side or end, and a clamping wire having a hook end seated in said bore and groove and its other end engaged with the side or end adjacent its opposite edge.

5. A box or crate side or end having oppositely disposed bores in its opposite edges and grooves in said edges extending from the bores to one face of the side or end, and a clamping wire having hook ends seated in said bores and grooves and taut between said hook ends.

6. A box or crate side or end comprising a plurality of sections having oppositely disposed bores in its opposite edges, and a clamping wire having hook ends to engage said bores, said clamping wire being of such length between the hook ends that it will permit assembly of the sections and the wire with the sections relatively tilted and their adjacent edges engaging, and adapted to tautly hold the sections rigidly in abutting relation when the sections are sprung to alignment.

7. A box or crate member comprising a plurality of sections arranged edge to edge and clamped together by a wire having its ends secured to the opposite edges of said member and its body portion drawn along the aligned sides of said sections.

8. A box or crate member comprising a plurality of sections placed edge to edge out of alignment with each other and a strap connected to the sections at points remote from the adjoining edges thereof and stretched by bringing the sections into alignment with each other.

9. A box or crate member comprising a plurality of sections arranged with corresponding corners in contact and alignment and with the adjacent side faces at an angle, and a strap secured to said sections at points remote from the contacting corners and inwardly from said faces, said strap being stretched by bringing said sides into alignment whereby said strap will resist buckling of said members.

TIMOTHY V. THOMALL.