This invention relates to the structure of cardboard boxes and more particularly to an improved end closure therefor. It is a division of my application Serial No. 300,294, filed October 20, 1939, for Cardboard containers.

Cardboard containers have decided advantages over wooden or metal boxes as shipping containers since they are collapsible, and occupy less space when unfilled, are much lighter in weight, and cost much less. Difficulty has been encountered, however, in providing cardboard containers with end closures which are sufficiently strong and durable for many different kinds of objects, particularly heavy objects such as small motors and the like which are of such a size that they can be boxed. In cardboard boxes heretofore provided there is a tendency for the structure to tear along an extension of the line of division between adjoining end flaps.

It is the object of this invention to provide an improved end closure for cardboard containers which will be highly resistant to tearing, and easy to seal.

In carrying out my invention I provide an end structure, preferably without division between adjoining end flaps, and having reentrant portions in the outer edges in an opposed pair of end flaps terminating in circular cut outs at the point of intersection of the wedge-shaped cut outs formed by said reentrant edge portions and lines of fold converging outwardly from the inner corners of said end flaps.

The invention will best be understood if the following description is read in connection with the accompanying drawings, in which like characters refer to like parts and in which,

Figure 1 is a perspective view of my cardboard box showing one set of the end flaps, in open position;

Figure 2 is a plan view of the box blank; and

Figure 3 is a detail view showing how the overlapping ends may be Stapled together.

The box 10 comprises the body panels b divided by lines of fold 10a, and the end flaps 11', 12', 13' and 14'. End flaps 12' and 14' are adapted to overlap as will be more fully explained. End flaps 11' and 13' are divided by lines of fold 12' into side triangular portions z' and z', and Intermediate portion y'. The outer edge of Intermediate portion y' has a reentrant portion which may terminate below the outer edge of the adjoining end flap forming the wedge-shaped cut outs or gorges c, extending from the outer corners of the panel, converging inwardly and terminating in the circular cut outs o, which are located at the points of intersection between said wedge-shaped cut outs or gorges c, and the lines of fold f' respectively.

The said intermediate portion of end flaps 11' and 12' is suggestive of an hourglass in form.

It will be seen that the part of the intermediate portion y' located below the circular cut outs o is joined to the triangular portions z' and z', while the part t above the circular cut outs, is not so attached.

When the box is filled it may be closed at the end by folding the flaps 11' and 13' along the lines of fold f' and inserting the flap 14', which may be tapered inwardly toward its outer edge, into the pocket formed by the flap 12' and the adjoining triangular portion z' of flaps 11' and 13'. The portions z' fold inwardly along lines of fold f' and thus provide a closure around the end of the inserted end flap 14' and prevent its displacement side wise. The overlapping ends of flaps 12' and 14' may then be stapled together as illustrated in Fig. 3 thus providing a very strong and durable end closure.

The structure described above by which the lower portions of panels 11' and 13' are joined to panels 12' and 14', while the upper portion t of panels 11' and 13' is unattached, facilitates the stapling together of the overlapping ends of end flaps 11' and 14'. In the operation of stapling machines now most commonly used a portion or arm of the machine must be placed under the overlapped end flaps, while another projecting portion or arm extends over the overlapped end flaps. The under arm of the stapling machine can be readily slid over portion t of either end flap 11' or 12', under the overlapped and interengaged flaps 12' and 14', for stapling, which would obviously not be possible if the lines of fold f' extended all the way to the top edge of end flaps 11' and 12', as they would were it not for the wedge-shaped cut outs or gorges c.

I have found that the circular edge provided by the circular cut outs o is extremely resistant to tearing. Tearing of cardboard boxes often begins at the end of a line of division between end flaps. By eliminating lines of division between the end flaps and causing the gorges c to terminate in the circular cut outs o I provide a box end which is substantially free from tearing.

My end structure has the advantages that; when the box end is closed a pair of end flaps are overlapped and interengaged along their side edges, and may be readily stapled together.
forming a tight closure; and tearing of the end flaps is reduced to a minimum.

What I claim is:

A box having an end closure comprising four sides and four end flaps, each integrally connected to its adjoining end flaps along fold lines, defining a portion of the lateral edges respectively, two of said end flaps forming an opposed pair being long enough to overlap, and each being without line of fold within its body, the other two of said end flaps each being of substantially the same length as the overlapping flaps but cut away along its upper lateral edges leaving the outer lateral edges of said first mentioned pair of end flaps free, said other end flaps also each having lines of fold extending upwardly and inwardly at an angle from their lower corners and terminating respectively in circular cut-outs, the said cut away portions at the upper lateral edges of said other flaps respectively being tapered downwardly and inwardly and also terminating in said circular cut-outs respectively, one of said overlapping end flaps together with the adjoining folded over portions forming a pocket for the reception of the end of the other overlapping end flap.

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