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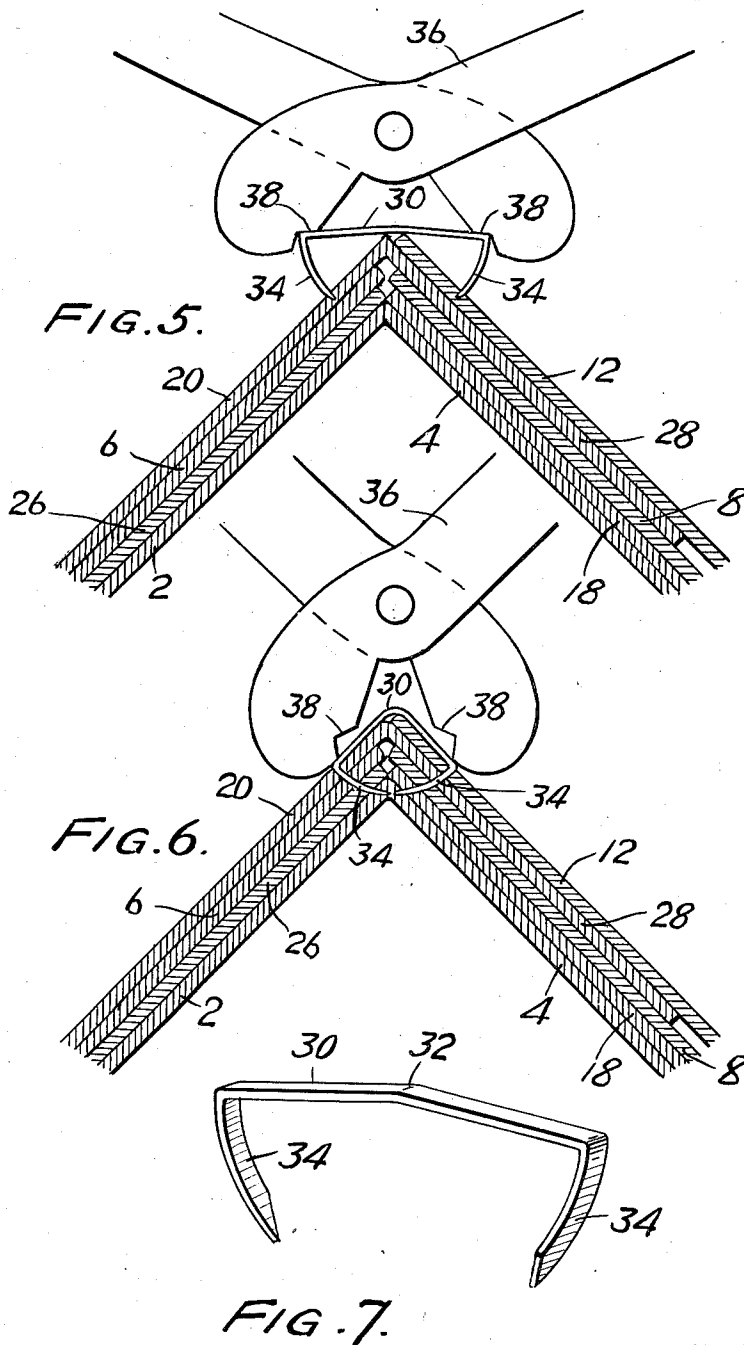
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BOX

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WITNESS:

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UNITED STATES PATENT OFFICE

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BOX

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7 Claims. (Cl. 229—23)

This invention relates to a box and particularly to a type to be used for shipping which is, as a consequence, made of heavy material capable of withstanding considerable abuse. In my prior application Ser. No. 41,035 there is disclosed a box which offers various advantages over those heretofore found in the art. The box shown in said application is provided with an improved type of closure which may be either top or bottom or both, which is readily located in closed position and which will maintain such position without any sealing whatever. Briefly stated, the box is provided with flanges about one or more open sides, with which flanges there lock intumed flanges carried by a closure. While the closure, if unsealed, may be readily opened, there is no danger of its accidentally being opened and the removal is not so easy as to suggest unwarranted opening.

In general, however, it is desired to seal such a box during shipping irrespective of whether or not the closure is of such nature as to accidentally open. The nature of the box is such, however, that the sealing means is not required to contribute to any great extent to hold the box closed during quite rough handling due to the interlocking nature of the closure and box sides.

It is the object of the present invention to provide means of simple character for permanently closing a box of the type just described, which means is particularly effective in protecting the corners against rough usage. The improved closure means comprises a staple which extends about the corners and grips a large number of plies of the box material to thereby afford not only a permanent closure but, by gripping and compressing the fibres at the corner, a strong corner which will resist damage. It may be remarked that corners of shipping boxes are the most vulnerable points and the indestructibility of a box is to a major degree determined by the resistance to destruction at its corners.

The objects of the invention will be apparent from the following description read in conjunction with the accompanying drawings, in which:

Fig. 1 is a perspective view showing a preferred modification of the invention with the corner staples provided at both the top and bottom of a box;

Fig. 2 is a vertical section taken on the plane indicated at 2 in Fig. 1;

Fig. 3 is a vertical section taken on the plane indicated at 3 in Fig. 1;

Fig. 4 is a fragmentary view of a partially locked closure illustrating cooperations of various parts;

Figs. 5 and 6 are diagrammatic sectional views illustrating successive steps in stapling a corner of the box; and

Fig. 7 is a perspective view showing the preferred type of staples.

It will be understood that the type of closure herein specifically described may be used for the top or bottom of a box or both; in the present instance it is shown as applied to both the top and bottom. The box accordingly consists of side walls 2 and end walls 4 providing upper and lower rectangular openings, which openings are arranged to be closed by identical closure members. The upper and lower free edges of each of the side walls 2 are provided with outwardly directed integral locking flanges 6, while the end walls 4 are provided with similar locking flaps 8. These locking flaps are designed to extend substantially parallel with their integral walls. Since all of the parts of the box are made of heavy cardboard, which may, for example, be of a laminated character having a corrugated intermediate ply to provide strength, the various flaps already mentioned and those hereafter described may be conveniently delineated by scored lines, as is well known in this art. The presence of such scored lines provides for the ready bending of flaps in the proper fashion for use.

Each of the closure members comprises a central rectangular portion 10 having dimensions exceeding the outside dimensions of an open end of the box. At the ends of the portion 10 are located end closure flaps 12 connected by intermediate portions 16 with integral outer extensions 18. These portions are defined from each other by scored lines along which folding may take place. The extensions 18 are shorter than the flaps 12. The necessity for this will be obvious hereafter upon consideration of the mode of use of the closure. Similar flaps 20 and intermediate portions and extensions 24 and 26 are integrally carried by the longitudinal edges of the central part 10 of the closure. At the ends of the longitudinally extending flaps 20 there are end extensions comprising the sections 28. Instead of the single end extensions there may be provided the double ones as disclosed in my prior application.

In assembling the improved closure, the central portion 10 is located over the rectangular opening of the box as indicated in Fig. 1. The longitudinally extending flanges 20 are then folded over the locking flaps 6 and their outer extensions are tucked under the flaps 6 as indicated in Fig. 2. Following this the end extensions 28

are folded inwardly outside the ends of the locking flaps 8 and then the flaps 12 are folded over the locking flaps 8 and the end extensions 28 and their outer extensions forced between the flaps 8 and the walls 4. The placing of each closure in position is preferably effected so that the opposite flaps are manipulated simultaneously. When this is done, closure of the box is merely a matter of a few seconds.

If cardboard is used, such as the corrugated intermediate ply type in common use, the stiffness of the various flaps is such that a quite secure closure is obtained which may be opened only with substantial difficulty considerably greater than that required to effect closure. This is by reason of the fact that the intumed outer extensions of the flaps are not readily pulled outwardly and can be engaged only frictionally by the fingers.

Examining the box at this point, it will be noted that the corners have sections as illustrated in Figs. 5 and 6, there being four thicknesses of cardboard on one side of a corner and five on the other. It may be remarked, however, that the extension 26 may, in some cases, not be used, thereby providing only three thicknesses on one side. Other variations of the plies may be provided but desirably there will be a plurality of thicknesses on each side of each corner, forming a stronger reinforced corner even without the use of any additional reinforcing means. In view of the reinforcing nature of the staples, plural plies are not absolutely necessary, however, if the box is not to be subjected to very hard usage.

In accordance with the present invention, however, additional reinforcement is provided by embracing and penetrating the corners by means of staples indicated at 30. As shown in Fig. 7, each of these staples comprises a corner-embracing portion 30 preferably provided with a slight bend at 32 so as to facilitate proper placing and insure the attainment of a symmetrical result. The ends of the staple are provided with curved prongs 34. The staples are preferably formed of steel and are flat, as indicated in Fig. 7. However, their cross-section may be of other forms, for example, circular, and it has been found quite satisfactory to use pig-rings instead of the specific form of staple shown herein. The staple may be conveniently secured in position by the use of a tool such as 36 operated through the successive steps indicated in Figs. 5 and 6. At first the staple may be located in notches 38 in the jaws of the tool and pressed against the corner, as indicated in Fig. 5, so that a slight initial penetration of the prongs 34 takes place into the outer cardboard plies. Thereafter, by closing the jaws and maintaining the pressure on the corner, the staple may be finally driven into the position indicated in Fig. 6, with the two prongs substantially meeting each other, preferably slightly overlapping and penetrating the junction of walls 2 and 4 so that every ply at the corner is penetrated by one or the other of the prongs. Overlapping is facilitated if the prongs are oppositely bevelled in pointing, as indicated in Fig. 7. The size of the prongs should be so chosen that innermost plies at the corner are penetrated but nevertheless so that the prongs do not project, at least to any appreciable extent, inside the box. By choosing the proper size prongs it has been found that complete penetration of all the plies without substantial over-penetration may be readily secured.

During the stapling operation the forces exerted tend to locally compress the plies. This compacting aids very greatly in strengthening the corners by preventing any successive separation of the plies in use. At the same time it will be clear that the corners are additionally metal-lically reinforced by the exterior portions of the staple. Additional reinforcement may be provided by inserting more than one staple in each corner.

It will be clear that numerous variations in the embodiment of the invention may be made without departing from its scope as defined in the following claims.

What I claim and desire to protect by Letters Patent is:

1. A box formed of pasteboard or the like comprising side and end walls having free edges defining a rectangular opening, and a rectangular closure for the opening, at least two opposite walls having integral locking flaps extending outwardly from their free edges, said closure having at its four edges integral closure flaps free from each other at their adjacent ends, at least two of said closure flaps, which correspond to said locking flaps, having integral outer extensions, and each of the other closure flaps having a pair of end extensions, said parts being constructed and arranged so that, when the closure is in place, it covers said rectangular opening, with the locking flaps located substantially parallel to their carrying walls and covered by the corresponding closure flaps, the outer extensions of the last-named closure flaps being located between the respective locking flaps and their walls, and the end extensions of the other closure flaps being embraced between the first-mentioned closure flaps and their outer extensions, and staples, each embracing a corner of the closure and having prongs penetrating through the various plies at the corner and substantially meeting adjacent the inner angle of the box walls.

2. A box formed of pasteboard or the like comprising side and end walls having free edges defining a rectangular opening, and a rectangular closure for the opening, said walls having integral locking flaps extending outwardly from their four free edges, said closure having at its four edges integral closure flaps free from each other at their adjacent ends, all of said closure flaps having integral outer extensions, and each of two of the closure flaps having a pair of end extensions, said parts being constructed and arranged so that, when the closure is in place, it covers said rectangular opening, with the locking flaps located substantially parallel to their carrying walls and covered by the corresponding closure flaps, the outer extensions of the closure flaps being located between the respective locking flaps and their walls, and the end extensions being embraced between the closure flaps which do not carry them and their outer extensions, and staples, each embracing a corner of the closure and having prongs penetrating through the various plies at the corner and substantially meeting adjacent the inner angle of the box walls.

3. A box formed of pasteboard or the like comprising side and end walls having free edges defining a rectangular opening, and a rectangular closure for the opening, at least two opposite walls having integral locking flaps extending outwardly from their free edges, said closure having at its four edges integral closure flaps free from each other at their adjacent ends, at

least two of said closure flaps, which correspond to said locking flaps, having integral outer extensions, said parts being constructed and arranged so that, when the closure is in place, it covers said rectangular opening, with the locking flaps located substantially parallel to their carrying walls and covered by the corresponding closure flaps, the outer extensions of the last-named closure flaps being located between the respective locking flaps and their walls, and staples, each embracing a corner of the closure and having prongs penetrating through the various plies at the corner and substantially meeting adjacent the inner angle of the box walls, the prongs being concave outwardly at the corner.

4. A box formed of pasteboard or the like comprising side and end walls having free edges defining a rectangular opening, and a rectangular closure for the opening, said walls having integral locking flaps extending outwardly from their four free edges, said closure having at its four edges integral closure flaps free from each other at their adjacent ends, all of said closure flaps having integral outer extensions, said parts being constructed and arranged so that, when the closure is in place, it covers said rectangular opening, with the locking flaps located substantially parallel to their carrying walls and covered by the corresponding closure flaps, the outer extensions of the closure flaps being located between the respective locking flaps and their walls, and staples, each embracing a corner of the closure and having prongs penetrating through the various plies at the corner and substantially meeting adjacent the inner angle of the box walls, the prongs being concave outwardly at the corner.

5. A box formed of pasteboard or the like comprising side and end walls having free edges defining a rectangular opening, and a rectangular closure for the opening, at least two opposite walls having integral locking flaps extending outwardly from their free edges, said closure having at its four edges integral closure flaps free from each other at their adjacent ends, at least two of said closure flaps, which correspond to said locking flaps, having integral outer extensions, said parts being constructed and arranged

so that, when the closure is in place, it covers said rectangular opening, with the locking flaps located substantially parallel to their carrying walls and covered by the corresponding closure flaps, the outer extensions of the last-named closure flaps being located between the respective locking flaps and their walls, and staples, each embracing a corner of the closure and having prongs penetrating through the various plies at the corner and substantially meeting adjacent the inner angle of the box walls.

6. A box formed of pasteboard or the like comprising side and end walls having free edges defining a rectangular opening, and a rectangular closure for the opening, said walls having integral locking flaps extending outwardly from their four free edges, said closure having at its four edges integral closure flaps free from each other at their adjacent ends, all of said closure flaps having integral outer extensions, said parts being constructed and arranged so that, when the closure is in place, it covers said rectangular opening, with the locking flaps located substantially parallel to their carrying walls and covered by the corresponding closure flaps, the outer extensions of the closure flaps being located between the respective locking flaps and their walls, and staples, each embracing a corner of the closure and having prongs penetrating through the various plies at the corner and substantially meeting adjacent the inner angle of the box walls.

7. A box formed of pasteboard or the like comprising side and end walls having free edges defining a rectangular opening, and a rectangular closure for the opening, said closure having at its four edges integral closure flaps free from each other at their adjacent ends, said parts being constructed and arranged so that, when the closure is in place, it covers said rectangular opening with the closure flaps exteriorly overlapping the free edges of the side and end walls, and staples, each embracing a corner of the closure and having prongs penetrating through the various plies at the corner and substantially meeting adjacent the inner angle of the box walls.

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