No. 800,243. PATENTED SEPT. 26, 1905.

W. L. POPPLE.

STAY STRIP FOR PAPER BOXES.

APPLICATION FILED FEB. 4, 1905.

Fig. 1.

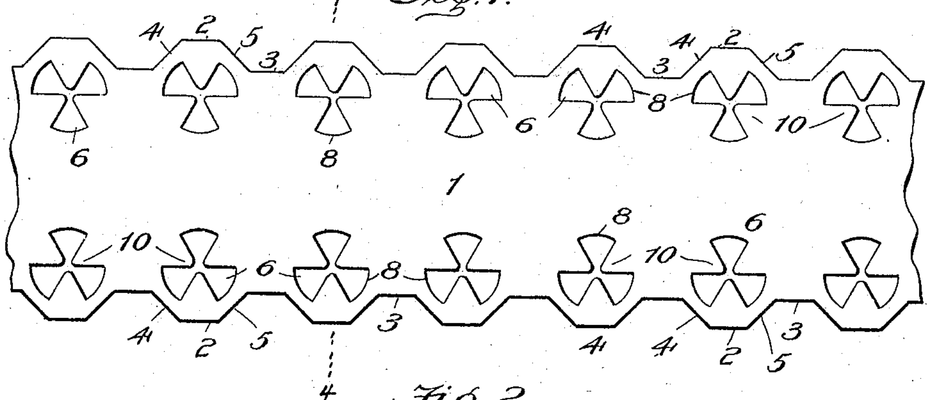


Fig. 2.

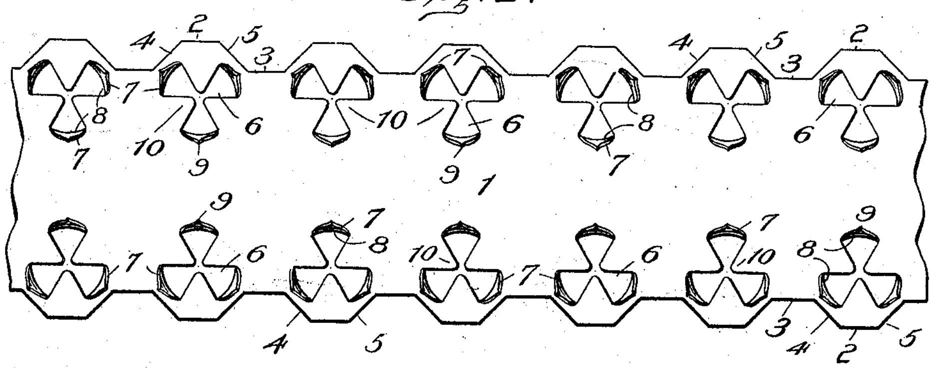


Fig. 3.

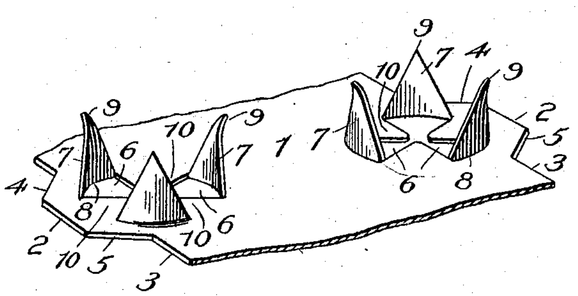


Fig. 4.

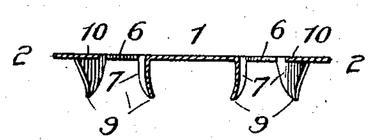
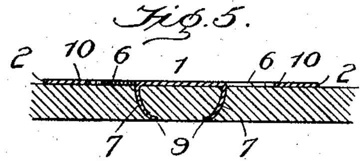


Fig. 5.



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STAY-STRIP FOR PAPER BOXES.

No. 800,243. Specification of Letters Patent. Patented Sept. 26, 1905.

Application filed February 4, 1905. Serial No. 244,213.

To all whom it may concern:

Be it known that I, WALLACE L. POPPLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Stay-Strips for Paper Boxes, of which the following is a specification.

My present invention relates to certain new and useful improvements in metallic stay-strips for paper, cardboard, and veneer boxes; and it has for its objects to provide a strip of the character described that is simple in construction, comparatively inexpensive to manufacture, strong and effective in use, and one in which the various known objections to the common forms of stay-strips now in use are entirely overcome.

In all the known forms of stay-strips of which I am aware the penetrating prongs are formed by punching a row of single eyelet-openings along each edge of the strip, said openings being either round, square, or triangular. Strips thus formed are not entirely satisfactory for several important reasons, to wit: Where single round or square openings are punched in the strip the resulting burs which form the penetrating prongs are necessarily very short and do not, therefore, take sufficient hold on the stock to which the strip is applied to form a strong and secure union of the parts. In other words, where an eyelet form of opening is employed the length of the penetrating prongs is necessarily limited, and as it is not practicable in a stay-strip of the character described to make very large openings therein the resulting prongs are too short, especially where the strip is to be used on thick or heavy stock. Thus when a strip having short prongs is used on comparatively stiff or hard board these small weak prongs work or bend down without penetrating the stock, and it frequently happens that the box falls apart or opens. A further serious objection to the single-eyelet form of openings in a stay-strip resides in the fact that when the strip is applied to soft or light stock the latter will be punched out within the boundary of the openings, leaving holes in the stock which are not only unsightly and undesirable, but which tend greatly to weaken the finished structure.

The form of strip herein shown and described is especially designed to overcome the foregoing objections present in the known forms of stay-strips; and it consists of a strip of metal having along each edge a row of separate intersecting openings of cluster form, from each cluster of which projects a plurality of outwardly-projecting penetrating prongs and a plurality of intermediate inwardly-extending stay-pieces which lie in the plane of the strip, some of said prongs being arranged on a line parallel with other prongs and longitudinally of the strip and the remaining prongs being arranged at an angle to the first-named prongs, the structure being such that there are a plurality of outwardly-projecting penetrating prongs offstanding from each cluster-opening and from the strip with an inwardly-extending stay piece or extension between each two prongs, said stay-pieces lying in the plane of the strip and serving to support the board or stock within the boundary of the prongs.

The invention further consists in a stay-strip having its opposite edges provided with alternate hexagonal projections and indentations and with penetrating prongs struck up therefrom, said prongs being of concavo-convex form in cross-section and each having its entering point bent or curved outwardly slightly, so that when driven or forced into the stock they will bend or turn outward and clench.

In order to enable others to clearly understand, make, and use the invention, I will now proceed to describe the same in detail, reference being had for this purpose to the accompanying drawings, in which—

Figure 1 is a top plan view of a stay-strip made according to this invention. Fig. 2 is a bottom plan view of the same. Fig. 3 is a perspective view of the strip. Fig. 4 is a transverse section taken on the line 4 4 of Fig. 1, and Fig. 5 is a similar section showing the strip applied to a piece of cardboard.

Referring to the drawings, the reference-numeral 1 designates a thin strip or ribbon of ductile metal, such as is usually employed in stays of this character, the opposite edges of which are provided with alternate projections and indentations of semihexagonal form in plan, said projections and indentations being formed by the straight edges 2 and 3, which are joined by the oppositely-inclined edges 4 and 5. These projections and indentations are of equal size and the construction is such that a number of strips or ribbons may be cut

from a sheet of metal without waste of material. A row of what I have termed "cluster-openings" is formed along each edge of the strip, one of said cluster-openings being arranged partially within the boundary of each projection, as shown. In the form of strip herein illustrated each cluster-opening consists of a plurality of substantially triangular-shaped openings 6, the apices of which are arranged at a common point, so that the triangular openings intersect one another. The metal from which these openings 6 are formed is stamped or forced up from the strip to form penetrating prongs 7 of definite and equal dimensions, said prongs being joined to the strip at the base 8 of each triangular opening. Each prong 7 is slightly concavo-convex in cross-section to add to its strength and rigidity, the concaved side facing the openings, and the point 9 of each prong is bent slightly outward, as shown, to insure a positive clench when driven or forced into the stock. By making the openings in the form of a cluster, as shown, it will be seen that an inwardly-extending stay piece or point 10 will be formed between each prong of the series, said stay-pieces lying in the plane of the strip. These stay pieces or points afford increased strength and rigidity to the penetrating prongs 7, and also serve to support the stock within the boundary of the cluster of prongs and prevent the formation of holes therein during the application of the strip, which is a serious objection present in the common forms of strip having the ordinary eyelet-openings therein.

As shown in the drawings, it will be seen that the triangular cluster-openings are arranged so that some of the prongs 7 of the series along one edge of the strip will stand parallel with the corresponding prongs along the opposite edge of the strip and parallel with a line taken centrally and longitudinally of the strip, while the other prongs of each series will stand diagonally to each other and to the parallel prongs. This arrangement of the prongs will insure them taking a firm grip into the stock in several directions, thus making a secure union of the parts.

By forming the outer edges of the stay-strip in the shape shown and described the angular projections will be caused to sink into the stock when applied and the outer or diagonal prongs will clench into the corners, thus making a secure lock.

As will be apparent by an inspection of the drawings, substantially all of the metal between the prongs 10 that lie in the plane of the strip is removed to form the prongs 9, that project laterally of the strip, the spaces between the prongs 10 of each group therefore intercommunicating.

By way of recapitulation I have provided a stay, comprising a metallic strip having a plurality of groups of prongs extending along each longitudinal edge of the strip, some of which project laterally of the strip and some of which lie in the plane of the strip, each group of prongs, including three that lie in the plane of the strip and three that project laterally of the strip, the prongs that lie in the plane of the strip intervening between the prongs that project laterally of the strip, these latter prongs being formed of substantially all of the metal between the prongs that lie in the plane of the strip, whereby the spaces between the prongs that lie in the plane of the strip communicate and the laterally-projecting prongs of each group are as closely approached and made as long as practicable, the bases of the prongs of each group being substantially the same length and arranged substantially in a circle.

In the claim I intend to cover the metal stay-strip of my invention either before or after the same is used for its purpose.

By arranging the projecting prongs about a circle and intervening between the same the prongs that lie in the plane of the strip a very effective clamping action is secured between the strip and the stock of the box, which is not had at the expense of a weakening in the box.

The distinctions between the structure of my invention and the structures of the prior art are clear.

In Patent No. 515,310, granted to A. A. Wood, February 20, 1894, for a box-corner binding there is disclosed a box-corner binder consisting of a strip of metal, adapted to be bent longitudinally along its middle, having integral spurs cut and bent up therefrom along its edges, said spurs being curved on decreasing radii from base to point and leaning inwardly at such an angle that the median line of the curved spur will follow the point thereof through the box side as the strip is bent along its middle in affixing. It will be apparent that this is not the structure herein disclosed. Particularly will it be apparent that the spurs or prongs of my structure are not curved on decreasing radii from base to point.

By arranging the projecting prongs around a circle with intervening flat prongs it is apparent that the laterally-projecting prongs along each longitudinal edge of the strip will effectively coöperate with the laterally-projecting prongs upon the companion longitudinal edge of the strip, so as to resist all strains in whatever direction they may be imposed upon the adjacent sides of the box.

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

A stay, comprising a metallic strip having a plurality of groups of prongs extending along each longitudinal edge of the strip, some of which project laterally of the strip and some of which lie in the plane of the strip, each group of prongs including three

that lie in the plane of the strip and three that project laterally of the strip, the prongs that lie in the plane of the strip intervening between the prongs that project laterally of the strip, these latter prongs being formed of substantially all of the metal between the prongs that lie in the plane of the strip, whereby the spaces between the prongs that lie in the plane of the strip communicate and the laterally-projecting prongs of each group are as closely approached and made as long as practicable, the bases of the prongs of each group being arranged substantially in a circle.

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

WALLACE L. POPPLE.

Witnesses:
L. BUSH ROSSITER,
MAYME F. BRAND.