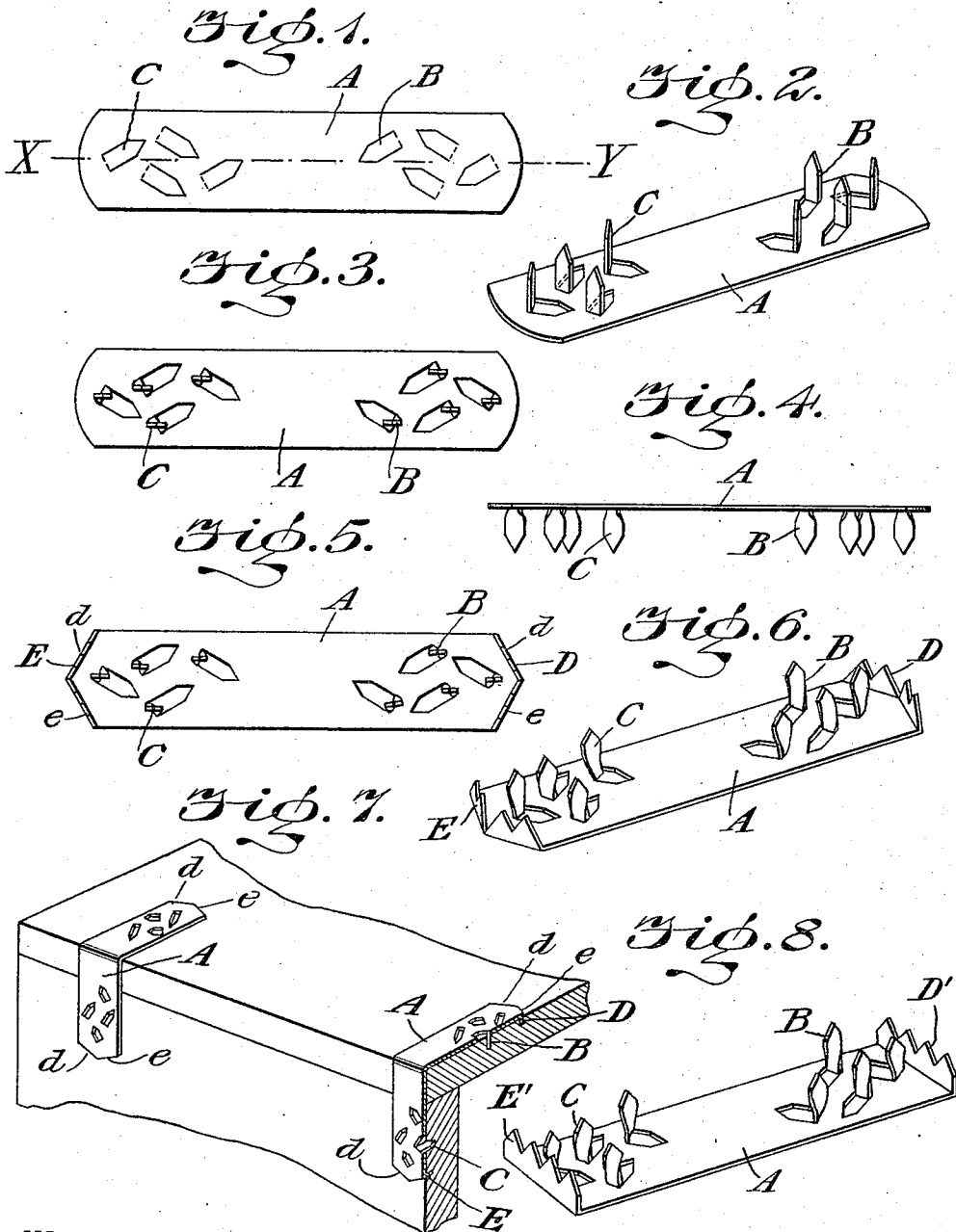


G. C. D. MILLER.
BOX FASTENER.
APPLICATION FILED JAN. 25, 1912.

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Patented May 30, 1916.



WITNESSES:

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BOX-FASTENER.

1,185,231.

Specification of Letters Patent.

Patented May 30, 1916.

Application filed January 25, 1912. Serial No. 673,302.

To all whom it may concern:

Be it known that I, GEORGE C. D. MILLER, a citizen of the United States, residing in the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented a certain new and useful Box-Fastener, of which the following is a specification.

In a prior patent granted to the assignee of this application, No. 546,839, September 24, 1895, a box fastener of the general type of this invention is described and claimed. Practical use has developed the fact that said patented fastener has certain disadvantages, among which may be mentioned, first, they are not entirely secure if driven with the grain of the wood, and, second, the prongs cannot be twisted without undue or excessive wear on the operating tool owing to the large amount of twist which must be given to the prongs.

The box fastener herein described and claimed overcomes the disadvantages inherent in the structure of the prior patent, and to this end it embodies a fastener the prongs of which are formed by first stamping out two series of tongues, both of which series, prior to bending, extend at an angle to the longitudinal medial line of the fastener, instead of parallel thereto as in the prior construction, and then bending up said tongues, after which the bent up tongues are, preferably, twisted. The prongs of one series in one form of construction, are twisted in an opposite direction to those in the other series, in contradistinction to the prongs of the patented structure which are all twisted in the same direction. By stamping out the tongues in the manner specified, they can be twisted to the desired form, or operative position, by applying less twist thereto than was required in the prior construction. This not only expedites the operation, and lessens the work on the twisting machine, but, also, produces a stronger prong, the excessive twisting of the prongs of the prior device having a tendency to wrench and weaken them.

In a preferred form of fastener, the respective end portions of the plate are bent and provided with teeth, each end of the plate being provided with inclined and serrated edges which are reversely positioned to each other. By providing the plate with

the reversely inclined and serrated lips, the fastener is adapted to be driven into the wood, either with or across the grain thereof, without a tendency of the prongs to bend or break off instead of driving said prongs into the wood.

In the accompanying drawings, I have illustrated different practical embodiments of the invention, but the constructions shown therein are to be understood as illustrative, only and not as defining the limits of the invention.

Figure 1 is a plan view of the metal blank illustrating the positions of the tongues when the blank is stamped or cut. Fig. 2 is a perspective of the embryo article after the tongues are bent at an angle to the plate and prior to twisting the tongues. Figs. 3 and 4 are views in plan and side elevation of the completed article. Figs. 5 and 6 are, respectively, a plan view and a perspective of the preferred form of corner strap for a box, crate, etc. Fig. 7 is a perspective view, partly in section, of two fasteners, of the form shown in Figs. 5 and 6, applied to a box or crate. Fig. 8 is a perspective view of another embodiment of the invention.

The fastener consists of a single piece of metal, preferably sheet metal, provided with peculiarly formed prongs B, C integral with a plate A. The plate in Figs. 1 to 4 is shown as being oblong with curved end portions, although the shape and size are not material. The tongues or prongs are cut from the metal composing the plate, the tongues or prongs B of one group or series being positioned near one end portion of the plate, whereas the tongues or prongs C of the other group or series are near the opposite end portion of the plate.

One of the novel features consists in positioning each tongue so that the medial line of the tongue is at an angle to the longitudinal medial line, indicated at X—Y, of the plate; in other words, each tongue is cut from the plate diagonally or obliquely thereto, instead of stamping the tongue parallel to the side edge of the plate, as in the prior construction disclosed in the patent to which reference has been made.

As shown in Fig. 1, each series or group comprises four tongues, although the number is not material. The first tongue nearest

the end of the plate is inclined in one direction toward one side edge; the two next tongues are inclined in an opposite direction to the first tongue and toward the opposite side edge of the plate, and the fourth tongue is inclined in the same direction as the first tongue. This arrangement results in staggering the tongues, and permits them to be grouped closely together without substantially weakening the metal of the plate.

The two groups or series of tongues are cut or stamped at one operation, each tongue being cut on four lines, two of which are parallel and two converging, but all the cuts are inclined or diagonal to the medial line X—Y of the plate. The tongues are thus joined to or integral at one end with the plate. After stamping or cutting, the tongues are bent at right angles to the plate, see Fig. 2, each tongue standing crosswise of the plate and diagonally thereto, *i. e.*, the tongue is at an angle to the medial line X—Y of the plate. This operation of stamping the tongues and bending them as described, imparts a preliminary bend or twist thereto, and according to the form of the invention shown in Figs. 3 and 4, the fastener is subsequently completed by imparting a partial twist to each prong which results from bending up the tongues from the plate.

As previously stated in connection with Figs. 3 and 4, the prongs are completed by applying to them a tool of a certain form, and operating said tool to impart a partial twist to the prongs. By preliminarily twisting the prongs, *i. e.*, cutting the tongues diagonally to the plate and bending them up at an angle to the plate, the work required to be performed by the twisting tool is very materially reduced, and as a result the work required to be performed to complete the article is accomplished more expeditiously and economically, besides effecting a considerable saving in the friction and consequent wear on the twisting tool.

The prongs comprised in one group, say the group B, are twisted by the tool in one direction, say to the right hand, whereas the prongs in the group C are twisted in an opposite direction, or toward the left hand. It follows, therefore, that the two series or groups of prongs are twisted in opposite directions to each other, each prong being pointed so as to readily penetrate the wood.

A preferred form of construction is shown in Figs. 5 and 6, wherein the fastener embodies the plate A, two series or groups of prongs B, C, and serrated or toothed flanges D, E. The respective end edges of plate A are beveled in two directions, at *d*, *e*, the bevel *d* being inclined in an opposite direction to the bevel *e*, said beveled ends *d*, *e*, being toothed or serrated in the operation of cutting or stamping out the metal so as to

produce the two series of tongues. The stamped or cut blank is then manipulated by bending the tongues at an angle to the blank and by bending the inclined ends at an angle to the blank, thus producing the groups of prongs and the serrated or toothed flanges. The serrated end flanges are reversely inclined to each other at each end of the blank. The prongs may be left untwisted or twisted, as desired, after bending them at an angle to the plate. The inclined serrated end flanges and the groups of prongs are adapted to be driven into the wood, either with or across the grain, and the presence of said end flanges enable the fastener to be secured in position without a tendency of the prongs B, C to bend relative to the plate when securing the fastener in place.

In Fig. 8 of the drawings there is shown another embodiment of the invention wherein untwisted prongs B, C and serrated flanges D', E' are employed on plate A. The plate is provided with square ends, *i. e.*, each end edge of the plate is at a right angle to the side edges. These end edges are bent at an angle to the plate so as to result in serrated flanges, the length of each flange being at a right angle to the plate, in contradistinction to the beveled flanges of Figs. 5 and 6. Each flange is provided with a series of teeth or serrations adapted to be driven into the material of the box or packing case. The prongs are produced in the plate between the serrated end flanges thereof, said prongs being struck up from the plate, and positioned with relation to said plate as hereinbefore described, except that the prongs may or may not be given a partial twist subsequently to bending them at a right angle to the plate. The prongs occupy the diagonal relation to the plate, and they are arranged in groups or series as hereinbefore mentioned, said prongs being somewhat longer than the teeth or serrations on the end flanges.

When the fastener is in position to be used, it is bent around the corner of the box or packing case, as shown in Fig. 7, and the prongs and the serrated flanges are driven into the material composing the case. The flanges and the diagonal prongs occupy different relative positions to each other on the plate, and they operate efficiently in attaching the plate to the box; in fact, it is impossible to dislodge the plate from the box except by applying very considerable force.

The new fastener is so simple in construction as to be capable of manufacture economically and rapidly. It is easily and quickly applied, and such application is effected without bending the prongs during the operation of driving them into the wood.

Having thus fully described the inven-

tion, what I claim as new, and desire to secure by Letters Patent is:—

1. As a new article of manufacture, a fastener comprising a metal plate and groups of bent prongs positioned adjacent to the respective end portions of the plate, each prong being cut from the metal of the plate within the edges thereof so as to leave the side edges and the middle portion of the plate continuous and unbroken, all the prongs prior to bending being positioned diagonally to the medial line of the plate and certain of the prongs in each group being inclined and twisted in an opposite direction to the other prongs in the same group.

2. As a new article of manufacture, a fastener comprising a metal plate the side edges and the middle part of which are unbroken, and groups of bent prongs positioned adjacent to the respective end portions of said plate, said prongs being cut from the metal composing the plate intermediate the edges thereof and each prong prior to bending it being positioned diagonally to the medial line of the plate, certain of the prongs of one group being twisted in an opposite direction to other prongs of the other group.

3. As a new article of manufacture, a fastener comprising a metal plate the side edges and middle part of which are continuous and unbroken, and two groups of bent prongs positioned adjacent to the respective end portions of the plate, each prong being cut from the metal of the plate so as to extend in a direction diagonally to the medial line of the plate and certain prongs in each group being inclined in an opposite direction to the other prongs in the same group, the prongs in each group being staggered with respect to each other and certain of said prongs of one group being twisted in an opposite direction to other prongs in the same group.

4. A box fastener comprising a plate provided with two groups or series of tongues, the medial lines of which are at an angle to the longitudinal medial line of the plate,

said tongues being bent at an angle to the plate, and certain of the tongues of one group being twisted in one direction whereas the other tongues of the same group are twisted in an opposite direction.

5. As a new article of manufacture, a fastener comprising a metal plate the side edges and middle part of which are unbroken, groups of prongs extending in a direction diagonally to the medial line of the plate, some of the prongs of one group being twisted in an opposite direction to the other prongs of the same group, and serrated flanges at the respective end edges of the plate, said serrated flanges being inclined to the longitudinal axis of the plate.

6. As a new article of manufacture, a fastener comprising a metal plate the sides and middle parts of which are unbroken, groups of staggered prongs near each end thereof, said prongs being formed from the plate by cutting the plate in a direction diagonally to the medial line thereof, the prongs of each group being slightly twisted, some of which prongs are twisted in a direction opposite to other prongs to bring their engaging points substantially parallel to the medial line of the plate.

7. As a new articles of manufacture, a fastener comprising a metal plate the sides and middle parts of which are unbroken, groups of prongs arranged in staggered relation near each end thereof, each group comprising a pair of prongs cut from the plate in a direction diagonally to the medial line thereof, the intermediate pair of prongs of a group being twisted in a direction opposite to the remaining prongs of the same group to thereby present the engaging points of the entire group substantially parallel to the medial line of the plate.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE C. D. MILLER.

Witnesses:

H. I. BERNHARD,
J. F. MOTHERSHEAD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."