Dec. 2, 1924. 1,517,528

A. E. BLACKMAN

METAL BOX CORNER FASTENER

Filed April 23, 1921

Fig. 1.

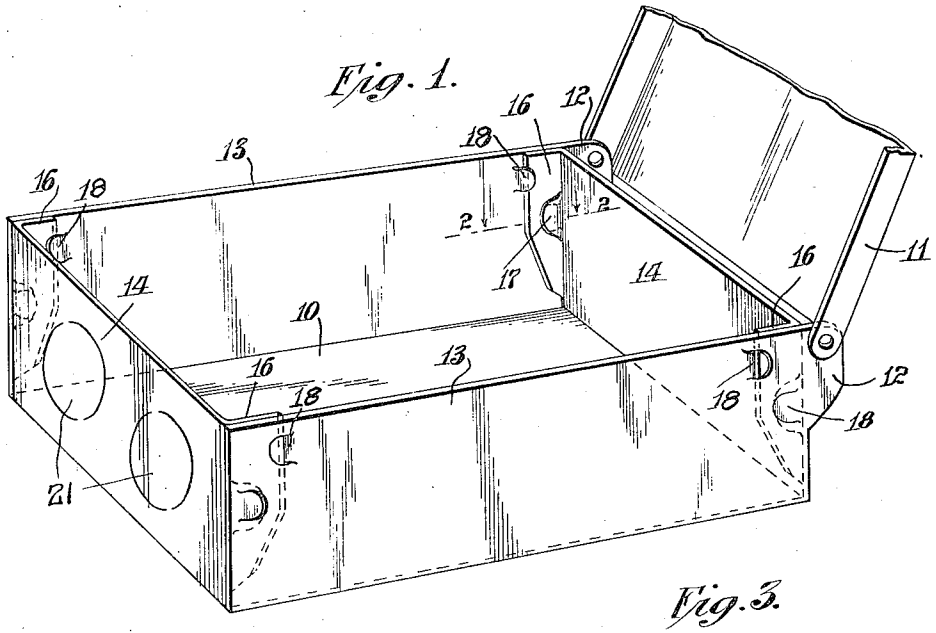



Fig. 2.

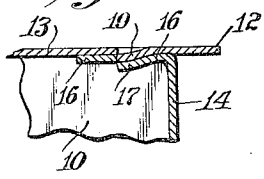



Fig. 3.

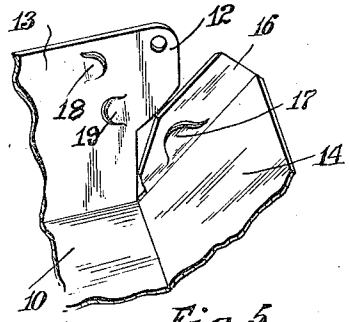



Fig. 4.

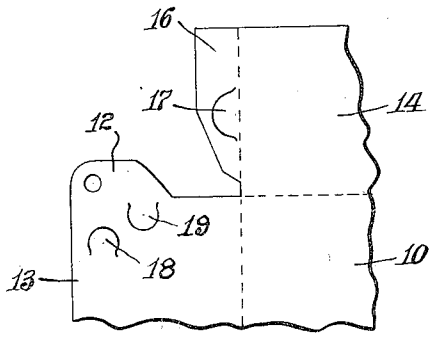
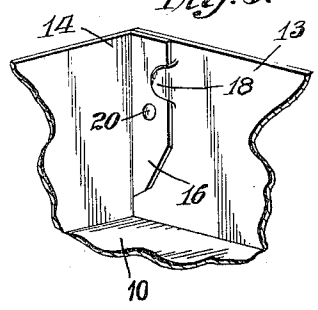



Fig. 5.




Attest:

Mc Yehell

by

Inventor:
Albert E. Blackman
Otto Munk
his Atty

Patented Dec. 2, 1924. 1,517,528

# UNITED STATES PATENT OFFICE.

ALBERT E. BLACKMAN, OF NEW YORK, N. Y.

## METAL BOX-CORNER FASTENER.

Application filed April 23, 1921. Serial No. 464,018.

*To all whom it may concern:*

Be it known that I, ALBERT E. BLACKMAN, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Metal Box-Corner Fasteners, of which the following is a specification.

My invention relates to improvements in metal box construction and more particularly to boxes used to encase electrical switches or other electrical devices commonly known commercially as metal switch boxes.

The customary procedure when assembling or forming boxes of this character is to bend the side and end walls to their upright position and hold each corner with a pair of pliers or other suitable means until the spot-weld or rivet has been applied. The result of this mode of forming up boxes is very unsatisfactory, because it will be understood that heavy gauge metal is naturally springy and the tendency of the walls when bent upright is to spring outward so that the operator is required to hold the corners in place until the spot-weld has been applied. This task is not at all easy and the corners often slip out of true while being welded, which results in an uneven box.

The object of the present invention is to provide means whereby the side walls of a metal box, of the character hereinafter described, may be securely attached together without the use of spot-welding or rivets.

A still further object of the invention is the provision of a box-blank of heavy gauge metal which can be formed up in the proper shape and permanently held in shape without the use of clamping means or spot welding.

The invention consists in the structural features hereinafter fully described with reference to the accompanying drawing, wherein—

Fig. 1 is a perspective view of a switch box showing the corner fastening means.

Fig. 2 is a detail sectional view taken on the lines 2—2 of Fig. 1.

Fig. 3 is a perspective view of one corner of the box showing the end wall before it is locked in upright position.

Fig. 4, is a plan view of the development or blank of one corner of the box.

Referring to the drawing 10 denotes the body of a switch-box having a suitable cover 11, hinged on ears 12, projecting from one end of the upper portion of the body of the box 10. The side walls 13, and end walls 14, are bent upright from the bottom 15. The edges of the end walls are provided with extensions or ears 16, which are adapted to be bent at right angles to the end walls and are provided with suitably shaped tongues 17. The free edge of each tongue is preferably raised slightly beyond the plane of the remaining portion of the ear and lies parallel thereto, so that when the ear is brought into position the tongue 17, will be projected into the interior of the box. It will be noted with reference to the drawing that the arcuate cut in each of the ears 16, forming a tongue 17, begins and ends at the bend forming the corner of the box, so that when the box is assembled the free edge of the tongues will be disposed toward the center of the side walls 13.

Adjacent the front and rear edges of the side walls 13, a pair of oppositely extending tongues 18 and 19, are arranged, one being disposed above the other. These tongues 18 and 19 respectively, are also bent beyond and then parallel to the walls so that when the side walls are in upright position the tongues will be projected into the interior of the box.

It will be apparent that should the upright walls of the box-form be of such height that one group of interlocking tongues would not be sufficient to securely hold the walls in their proper place, any additional number of such groups of tongues may be used.

In the operation of assembling the box-form from a blank in accordance with my invention, a piece of heavy sheet metal is cut into the desired form by means of a cutting die. The necessary tongues and ears as above described may be provided for in the same cutting die resulting in a blank which is then ready to be formed.

A forming die is brought down over the cut blank and the ears 16, are raised at right angles to the end walls 14, whereupon the side walls 13 and end walls 14, are raised to a vertical position. The ears 16 will ride in on the inner face of the side walls until the straight edges of the ears 16 abut the closed end of the upper tongues 18 on the side walls 13, and at this point the lower tongues 19 will have entered the space left by the tongues 17 on the ears 16. The free

edges of the lower tongues 19 in the position just described, will be seated against the edge of the cut left by the inwardly bent tongues 17 upon the ears 16. It will be noted that when the sides of the box are interlocked by means of the tongues 18 and 19, respectively, with the end wall 14, that it is practically impossible to move the latter walls either inwardly or outwardly.

If it is further desired to more securely attach the walls together at the corners a spot-weld may be applied, but in practice it has been found that the metal is of sufficient stiffness to assure the permanent locking of the walls and will withstand the most severe strains without becoming disengaged. The overlying portion of the upper tongues 18, upon the inner edge of the ears 16, provides a means whereby the side walls 13 are held in vertical position, thus the tongues 18 perform the dual function of preventing the inward movement of the end walls 14 and also the outward movement of the side walls 13.

It will be understood that the invention is not limited to interlocking the walls of the body of a metal box, but may also be successfully employed in the cover of the box where for some particular reason the lid or cover is of deep construction to accommodate an electrical device having considerable height.

It has been found in practice that the coextending tongues 17 and 19 may be omitted in the construction of the corners and ears 16 of the box when a very heavy gauge metal is used and in their place I propose to set the ear 16 in its proper position by means of an offset caused by striking the surface of the overlapped corner portion with a punch or other suitable means, whereby a dent or inset may be made in the members. This construction is particularly advantageous where very heavy gauge metal is used and it is a simple operation to inset, as shown at 20 in Fig. 5, the adjacent surfaces of the metal ear 16 and wall 13.

The use of knock-out plugs 21 in the walls 13 and 14 of the body portion of the box 10 is known not to be new in the art, but their use in connection with the specific form of box construction herein described is of particular importance because these knock-out plugs may be indicated on the walls 13 and 14 by one operation of the cutting die and at the same time that the tab or tongue 19 is struck out.

I claim:—

1. A folded metal box formed from a cut blank, the body portion of said blank provided with marginal portions adapted to be bent to form the sides of said box, corner ears bent at substantially right angles to each of the edges of alternate side portions, each of said ears having an opening therein, and pairs of oppositely extending tongues provided in the other alternate side portions and adapted to interlock with the edges of said ears, one member of each of said pairs of tongues making surface engagement with but not projecting beyond the plane of said ears, and the edges formed by said openings therein whereby each of the sides of said box may be locked in engagement with the adjacent side portion.

2. A folded metal box formed from a cut blank, the body portion of said blank provided with adjacent marginal portions capable of being bent to form side wall members, additional side wall members provided with ears disposed at right angles thereto and adapted to lie parallel to the first mentioned side wall members, an opening formed in the surface of each of said ears, and pairs of oppositely extending tongues provided in the first mentioned side wall members adapted to engage the edges of said ears and the edges formed by said openings therein, one of said tongues of each pair making surface engagement with but not projecting beyond the plane of said ears, whereby the wall members may be held against separation.

3. A folding box made from a cut blank having a bottom provided with marginal portions adapted to be bent to form sides and ends of said box, said ends being provided with ears bent at substantially right angles thereto and having a tongue struck up in each ear, said ears having opposed edges formed by the ends of the ears and the edges formed by cutting out said tongues, and pairs of oppositely extending tongues struck up from the surface of the sides not having said ears, one member of each of said last named tongues making surface engagement with but not projecting beyond the plane of said ears, said last named tongues being further disposed to limit the inward and outward movement of said ends.

4. A folding metal box made from a cut blank having marginal portions adapted to be bent to form the walls of said box, the two alternate walls having ears extending at substantially right angles thereto and provided with struck up tongues which form an opening and expose an edge opposite to the outer edge of said ears, and pairs of oppositely arranged tongues struck up from the side walls not having the said ears, said last named tongues being disposed one above the other so that when the side walls having the ears are bent the last named tongues will engage the said opposed exposed edges of the ears, one member of each of said pairs of tongues projecting to but not beyond the plane of the adjacent ears and those of the openings formed by the tongues in the ears thereby interlocking the walls against relative movement.

5. A folded metal box formed from a cut blank having marginal portions which are bent at substantially right angles to the portion forming the bottom of said box, ears on two of the marginal bent portions adapted to extend substantially parallel to the adjacent marginal bent portions, each of said ears having an opening therein which presents an edge which is opposite to the outer edge of said ear, and pairs of tongues struck up from the surface of each marginal portion not having said ears, the free end of said tongues extending substantially parallel thereto, said tongues extending in opposite directions and arranged one above the other whereby when the marginal portions not having the ears are bent the portions having the ears may be moved in an arcuate course until the said outer edge of said ear moves under said upper tongue and seats against the rear of the latter, one member of each pair of tongues projecting to but not beyond the plane of said ears when they interlock.

6. A metal box, comprising a bottom and side walls, ears projecting from certain of said side walls and lying parallel to the other side walls, and pairs of oppositely projecting tongues in one side wall engaging an adjacent ear in another side wall, one member of each of said pairs of tongues making surface engagement with but not projecting beyond the plane of said ears.

7. A metal box, comprising a bottom and side walls, a pair of oppositely projecting tongues struck up near the two ends of each of two of said side walls, ears carried at the opposite edges of each of the other side walls and adapted to lie parallel to the first mentioned side walls, said tongues being adapted to engage said ears in a manner so that one tongue will engage the edge of said ear and the other tongue will engage the edge of an opening in said ear and make surface engagement with but not project beyond the plane of said ear.

In testimony whereof I have affixed my signature.

ALBERT E. BLACKMAN.