April 27, 1937. E. N. MILLAN 2,078,718

ANNEALING COVER

Filed Jan. 22, 1936

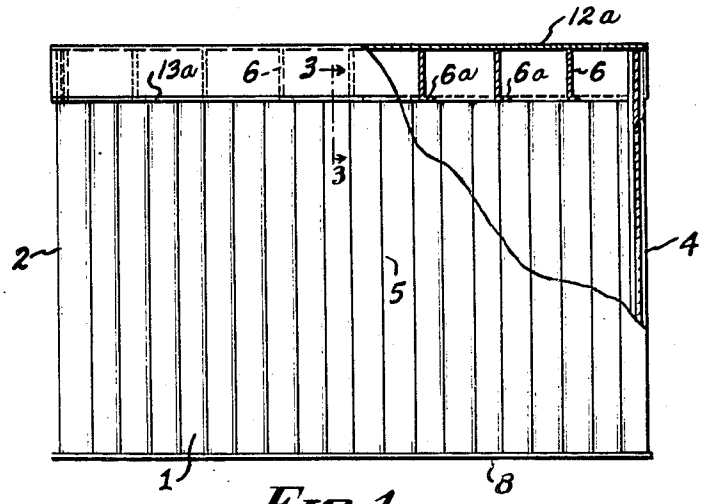

FIG. 1.

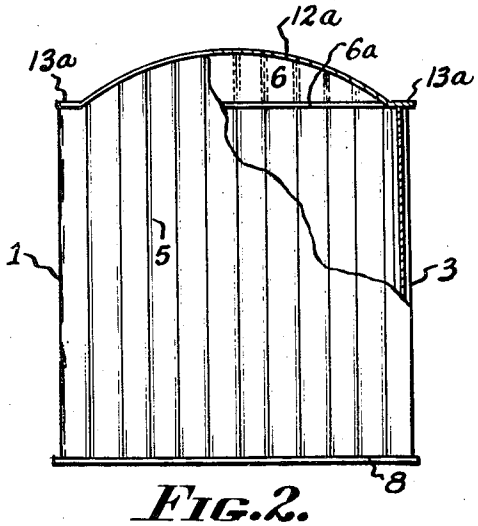

FIG. 2.

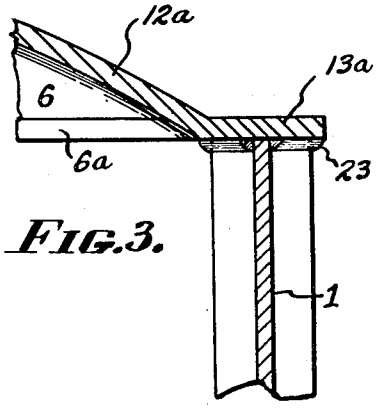

FIG. 3.

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ANNEALING COVER

Edward N. Millan, Middletown, Ohio, assignor to The American Rolling Mill Company, Middletown, Ohio, a corporation of Ohio

Application January 22, 1936, Serial No. 60,241

6 Claims. (Cl. 263—49)

My invention relates to annealing covers for covering packs of sheet metal or coils while they are being heat treated, and is a continuation in part of my copending application Serial No. 37,858, filed August 26, 1935, which application is itself a continuation in part of my copending application Serial No. 3,083, filed January 23, 1935. The uses of annealing covers are well known, and particular description thereof is not necessary. The employment of annealing covers to retain particular atmospheres surrounding the pieces being heat treated is also well known. Because of their uses, annealing covers should be relatively rigid, but at the same time they should be as light as possible, both for convenience in handling and also for efficient heat transfer. This desirable lightness has not been attained in the cast annealing covers in current use. It has hitherto for the most part been considered necessary to provide a great bulk of metal to give satisfactory rigidity under high heats. Because of the rough usage and the great heat to which annealing covers are subjected, they must of course be very rugged and strong. Another difficulty present where gaseous media under pressure are introduced into the box while hot, is that there is a tendency for the sides to bulge. The rough handling to which such covers are subjected also has a tendency to cause the roof to sag.

It is an object of my invention to provide an annealing cover which is extremely strong and rigid and capable of forming a gas tight chamber, and very resistant to heat and wear, but which is at the same time light in weight.

It is a further object of my invention to provide annealing covers which are relatively inexpensive to construct but which when constructed have all of the above advantages.

Another object of my invention is to provide annealing covers having the above mentioned desirable qualities which may be constructed with a minimum of welding.

Still another object of my invention is to provide annealing covers of such a construction that the tendency of the covers to bulge outwardly under the influence of hot gases is neutralized.

These and other objects of my invention which will be set forth hereinafter, or will be apparent to one skilled in the art upon reading these specifications, I accomplish by that certain construction and arrangement of parts of which I shall now describe a preferred embodiment. Reference is made to the drawing which forms a part hereof, and in which:

Figure 1 is a side elevation with part cut away, of my annealing cover.

Figure 2 is an end elevation of the same, with part cut away.

Figure 3 is a section taken on the line 3—3 of Figure 1.

Broadly my invention comprises providing an annealing cover formed of relatively heavy corrugated metal sheets welded together to form the desired sealed chamber. The corrugated sheets which I prefer to use are of rough plate, by which I mean the product of the modern continuous mill, which is of a weight of 8 to 12 gauge or thereabouts, and are welded together with strengthening struts or bands where desired, to form a chamber, with sides, ends and a top, to fit over a pack or stack of sheets while they are being annealed.

I prefer to use an alloy containing 15% or more of chromium, and 85% or less of iron. I may further use an alloy containing 25% chromium, 12% nickel, and 63% iron. However, variations in the percentage of metals used in the alloys may be made without departing from the scope of my invention.

Briefly, in the practice of my invention, I provide a chamber or annealing cover having four sides 1, 2, 3 and 4 formed of a relatively heavy corrugated sheet metal. These side pieces 1, 2, 3 and 4 are so positioned as to form a hollow rectangle with the corrugations 5 vertical and with the ends of the sheets abutting. These ends are preferably welded to each other so as to form an integral unit of the sides 1, 2, 3, and 4, all as described in my copending application hereinabove referred to.

The corrugated pieces which I prefer to use are made of rough plate as above described, or similar material of 8 to 12 gauge or thereabouts, corrugated with large corrugations between rolls in the direction of the shorter dimensions of the sheets, say with corrugations having a depth of substantially 1½ inches and a pitch of six inches, and where the corrugated pieces are to be curved, this is done progressively between dies. The figures given are, of course, exemplary and not limiting.

About the lower edge of the four sides 1, 2, 3 and 4, I place four strips of iron 8, and weld them to the lower edges of the said sides along their contacting portions. The ends of the four irons 8 may be beveled and welded to each other in order to form an integral frame. The welding may be done in any convenient commercial way, as by electricity or flame.

In the construction shown in the drawing, I

have eliminated certain elements disclosed and claimed in my said copending application Serial No. 37,858, filed August 26, 1935, and have somewhat altered the form of the arch. In this embodiment I form the arch 12a from a flat plate, i. e. not corrugated, and curve it so as to fit the curved upper ends of the end walls. Along the sides I flatten out lips 13a and turn them outward until they are in a horizontal plane. The roof section is then simply set on top of the side and end walls and welded thereto, as at 23, the lip 13a taking the place of the member 13 of my said copending application.

In order to prevent sagging of the roof I may provide the plates 6. These plates are cut out along one edge to conform to the curvature of the arch, and along the other edge there is formed an angle leg 6a at right angles to the plane of the supporting plate. The plate 6 is welded in several places along the line of contact between the plate and the arch, and the angle leg 6a gives it strength in a transverse direction.

The different configurations and shapes of the cover shown in my drawing are not intended as a limitation, since numerous other forms may be used without departing from the spirit of my invention.

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

1. An annealing cover comprising corrugated side wall members of plate metal, an arc shaped top of plate metal, the longitudinal edges of said top being bent outwardly to a horizontal plane to form lips, said lips being welded to the tops of said side wall members.

2. An annealing cover comprising corrugated side wall members of plate metal, an arc shaped top of plate metal, the longitudinal edges of said top being bent outwardly to a horizontal plane to form lips, said lips being welded to the tops of said side wall members, and segmental plates conforming to the inner cross section of said top and welded thereto, for the purpose described.

3. An annealing cover comprising corrugated side wall members of plate metal, an arc shaped top of plate metal, the longitudinal edges of said top being bent outwardly to a horizontal plane to form lips, said lips being welded to the tops of said side wall members, and segmental plates conforming to the inner cross section of said top and welded thereto, the lower edges of said plates being formed with an angle leg, for the purpose described.

4. An annealing cover according to claim 1, the side walls of which are of such proportions that the horizontal cross sectional area of said cover at its top is smaller than its horizontal cross sectional area at its base.

5. An annealing cover comprising corrugated trapezoidal side wall members of plate metal, an arc shaped top of plate metal, the longitudinal edges of said top being bent outwardly to a plane at right angles to the planes of the side walls to form lips, said lips being welded to the tops of said side wall members.

6. An annealing cover according to claim 1, the end walls of which are of such proportions that the horizontal cross sectional area of said cover at its top is smaller than its horizontal cross sectional area at its base.

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