No. 714,385. Patented Nov. 25, 1902.

W. F. J. LUTZ.

MOLD.

(Application filed Feb. 14, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig 1

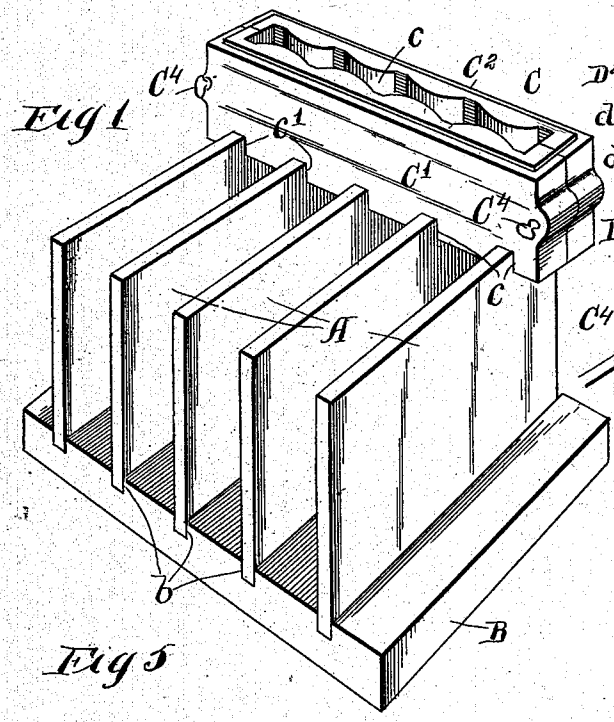


Fig 2

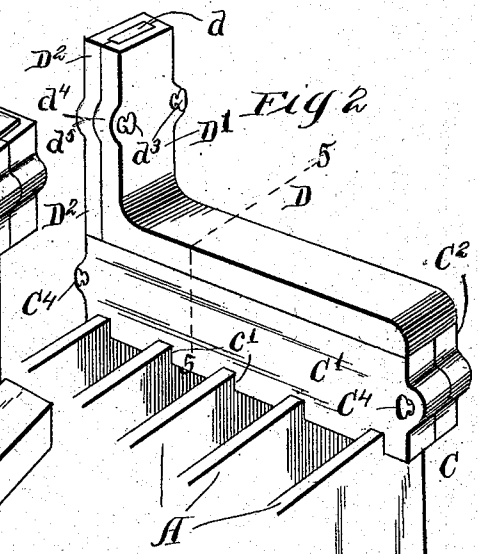


Fig 5

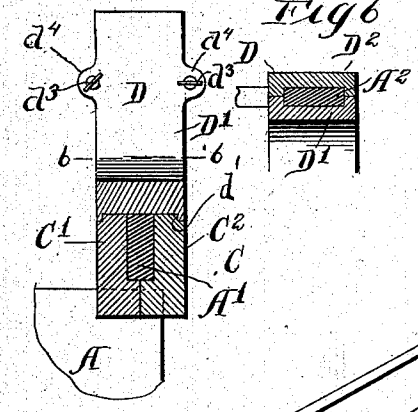


Fig 6

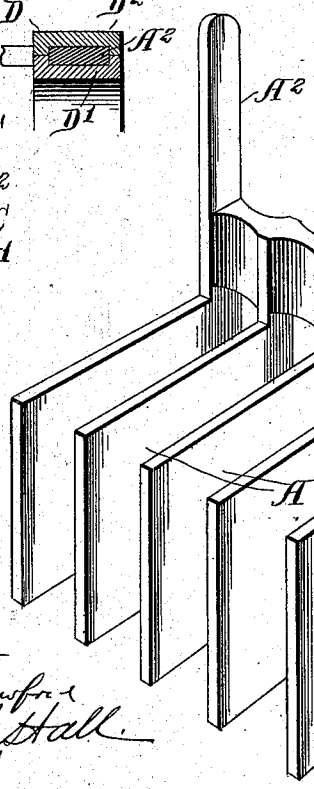


Fig 7

Fig 3

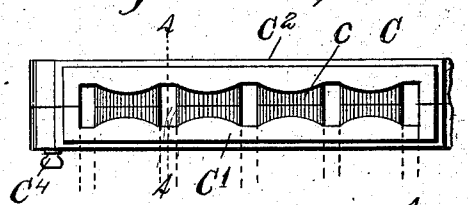
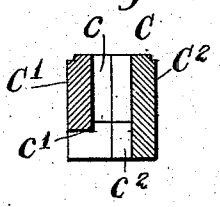


Fig 4



Witnesses:-
Earl H. Crawford
William L. Hall

Inventor:-
William F. J. Lutz
by Poole & Brown
his Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 714,385. Patented Nov. 25, 1902.

W. F. J. LUTZ.

MOLD.

(Application filed Feb. 14, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig 8

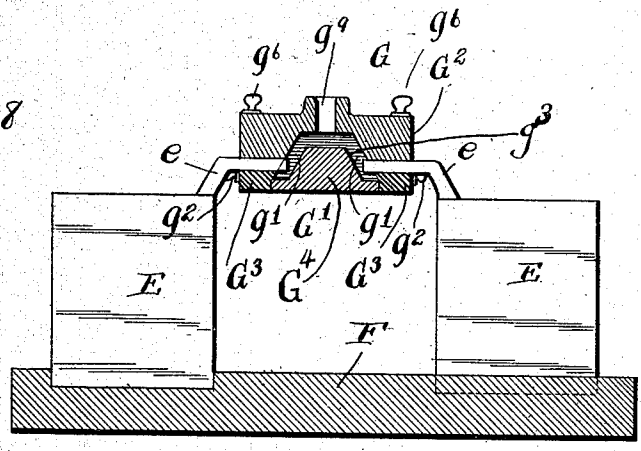


Fig 9

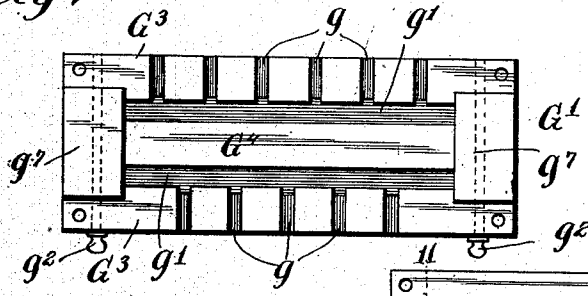


Fig 10

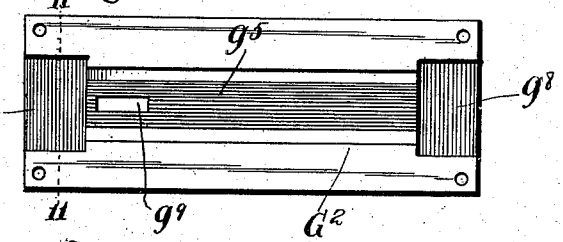


Fig 11

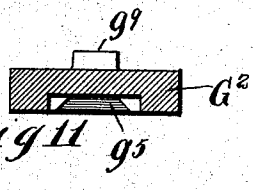


Fig 12

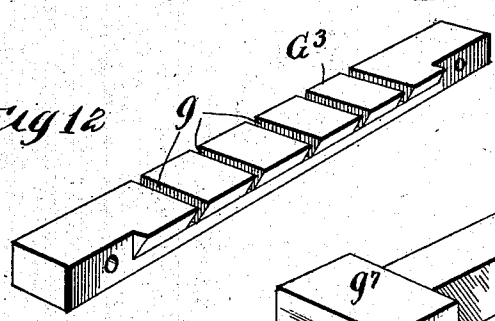
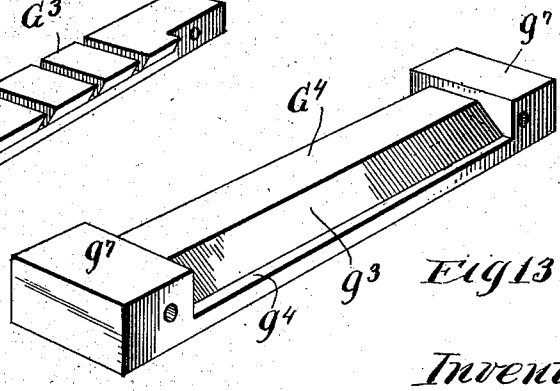


Fig 13



Witnesses:-
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Inventor:-
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his Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM FRED JOHN LUTZ, OF CHICAGO, ILLINOIS, ASSIGNOR OF TWO-THIRDS TO HANS ADAM SCHLOETZER AND JOHN HENRY GEORGE LUTZ, OF CHICAGO, ILLINOIS.

MOLD.

SPECIFICATION forming part of Letters Patent No. 714,385, dated November 25, 1902.

Application filed February 14, 1901. Serial No. 47,274. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FRED JOHN LUTZ, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Molds; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to a novel form of mold which is designed to connect together by an integral metallic connection two or more metal parts, said mold being constructed to permit the parts which are to be joined to extend into the chamber of the mold in such manner that said parts so contained in the chamber may be fused, so that molten metal thereafter poured into the mold-chamber to form the connection between said parts will coalesce with said fused parts, and when the metal has hardened the several parts will be connected together in one integral structure.

I have shown my invention as adapted for connecting together all of the plates of a single cell of a storage battery and also for connecting the plates of like polarity of two adjacent cells of a storage battery. It will be obvious, however, that my improved mold may be used for joining together other metallic parts which are adapted to be connected in similar relation.

In the drawings, Figure 1 is a perspective view of the several plates of a single cell of a storage battery and a mold made in accordance with my invention in place thereon. Fig. 2 illustrates the parts shown in Fig. 1 and in addition thereto an extension-mold for forming on the connecting bar or bond a lug which forms part of the connection between the plates of two adjacent cells. Fig. 3 is a plan view of the mold shown in Fig. 1. Fig. 4 is a transverse section on line 4 4 of Fig. 3. Fig. 5 is a fragmentary section on line 5 5 of Fig. 2. Fig. 6 is a transverse section on line 6 6 of Fig. 5. Fig. 7 illustrates a completed structure consisting of the plates, the integral connecting-bar, and the integral lug formed thereon. Fig. 8 illustrates my improvement as adapted for joining together the connecting-lugs of the plates of like polarity of adjacent cells, showing the mold in cross-section and the lugs extending thereinto. Fig. 9 is a plan view of the lower parts or drag of said mold. Fig. 10 is a bottom plan view of the top or cope of the mold. Fig. 11 is a transverse view on line 11 11 of Fig. 10. Figs. 12 and 13 are perspective views, separately shown, of parts embraced in the construction of the lower parts of the mold.

In Fig. 7 is illustrated the plates of like polarity for use in one cell, said plates, which are designated by the letter A, being connected by an integral bar or bond A′, and said bar having thereon an integral lug A^2, adapted for connection with parts outside the cell in which the plates are used.

Referring to the construction shown in Figs. 1 to 5, inclusive, which is adapted for connecting the plates A (shown in Fig. 7) and the manner of using the same, these parts are constructed as follows: The plates A to be joined may be made of any suitable or preferred form and are desirably cut from sheet-lead by a shearing operation. In order to hold said plates in proper position while the connecting-bar A′ is being formed thereon, said plates are shown as supported on a notched rack B, the notches *b* of which are made of such depth and size as to hold said plates in vertical positions. The connecting bar or bond A′ of said plates is formed in the lower part or drag C of a mold, which part consists, essentially, of two members C′ C^2 and is constructed to inclose the corresponding upper corners of the plate at the parts thereof where they are to be joined together. Said mold members C′ C^2 are recessed on their proximate faces to form the desired shaped mold-chamber *c*. Said mold members are fitted closely together at their ends and are so constructed at their lower edges as to form in connection with the upper margins of the plate A at the corners thereof a closed bottom for the mold-chamber. For this purpose the mold member C′ is provided at its lower margin with a plurality of notches *c*′, and when said member is in place the upper edges of the

plates fit into said notches. The mold member C^2 is provided at its inner side, at the bottom thereof, with a plurality of notches c^2, located opposite to the notches c', which when the member is in place fits upon the end margins of the plates. The parts of said mold members between the plates are brought into contact with each other in the plane of the contact-faces of the ends of said members and form, with the margins of said plates, a closed bottom for said chamber. The mold is provided with a suitable top part or cope—such, for instance, as the part D, (shown in Fig. 2)—which latter is in this instance constructed to give form to the lug A^2. The mold members C' C^2 are attached together by means of clamping-screws C^4, which pass through apertured lugs or swells on one of said members and have screw-threaded engagement with corresponding parts on the other member. After the mold thus described has been fixed in place on the plates A and before the molten metal is poured thereinto for the purpose of forming the bar or bond A' (the top or cope being removed, as shown in Fig. 1) the corners of the plates, which extend into the mold-chamber, are heated to fuse the same. This may be conveniently accomplished by the use of a blowpipe and directing the flame thereof into the open top of the mold and upon the corners of said plates until the temperature thereof has been sufficiently raised to fuse the same. After said plates have been fused in the manner described a charge of molten metal is poured into the mold-chamber until said chamber is filled. The molten metal of said charge commingles with the molten metal from the fused parts of the plates, so that when the metal hardens the bar and plates form an integral structure.

As before stated, the lug A^2 is formed in the upper part or cope D of the mold, which part is specially constructed for this purpose. As herein shown, said part consists of two members D' D^2 and are constructed to provide between the same a vertical mold-chamber d, which communicates at its lower end with the mold-chamber c. The mold member D' consists of a horizontal part and a vertical part, which latter is provided on one face with a longitudinal recess, and the part D^2 consists of a straight piece or member having on one face a like longitudinal recess which forms, with the recess in the other member, the mold-chamber d. Said mold members are connected together by means of clamping-screws d^3, which pass through lugs d^4 on one of said members and engage screw-threaded lugs d^5 on the other member. In forming the lug A^2 on the connecting-bar the part D of the mold is applied to the part C after the latter has been filled with molten metal, as stated, and before the metal therein has hardened, so that the charge of lead poured into said part D coalesces with the molten metal in the part C. The two charges harden as a single integral structure. The lower surfaces of said mold members D' D^2 are recessed and fit over a rabbet d', formed upon the upper face of the lower part of the drag C of the mold.

Referring now to the form of mold illustrated in Figs. 8 to 13, inclusive, and the manner of using the same, the parts are made as follows: The plates E, the lugs e of which are to be joined, are arranged in sets opposite each other on a notched rack F, constructed to hold them in their proper relative position, with the plates of one set opposite to the spaces between the plates of the other set. G designates as a whole the mold, which consists of a lower part or drag G' and an upper part or cope G^2. Said drag is formed to provide on its top surface a plurality of notches g g, which extend from the sides of said cope inwardly and intersect at their inner ends two longitudinal recesses g' g', which constitute the bottom parts of the mold-chamber on each side thereof. Said recesses extend longitudinally of the drag and are arranged parallel with each other on each side of the center of the drag, and the notches at one side are opposite to the spaces between the notches at the other side to correspond with the positions of the plates. Said cope is preferably formed of three longitudinally-separable sections, two similar side sections G^3, and a central section G^4, which fit together edge to edge. Said parts are joined by means of clamping-screws g^2, passing through one of the side sections and the central section and having screw-threaded engagement with the other side section. Said drag is made of separable parts to permit the same to be readily removed from the casting formed therein. The recesses g' are formed between the central section and side sections, said central section being for this purpose obliquely cut away in its parts adjacent to the notches g, as shown at g^3, Fig. 13, and the parts of said side sections G^3 containing said notches being inclined parallel with the inclined proximate faces g^3 of the central section and constructed to overlap the margins of said central section. The inclined faces g^3 of the central section do not extend to the extreme margins thereof, but intersect horizontal surfaces g^4, Fig. 13, which form the bottoms of the recesses g'. The cope G^2 is provided on its bottom face with a recess or depression g^5, the side walls of which are oblique and parallel with the inclined surfaces of the central sections of the drag and the upper wall of which is horizontal and parallel with the upper surface of said central section. Said recess of the cope and the recesses g' of the drag together form a mold-chamber which has the general form of an arch in cross-section, as clearly shown in Fig. 8. The cope and drag are secured together by means of clamping-screws g^6, which pass through the cope and has screw-threaded engagement with the drag. Interfitting connections are provided

between the cope and drag which prevents both longitudinal and lateral movement of the cope with respect to the drag. Such interfitting connections consist in the present instance of upward angular extensions g^7 on the upper surface of the drag at the ends thereof, which are engaged by similarly shaped and located recesses g^8 on the lower face of the cope. The inner sides of said extensions constitute the ends of the recesses g' and are engaged by the overlapping parts of the side sections to hold the latter from endwise movement. The cope is provided in its upper wall near one end thereof with a pouring-opening g^9, which communicates with the mold-chamber formed between the cope and drag. Said opening is formed partly in a nipple which extends above the upper surface of the cope, so that a lug of some length may be formed on the connecting-bar cast in said mold, said lug being adapted to constitute part of the connection between plates of two adjacent shells of a storage battery or to be connected with a conductor leading from the battery in which the plates are contained.

When the lugs e of the plates E are to be joined by the use of the mold described, after said plates have been arranged upon the racks F in the manner shown in Fig. 1 the drag is placed under said lugs, with the lugs resting in the notches g thereof. The lugs e, as will be seen from an inspection of Fig. 6, pass at their inner ends into recesses g' in said drag and in position to be exposed to a flame which may be directed to and upon the same for fusing the logs. Before the cope has been placed on the drag a flame from a blowpipe or the like is directed against said lugs to fuse the same, and thereafter molten metal is poured into the recesses g' to the level of the upper surfaces of the lugs e. The cope is then placed in position upon the drag and secured thereon, and the mold-chamber is filled with molten metal, the added metal filling said chamber and commingling with that previously introduced. The metal is thereafter allowed to harden, and thereby forms a connecting-bar which is integral with the lugs e, said bar being of a cross-section like that of the mold-chamber.

The use of the new improved mold for joining two metallic parts in the manner described has the important advantage of providing a strong connection between said parts and one which is in fact integral with the parts joined and at the same time avoids the necessity of casting the integral structure in a mold made for that purpose.

The joining of the plates in the manner described is obviously superior to casting the connected plates in an integral structure, for the reason that molds made to cast said plates would necessarily be of complicated structure, and the operation of casting the same would be correspondingly complicated. The use of the molds herein described for connecting the two metallic parts is also advantageous over the connection of the plates by soldering or like means, as it provides a stronger joint and one in which the parts carrying the electric current are homogeneous and of equal conductivity throughout.

I claim as my invention—

As a means for connecting a plurality of metal plates, a notched or recessed rack or holder for supporting the plates to be united and a mold consisting of separable upper and lower parts and which is provided in its lower part with openings adapted to receive parts of the plates held in said rack, and through which said parts of the plates are inserted in such manner as to close said openings and to be exposed within the said lower part of the mold, so that a heating-flame may be directed thereon when the upper part of the mold is removed from such lower part.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 8th day of February, A. D. 1901.

WILLIAM FRED JOHN LUTZ.

Witnesses:

JOHN HENRY GEORGE LUTZ,

HANS ADAM SCHLOETZER.