Dec. 6, 1932. C. R. COOK 1,890,369

TOOL FOR REMOVING TERMINAL CLAMPS FROM STORAGE BATTERY BINDING POSTS

Filed July 16, 1930

Fig. 1.

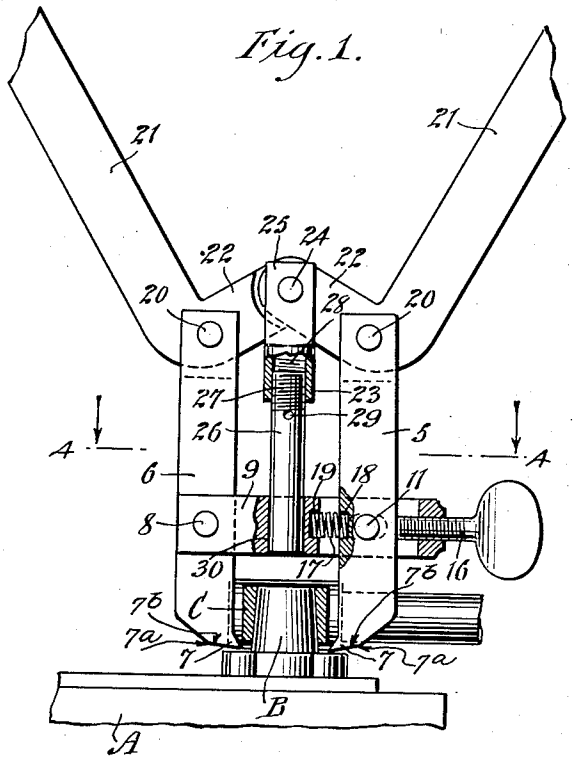


Fig. 2.

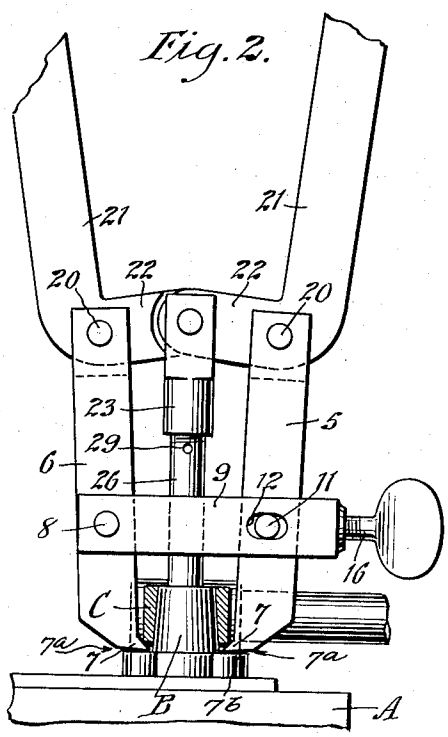


Fig. 3.

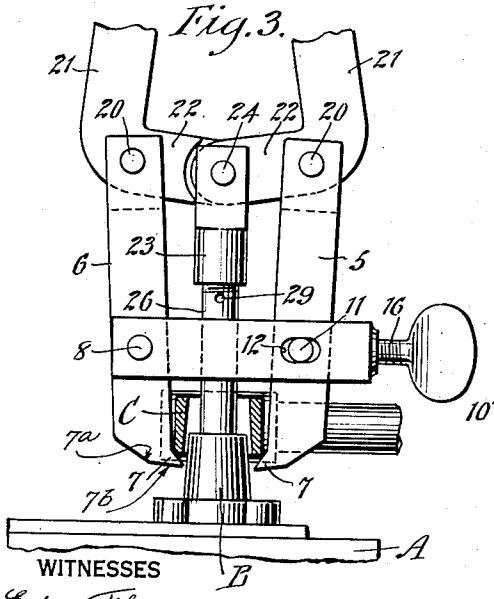
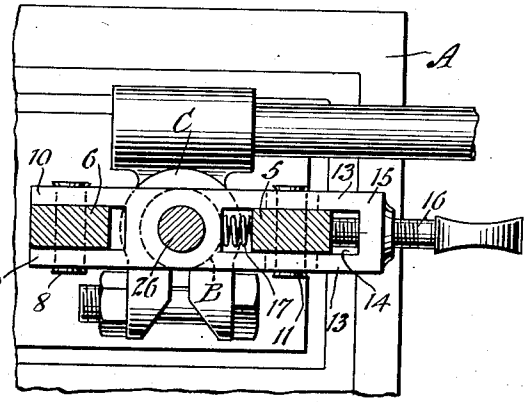


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE

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TOOL FOR REMOVING TERMINAL CLAMPS FROM STORAGE BATTERY BINDING POSTS

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This invention relates generally to the class of tools, and refers more particularly to an improved tool which, while not necessarily restricted to such use, is especially designed for the purpose of removing terminal clamps from storage battery binding posts.

In recognition of the difficulty of removing terminal clamps from storage battery binding posts, especially where corrosion has tended to freeze the clamp to the binding post, the present invention aims to provide a tool which will expeditiously accomplish the removal of said clamp without damage either to the clamp, to the binding post or to the battery.

The invention primarily aims to provide a tool of the indicated character and for the purpose specified which includes a pair of jaws adapted to engage under diametrically opposite points of the terminal clamp for which purpose said jaws include heels and confronting wedges the bottoms of which are relieved upwardly toward the heels when in a gripping position, together with a plunger and handle members operatively connected with the plunger and jaws for initially effecting simultaneous swinging movement of the free ends of the jaws toward each other to a gripping position under the clamp and the downward movement of the plunger into contact with the upper end of the binding post and a subsequent relative upward movement of the jaws with respect to the plunger whereby a pull is exerted directly upward on the terminal clamp to remove it from the binding post.

As a further feature, the invention resides in the provision of means for adjusting the plunger as to its length to compensate for differences in the height of battery binding posts and/or means for adjusting the normal relative spacing of the jaws to compensate for variations in the diameter of the binding posts and terminal clamps.

As a still further object, the invention resides in the provision of a tool of the indicated character, in which the parts are guided and maintained in proper relative position so as to facilitate its use and association with the parts to be operated on thereby.

Other objects of the invention reside in the comparative simplicity of construction and mode of use of the device, the economy with which it may be produced and the general efficiency derived therefrom.

With the above recited and other objects in view, reference is had to the following description and accompanying drawing, in which there is exhibited one example or embodiment of the invention, while the claim defines the actual scope of the same.

In the drawing:

Figure 1 is a fragmentary side view with parts broken away and shown in section, illustrating the initial positioning of the tool with respect to the battery binding post and terminal clamp.

Figure 2 is a similar view illustrating the jaws moved into engaging position with the terminal clamp and the plunger into engagement with the binding post.

Figure 3 is a similar view illustrating the final position of the tool after the terminal clamp has been pulled upwardly and loosened from the binding post.

Figure 4 is an enlarged sectional plan view taken approximately on the line indicated at 4—4 in Figure 1.

Referring to the drawing by characters of reference, A designates a storage battery, B the binding post, and C a terminal clamp of any approved type fitted thereover.

Ordinarily, the binding post is tapered upwardly and the terminal clamp is correspondingly formed with an internal taper.

The tool for effecting the removal of the terminal clamp C from the binding post B includes a pair of spaced jaws 5 and 6 which may be of any desired configuration and which are formed at the lower free ends with projecting noses or confronting wedges 7 which extend toward each other and which are designed to engage under the terminal clamp at diametrically opposite points. These wedges include heels 7^a toward which the wedge bottoms 7^b are upwardly relieved when the wedges are in the gripping position (Fig. 2). The jaw 6 is fulcrumed intermedi-

ate its ends on a fixed fulcrum 8 of a cross member 9, preferably between the furcations 10 of the bifurcated end of the cross member 9. The jaw 5 is fulcrumed intermediate its ends on an adjustable fulcrum 11 which extends through aligned slots 12 in the side rails 13 defined by an elongated opening 14 in the opposite end of the cross member 9. The opening 14 also defines a bight portion 15, through which a set screw or thumb screw 16 is threaded for abutting engagement with the jaw 5. A coiled expansion spring 17 is arranged in the elongated opening 14 and is interposed between the opposite inner side of the jaw 5 and the inner end of the opening 14. The spring 17 is preferably seated at its opposite ends in recesses 18 and 19 formed in the inner face of the jaw and in the inner end wall of the slotted portion. In practice, the spring normally exerts a pressure to move the jaw 5 outwardly into engagement with the set screw 16 and, obviously, inward threading movement of the set screw shifts the pivotal point or fulcrum 11 inwardly while outward threading movement of the set screw permits the spring to move the fulcrum 11 outwardly. This adjustment varies the normal spacing of the jaws to accommodate the tool to battery binding posts and terminal clamps of varying diameters.

The upper ends of the jaws 5 and 6 are pivotally attached by pivots 20 to a pair of handles 21, which handles are formed with offset or angularly disposed terminals 22, preferably projecting at a right angle to the major length of the handles with the pivots 20 arranged approximately at the juncture of the terminals 22 with said major portion of the handles 21.

A plunger designated generally by the reference character 23 is pivotally attached to the free ends of the offset terminals 22 of the handles, preferably by a connecting pivot 24 which extends through the furcations 25 of the bifurcated upper end of the plunger and through the lapped free ends of the extremities 22. The plunger is adjustable as to its length to compensate for variation in the height of the binding post B of the battery, and this is accomplished by forming the plunger with a rotatable lower section 26 having a threaded upper end 27 which engages the internal threaded upper section 28 of the plunger, a radial opening 29 being provided in the lower plunger section 26 for facilitating the turning of the same to increase or decrease the length of the plunger structure. The cross member 9 is provided with a guide opening 30 through which the plunger extends and is guided in its movements. In addition to the foregoing compensating factor of the plunger section 26, the provision for its adjustment plays an important part in the manipulation of the puller. The plunger section 26 is intended to be so regulated in each instance of use of the puller as to initially and momentarily remain out of contact with the upper ends of the binding post B until the wedges 7 have performed their function (at least in part) of wedging the clamp C loose from the binding post.

In use and operation, the handles 21 are swung initially to a position away from each other substantially as illustrated in Figure 1 of the drawing, which retracts or moves the plunger 23 upwardly and at the same time swings the upper ends of the jaws 5 and 6 inwardly, spreading the noses 7 at the lower free ends of said jaws to space the same apart an appropriate distance to permit of the positioning of the jaws relative to the binding post B and terminal clamp C in the manner illustrated in Figure 1. If the noses 7 of the jaws are not spaced apart sufficiently, the set screw may be retracted. Conversely, if the noses are too far apart, the set screw may be threaded inwardly to a properly spaced position. The initial inward swinging movement of the handle members 21 toward each other spreads the upper end of the jaws 5 and 6 and causes the noses or wedges 7 to engage under and behind the clamping terminal C at diametrically opposite points, at the same time moving the plunger 23 downwardly until its lower end engages with the upper end of the battery binding post B. At this point the importance of the relieved positions which the bottoms 7^b assume while the jaws are in the gripping position will become evident. By virtue of the fact that the bottoms 7^b slant upwardly in the outward direction there is a very definite clearance between the heels 7^a and the abutment from which the binding post B arises, making it possible for the wedges to dig between the abutment and the clamp C, this absolutely assuring a gripping engagement which will not slip in the removing operation. Subsequent inward movement of the handles 21 will cause a lifting of the elements of the tool with respect to the plunger without materially effecting a further movement of the jaws 5 and 6, due to the fact that the path of travel of the pivotal points 20 will now have reached approximately a straight line movement. The relative upward movement of the jaws with respect to the plunger engaging on the upper end of the binding post B will exert a direct upward pull on the terminal clamp C which due to the leverage exerted on the handles by their inward movement, readily effects the displacement of the clamping terminal from the binding post without any side strains being imparted to the binding post. The remaining operation is merely to lift the tool bodily with the clamping terminal therein.

While there has been illustrated and described a single and preferred embodiment of

the invention, it is to be clearly understood that no limitation is intended as to the precise structural details, but that modifications and variations which properly fall within the scope of the appended claim may be resorted to when found expedient.

What is claimed is:

A puller of the type comprising a pair of handles having offset terminals, a plunger, a pair of jaws, and means by which the jaws are pivoted at one end to the offsets of the handles; in combination, wedges at the other ends of the jaws having bottoms assuming upwardly relieved positions when in the act of gripping, an extension carried by the plunger and being directed toward the wedges, a cross member both linking the jaws together and providing a central guide for the plunger extension, and means to adjust said extension simultaneously both in respect to the plunger and said wedges, enabling a preliminary unimpeded entering action of said wedges between a fixed abutment and an object to be pried from a post projecting from said abutment before said plunger extension assumes engagement with the post for the lifting off of said object.

CHARLES R. COOK.