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W. E. HARRISON

1,792,837

PLIERS

Filed Sept. 30, 1929

FIG. 1.

FIG. 2.

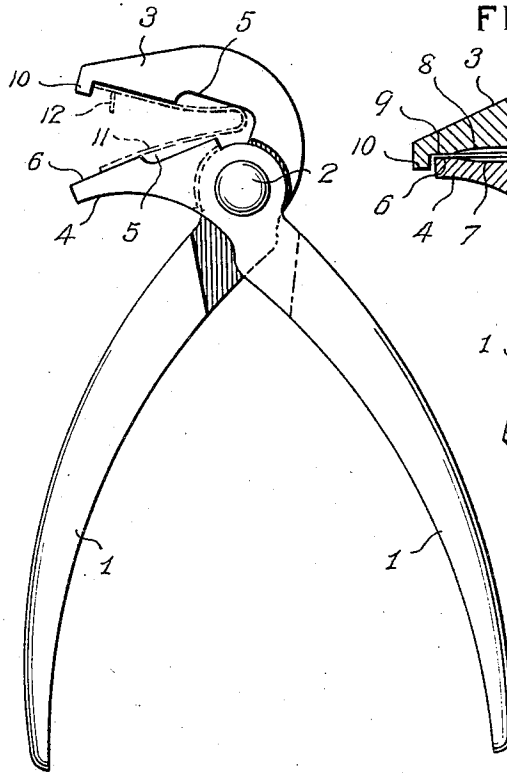
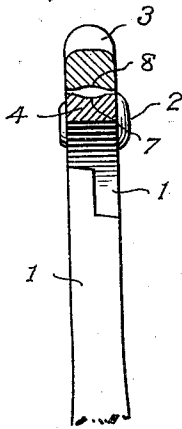


FIG. 3.

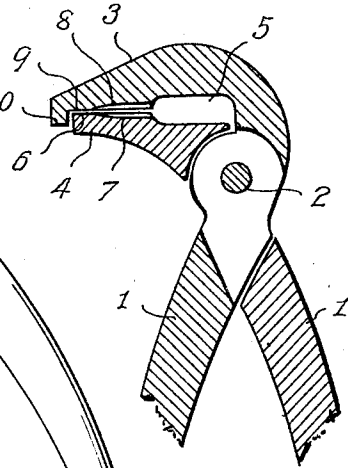


FIG. 4.

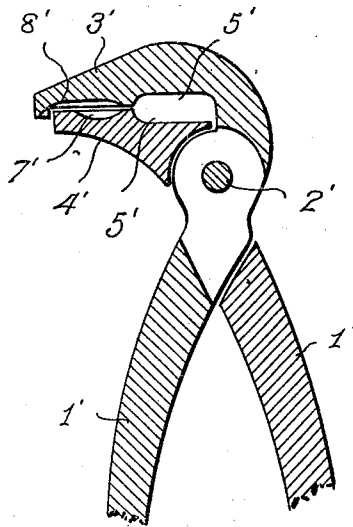
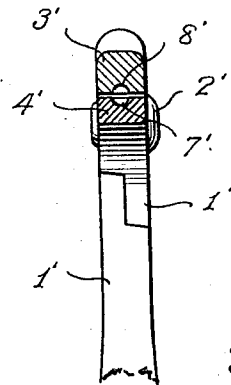


FIG. 5.



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# UNITED STATES PATENT OFFICE

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## PLIERS

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This invention relates to improvements in tools designed for clamping parts for manual manipulation, and is more particularly directed to the construction of the gripping jaws.

Among the objects in view are increased facility and accessibility of the jaws to otherwise inaccessible work; the assured retention of work in proper relation to the jaws preceding an application thereof, and the accommodation of the work when of a contour other than accommodated by the jaws of well known types of pliers.

With these and further objects in view as will in part hereinafter become apparent and in part be stated, the invention comprises certain novel constructions, combinations, and arrangements of parts as subsequently specified and claimed.

In the accompanying drawings,—

Figure 1 is a view in side elevation of a pair of pliers embodying the features of the present invention, the parts being shown in the open position preparatory to application to work, and a clip comprising a part of the work being indicated in dash lines in operative relation to the jaws of the pliers.

Figure 2 is a transverse section through the nose of the jaws in the closed position with the clip omitted.

Figure 3 is a longitudinal, vertical section taken on a plane transversely of the pivot, the jaws being seen in the closed position, and

Figures 4 and 5 are views similar respectively to Figures 3 and 2, but illustrating a slightly modified embodiment.

It has heretofore been common practice to apply signs to backing sheets and to suspend signs from supports by the application of metal clips. The metal clips commonly employed are each formed of a strip of metal folded substantially midway of its length and provided with a laterally, outstanding prong projecting from one end portion toward the other end portion, the second end portion being formed with an aperture adapted to receive the prong when the folded parts are collapsed upon each other, and the prong being adapted to pass through the

aperture and then be collapsed and folded down against the apertured end portion for locking the two end portions together and for securing together any parts located between the folds of the clip. The parts secured together by the clip may be a thin paper sheet carrying printed letters and referred to as a sign together with a backing or heavier sheet, or may be merely a sign which is to be supported by the clip. In many instances it is desirable to suspend signs on wire fences and to effect this result it has been common practice to place the fold or bight of the clip in position to enclose a wire or rod of the fence, and then to clamp the clip onto the sign. This has been previously done by the use of a common form of pliers whose gripping jaws project substantially straight out from the pivot of the operating levers or handles. In various instances, however, it has been found that when applying signs to a wire fence in this manner upper portions of the fence very materially interfere with the proper location of the pliers because the operating handles or levers of the pliers must be extended above the sign in the very space occupied by upper wires. It is an essential object of the present invention to overcome the difficulty thus presented in the use of a common pair of pliers by providing clamping jaws located substantially at right angles to the line of the operating handles or levers, so that the said handles may outstand substantially straight from the fence when the jaws are positioned over the rod of the fence and about parts of the sign for applying a clamp thereto. While the flat sheet metal clamp has been described, other forms of securing means may be employed, such as a wire ring consisting of a round wire rod, that is, a transversely circular rod bent to form substantially a circle but open at one point and adapted to be closed to a complete circle by the use of pliers for causing the ends of the ring to engage the parts to be secured. Pliers designed for manipulating the wire rings are sometimes referred to as "hog ringers," and the same difficulty has been experienced with the straight jawed hog

ringers as with the flat clip applying pliers having straight jaws.

Referring to the drawings by numerals, 1, 1 indicate the levers or operating handles of a pair of pliers embodying the features of the present invention, and said levers are pivotally connected by the pivot 2 of ordinary construction. That portion of one of the levers 1 extending above the pivot 2 is formed into an outer or upper jaw 3, while the corresponding portion of the other lever or handle is formed into a cooperating jaw 4. The jaws 3 and 4 do not outstand substantially in a straight line with levers 1 from pivot 2, but, as clearly seen in Figure 1, are shaped to outstand substantially at right angles thereto so as to produce a kind of beak disposed to extend downward or upward from the handles 1 when said handles are outstanding horizontally. Each of the jaws 3 and 4 is notched at 5, each located to register with the other to provide an enlarged opening when the jaws meet as seen in Figure 3, and the said opening is well adapted to accommodate the bent end portion of the clip or other sign-securing means, and also to accommodate the fence wire or other rod about which the clip is extended while leaving the outer portions of the jaws 3 and 4 free to meet and function properly in the clamping of the clip to its final position.

Outward of the notch 5, jaw 4 is provided with a straight portion 6 having formed in it a recess or depression 7, which depression, as seen from Figure 3, tapers from the outer portion of the jaw 4 toward the recess 5, and the said recess 7 also, as seen in Figure 2, is provided with transversely inclined walls forming a shallow groove. The inclined surfaces of the recess 7 are located to receive the tip or tips of the prong or prongs of the clip being operated on for directing the same toward a collapsed and overlapping position beneath the engaged part of the clip.

The jaw 3 is provided outward of the notch 5 with a straight portion 9 corresponding to the straight portion 6 and extending slightly beyond the same, and there provided with a terminal, pendent lip 10 located to overlie the outer free end of jaw 4 when the jaws are in the closed position, as seen in Figure 3. While the draftsman has indicated a substantial space between the pendent lip or beak 10 and the outer end of jaw 4, it is preferable in actual practice to sufficiently reduce the space to cause the lip to give a clicking sound as it reaches a final position overlapping the end of jaw 4, which sound reassures the operator that the operation is fully completed. The straight portion 9 of jaw 3 is provided with a recess or depression 8 corresponding in location, form, and dimensions to the recess 7, so as to enable effective operation on the clip whether the prong or prongs be located to project downward or upward when

the clip is positioned within the jaws, as indicated in dotted lines in Figure 1. It is, accordingly, not necessary to exercise special care in selection and location of the clip, and besides it is entirely feasible to deliberately arrange alternate clips with the prongs projecting in alternately opposite directions while assuring successful operation by the employment of the present improved pliers.

In operation, the clip indicated in dash lines at 11 in Figure 1 is inserted between the jaws 3 and 4 to a position where one leg of the clip rests against the beak or lip 10. The clip will be held against edgewise displacement by frictional contact with the jaws and against longitudinal displacement by direct contact of the end of the clip against the lip 10. Thus, the clip may be applied vertically over the wire of the fence and about the sign to be engaged without any danger of loss by gravity. When the clip has been so located, the jaws will be either pendent or upstanding, while the handles or levers 1 will outstand horizontally from the fence and the operator merely closes the handles and thereby clamps the clip to its final position, forcing the prong 12 through the intervening sign or other parts to be engaged, through the aperture in the opposing leg of the clip and down into the recess 7 or 8, as the case may be, and to completely flattened and collapsed condition against the engaged face of that leg of the clip having the aperture. The inclination of each of the recesses 7 and 8 from the outward portion of the jaws toward the notches 5 assures the proper direction of a single prong 12, but if a clip be employed having two prongs extending from one leg and two apertures formed in the opposite leg, then the inclination seen in Figure 2, producing the troughlike appearance of the recesses 7 and 8, will effect appropriate direction of both of the prongs, one preferably in one direction and the other in the opposite, according to the location of the prongs.

In Figures 4 and 5 is seen a slight modification of the invention, the modification relating solely to provision for acting upon a round wire instead of a flat clip. In such instance, the parts 1', 1', 2', 3', and 4' correspond in form and function to the parts 1, 2, 3, and 4 above described, except for the recesses at the inner surfaces of the jaws 3' and 4'. The said jaws are provided with similar notches 5', 5' for the same purpose, and the jaw 4' is provided with a recess 7' which is parti-circular in the direction of the length of the jaw, as clearly seen in Figure 4, and preferably substantially semi-circular transversely of the jaw, as clearly seen in Figure 5. The jaw 3' is provided with a similar recess 8', which is transversely semi-circular, as seen in Figure 5, but longitudinally elongated, as seen in Figure 4, so that, when a loop of wire substantially in the

form of a **C**, that is, a circle which is open at one point, is inserted, the lower part may be introduced into the recess 7' and the upper part into the recess 8', and may be firmly held therebetween by a slight pressure on the handles 1' while the ring is being applied to position. When the wire ring has been positioned with respect to the part to be engaged, the closing of the handles 1' will cause the parts of the ring to come to a closed and usually an overlapped position effectively securing the ring to the parts engaged. Thus, the pliers may be rendered effective hog ringers merely by providing that contour of recesses in the meeting portions of the jaws adapted for retaining the ring against escape during collapsing.

What is claimed is:—

1. Clip-applying pliers comprising a pair of pivotally connected handles and jaws extending from the handles beyond the pivot, each of the jaws being formed with a notch adjacent the pivot and with a flat face outward beyond the notch, the flat faces being located to be presented toward each other and one of the jaws being shorter than the other and terminating in an abrupt end, and the longer jaw having a square lip located to overhang the abrupt end of the shorter jaw when the jaws are closed, the flat face of one of the jaws being formed with a prong-shaping recess.

2. Clip-applying pliers comprising a pair of pivotally connected handles and jaws extending from the handles beyond the pivot, each of the jaws being formed with a notch adjacent the pivot and with a flat face outward beyond the notch, the flat faces being located to be presented toward each other and one of the jaws being shorter than the other and terminating in an abrupt end, and the longer jaw having a square lip located to overhang the abrupt end of the shorter jaw when the jaws are closed, the flat face of one of the jaws being formed with a prong-shaping recess, and the flat face of the other jaw being formed with a similar recess.

3. In apparatus of the class described, the combination, with a pair of pivotally connected handles, of jaws carried thereby and outstanding substantially at right angles to the extended line of the handles, one of the jaws being longer than the other, and the shorter jaw having an abrupt free end, the longer jaw having a lip providing a square shoulder for receiving an abutting end of a clip, and the said lip being located to overlie the abrupt end of the shorter jaw when the jaws are closed and being of a length not exceeding the thickness of said abrupt end, and one of the jaws having a prong-shaping recess.

In testimony whereof I affix my signature.

WILLIAM E. HARRISON.