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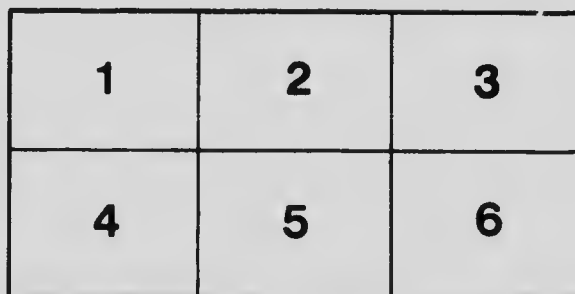
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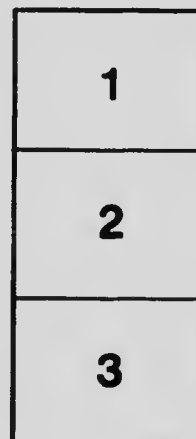
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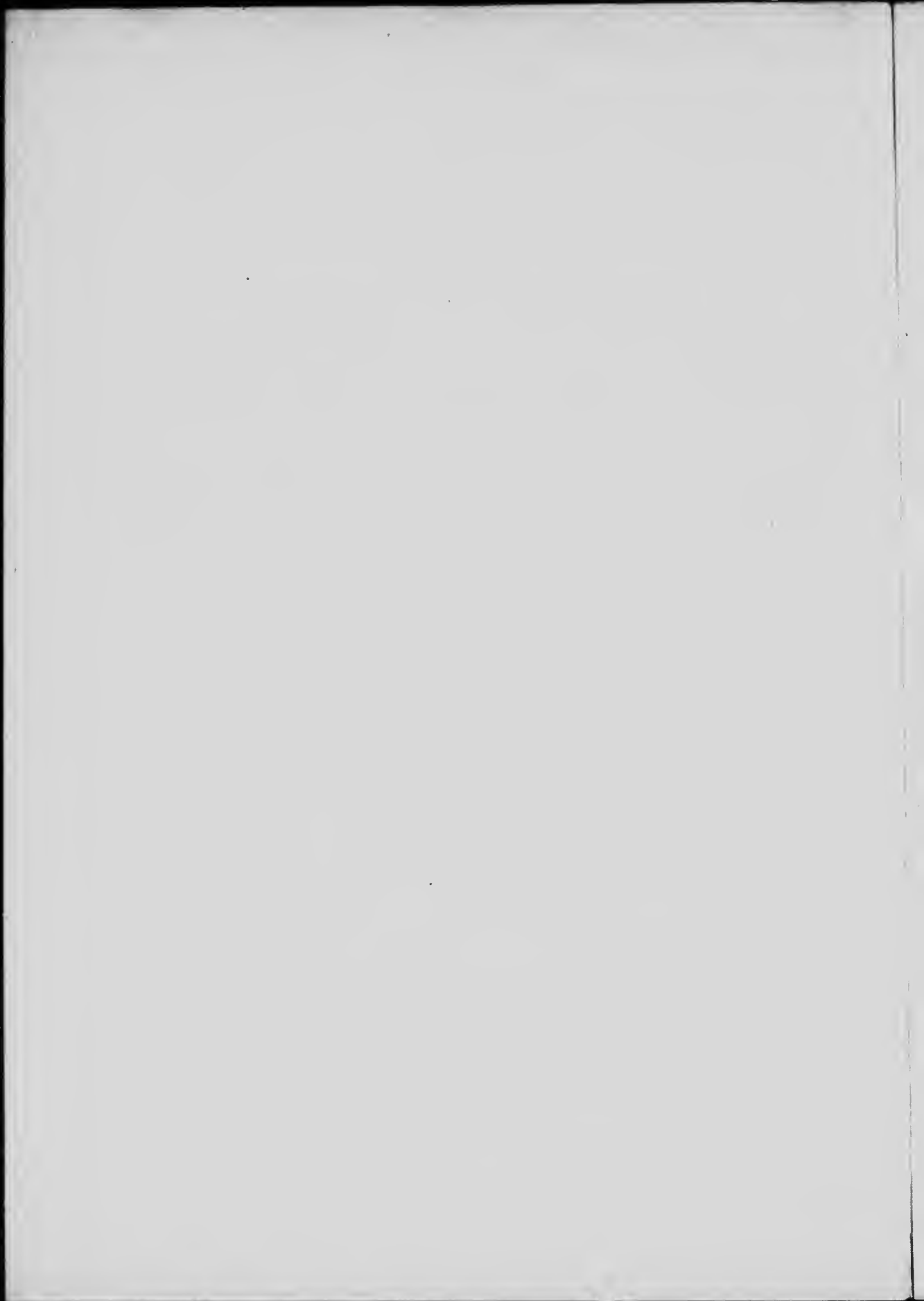
**A New Wrench for Use in the  
Correction of Stubborn  
Deformities.**

BY

**GEORGE A. PETERS, M.B., F.R.C.S. (Eng.).**

Associate Professor of Surgery and Clinical Surgery, University of Toronto; Surgeon, Toronto General Hospital; Surgeon, Hospital for Sick Children, Toronto.

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## A NEW WRENCH FOR USE IN THE CORRECTION OF STUBBORN DEFORMITIES.

BY GEORGE A. PETERS, M.B., F.R.C.S.(ENG.),

Associate Professor of Surgery and Clinical Surgery, University of Toronto; Surgeon, Toronto General Hospital; Surgeon, Hospital for Sick Children, Toronto.

IN the correction of deformities either in children or adults all surgeons, of course, agree that there is no other power which is so useful as that exerted by the subtle, intelligent, naked human hands. There is in power so applied a precision and nicety of direction and adjustment which cannot be imitated in any mechanical appliance. Moreover, the skin of the hand produces no injury to the skin of the part operated upon; so that in the correction of any deformity in which sufficient strength is supplied by the surgeon's hands, the use of any such apparatus as the one described is not to be countenanced. But there are cases within the experience of every surgeon, such as stubborn deformities in children of eight years or over, and in practically all cases of club-foot in adults, and of the knee joint in both children and adults, in which he feels that the powers of his own hands are totally inadequate. It is in such cases that the use of the apparatus described below is of great value. It is not contended that any such powerful apparatus as this wrench shall do away with the necessity of tenotomy and fasciotomy—in fact any retaining structure that can be divided safely and subcutaneously should be divided just as in the case of correction by hand power; but it is within the experience of every surgeon to find cases in which, after every possible retaining band has been divided subcutaneously, the power exerted by the human hand alone is quite inadequate to overcome the remaining obstruction, and in order to achieve his object he must then have recourse to mechanical aid.

It was with a view to meeting and overcoming these difficulties that the author devised the apparatus about to be described.

The wrench is made of round bar steel about 5-8 of an inch in diameter. The shape is sufficiently indicated by the accompanying sketch (Fig. 1). The reverse extremity of the wrench is expanded into a bow shape, so that in operating, for example, on an adult club-foot, the foot may be passed through this end and the wrench then slid into position. The apparatus is equipped with two movable bars, one (*b*) upon the upright limbs of the wrench, the other (*c*) upon the horizontal limbs. The bar (*b*), as shown in the figure, is bent towards the bow end of the wrench to the extent of about an inch and a half, and is provided with two thumb-screws which fit into small depressions on the upright limbs, so that it can be set accurately in any desired position. The bar (*c*) is attached by a close-fitting collar to one limb only

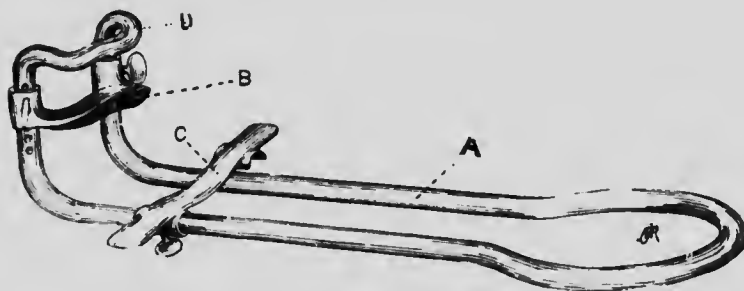


FIG. 1.—*A* the horizontal limbs expanded into a bow. *B* the bar on the vertical limbs provided with set screws. The bar *C* on the horizontal limbs is shown partly lifted. *D* joins the two limbs so as to prevent the collars from "binding."

of the horizontal portion of the wrench, the other end of the bar having merely a concave groove which fits upon the opposite limb. This bar is, of course, also provided with a set-screw. By this means the bar can be opened out completely, so as to allow the wrench to be slid over the foot up to any desired position between *b* and *c*. The bar (*c*) is made slightly concavo-convex on its upper surface, so as to fit the limb, while bar (*b*) is also concavo-convex on its under surface for the same purpose. It will be observed that the bowing of bar (*b*) towards the body of the wrench allows the two bars (*b*) and (*c*) to be practically placed one under the other when in position on the foot, and thus the fullest possible extent of short leverage is permitted. In my first wrench the vertical limbs terminated by free ends above the bar (*b*), as in

Fig. 2. It was found, however, in practice that the slight spring between the limbs caused the collars on (b) to "bind," and the connection (d) bent to correspond to (b) was a valuable suggestion by my confrere, Dr. Clarence L. Starr.

In operating with the wrench, the skin over the part may be further protected by placing blocks of "rubber sponge" between the bars (b) and (c) and the limb. The total length of the wrench is about two feet, and the width between its limbs from centre to centre four inches. This will be found to be large enough for almost any limb, and to be also small enough for children of such



FIG. 2.—Showing method of using the wrench. Notice that the curve on bar B brings it below the external malleolus, and almost opposite bar C on the horizontal limbs, thus increasing the leverage.

an age as to require the use of such a powerful wrench. Of course for any special case a larger or smaller one might be used.

I have used repeatedly the wrench described and figured above in children eight to ten years of age, and also on the knee of an average-sized adult. However, if I were having one made especially for the knee, I should have the limbs five inches apart from centre to centre. Of course a much lighter wrench would do for young children, but it should in any case be perfectly rigid, so that no spring in the wrench itself should take place, even when the surgeon was using all the effort he deemed wise. In practice



this wrench is found to be extremely useful. There is practically no limit to the force that can be applied by its use. The limit, indeed, is fixed by the resisting power of the soft tissues, and with the use of the spongy rubber I have never yet seen any considerable injury done to the skin or muscles.

The apparatus, being made entirely of metal, can be perfectly sterilized either by heat or by immersion in antiseptic solutions.

I have not used the instrument in cases of bow-legs or knock-knees, requiring fracture, and so cannot speak in regard to its suitability for such cases. I have, however, not the slightest doubt that sufficient power could be exercised through its use to fracture a bone in a young person, and I think without any undue injury to the soft parts. However, the open operation in these cases is usually so satisfactory, and accompanied by such slight danger, that any mechanism for producing subcutaneous fracture seems almost to be uncalled for.

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