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ARTIFICIAL ELBOW FLEXION

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A mechanical device has been developed for artificial elbow flexion. It consists of a brace for the complete upper extremity, including the shoulder and the hand. The shoulder support is kept in place by means of a strap

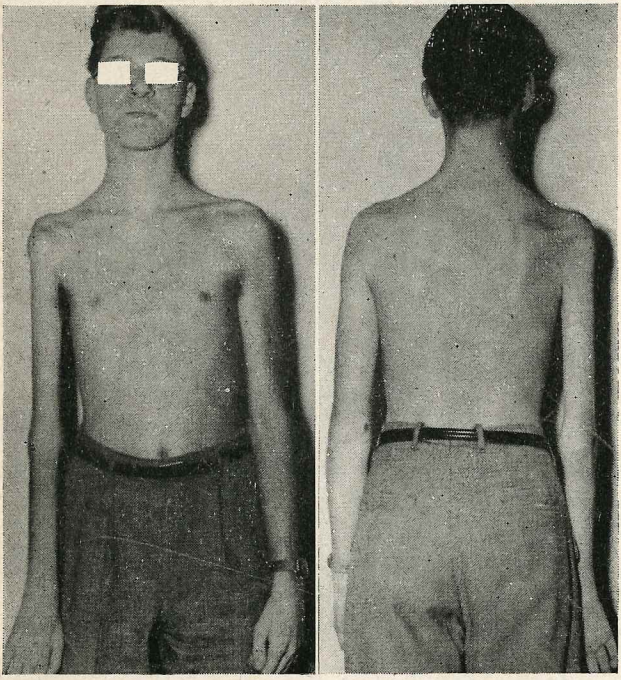

Fig. 1.—Front and back views of patient without device.

The brace was developed through the cooperation of the General Limb and Brace Company, 1916 Market St., Wilmington, Del.

Attending chief of communicable diseases, including poliomyelitis, Doris Memorial Unit of Wilmington General Hospital and St. Francis Hospital.

around the chest and under the opposite axilla. The hand mechanism, which appears fixed in the photograph, has been made movable at the wrist, so that the hand can be

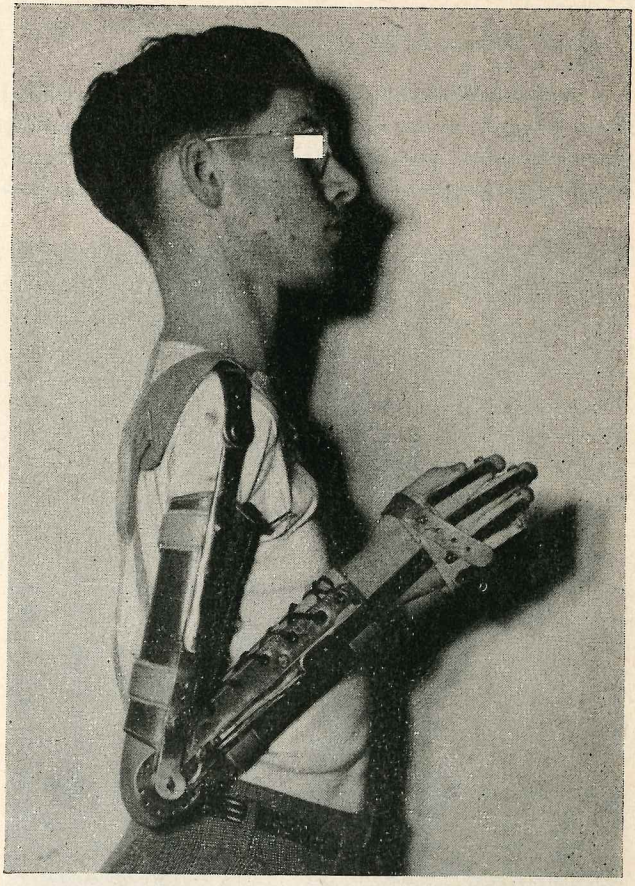

Fig. 2.—The right upper extremity is flail, with the exception of a trace of flexion power of the third and fourth fingers. The humerus is partly out of the socket. There is good power in the upper trapezius, rhomboids, supraspinatus, serratus anterior, latissimus dorsi, and levator scapulae. There is full range of motion of all joints.

fixed in the pronated position or in the mid position by adjusting a screw at the wrist portion of the brace. The patient is able to flex the elbow at any desired position by

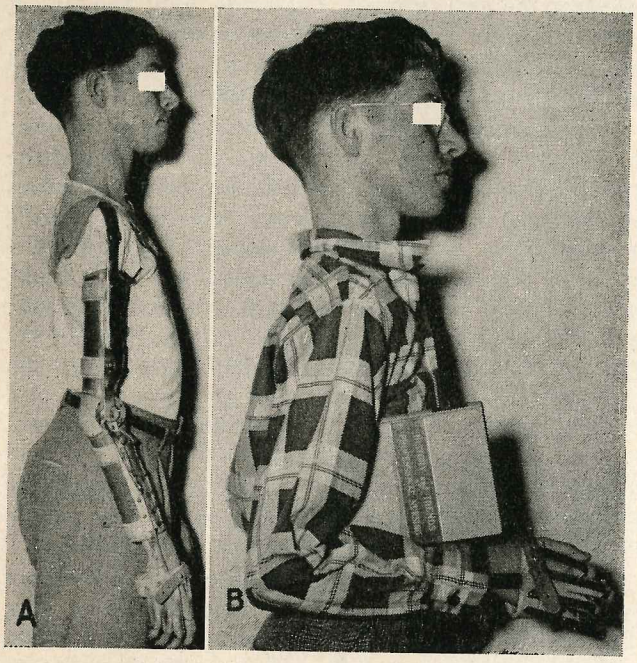

Fig. 3.—Views of patient, *A* showing elbow joint release lever, *B* showing natural appearance of arm when covered.

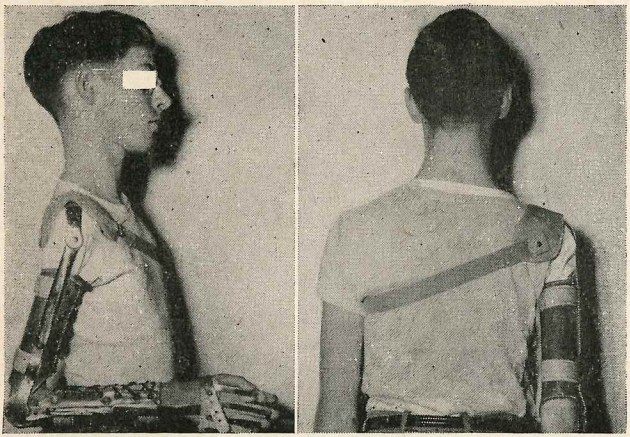

Fig. 4.—Side and back view of device showing shoulder support and elbow flexion.

swinging the arm forward. The elbow joint has several stops in flexion, with a release lever on the outside of the forearm. The hand may be turned into pronation or mid position by releasing screw catch at the wrist.

The functional benefits of this device are as follows: 1. The flail extremity does not hang loose against the body. 2. Further subluxation of the head of the humerus is prevented. 3. When the patient is dressed and wearing a glove or has his hand in his trouser pocket, the disability is not apparent. 4. The patient is able to make practical use of the arm adduction power against his body and thus hold objects. He cannot do this without the brace. 5. In school and at home when working on a flat top desk, he is able to hold paper and turn pages of a book by using a pushing motion in which power is transmitted from the shoulder and scapula muscles. He could not do this without the brace. 6. The patient is able to push and move objects with the hand by the transmission of power through the brace from his shoulder muscles.

Improvements desired include automatic methods of releasing the elbow joint latch and of flexing the forearm. The device is being modified to permit artificial flexion and extension (by means of a spring) at the elbow for the ambulatory patient with a flail upper extremity.

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