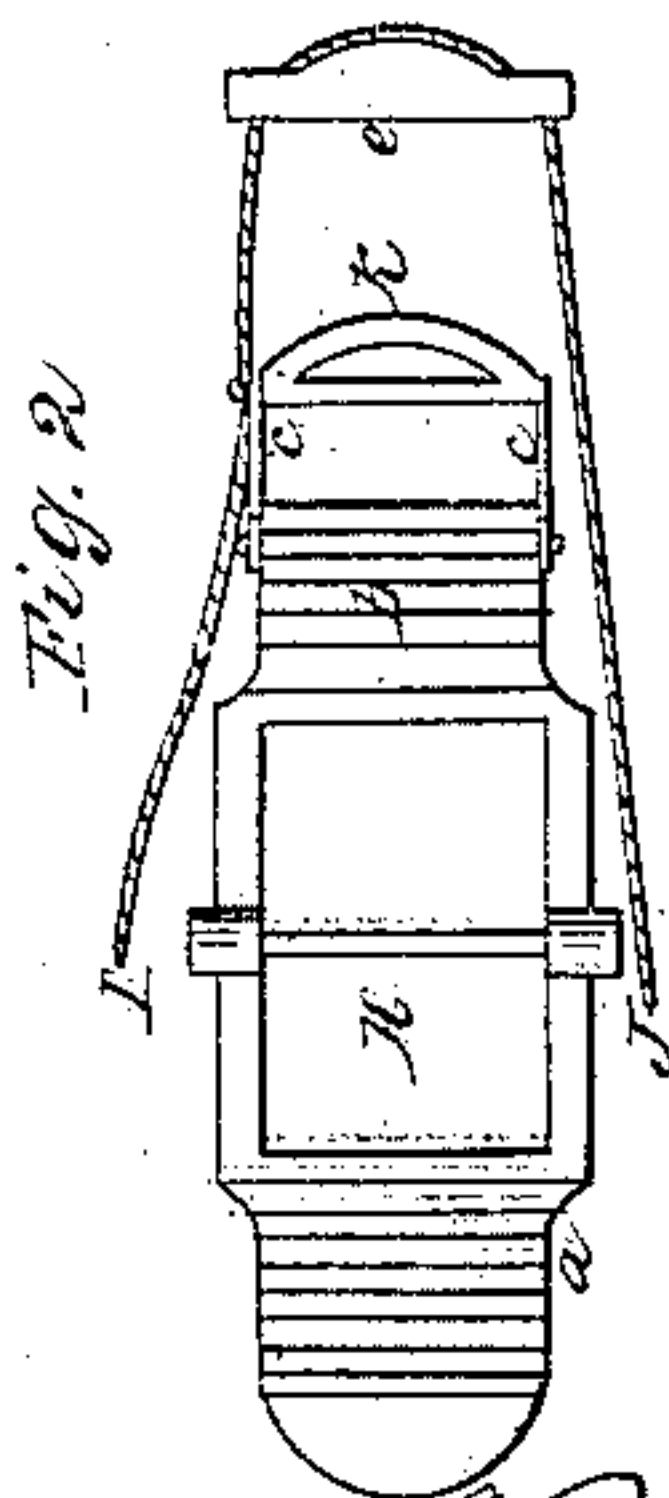
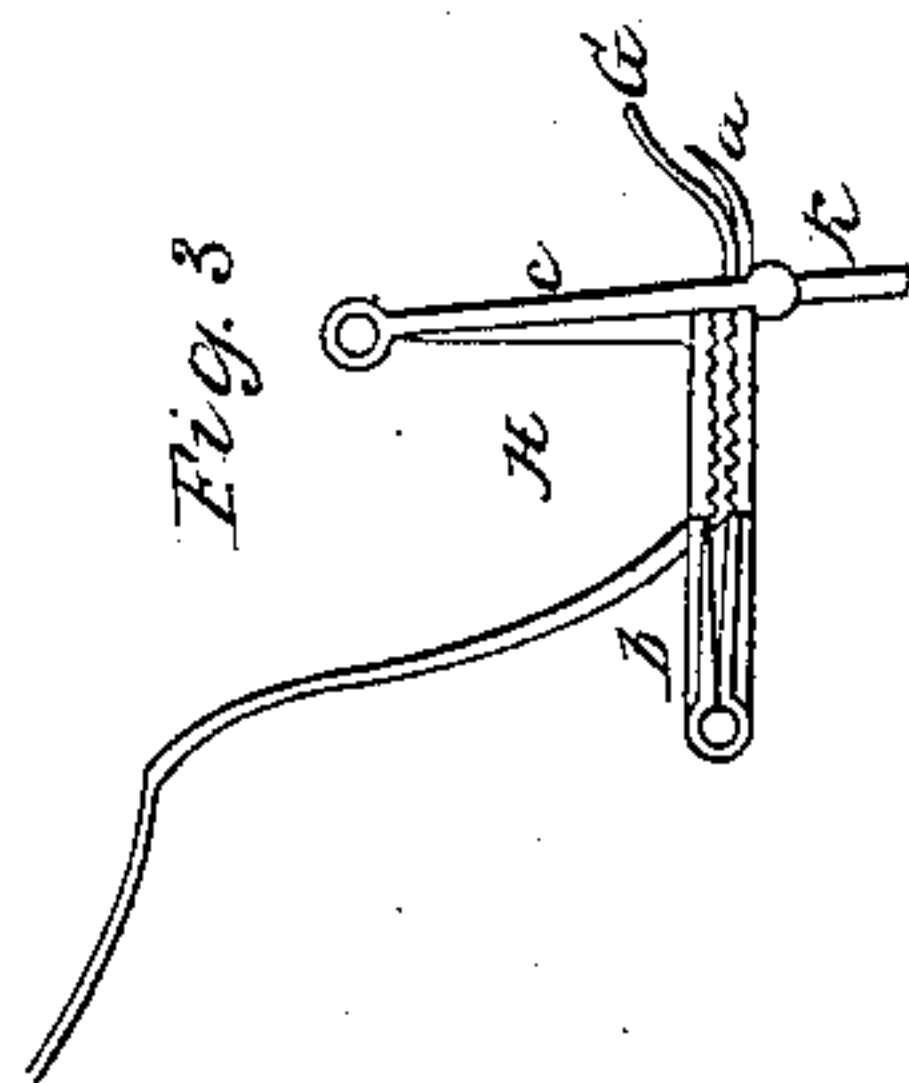
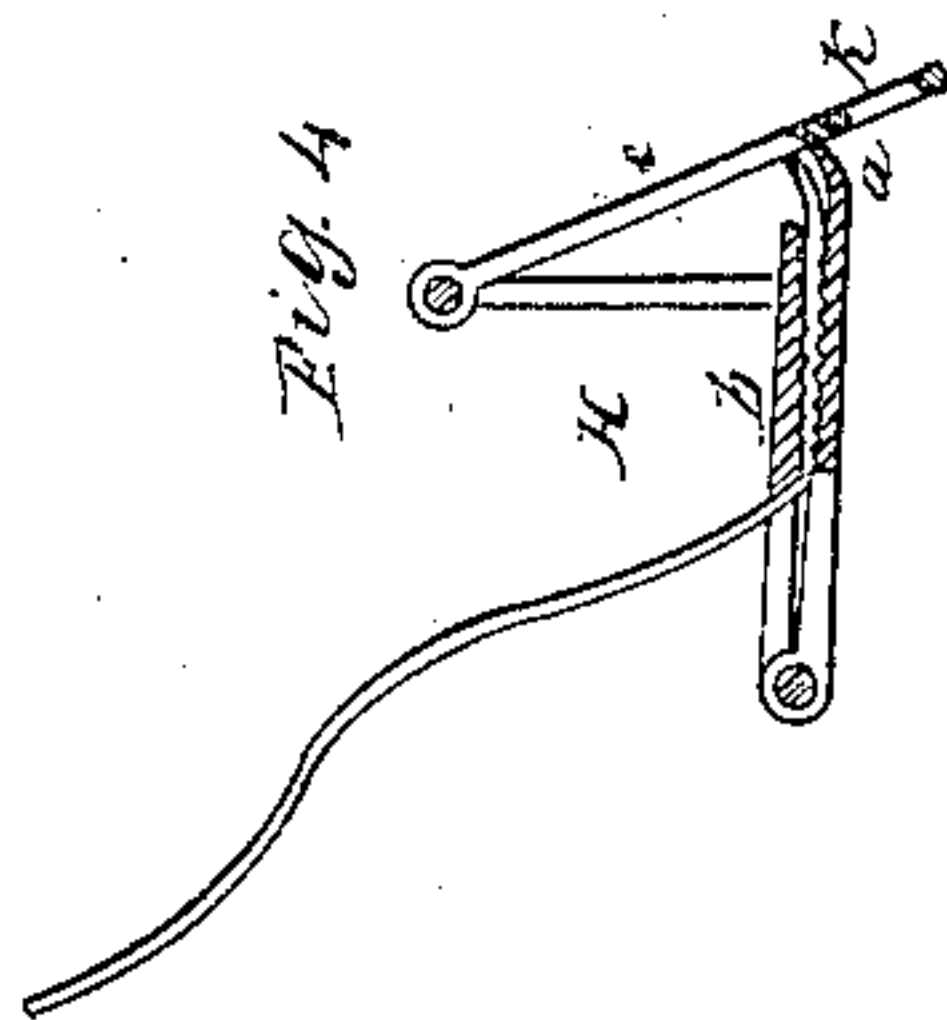
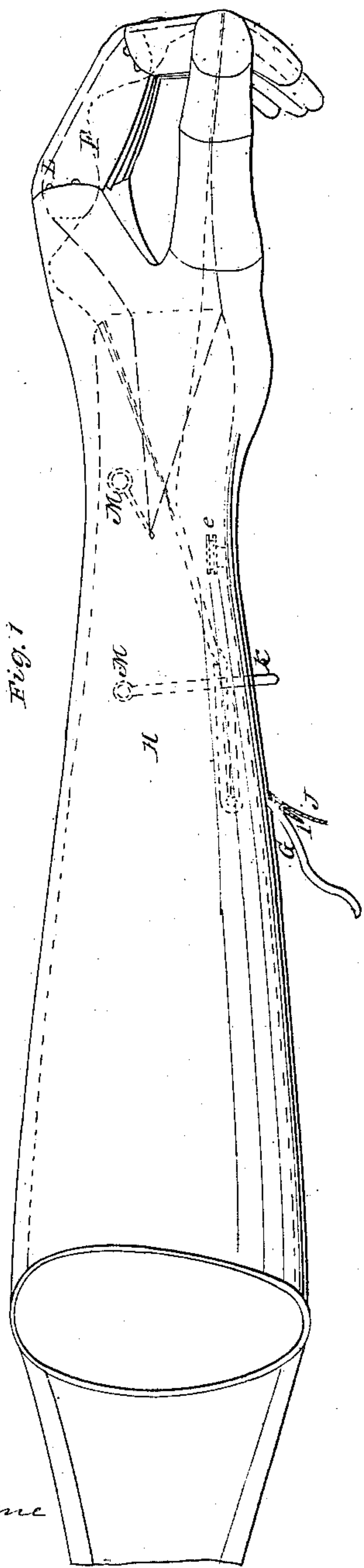


B. F. Palmer,
Artificial Arm.

N^o 22,575.

Patented Jan. 11, 1859.



Witnesses;
Edwin Osborne
J. Edward Stul

Inventor;
B. Frank Palmer

UNITED STATES PATENT OFFICE.

B. FRANK. PALMER, OF PHILADELPHIA, PENNSYLVANIA.

ARTIFICIAL FOREARM.

Specification of Letters Patent No. 22,575, dated January 11, 1859.

To all whom it may concern:

Be it known that I, B. FRANK. PALMER, of Philadelphia, in the State of Pennsylvania have invented a new and useful Artificial Forearm; and I do hereby declare the following to be a correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents the artificial forearm complete; Fig. 2 is a top view of the clamp opened, showing its corrugated inner surfaces; Fig. 3 is a section of the clamp closed; Fig. 4 is a section of the clamp open.

The same part is indicated by the same letter of reference in all the figures.

The nature of my invention consists in the modifications of my improved arm and hand, hereinafter particularly described for the purpose of adapting them to the amputation below the elbow.

An artificial member for the supply of an amputated forearm must differ in various particulars from one intended to replace an arm amputated above the elbow. In this case no elbow joint is required; there is no motion of the wrist, either flexure or rotation, and of course, the mode of flexing and extending the fingers, dependent in the other case upon the flexure of the wrist, must be varied.

In Fig. 1 the hand is shown to be exactly like the hand used with my improved arm, but it is attached to the forearm by a rigid wrist. The flexor tendons F and the extensor tendons L operate as they do in the arm; but the closing of the hand is effected by means of a strap or muscle G to which the flexor tendons F are attached, which strap is carried across the back to the shoulder of the opposite arm, and is operated by an easy motion of the shoulders. Less than half an inch of movement is necessary in order to close the hand firmly. In order to keep the hand closed, it is necessary to clamp the muscle G to prevent its receding after being pulled. This is effected by means of the clamp H shown in its place in Fig. 1 by dotted lines, and shown in various positions in Figs. 2, 3 and 4. The strap G, having been firmly attached to the flexor tendons F, is passed through the jaws of the clamp, and out through a slot in the inner face of the forearm. Thence it passes up to the body and across back of the neck

in a manner similar to that described in the specification of the arm for attaching the full member to the body. This strap G, being on the front side of the arm, is drawn tensely by extension of the forearm and thus the fingers and thumb are flexed; and they may be opened by a counter movement if the clasp be not fastened. When the strap G has been drawn to close the hand, the jaws *a, b*, of the clamp are forced together by the hinged piece *c* being drawn back so as to slide up the curved point of jaw *a*, giving a powerful compression or grip to the strap G, held between *a* and *b*. The inner surfaces of these jaws are corrugated as shown in Fig. 2 to increase the extent of their pressing surfaces. The hinged piece *c* may be drawn back or released, either by the natural hand taking hold of the projecting finger piece K, or by means of the cords I and J, operating around the pulley or sheave *e*. These cords may be attached to straps passing up to the shoulder, and may be operated, one by the effort to straighten the arm, and the other by bending the arm. The best attachment in each case will be a matter for the skill of the mechanical surgeon.

The surface of the forearm is covered by a delicate enameled skin impervious to water, and tinted to correspond with the color of the natural skin. This delicate but strong waterproof covering is very valuable as well as beautiful, as without it moisture would be absorbed, and some of the parts would swell and injure the action of the mechanism.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent is—

1. Closing the hand by means of a strap operated by an attachment to the shoulder of the opposite arm, substantially in the manner described.

2. The clamp H constructed and operating as described and applied to the purpose specified.

The above specification signed and witnessed this fourth day of November, 1858.

B. FRANK. PALMER. [L. S.]

Witnesses:

D. W. BURCHARD,
J. EDWARD HEEL.