P. M. McKAY.

ARTIFICIAL HAND.

APPLICATION FILED AUG. 4, 1920.

1,390,802.

Patented Sept. 13, 1921.

2 SHEETS—SHEET 1.

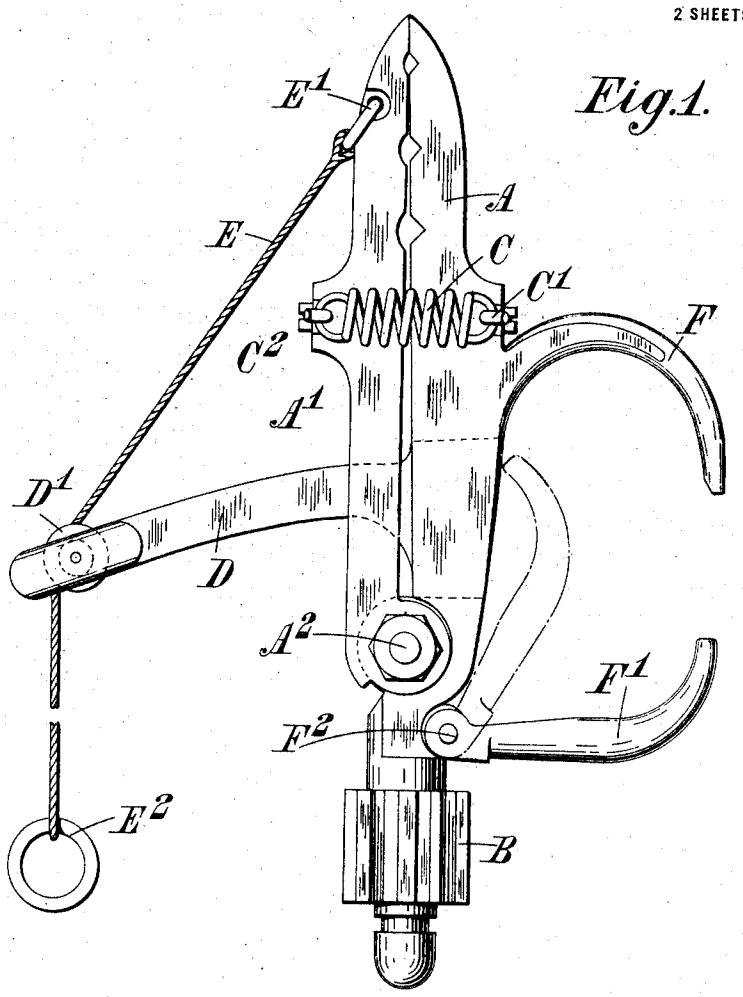


Fig. 1.

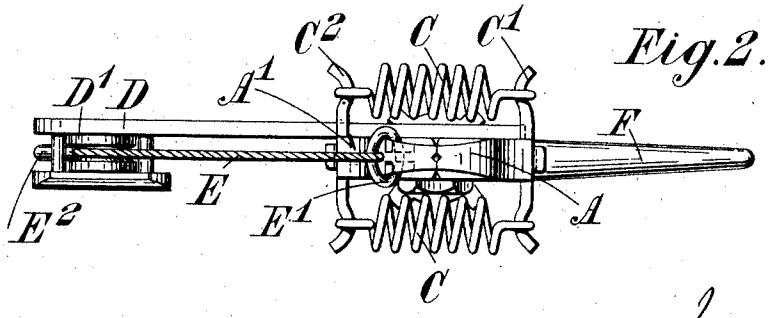


Fig. 2.

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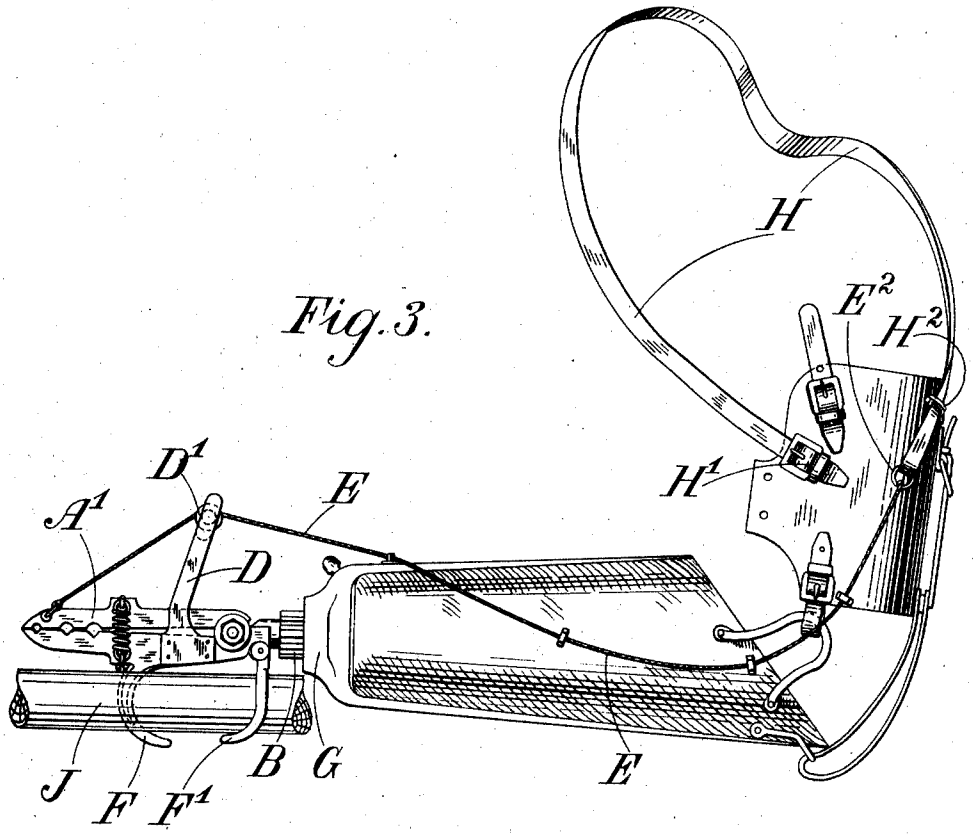
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Fig. 3.



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UNITED STATES PATENT OFFICE.

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ARTIFICIAL HAND.

1,390,802. Specification of Letters Patent. Patented Sept. 13, 1921.

Application filed August 4, 1920. Serial No. 401,111.

To all whom it may concern:

Be it known that I, PETER MURRAY McKAY, a subject of the King of England, residing at London, in England, have invented certain new and useful Improvements in Artificial Hands, of which the following is a specification.

This invention relates to improvements in artificial hands for use with artificial arms, of the kind in which one of the fingers of a spring-closed pair of fingers is adapted to be carried rigidly in a socket at the wrist end of the artificial arm, while the second or movable finger is pivoted to the first finger and operated by a cord or the like.

According to this invention, a gripping extension is rigidly connected to one of the fingers, and an opposed hinged gripping extension is so located that in its operative position it forms an opening with the said rigid gripping extension.

In the accompanying drawings which illustrate one method of carrying out this invention.

Figure 1 is a side elevation of an artificial hand.

Fig. 2 shows the same viewed from the top of Fig. 1, and Fig. 3 is an elevation of an artificial arm with the artificial hand according to my invention in position of use.

The finger A, which may be termed the fixed finger is carried rigidly, or if desired so as to swivel, in a socket on the end G of the bucket portion of an artificial arm shown in Fig. 3 which wrist end is engaged by a part B. This part and its engagement with the end G is well known and constitutes means whereby various tools may be interchangeably inserted in the artificial arm. The movable finger A^1 is pivoted to the fixed finger at A^2 and is normally held in the closed position by springs C arranged on opposite sides of the two fingers and engaging with laterally projecting hooks C^1 and C^2 on the fingers A and A^1 respectively. Projecting from the fixed finger A is an extension D carrying a pulley D^1. An operating cable E is connected at E^1 to the free end of the movable finger A^1 and passes over the pulley D^1 beyond which it is connected by the ring E^2 to a band H secured by one end, H^1, to the artificial arm and having its other end freely engaged by an eyelet H^2. Band H is operable in the well known manner by the working of certain of the wearers muscles to exert a pull on cable E. The operating means for cable E, however, may be of any desired kind and constitutes no part of the present invention.

On the fixed finger A is a rigid gripping extension F having its carrying face directed backwardly along the artificial arm away from the fingers, and an opposed gripping extension F^1 is pivoted at F^2 to the fixed finger. When the gripping extension F^1 is in the extended position as shown in full lines in Fig. 1, it forms with the gripping extension an opening and into which an article such as a broomstick, can be introduced so that a grip can be obtained upon the article by swinging the tool in such direction that the two gripping extensions bear on opposite sides of it.

For instance in Fig. 3, J designates an object which is being grasped between the two gripping extensions F and F^1. This is accomplished by placing the part in the opening, formed by the two gripping extensions, and then swinging the arm in a horizontal plane until the rigid gripping extension is bearing against the far side of the part, and the pivoted gripping extension F^1 against the near side thereof, as shown. If it is assumed that the part J is a lever pivoted forwardly of the arm it is obvious that by the further movement of said arm in the same direction the lever could be swung about its pivot and it will be appreciated that in this manner a good purchase can be had on such a lever.

When the opening is not required, the gripping extension F^1 can be folded down to the position shown in chain line in Fig. 1, in which case the gripping extension F can be used as a plain hook for carrying and other purposes.

It will be seen that with this arrangement of artificial hand the fingers can be held firmly together, as the springs can be placed comparatively near the gripping end of the fingers, and although powerful, they are compactly arranged, as they lie close to the flat faces of the fingers on opposite sides. A good mechanical purchase is obtained on the loose finger by reason of the operating cable being passed over the pulley D^1 and connected practically at the end of the movable finger; also the gripping extension F not only performs the function of an ordinary hook on such tools, but coöperates with the gripping extension F^1 to provide the

aforesaid opening with its accompanying advantages.

The artificial hand according to my invention has been described with reference to one kind of artificial arm but it is to be understood that my invention is not limited in this respect since the artificial hand can be used with any other suitable arm.

What I claim as my invention and desire to secure by Letters Patent is:—

1. An artificial hand comprising in combination a member for attachment to the limb of the wearer, two fingers hinged together, spring controlled and mounted at the extremity of said member, a fixed gripping extension on the said member having its bearing face directed backwardly along the limb away from the fingers and an opposed hinged gripping extension so located opposite the bearing face of the fixed gripping extension that in its operative position it forms an opening with the said fixed gripping extension.

2. An artificial hand comprising in combination a member for attachment to the limb of the wearer, two fingers hinged together, spring controlled and mounted at the extremity of said member, a fixed gripping extension on the said member having its bearing face directed backwardly along the limb away from the fingers, and a second gripping extension pivoted to swing in the plane of the fixed gripping extension having its bearing face toward that of the fixed gripping extension and arranged so that at one limit of its movement it lies extended opposite the fixed gripping extension and forms an opening and at the other limit of its movement lies in such position that the fixed gripping extension is freely exposed.

3. An artificial hand comprising in combination a socket for engagement with an artificial arm, a finger fixed thereto and extending longitudinally therefrom, a second finger hinged to the first and spring controlled to coöperate therewith, a gripping extension secured to the fixed fingers having its bearing face directed backwardly along the limb away from the fingers, and a second gripping extension hinged to the fixed finger so as to swing in the plane of the other gripping extension its bearing face being toward that of the fixed arm and arranged so that in one limit of its movement it lies extended opposite the fixed gripping extension and forms an opening into which an article to be gripped can be introduced, and at the other limit of its movement lies in such position that the fixed gripping member is freely exposed.

In testimony whereof I affix my signature.

PETER MURRAY McKAY.