R. F. ARMSTRONG.

ARTIFICIAL HAND.

APPLICATION FILED NOV. 27, 1920. RENEWED DEC. 6, 1921.

1,409,513. **Patented Mar. 14, 1922.**

Fig. 1.

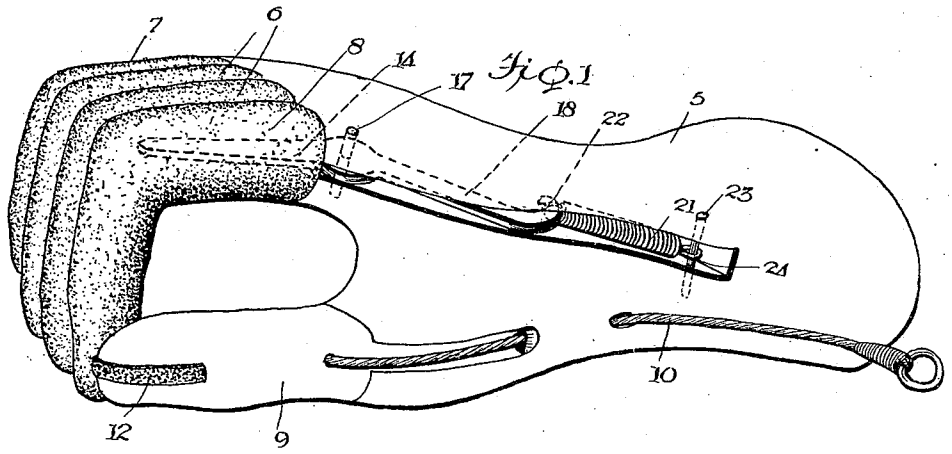


Fig. 4.

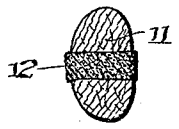


Fig. 2.

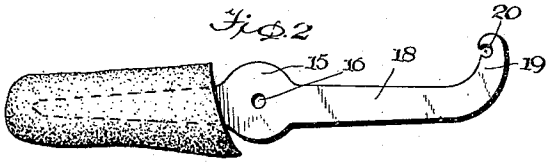
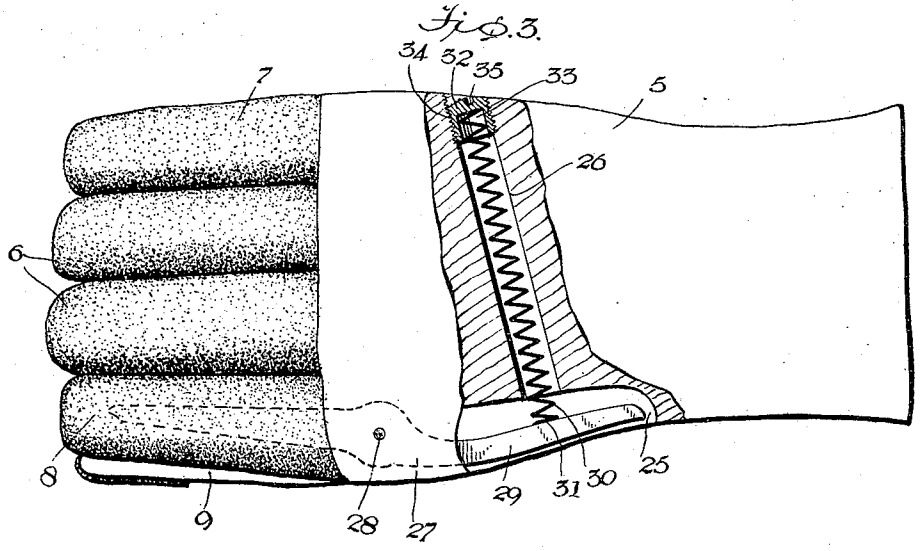


Fig. 3.



WITNESSES

R. E. Rousseau.

W. F. Buckley.

INVENTOR

Robert F. Armstrong.

BY Munn & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

ROBERT FRANCIS ARMSTRONG, OF LA CYGNE, KANSAS, ASSIGNOR TO FREDERICK W. POLLMAN, JR., OF LA CYGNE, KANSAS.

ARTIFICIAL HAND.

1,409,513. Specification of Letters Patent. Patented Mar. 14, 1922.

Application filed November 27, 1920, Serial No. 426,798. Renewed December 6, 1921. Serial No. 520,403.

To all whom it may concern:

Be it known that I, ROBERT FRANCIS ARMSTRONG, a citizen of the United States, and a resident of La Cygne, in the county of Linn and State of Kansas, have invented certain new and useful Improvements in Artificial Hands, of which the following is a specification.

My invention relates in general to artificial hands, and more particularly to an improved artificial hand of the type forming the subject-matter of my Patent No. 1,334,689, and my co-pending application, Serial No. 373,518.

The object of the invention is to provide an improved artificial hand of this character which is capable of readily and easily performing all of the important functions of the human hand and which is of extremely simple and durable construction reliable in operation and easy and inexpensive to manufacture.

Other objects and advantages of the invention reside in certain novel features of construction, combination and arrangement of parts which will be hereinafter more fully described and particularly pointed out in the appended claims reference being had to the accompanying drawings forming part of this specification, and in which:

Figure 1 is a perspective view of one embodiment of the invention;

Figure 2 is a detail view in plan of the index finger;

Figure 3 is a plan view of another form of hand, parts being broken away and shown in section for the sake of illustration; and

Figure 4 is a detail view in section of the tip of the thumb member.

Referring to the drawings it will be seen that both embodiments of the invention contemplate a hand body or hand proper designated at 5, middle finger 6 and thumb fingers 7 are associated with the hand body 5. Index finger members 8 are provided and are arranged with the hand body 5 so as to be capable of partaking of a swinging motion toward and away from the adjacent middle finger on an axis extending substantially perpendicularly through the body of the hand from the palm to the back thereof. A thumb member 9 is also pivotally connected to the hand body and the top or outer extremity of the thumb member is adapted to engage the index finger member as shown in the drawings. An operator 10 for the thumb member is provided, as shown in Figure 1.

The thumb member 9 is adapted to coact with the index finger member in the handling or manipulation of small articles and in order to provide for the high degree of grasping action as between the thumb member and the index finger member the tip or outer extremity of the thumb member is provided with a kerf 11 (see Figure 4). A gripping element 12 of felt or the like, is arranged and secured in the kerf 11 and projects beyond the periphery of the tip of the thumb on both sides thereof. When the thumb member is engaged with the index finger member the gripping element 12 provides correct grasping action especially for the proper handling of small objects such as pins, sheets of paper and the like.

In the form of my invention shown in Figure 1, the hand body 5 is provided with a slot 13 extending interiorly of the hand body from one side thereof and substantially parallel with the plane of the palm of the hand. A swinging bar or lever 14 carries the index finger. The bar 14 is provided centrally with a circular enlargement 15 having centrally thereof a pivot opening 16 through which a pivot pin 17 journaled in the body of the hand extends whereby to pivotally connect the swinging bar 11 to the hand body in such manner as to constrain the same to swinging movement on an axis extending substantially parallel to the hand body to the back thereof. The swinging bar or lever 14 is also provided with an extension 18 which operates in the slot 13, as shown in Figure 1. The extension 18 is provided with an inwardly curved hooked end 19 having a notch 20 therein.

A retractile coil spring 21 has one end thereof engaged with the notched portion of the hooked end 19 of the extension to the swinging lever, as indicated at 22 and has its opposite end secured to a fixed abutment 23, as shown at 24. The retractile coil spring 21 serves to bias the index finger in that it is so tensioned as to exert a pull upon the extension 18 of the swinging lever to throw the swinging lever about its pivot 17 in a clockwise direction whereby the index finger is urged at all times against the middle finger.

In the embodiment of my invention shown

in Figure 3, the hand body 5 is provided with a slot 25 similar to the slot 18 and is further provided with a bore 26 extending transversely of the hand body and intersecting the slot 25. A swinging bar or lever 27 carries the index finger and is pivoted to the hand body as at 28. The swinging bar or lever 27 is provided with an extension 29 which operates in the slot 25 and extends across the bore 26.

A compression coil spring 30 is arranged in the bore 26 and has one end directly engaging and abutting the extension 29, as shown at 31. The opposite end of the coil spring is received within the socket 33 formed in the adjustable abutment 32 and which has threaded engagement, as indicated at 38 with the wall of the bore 26. The compression coil spring 30 serves to bias the index finger that is, it serves to urge the same against the middle finger. The tension of the compression coil spring 30 is variable and the variations of this tension may be effected by simple manipulation of the abutment 32. In order to render the abutment 32 easily operable it is preferably provided with a slot 35.

Having thus described my invention, I claim:

1. An artificial hand having a hand body provided with a slot and a bore intersecting the slot, an index finger adapted to swing about an axis extending substantially parallel through said hand from the palm to the back thereof, a swinging bar or lever carrying said index finger and pivoted to said hand, said swinging bar or lever having an extension operating in said slot, a compression coil spring arranged in said bore and having one end abutting said extension to bias said index finger and an adjustable abutment at the opposite end of said spring having threaded engagement with said bore.

2. An artificial hand having a hand body provided with a slot and a bore intersecting said slot, a swinging index finger, a swinging bar or lever pivoted to said hand body and carrying said index finger, said swinging bar or lever having an extension operating in said slot, a compression coil spring arranged in said bore and having one end abutting said extension to bias said index finger, and an adjustable abutment for the opposite end of said coil spring having threaded engagement with said bore.

3. An artificial hand having a hand body comprising a solid stock provided with a transverse slot therein, a swinging index finger, a bar or lever carrying said index finger and pivotally connected to the hand body, said bar or lever having an extension and said extension and said bar or lever operating in said slot, a coil spring having one end engaged with the extension for biasing the index finger, and an abutment carried by the stock and engaging the opposite end of the coil spring.

ROBERT FRANCIS ARMSTRONG.