

No. 827,711.

PATENTED AUG. 7, 1906.

J. T. F. CONTI.
UNIVERSAL SCREW WRENCH.
APPLICATION FILED MAY 31, 1905.

3 SHEETS—SHEET 1.

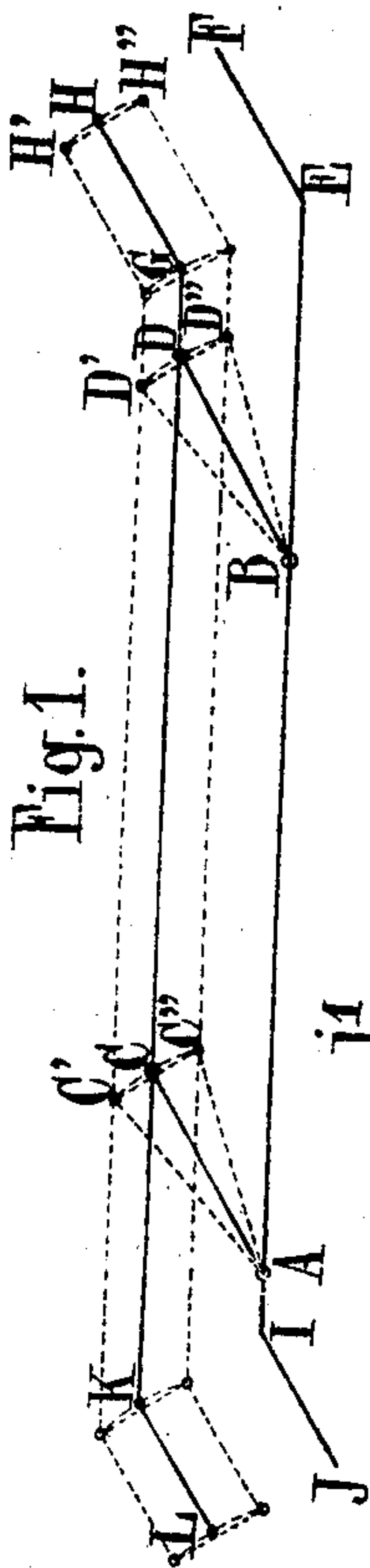


Fig. 1.

Fig. 2.

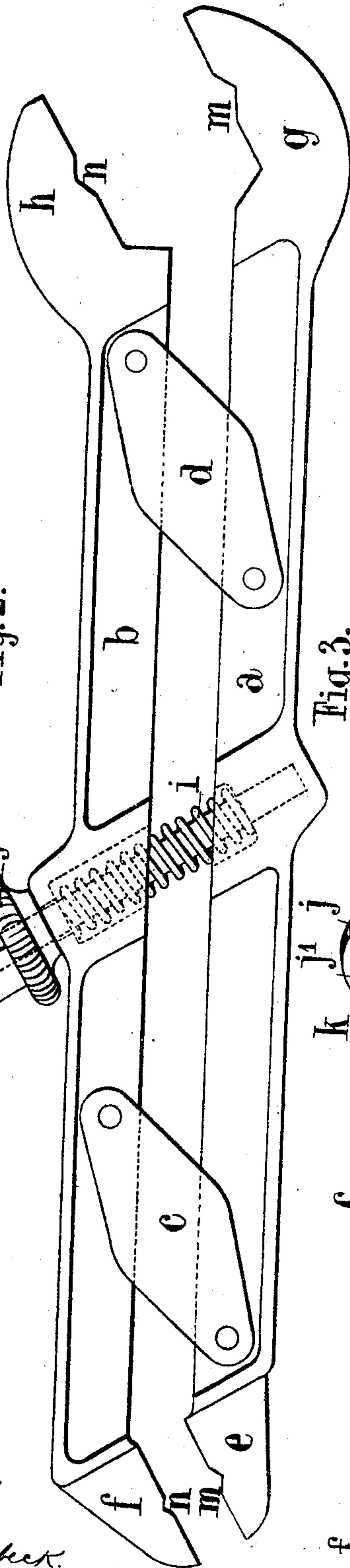


Fig. 3.

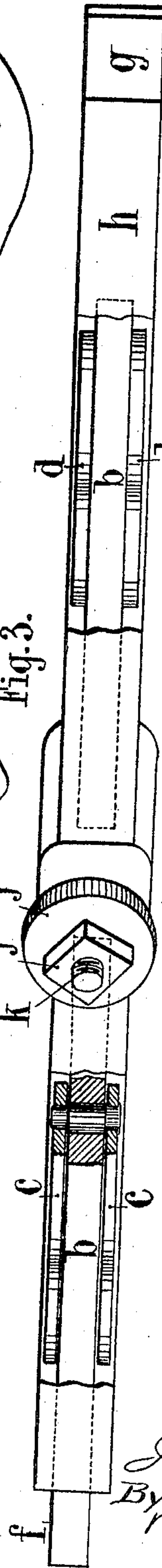
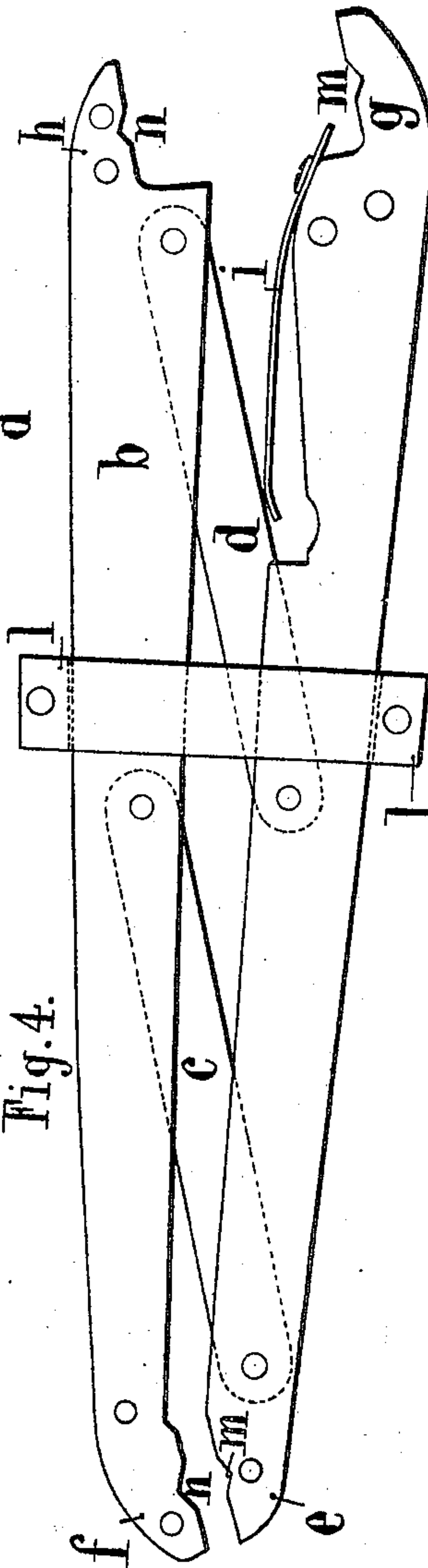


Fig. 4.



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3 SHEETS—SHEET 2.

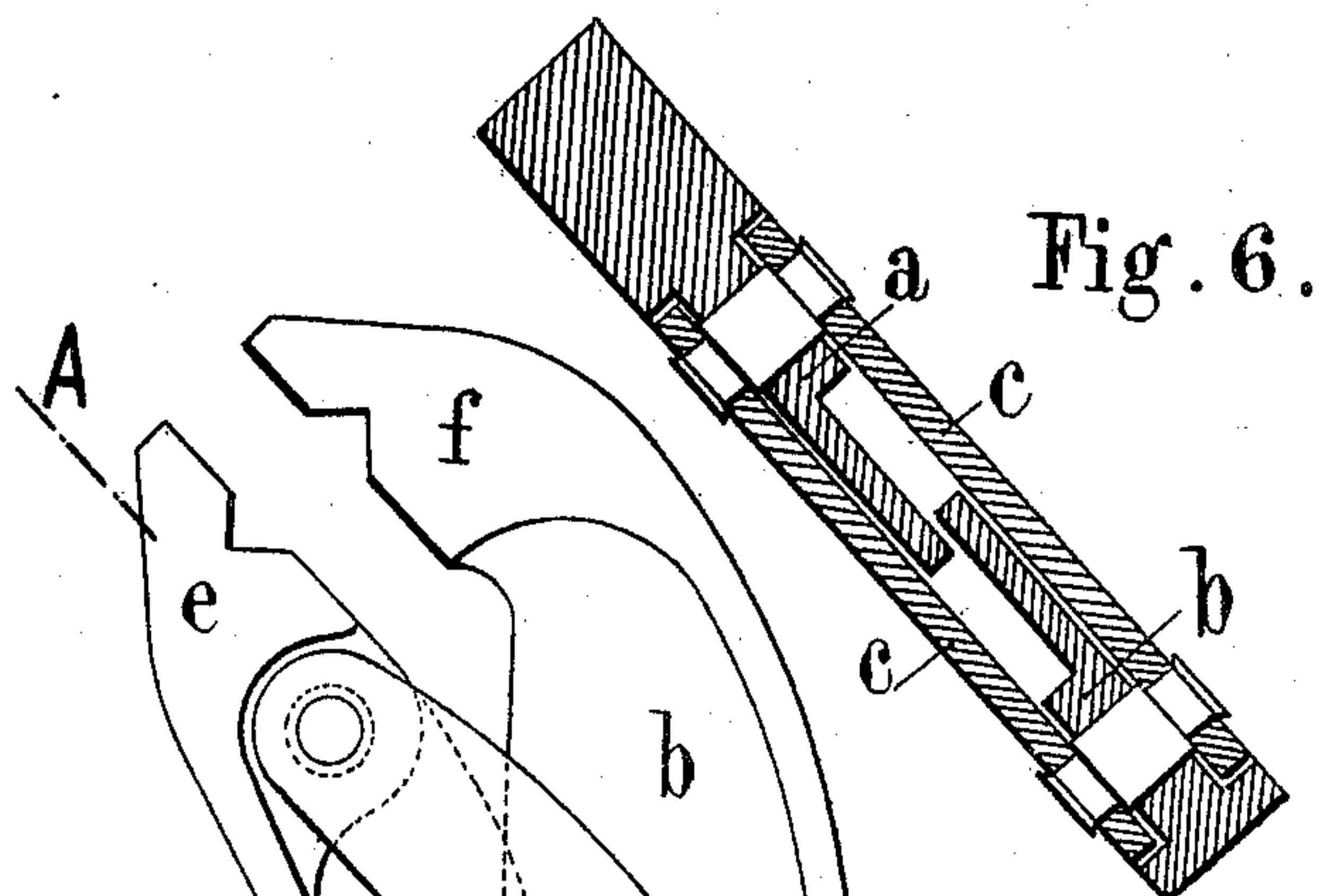


Fig. 6.

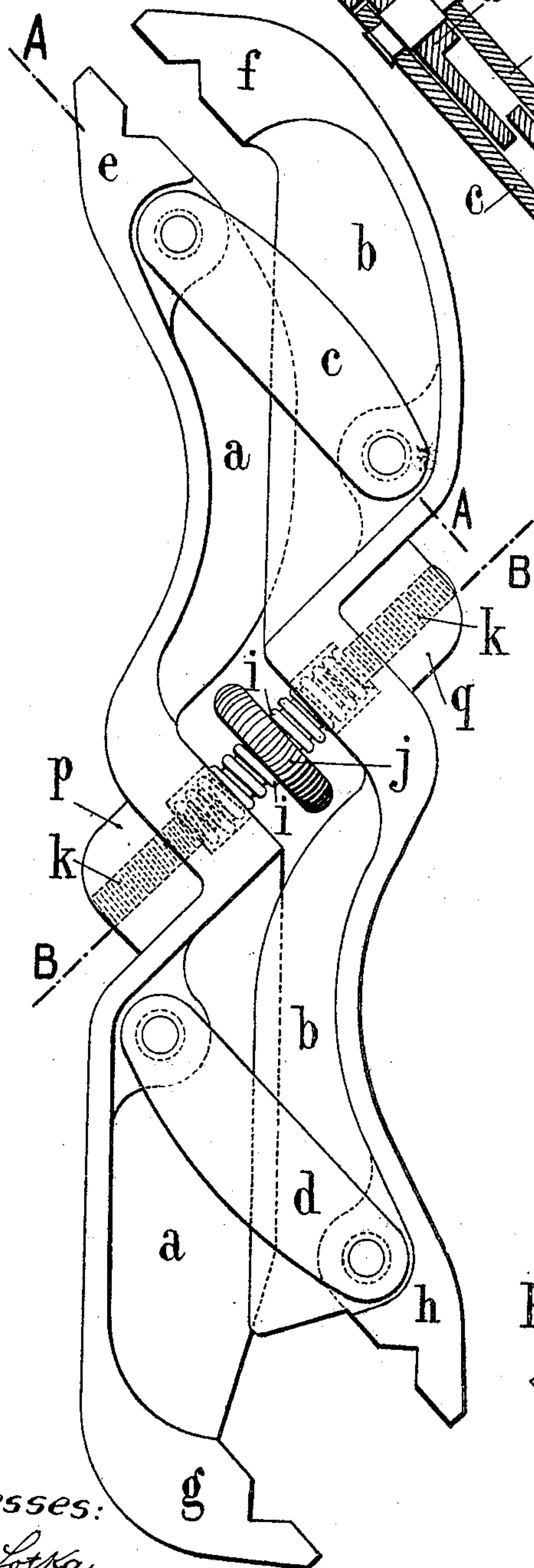


Fig. 5.

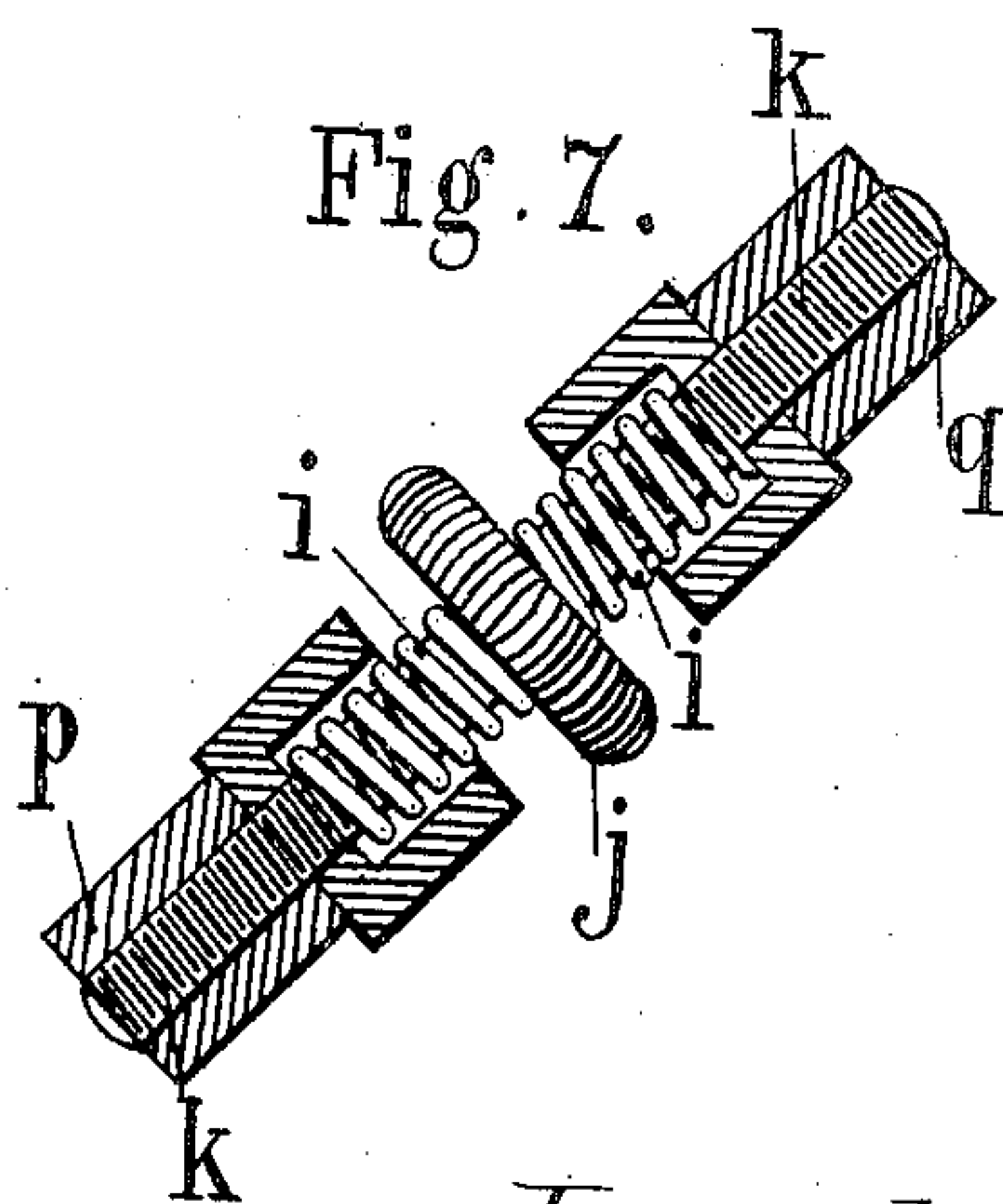


Fig. 7.

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3 SHEETS—SHEET 3.

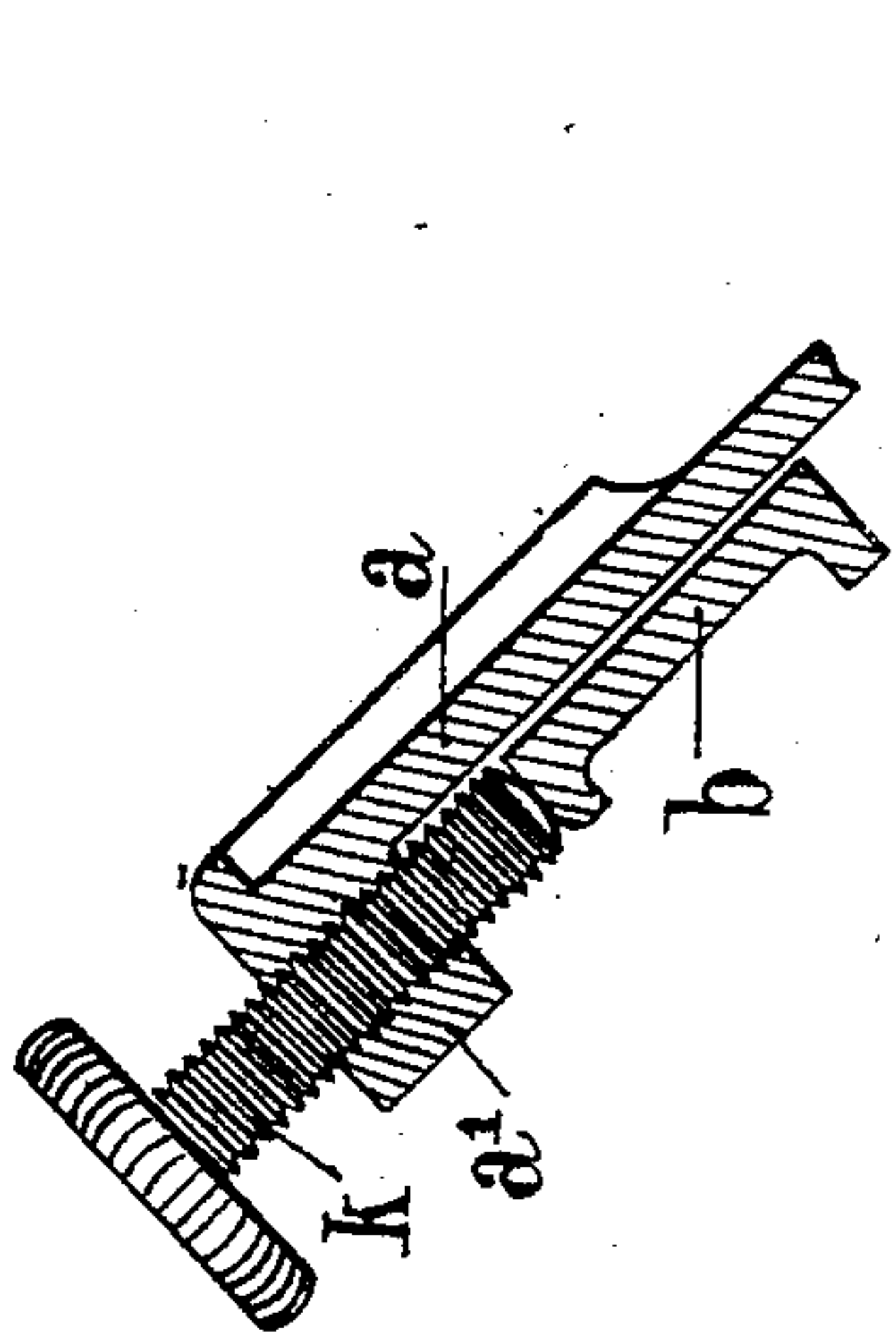


Fig. 9.

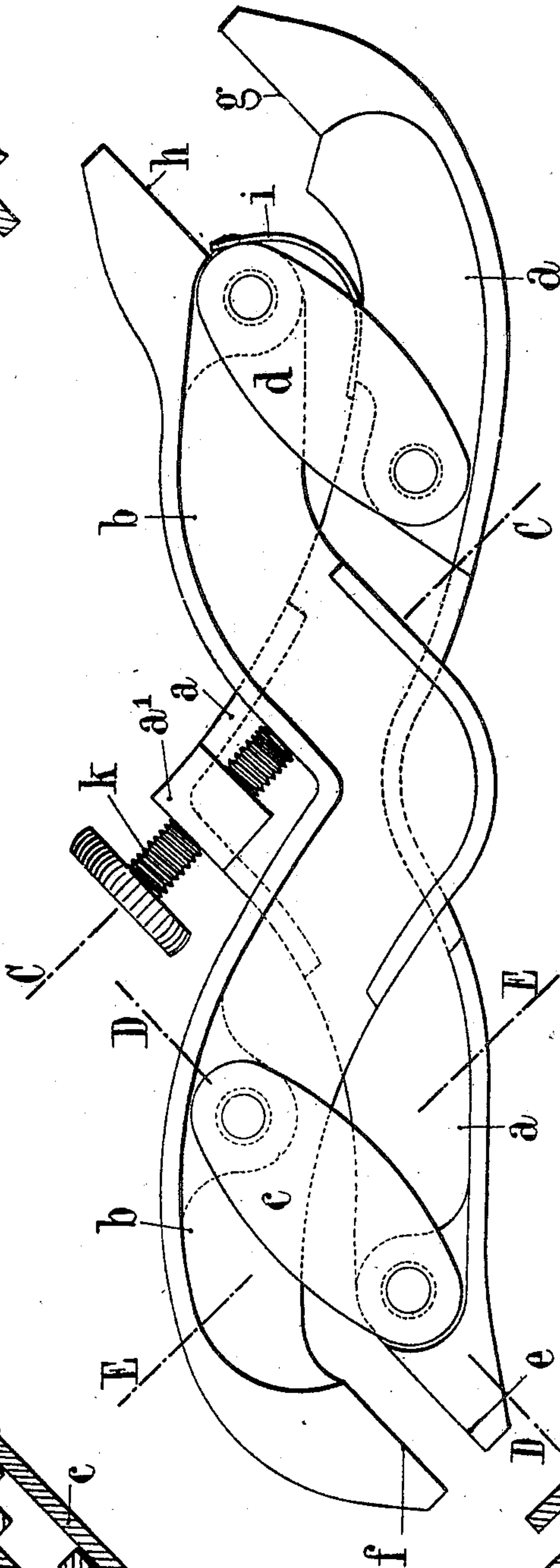


Fig. 8.

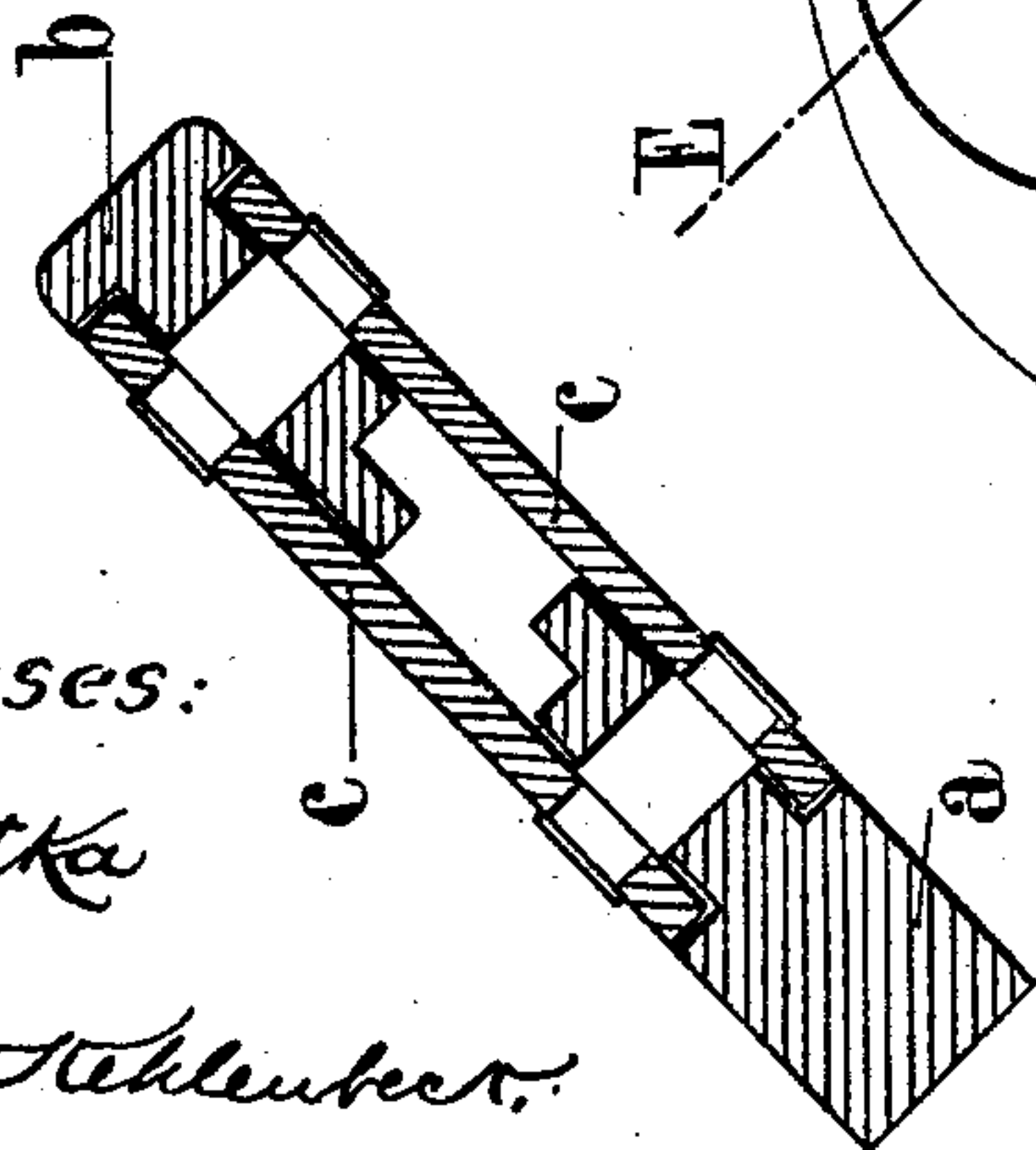


Fig. 10.

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Fig. 11.
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UNITED STATES PATENT OFFICE.

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UNIVERSAL SCREW-WRENCH.

No. 827,711.

Specification of Letters Patent.

Patented Aug. 7, 1906.

Application filed May 31, 1905. Serial No. 263,022.

To all whom it may concern:

Be it known that I, JAMES TIBURCE FELIX CONTI, engineer, of 8 Quai d'Orléans, in the city of Paris, Republic of France, have invented a Universal Screw-Wrench, of which the following is a full, clear, and exact description.

This invention relates to a universal screw-wrench essentially characterized by nippers or tongs with parallel jaws, the said wrench being also able to be used as hand-vise.

This wrench, which has not any slide nor any guide, is essentially characterized by the two following features: First, the two jaws are mounted upon the two opposite sides of an articulated parallelogram; second, the binding-surfaces of these jaws are parallel to the direction of the bisector of the angle formed by the two extreme positions of the two other sides of this parallelogram and respectively corresponding to the maximum closing and opening of the wrench, so that no appreciable shifting of the jaws in a direction perpendicular to that of tightening will take place while the wrench is closed.

This wrench is illustrated by way of example in the accompanying drawings, in which—

Figure 1 is a schematic view showing the principle of the invention. Fig. 2 shows in elevation a wrench made according to this invention. Fig. 3 is a plan thereof. Fig. 4 shows a modified form of wrench. Figs. 5 to 7 show a second modification. Fig. 5 is an elevation; and Figs. 6 and 7 are two cross-sections, respectively, made according to lines A A and B B of Fig. 5. Figs. 8 to 11 show a third modification. Fig. 8 is an elevation; and Figs. 9, 10, and 11 are cross-sections, respectively, made according to lines C C, D D, E E of Fig. 8.

The present wrench is made according to the following principle: Let us suppose an articulated parallelogram A B C D, the two opposite sides A B and C D of which can be brought nearer or removed the one from the other in a predetermined quantity. In order to be better understood, the side A B is supposed to be fixed and the side C D alone is movable, A B C D being the middle position of this parallelogram and A B C' D', A B C'' D'' the two extreme positions of the latter. The fixed side A B is continued by an inclined arm E F and the movable side C D by an arm G H, which is also inclined and parallel to the preceding one.

When the side C D G H is brought nearer to the fixed side A B E F or is removed from the latter, all the points of this side C D G H will respectively strike a curve parallel to the arcs C' C C'', D' D D'', and if the two members or arms E F G H receive a direction parallel to the bisectors A C and B D of angles C' A C'' and D' B D'' these two members E F, G H will be brought nearer the one to the other with the minimum of displacement in a direction at right angles with the tightening. Every one of the points of the member G H when striking, as described, a curve parallel with the arcs C' C C'', D' D D'' will be shifted relatively to the corresponding point of the fixed arm or branch E F of a quantity equal to the pitch of the arc struck, this displacement being practically of no importance. The same will happen with the arms I J and K L.

The wrench shown, Figs. 2 and 3, is made according to this principle. It is composed of two parallel members *a b*, connected together by links *c d*, forming with said members an articulated parallelogram. These branches are provided at each of their ends with jaws *e f g h*, the binding-faces of which are directed, as hereinbefore specified, parallelly to the middle position of the links *c* and *d*.

In order that the two ends of the wrench may be utilized, the distance between the jaws *e f* is different from that of the jaws *g h*. When the wrench is completely closed, the two jaws *e f* are applied against one another, while there is between the two jaws *g h* a space equal to the distance between the two jaws *e f* when the wrench is completely open. With such a device a double opening of the jaws is obtained for a given course.

A spring *i* tends constantly to open the wrench, and this opening of the wrench can be regulated by means of a milled nut *j*, which is screwed upon a threaded stem *k*, fastened upon the member *a* in a direction parallel to that in which the tightening operation takes place—that is to say, at right angles to the middle position of the links *c d*—and freely traversing the member *b* with a play corresponding to the pitch of the arc struck from each of the points of the arm or member *b*.

Fig. 4 shows a modified form in which the opening of the wrench is adjusted by a slide *l*. In this case the external edges of the two members *a b* will be inclined, as shown in the

drawings. The two jaws *e f*, as well as the two jaws *g h*, can be provided with two notches *m n*, arranged opposite the one to the other and allowing to take hold of a nut by means of its edges. The milled stud *j* can be provided with a square portion *j'* or any other device enabling to easily handle the same either by means of a wrench or with the hand and to exert a strain in the case when the nippers are used as a hand-vise.

Figs. 5 to 7 show a modified form in which the adjusting device is so arranged as to allow to place the operating milled knob between the two members of the wrench. The two members *a b*, outlined as shown in the drawings, are centrally traversed by a stem *k* perpendicular to the plane of the binding or tightening surfaces. This stem carries in its middle a milled nut *j*, made in one with the same, and is provided at its ends with two inversely-threaded parts engaged with two nuts *p q*, so arranged as not to be able to rotate upon the stem *k* and adapted to act upon two shoulders respectively presented by the two members *a b*. Springs *i*, interposed between the milled nut *j* and the two members *a b*, constantly tend to maintain at a distance the jaws of the wrench. This arrangement of the wrench has for advantage to allow a more rapid adjusting of the opening of the jaws. Furthermore, there being no threading of the holes provided in the members *a b* for the passage of the stem *k* the mounting of the latter can be more easily effected. The nuts *p* and *q* are prevented from turning on the two members *a b* by having one of the flat sides of each nut in engagement with the member *a* and *b*, respectively. Thus as the milled nut *j* is turned the members *a b* will be brought together or spread apart, according to the direction of rotation of said nut *j*, and the nuts *p q* will follow along as the members *a b* are separated or brought together. The spring *i* might be omitted in this form, if desired.

Figs. 8 to 11 show another modified form, in which the opening of the jaws is controlled simply by a screw the stem of which works by compression. This device, while being of a simple construction, further increases the strength of the wrench and insures a perfect immobility of the jaws when the latter receive a certain range of opening. The two members *a b* having such a section as to be able to be displaced the one in advance of the other have each at the middle a V-shaped part, the two apices of the V-shaped parts of these members *a b* being opposite the one to the other, as shown in Fig. 1. The member *a* has a boss *a'*, provided with a threaded hole in which engages a screw *k*, directed at right angles with the binding or tightening faces of the jaws *e f g h*. The end of the stem of the screw *k* abuts against one of the internal sides of the V-shaped portion of the other

member *b*. A flat spring *i*, secured to the member *b*, also engages the member *a*, and thus tends to constantly maintain at a distance the jaws with which the two members *a b* of the wrench are provided. This new arrangement is very simple and insures a perfect rigidity of the jaws. Furthermore, the screw *k*, working by compression, is able to resist powerful strains.

With the present system of wrench the tightening of the nut can be obtained even when the wrench can be moved only through a very small angle. Thus for tightening a nut with six sides it will only be necessary, by seizing this nut alternately by its sides and by its edges, to turn the wrench a twelfth of a turn. Of course this result cannot be obtained with the ordinary wrenches.

This universal wrench requires no previous adjusting. It avoids the troublesome groping which is always required with the ordinary wrenches with milled nut.

This tightening device can receive several industrial applications, especially in the manufacture of stationary vises.

I claim—

1. A universal wrench capable of being used as nippers with parallel jaws and as a hand-vise comprising two members coupled by two parallel links, the whole forming an articulated parallelogram, the two parts presenting at each of their ends a tightening face following a direction parallel with the bisector of the maximum angle that can be struck from the longitudinal axis of each link around one of its joints, an adjusting device allowing to vary at will the respective position of the two members and accordingly the opening of the jaws, substantially as described.

2. A universal wrench capable of being used as nippers with parallel jaws and as a hand-vise comprising two members coupled by two parallel links, the whole forming an articulated parallelogram, the two parts presenting at each of their ends a tightening face following a direction parallel with the bisector of the maximum angle which can be struck from the longitudinal axis of each link around one of its joints, the minimum distance between the two tightening faces on one of the ends of the two members being equal to the maximum distance apart between the two tightening faces on the other end of these two members, an adjusting device allowing to vary at will the respective position of the two members and accordingly the opening of the jaws, substantially as described.

3. A universal wrench capable of being used as nippers with parallel jaws and as a hand-vise, comprising two members coupled by two parallel links, the whole forming an articulated parallelogram, the two parts presenting at each of their ends a tightening face following a direction parallel with the bisector of the maximum angle that can be struck

from the longitudinal axis of each link around one of its joints, a spring interposed between the two members and constantly tending to spread the same the one from the other, an
5 adjusting device allowing to vary at will the respective position of the two members and accordingly the opening of the jaws, substantially as described.

4. A universal wrench capable of being
10 used as nippers with parallel jaws and as a hand-vise, comprising two members coupled by two parallel links, the whole forming an articulated parallelogram, the two parts pre-
15 senting at each of their ends a tightening face following a direction parallel with the bisector of the maximum angle that can be struck from the longitudinal axis of each link around one of its joints, the two members moving
20 one in front of the other and presenting in the middle, a V-shaped part, the two apices of the V-shaped parts being opposite to each other, a boss acting as a nut carried by one of the members, a pressing-screw traversing the boss and abutting against the edge of the
25 other member, a spring placed between the two members and constantly tending to spread the same the one from the other and thus constantly pressing one of these members against the end of the screw carried by
30 the other member, substantially as described.

5. A universal wrench capable of being used as nippers with parallel jaws and as hand-vise, comprising two members coupled by two parallel links, the whole forming an articulated parallelogram, the two parts pre-
35 senting at each of their ends a tightening face following a direction parallel with the bisector of the maximum angle that can be struck from the longitudinal axis of each link around one of its joints, the two members moving
40 one in front of the other and presenting in the middle a V-shaped part, the two apices of the V-shaped parts being opposite to each other, a boss acting as a nut carried by one of the sides of the V-shaped central part of one
45 of the members, a pressing-screw directed at right angles with reference to the tightening faces and abutting against one of the internal sides of the V-shaped central part of the other member, a spring interposed between the
50 two members and tending constantly to spread the latter the one from the other, substantially as described.

The foregoing specification of my universal screw-wrench signed by me this 19th day of
55 May, 1905.

JAMES TIBURCE FELIX CONTI.

Witnesses:

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MAURICE H. PIGNET.