

No. 863,384.

PATENTED AUG. 13, 1907.

O. GRANUM.  
HAND BRACE.

APPLICATION FILED OCT. 17, 1906.

Fig. 1.

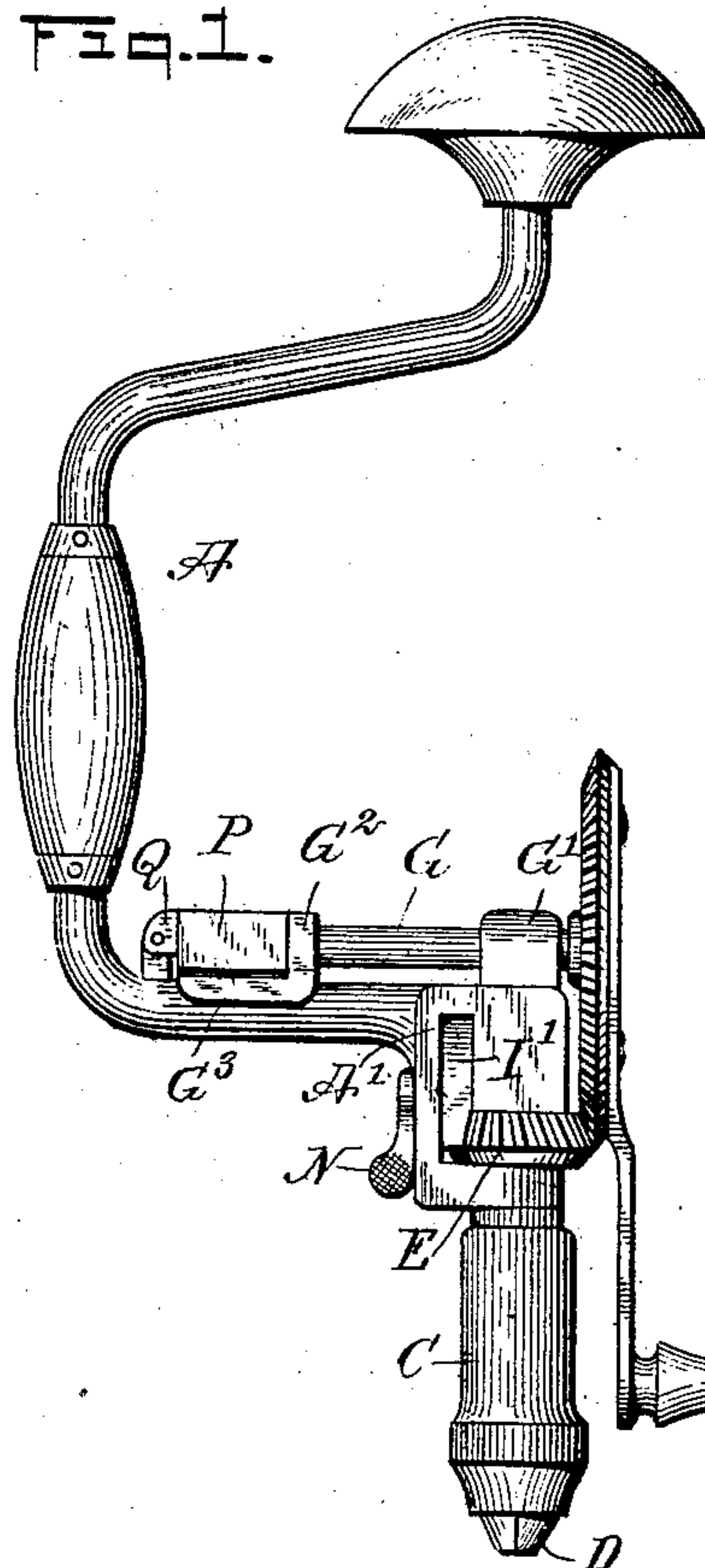


Fig. 2.

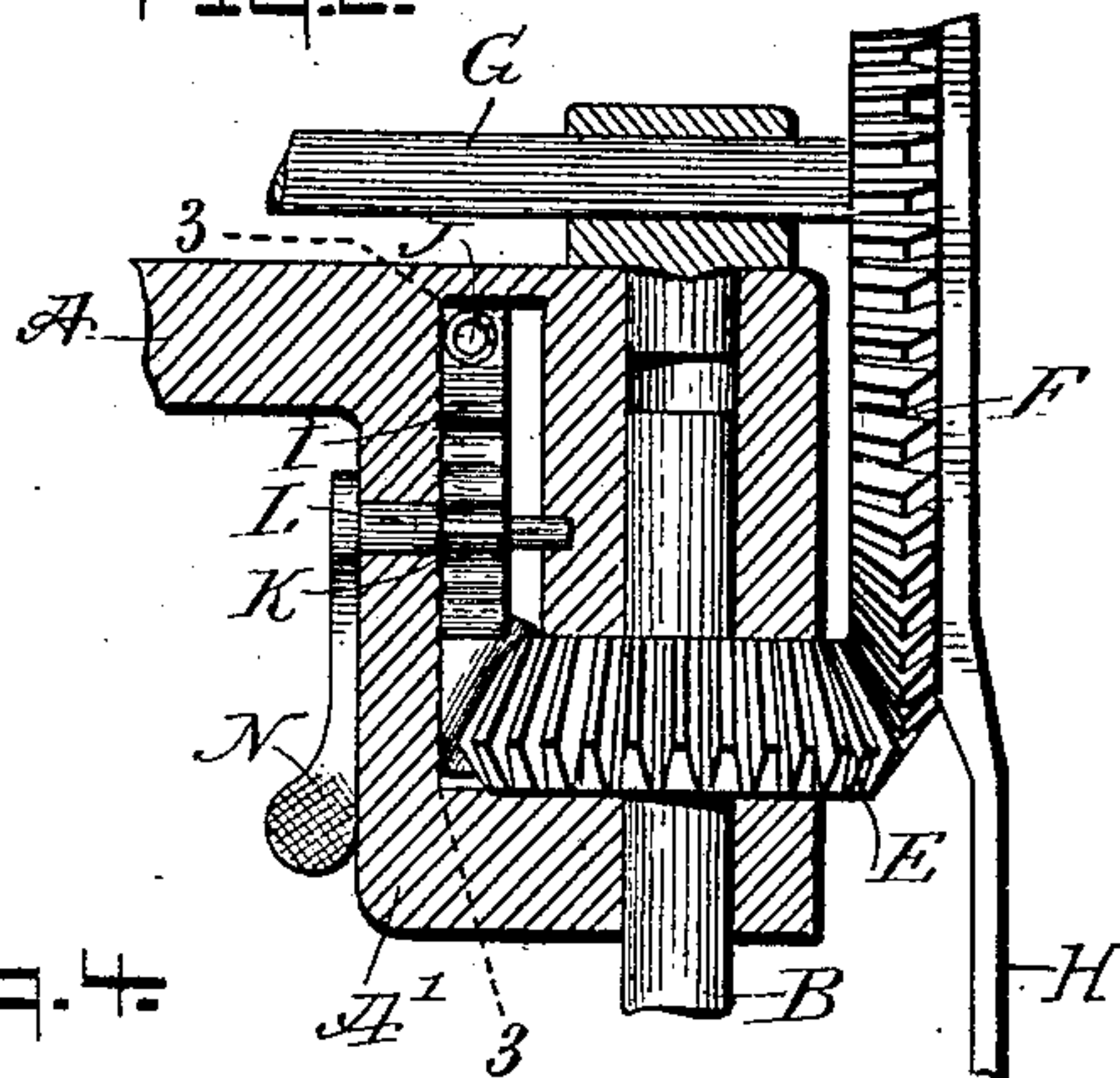


Fig. 4.

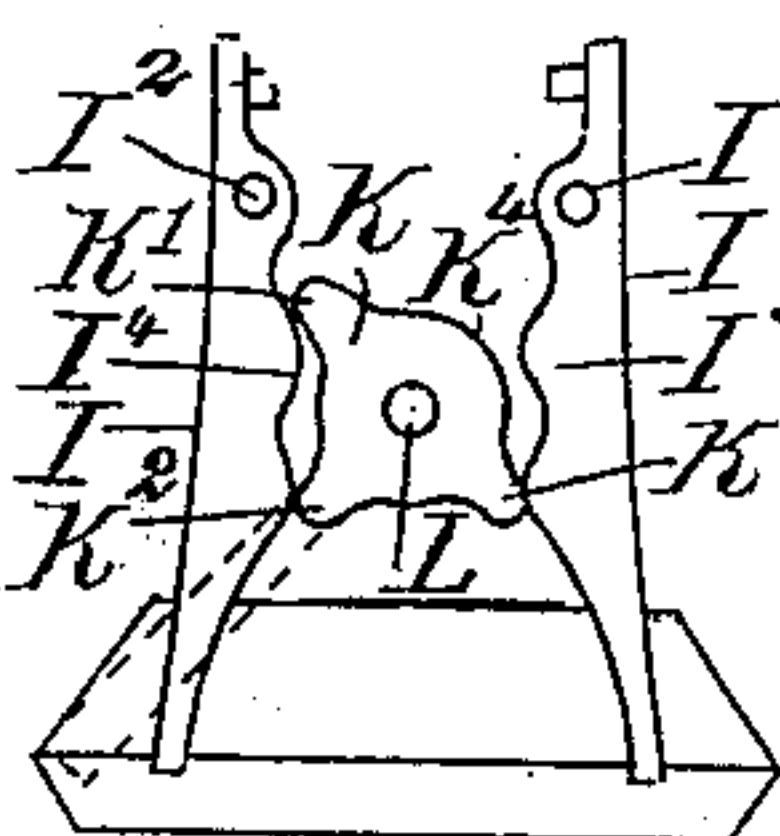


Fig. 3.

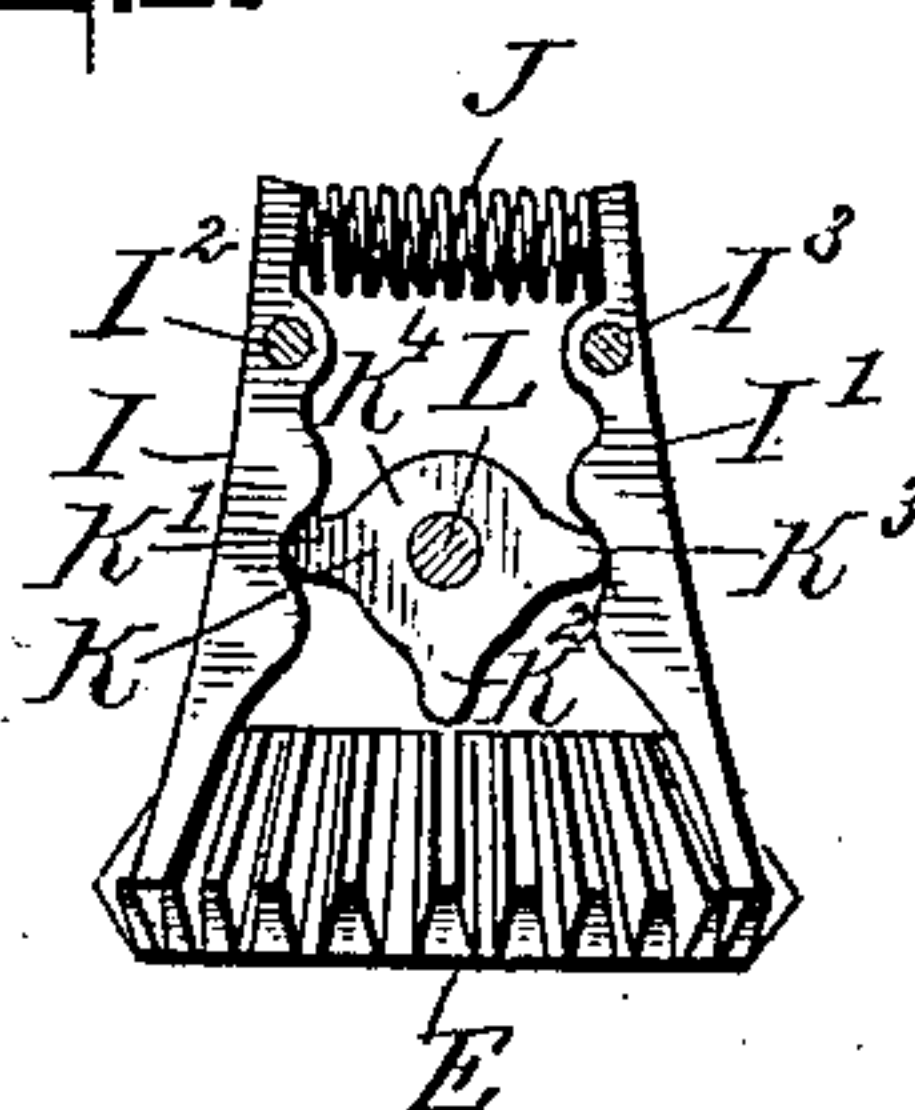


Fig. 7.

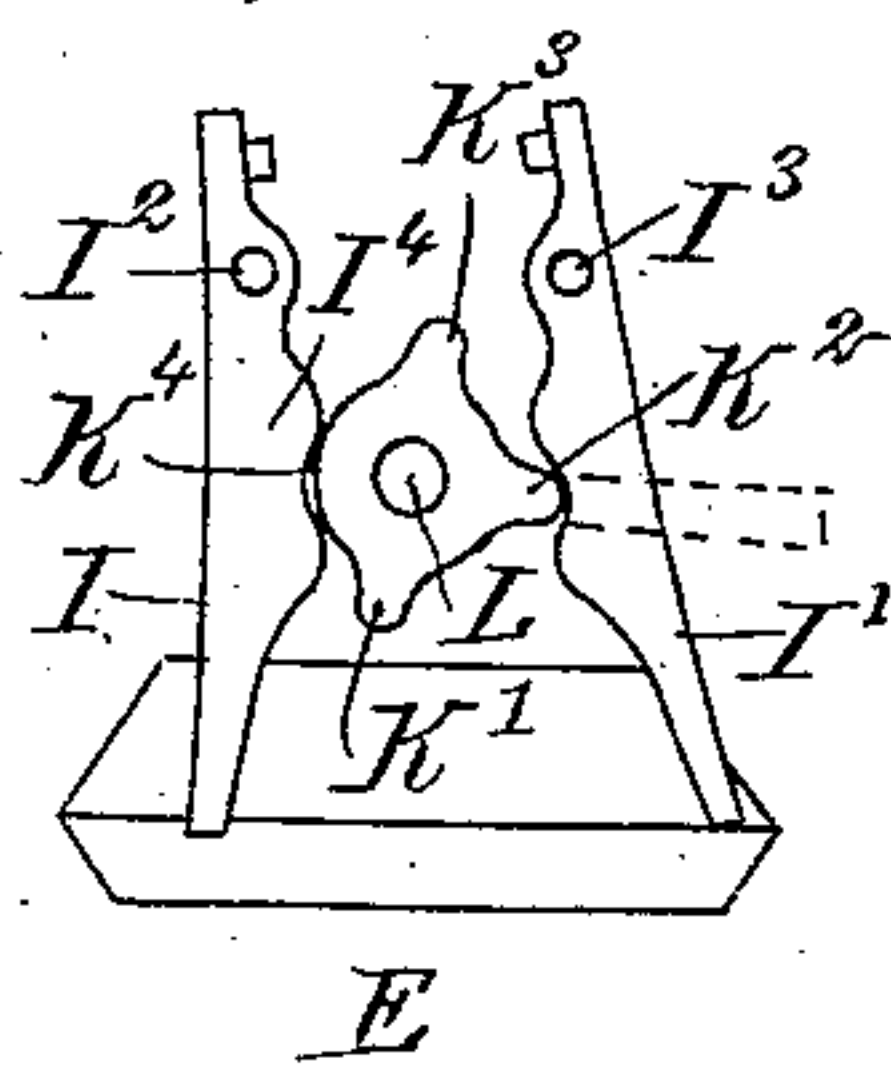


Fig. 6.

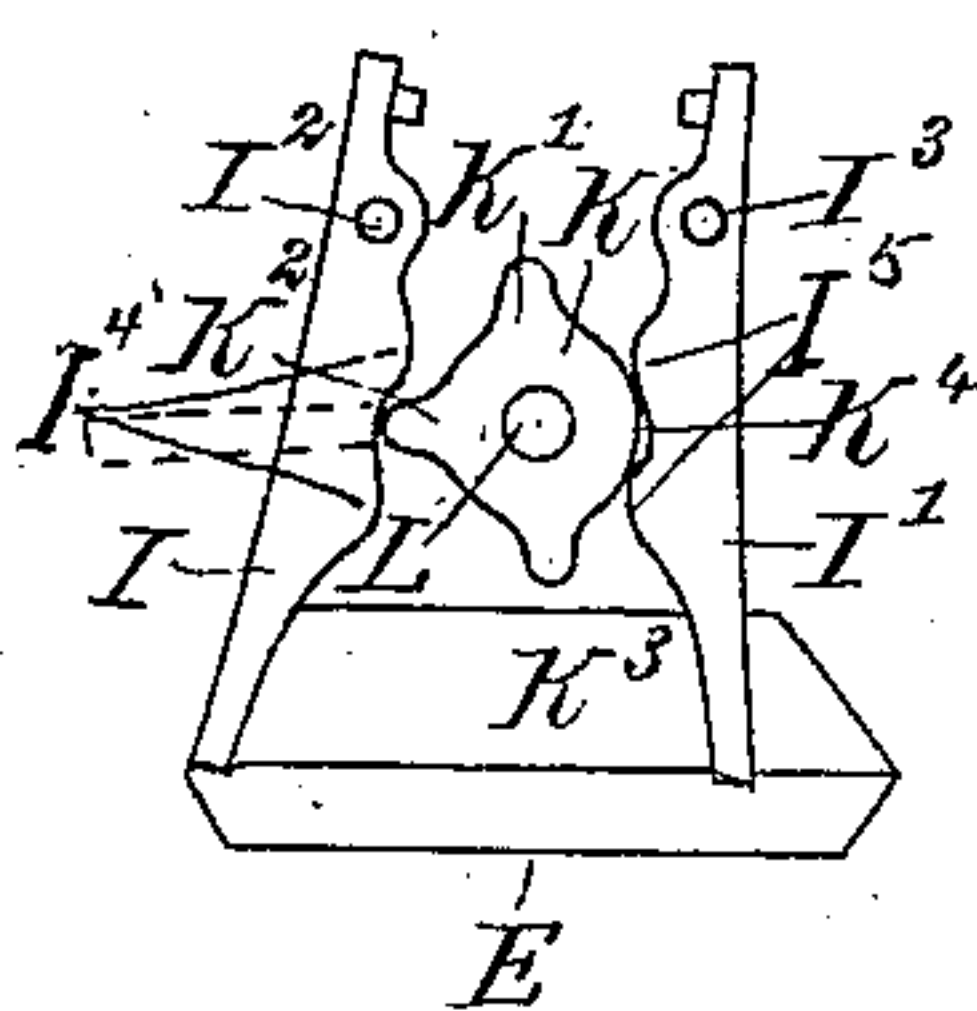


Fig. 5.

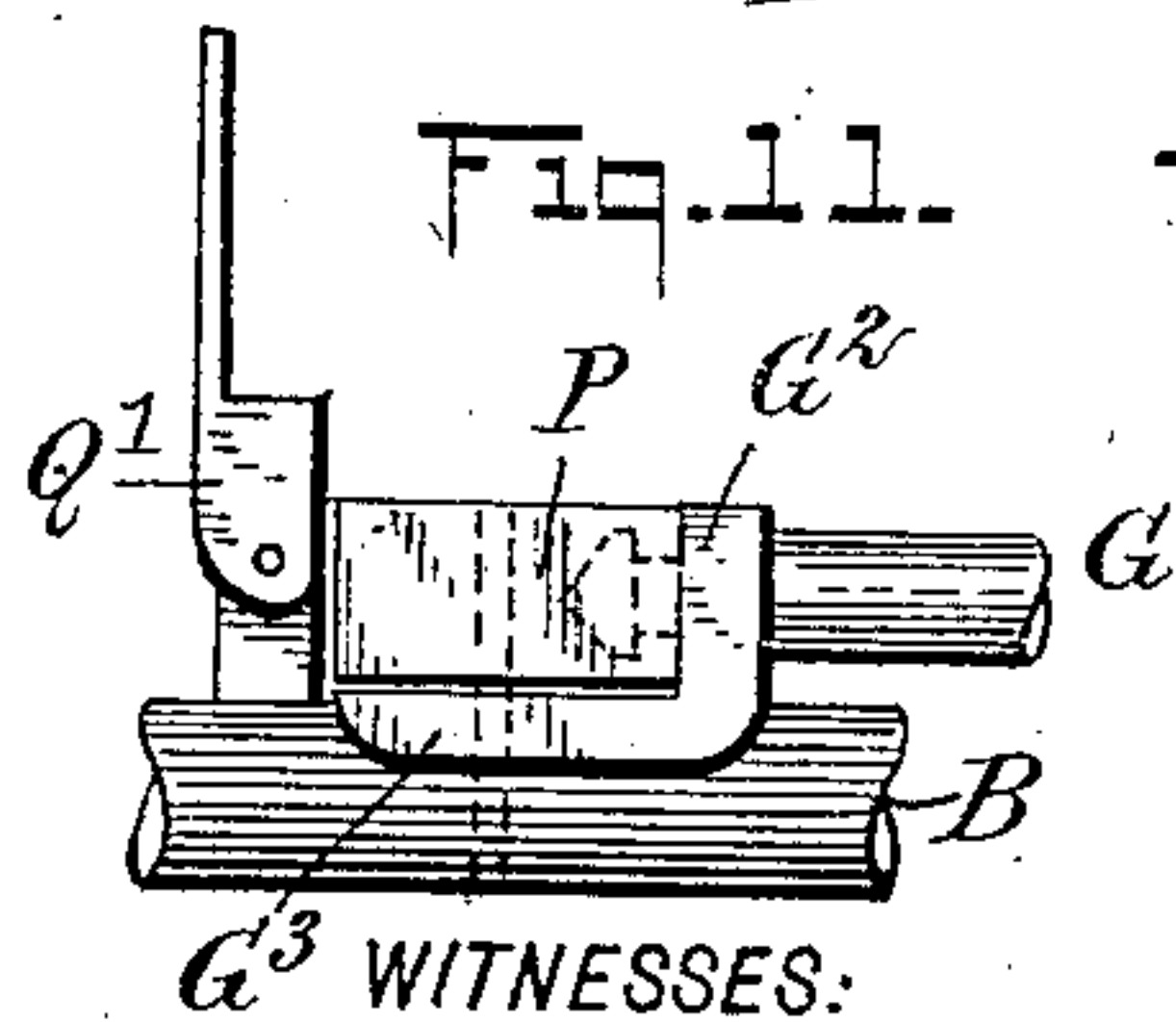
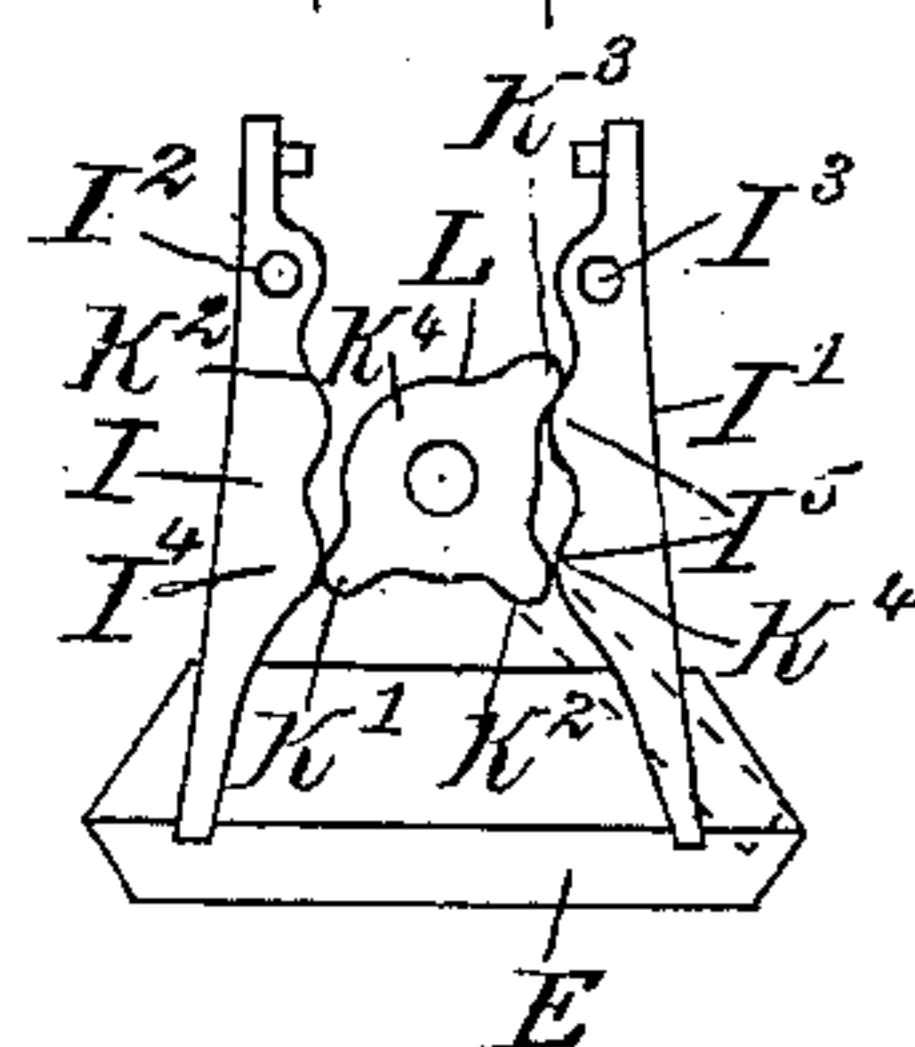


Fig. 8.

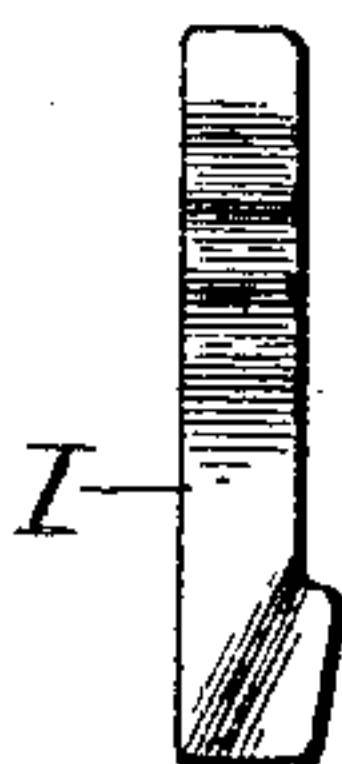


Fig. 9.

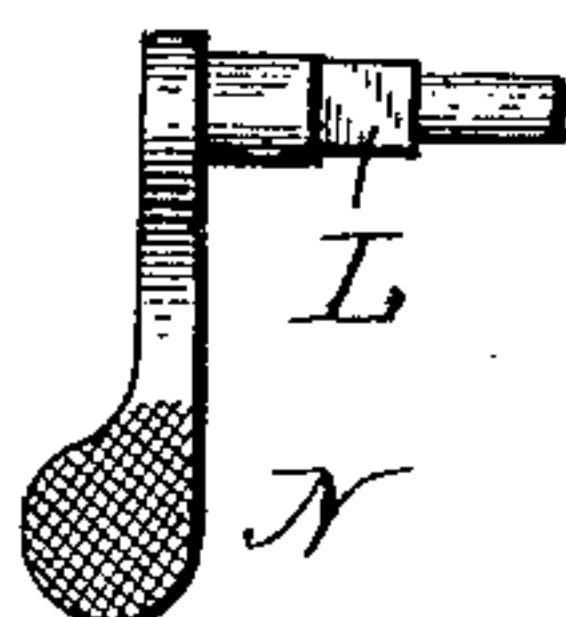
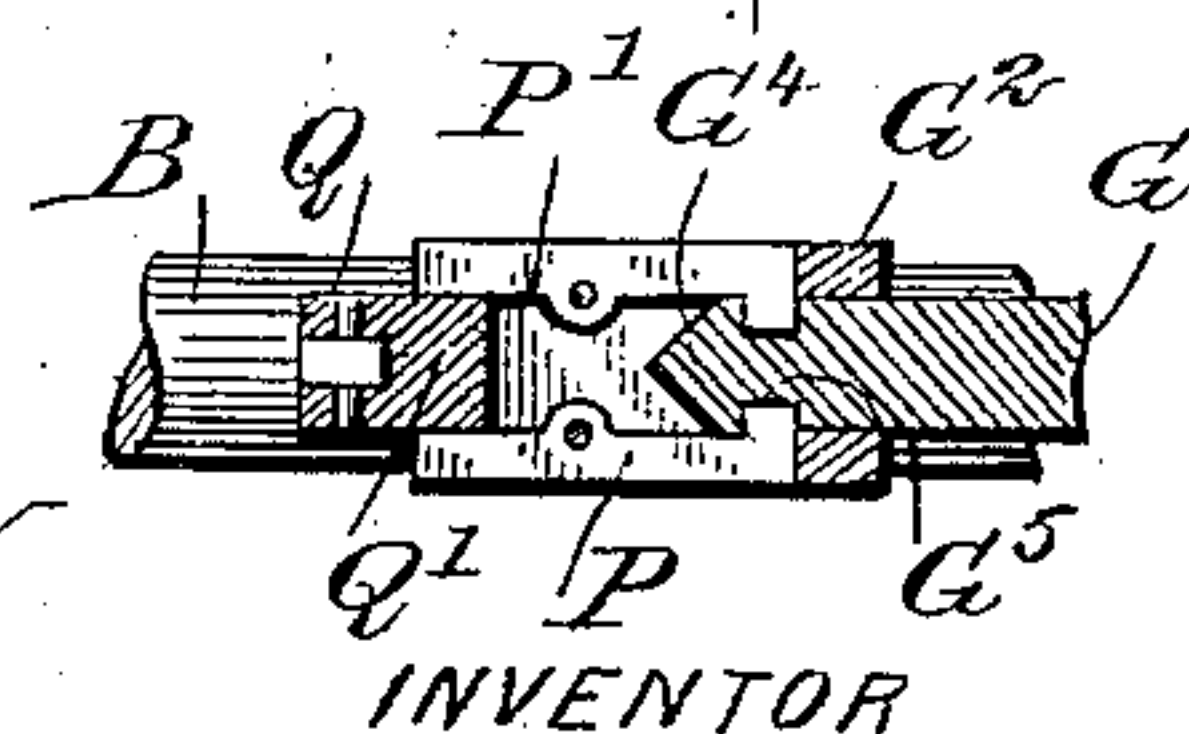


Fig. 10.

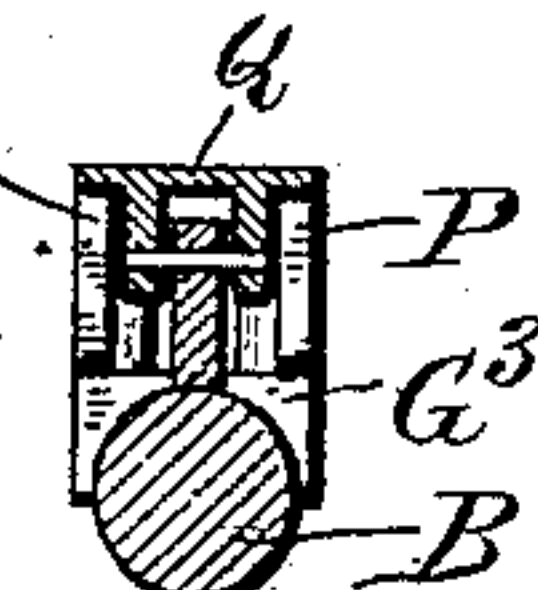


Fig. 12.



*WITNESSES:*  
*Wm. H. Hester*  
*Herb. Hester*

Fig. 13.



INVENTOR  
*Ole Granum*  
BY *Mum Co*  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

OLE GRANUM, OF AMERY, WISCONSIN.

## HAND-BRACE.

No. 863,384.

Specification of Letters Patent.

Patented Aug. 13, 1907.

Application filed October 17, 1906. Serial No. 339,324.

*To all whom it may concern:*

Be it known that I, OLE GRANUM, a citizen of the United States, and a resident of Amery, in the county of Polk and State of Wisconsin, have invented a new and Improved Hand-Brace, of which the following is a full, clear, and exact description.

The invention relates to boring and drilling and more particularly to drill braces, such as shown and described in the Letters Patent of the United States, No. 614,385, granted to me on November 15, 1898.

The object of the present invention is to provide a new and improved hand-brace having a setting device to permit quick and convenient converting of the brace into an ordinary crank-brace or a ratchet-brace.

The invention consists of novel features and parts and combinations of the same which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement; Fig. 2 is an enlarged sectional side elevation of the same; Fig. 3 is a cross section of the same, on the line 3—3 of Fig. 2; Figs. 4, 5, 6 and 7 are diagrammatic views, showing the pawls and cam-wheel in different positions relative to the pinion; Fig. 8 is a side elevation of one of the pawls; Fig. 9 is a side elevation of the handle-shaft for carrying the cam; Fig. 10 is a face view of the same; Fig. 11 is an enlarged sectional side elevation of the locking and releasing device for the gear wheel shaft, the said device being in an open position; Fig. 12 is a sectional plan view of the same in a closed position; and Fig. 13 is a cross section of the same.

The general construction of the hand-brace is similar to the one shown and described in the Letters Patent above referred to; that is, the hand-brace consists essentially of the operating crank A, in the heel A' of which is journaled the shank B of the stock or socket C, provided with the usual clamping jaws D adapted to engage the tang of the bit in the usual manner. On the shank B is secured a pinion E in mesh with a gear-wheel F secured on a shaft G, removably journaled in bearings G' and G<sup>2</sup> arranged on a saddle G<sup>3</sup> secured to the operating crank A, the said shaft G being normally held against removal by a manually-controlled locking and releasing device hereinafter more fully described.

On the gear-wheel F is secured a handle H for turning the said gear-wheel, and with it the pinion E, the shank B, stock C and the bit held in the clamping jaws D. The pinion E is adapted to be engaged by pawls I and I', fulcrumed at I<sup>2</sup> and I<sup>3</sup> on the heel A' and pressed on at their upper ends by a spring J to

normally hold the lower ends of the said pawls I and I' in mesh with the pinion E to cause the pinion to turn with the operating crank A whenever the brace is to be used as an ordinary crank-brace.

Either or both of the pawls I and I' may be thrown out of mesh with the pinion E, and for this purpose a setting device is provided, consisting essentially of a cam K in the form of a toothed wheel extending between the opposite faces of the pawls I and I', and secured on a shaft L mounted to turn in suitable bearings arranged on the heel A', the outer end of the said shaft L carrying a handle N within convenient reach of the operator for turning the handle, and consequently the shaft L and the cam K to a desired position, as hereinafter more fully explained and illustrated in Figs. 3, 4, 5, 6 and 7.

The cam K is provided, on its peripheral face, with three teeth K', K<sup>2</sup> and K<sup>3</sup>, and between the teeth K<sup>3</sup> and K', opposite the tooth K<sup>2</sup>, is arranged a non-toothed portion K<sup>4</sup>, as plainly shown in Figs. 3 to 7, inclusive. The handle N preferably extends radially from the shaft L in alinement with the tooth K<sup>2</sup>, as indicated in the figures just mentioned. The opposite faces of the pawls I and I' are provided with teeth I<sup>4</sup> and I<sup>5</sup>, operating in conjunction with the teeth K', K<sup>2</sup> and K<sup>3</sup> and the non-toothed portion K<sup>4</sup> in a manner presently to be described.

When the handle N extends vertically downward, then the teeth K' and K<sup>3</sup> extend horizontally and are in engagement with the teeth I<sup>4</sup> and I<sup>5</sup> to hold the pawls I and I' out of engagement with the pinion E, to allow of turning the latter by means of the gear-wheel F.

When the operator swings the handle N to the right or left, to either of the positions shown in Figs. 4 and 5, then both pawls I and I' are held in mesh with the pinion E by the action of the spring J, it being understood that the cam K allows the pawls to pass into the closed position mentioned. When the handle N is, however, thrown from its vertical position into an approximately horizontal position to the left, as shown in Fig. 6, then the middle tooth K<sup>2</sup> acts on the pawl I and throws the same out of mesh with the pinion E, while the non-toothed portion K<sup>4</sup> of the cam K extends between adjacent teeth I<sup>5</sup> of the pawl I', thus allowing the pawl I' to remain in mesh with the pinion E. When the several parts are in this position, the brace is used as a ratchet-brace, to be turned from left to right.

When it is desired to use the brace as a ratchet-brace to be turned from the right to the left, then the handle N is swung from a vertical position to the right into an approximately horizontal position, as shown in Fig. 7, to throw the pawl I' out of mesh with the pinion E and to allow the pawl I to remain in



mesh with the said pinion. In this case the middle tooth  $K^2$  engages the teeth  $I^5$  of the pawl  $I'$ , while the non-toothed portion  $K^4$  extends between the teeth  $I^4$  on the pawl  $I$ . It is understood that when the middle portion  $K^4$  of the cam  $K$  engages the teeth  $I^4$  or  $I^5$ , as above described and shown in Figs. 7 and 6, respectively, then the corresponding pawl is held in mesh with the pinion to turn the same when the operating crank is turned, but is free to glide over the teeth of the pinion  $E$  when the operating crank  $A$  is on the return or non-active stroke.

From the foregoing it will be seen that a single manually-controlled setting device is employed for controlling and operating both pawls  $I$  and  $I'$ , to move either or both out of engagement with the pinion  $E$  and to allow the pawls to be moved into engagement with the said pinion by the action of the spring  $J$ .

When the brace is to be used as a ratchet-brace, then the gear-wheel  $F$  and its shaft  $G$  and handle  $H$  are removed, and for this purpose the locking and releasing device for the gear wheel shaft  $G$  is moved by the operator into an open position to allow withdrawal of the shaft  $G$  from the bearings  $G'$  and  $G^2$ .

The locking and releasing device for the gear-wheel shaft  $G$  is arranged as follows: The gear-wheel shaft  $G$  is provided adjacent to its pointed outer end  $G^4$  with an annular groove  $G^5$  adapted to be engaged by clutch levers  $P$ ,  $P'$  fulcrumed in the saddle  $G^3$  previously referred to. A locking lever  $Q$  is provided with an offset  $Q'$  adapted to pass between the free ends of the clutch levers  $P$ ,  $P'$  to normally hold the same against swinging into an open position. Now when the operator swings the lever  $Q$  upwardly into an open position as shown in Fig. 11, then the offset  $Q'$  moves out of engagement with the levers  $P$ ,  $P'$  to allow of the operator to press the free ends of the said levers  $P$ ,  $P'$  toward each other to disengage the levers from the annular groove  $G^5$ . The operator can now pull the gear-wheel shaft  $G$  out of the bearings  $G'$ ,  $G^2$ .

The device is very simple and durable in construction and not liable to get easily out of order.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:—

1. A controlling device for a brace, comprising a pair of pivoted and spring pressed pawls adapted to engage a toothed rotatable part of the brace, the opposing faces of the pawls being each provided with a plurality of teeth, and a manually controlled cam located between the said

pawls and provided on its peripheral face with a plurality of teeth and a non-toothed portion for engagement with the teeth of the pawls.

2. A controlling device for a brace, comprising a pair of spring-pressed pawls adapted to engage a toothed rotatable part of the brace, the opposing faces of the pawls being provided with a plurality of teeth, and a manually-controlled cam-wheel extending between the said pawls and having its peripheral face provided with three teeth and a non-toothed portion, for engagement with the teeth of the pawls, the non-toothed portion being located between two of said teeth and opposite the remaining tooth.

3. A brace, comprising an operating crank, a socket for carrying the bit and rotatably mounted in the said crank, a pinion secured to the said socket, a pair of spring-pressed pawls fulcrumed on the said operating crank and adapted to engage the said pinion, the said pawls being provided with a plurality of teeth on their opposing faces, and a wheel mounted to turn between the said pawls and having its peripheral face provided with three teeth, and a non-toothed portion for engagement with the teeth of the pawls, the non-toothed portion being located between two of said teeth and opposite the remaining tooth.

4. A brace comprising an operating crank, a socket for carrying the bit and provided with a shank rotatably mounted in the said crank, a pinion secured to the said shank of the socket, a pair of spring-pressed pawls fulcrumed on the heel of said operating crank and extending parallel with the said shank, the said pawls being adapted to engage the said pinion and provided with teeth on their opposing faces, a shaft mounted to turn in bearings on the heel of said crank and provided at its outer end with a handle, the said shaft extending between the said pawls, and a cam secured on said shaft and having its peripheral face provided with three teeth and a non-toothed portion for engagement with the teeth of the pawls, two of said teeth being opposite each other, the non-toothed portion and the remaining tooth being opposite each other and substantially at right angles to the first mentioned teeth.

5. A brace comprising an operating crank, a socket for carrying the bit and rotatably mounted in the said crank, a pinion secured on the said socket, pawls adapted to engage the said pinion, the opposing faces of the pawls being provided with a plurality of teeth, a cam wheel mounted to turn between the pawls, the said cam wheel being provided on its periphery with three teeth and a non-toothed portion for engagement with the teeth of the pawls, two of said teeth being opposite each other and the remaining tooth and the non-toothed portion being opposite each other and extending at right angles to the first mentioned teeth, the said cam being arranged to throw either or both pawls out of engagement with the pinion or to allow both pawls to engage said pinion.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OLE GRANUM.

Witnesses:

W. W. WINCHESTER,  
JESSIE FERGUSON.