No. 614,385. Patented Nov. 15, 1898.

O. GRANUM.

DRILL BRACE.

(Application filed May 19, 1897.)

(No Model.)

Fig. 1.

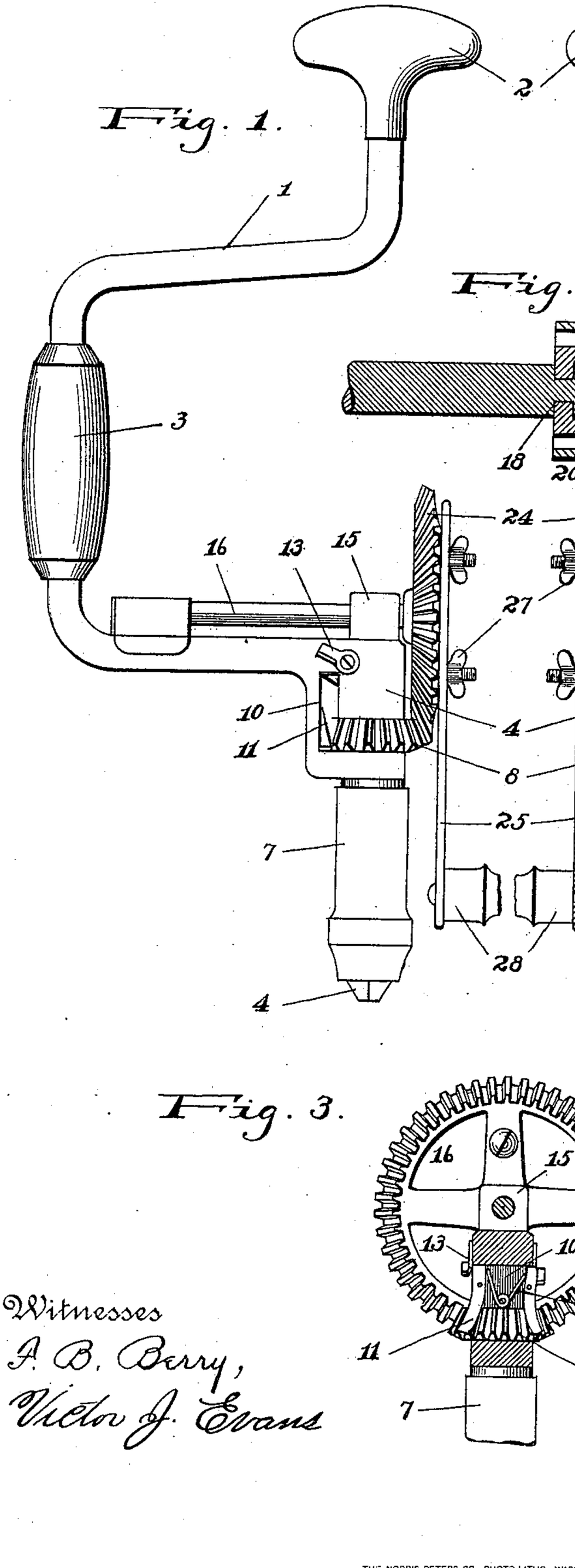

Fig. 2.

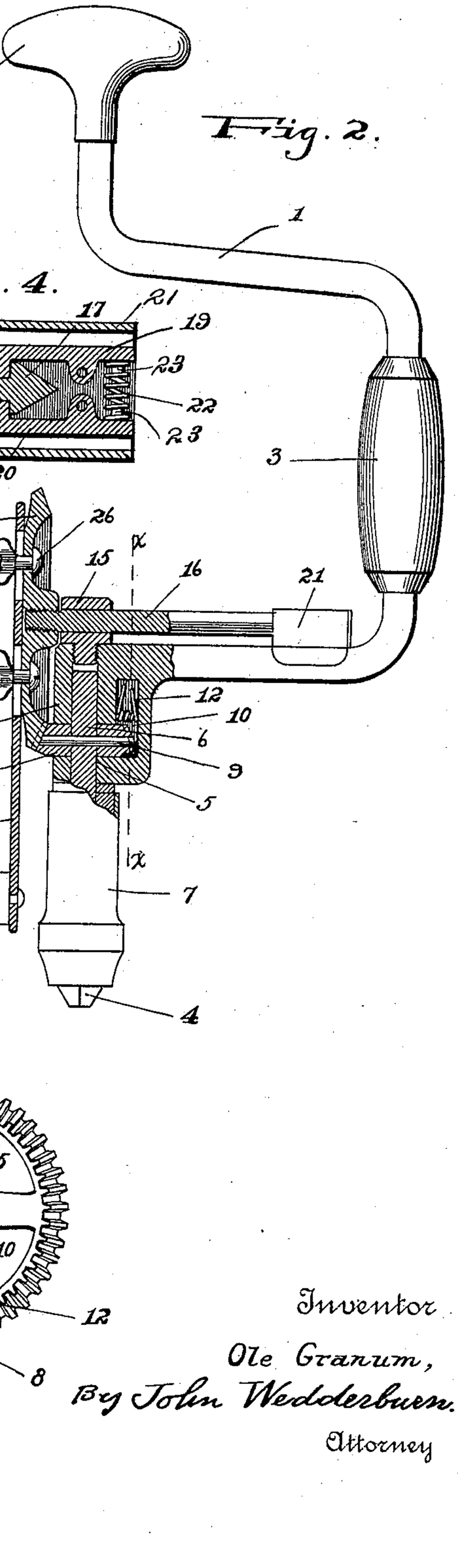

Fig. 4.

Fig. 3.

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DRILL-BRACE.

SPECIFICATION forming part of Letters Patent No. 614,385, dated November 15, 1898.

Application filed May 19, 1897. Serial No. 637,149. (No model.)

To all whom it may concern:

Be it known that I, OLE GRANUM, of Montevideo, in the county of Chippewa and State of Minnesota, have invented certain new and useful Improvements in Drill-Braces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide an improved hand-brace which can be readily and conveniently converted into an ordinary crank-brace, a ratchet-brace, and a corner-brace driven by a bevel wheel and pinion, the bevel-wheel being attachable and detachable to facilitate the change in the character of the brace.

To this end the invention contemplates a construction in which the heel of the crank portion is recessed to receive a bevel-pinion rigidly connected to the shank of the stock or socket, the horizontal member of the crank having bearings for removably connecting the shaft of the bevel-wheel that meshes with the bevel-pinion, the latter being engaged by spring-actuated pawls, which are manipulated to form the ratchet-brace.

In the following specification I have entered into a detail description of the parts which constitute my invention, reference being had to the accompanying drawings and to numerals thereon, which designate the different parts, and what I consider to be the novel features of construction are specifically recited in the claims.

In the drawings forming part of this specification, Figure 1 is a side elevation showing a hand-brace constructed in accordance with my invention. Fig. 2 is a sectional view through the heel of the crank and adjoining parts of the brace. Fig. 3 is a sectional view on the line *x x* of Fig. 2, and Fig. 4 is a sectional view of one of the bearings for the shaft which carries the bevel-wheel.

Referring to the drawings by numerals, 1 designates the crank portion of the brace, which is provided with the ordinary swiveled head 2 and sleeve 3. The lower member of the crank terminates in an enlarged portion or heel 4, having a vertical opening 5, into which fits a shank 6 of the stock or socket 7, the said heel also having a transverse opening which bisects the opening 5 and receives a bevel-pinion 8, having an axial opening through which the shank of the stock or socket passes. The bevel-pinion 8 is held in rigid engagement with the shank by means of a pin 9. The heel, in addition to the recesses or openings hereinbefore described, is provided with a transverse opening 10 in the rear of the opening for the shank to receive the spring-actuated pawls 11 11, located at opposite sides of the heel and adapted to engage the pinion. The heads of these pawls are thrown into engagement with the bevel-pinion by means of a spring 12, located within the opening 10 and having free ends which bear against the pawls above their pivots. These pawls are held out of engagement with the bevel-wheel by means of pivoted dogs 13, which are adapted to be thrown into engagement with said pawls. In this connection the bevel-pinion acts in the same manner as the ordinary ratchet-disk used with a ratchet-brace, the pawls being manipulated to throw one in engagement with the pinion and the other out of such engagement, according to the direction it is desired to turn the stock or socket. It may be here stated that the stock or socket is provided with the usual clamping-jaws 14, which engage the tang of the bit, being operated by a sleeve in the usual manner.

By providing the bevel-pinion, which is connected rigidly to the stock or socket, I make provision for turning the socket from a gear-wheel having a crank, thus adapting the hand-brace for use as a corner-brace or where it is desired to give a rapid rotation to the stock or socket in drilling or boring holes. To this end the upper end of the opening 5 in the heel of the crank is threaded to receive a bearing-block 15, having a horizontal opening through which the shaft 16 is passed in connecting the same therewith. The rear end of this shaft is brought to a point 17, directly in the rear of which is formed an annular recess or groove 18, this construction providing for the engagement with a two-part bearing, consisting of the pivoted sections 19 and 20, inclosed within a case or housing 21, rigidly attached to the horizontal member of the crank of the hand-brace. These pivoted sections present portions at

their forward ends which enter the annular groove or recess 18 of the shaft, being held in such engagement by a helical spring 22, interposed between their rear ends and engaging lugs 23 thereon. Upon the end of the shaft 16 opposite the pointed or tapered head 17 is mounted a bevel-wheel 24, which is adapted to engage the bevel-pinion 8 when the shaft is properly inserted within its bearings, and this bevel-wheel is provided with an operating lever or crank 25, adjustably secured thereto by forming a slot in the lever, through which pass screws 26 26, carried by the gear-wheel, the outer or free ends of said screws having thumb-nuts 27, which clamp the lever in place, the outer end of said lever having a handle 28. By this manner of connecting the lever to the gear-wheel it can be readily and conveniently adjusted for regulating the throw of the same, and by connecting the gear-wheel to the shaft, as shown, the said gear-wheel can be adjusted to bring it in closer mesh with the teeth of the bevel-pinion. It will also be noted that the arrangement for connecting the shaft of the gear-wheel to the crank of the hand-brace provides for extended and firm bearings for said shaft as well as for readily attaching and detaching this part of the implement, and it may be here stated that in detaching the shaft the rear end of the section 19 is depressed to release it from the annular groove or recess in the said shaft. In inserting the shaft the pointed end will act to spread the sections of the rear bearing, which provides an automatic engagement. It may also be stated that the arrangement of shaft above the crank-arm permits of the arrangement of the socket-driving pinion near the arm, while providing a driving-gear of adequate dimensions.

From the foregoing discription, in connection with the accompanying drawings, the construction and operation of my improved hand-brace or carpenter's implement will be readily understood, and its ready and convenient application for different purposes will also be appreciated by those familar with this particular style of implement.

In using the brace as an ordinary crank-brace the bevel-wheel is removed and the pawls 11 11 are both thrown into engagement with the bevel-pinion, in which case the stock or socket will be turned when the crank is turned either backward or forward. To form a ratchet-brace, the pivoted dog is thrown to release one of the pawls according to the direction it is desired to turn the stock or socket. Now when it is desired to turn the stock or socket by means of the lever or crank-handle and bevel-wheel to which it is attached this attachment is placed in engagement with the brace by passing the shaft 16 through the bearing 15 into engagement with the pivoted sections of the rear bearing. This will bring the gear-wheel in proper mesh with the bevel-pinion, and both pawls are then thrown out of engagement with the said pinion, so as not to interfere with its rotation in either direction.

This improved hand-brace forms one in which the parts can be readily changed or adjusted to suit the character of work which it is expected to perform, and it will be particularly noted that the parts are compact and neat in construction and arrangement.

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

1. A brace embracing the combination of the usual operating-crank provided with a heel or boss, a shank or socket for carrying the bit rotatably connected with the heel or boss, a pinion secured to the shank or socket, a shaft arranged above the crank-arm having extended bearings, a gear mounted on said shaft for driving the pinion and socket independently of the crank, pawls pivoted to the heel of the crank actuated to engage the pinion, and means for throwing the pawls out of engagement, substantially as described.

2. A hand-brace involving the combination of a crank portion provided with a heel or boss, a shank or socket for holding the bit mounted in the heel of the brace, a pinion fixed to the shank or socket, pawls for engaging the pinion to prevent the independent rotation of the shank or socket, means for throwing the pawls out of engagement with the pinion, a gear-wheel shaft over the crank-arm with extended bearings and a gear-wheel for driving the pinion independently of the crank, substantially as described.

3. In a brace, the combination of a crank portion having a heel or boss, a shank or socket rotatably mounted in said boss, a pinion rigidly secured to the shank or socket, pawls adapted to be turned into and out of engagement with the pinion, to lock the shank rigidly to the heel or boss, means for throwing the pawls out of engagement with the pinion, a shaft mounted on the arm having extended bearings and a gear-wheel detachably connected with the brace for driving the pinion, substantially as shown and described.

4. In a hand-brace, the combination of the crank portion, a shank or socket rotatably connected therewith, pawls adapted to be thrown into and out of engagement with the pinion, and a gear-wheel engaging the pinion having a shaft mounted in bearings above the crank-arm which is detachably connected with the brace, said gear-wheel being provided with a lever or crank-handle, substantially as shown and described.

5. In a hand-brace, the combination of a crank portion, a socket mounted therein, a pinion rigidly secured to the socket, pawls engaging the pinion, means for throwing the pawls out of engagement with the pinion, a gear-wheel engaging said pinion having a shaft and crank, a bearing-block carried by

the brace, and a second bearing adapted to automatically engage the shaft of the gear-wheel, substantially as described.

6. In a hand-brace, the combination of a crank portion, a shank or socket rotatably mounted therein, a pinion rigidly secured to the socket, a bearing-block rigidly attached to the crank portion, a two-part, spring-actuated bearing, a gear-wheel, a shaft attached to the gear-wheel having a tapered end with an adjoining, annular recess, means, as a lever, for driving the gear-wheel, means for locking the pinion and socket so that they will be operated by the crank, and means for unlocking the pinion and socket so that they may be driven by the gear-wheel, substantially as described.

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

OLE GRANUM.

Witnesses:
OLE F. AXNESS,
C. T. AXNESS.