M. C. HUTCHINSON.

PORTABLE DRIVING AND SPEED REDUCING DEVICE FOR REAMERS, DRILLS, AND THE LIKE.

APPLICATION FILED SEPT. 23, 1918.

1,305,111.

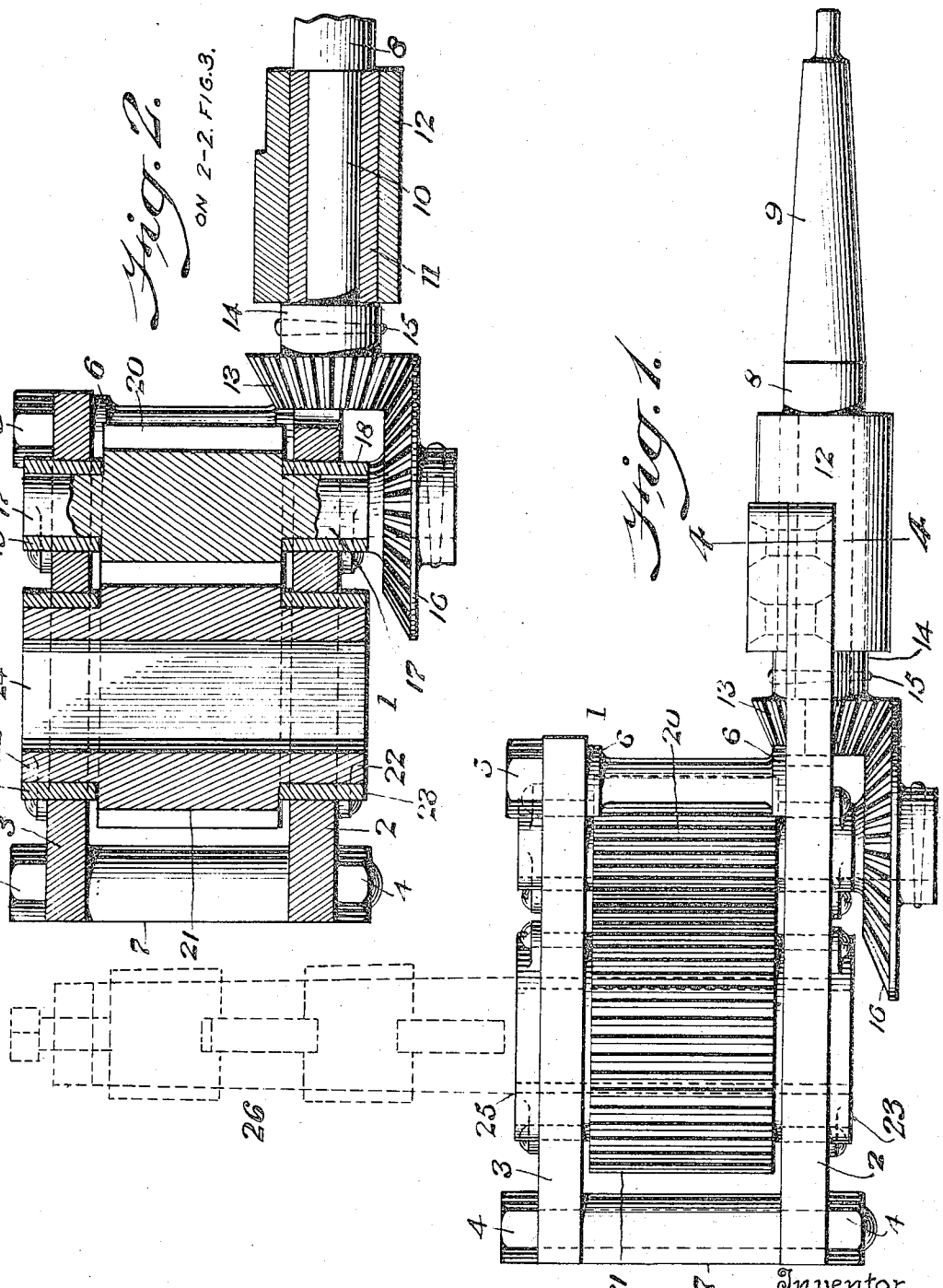
Patented May 27, 1919.

2 SHEETS-SHEET 1.

Fig. 2.

ON 2-2. FIG. 3.

Fig. 1.



Inventor

Morton C. Hutchinson.

By Wiedersheim Paine & Co.

Attorneys

M. C. HUTCHINSON.

PORTABLE DRIVING AND SPEED REDUCING DEVICE FOR REAMERS, DRILLS, AND THE LIKE.

APPLICATION FILED SEPT. 23, 1918.

1,305,111.

Patented May 27, 1919.

2 SHEETS—SHEET 2.

Fig. 3.

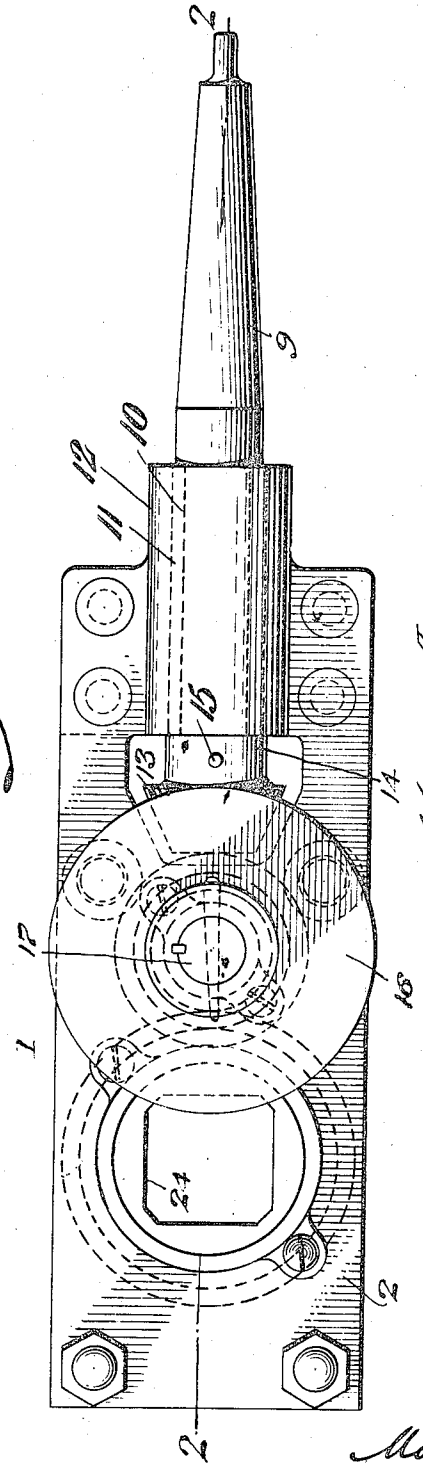
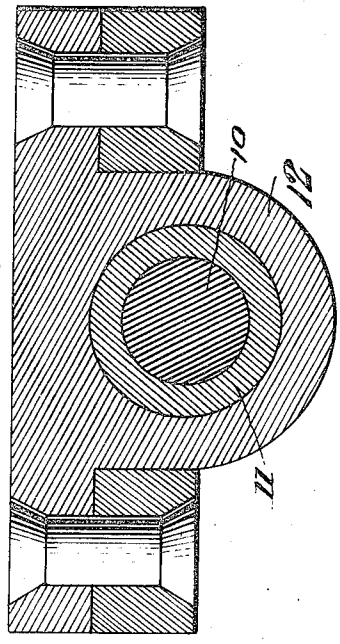


Fig. 4.



1 ON LINE 4-4 FIG. 1.

Inventor

Morton C. Hutchinson.

By Wiederhein & Fairbanks.

Attorneys

UNITED STATES PATENT OFFICE.

MORTON C. HUTCHINSON, OF WOODBURY, NEW JERSEY, ASSIGNOR OF ONE-HALF TO LEON G. BUCKWALTER, OF MERCHANTVILLE, NEW JERSEY.

PORTABLE DRIVING AND SPEED-REDUCING DEVICE FOR REAMERS, DRILLS, AND THE LIKE.

1,305,111. Specification of Letters Patent. Patented May 27, 1919.

Application filed September 23, 1918. Serial No. 255,247.

To all whom it may concern:

Be it known that I, MORTON C. HUTCHINSON, a citizen of the United States, residing at Woodbury, in the county of Gloucester, State of New Jersey, have invented a new and useful Portable Driving and Speed-Reducing Device for Reamers, Drills, and the like, of which the following is a specification.

In shipyards, machine shops, boiler shops and the like it has heretofore been the practice in reaming certain classes of work in close quarters or inaccessible places to actuate the reamer or roughing reamer by hand, on account of the inability to rotate the same mechanically, and my present invention is designed to obviate the foregoing objections and to utilize a high speed electric or pneumatic or other motor for the purpose of rotating a reamer, roughing reamer, drill or similar implement mechanically and in addition to reduce the high speed of rotation of the prime motor to the desired extent.

The object of my invention is to provide a novel, portable, self-contained, driving and speed-reducing device applicable to the foregoing purposes, having a preferably tapered shaft or driving spindle which is adapted to be inserted in the rapidly revolving chuck of a prime motor, and intermediate gearing adapted to reduce the speed of the motor chuck and of said shaft or spindle to the desired extent and to transmit and impart it to the reamer, drill or other tool which it is desired to rotate.

To the above ends my invention consists of a novel construction of a driving and speed-reducing mechanism for a reamer, drill or the like, the same being provided with a suitable frame work carrying the spindle, which is adapted to be inserted in the rapidly rotating chuck of the electric, pneumatic or other motor, and a novel collocation of gearing, the last member of the train of gearing being equipped and adapted to receive and actuate the reamer or other tool to be driven.

For the purpose of illustrating my invention, I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same will be found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a plan view of a driving and speed-reducing mechanism for reamers, drills and the like embodying my invention.

Fig. 2 represents a section on line 2—2 of Fig. 3,—certain of the parts being shown in elevation.

Fig. 3 represents a side elevation of Fig. 1, and

Fig. 4 represents on an enlarged scale a section on line 4—4 of Fig. 1.

Similar numerals of reference indicate corresponding parts.

Referring to the drawings—

1 designates my novel construction of driving and speed-reducing mechanism, the same comprising a frame work composed of a pair of front and rear plates 2 and 3 respectively, which are held in assembled position by means of the bolts 4 and 5, the bolts 4 being through bolts and the bolts 5 being preferably rivet bolts, which are provided with the flanges or shoulders 6 which in conjunction with the distance piece 7 seen at the left of Figs. 1 and 2 serve to hold the plates 2 and 3 in proper assembled position with respect to each other.

8 designates a driving shaft or spindle which is preferably tapered as indicated at 9 for the purpose of ready engagement with the tapered socket of a chuck or other appropriate part of the prime motor or driving member (not shown). The shaft or spindle 8 is provided with a reduced portion as indicated at 10 which revolves in the bushing 11 located in the bearing 12 and suitably supported from or connected with the framework.

13 designates a bevel gear, or beveled driving pinion, having a hub 14, which is pinned or otherwise secured at 15 to the reduced portion 10 of the shaft or spindle 8, so that the latter and said bevel gear 13 will rotate in unison. The bevel gear is in mesh with a bevel gear 16 or beveled driven pinion, which is pinned or otherwise secured to the driven shaft 17, the ends of which revolve in the bushings 18 and 19 which are respec-

tively supported on the front and rear plates 2 and 3.

20 designates a pinion or driving spur gear which is preferably formed on or integral with or applied to the shaft 17, and meshes with the driven spur gear 21, the hubs or ends 22 of which revolve in the bushings or bearings 23 which are respectively located in the front and rear plates 2 and 3 of the frame.

24 designates a squared, or polygonal socket, axially formed within the body of the driven spur gear 21, which is adapted to receive the squared or correspondingly formed end 25 of the reamer or other boring tool 26 as seen dotted in Fig. 1, said squared hole 24 extending through the entire length of the spur gear 21, so that the squared shank of the reamer or boring tool may be fed or forced into the work by a feed screw acting along the axis of the reamer and applied at the end of the reamer shank (not shown). The reamer is preferably of the construction shown in my contemporaneously pending application, filed Aug. 31, Serial No. 252,136, but it will be evident that any other desired form of reaming or boring tool may be utilized in connection with my device.

In Fig. 4, I have shown one manner of assembling or forming the bearings or housing for the bushing 11, and the reduced portion 10 of the shaft or spindle 8, which may, if desired, be employed, although it will be apparent that other forms may be employed without departing from the spirit of my invention.

The operation is as follows:—

The tapered end 9 of the shaft or spindle 8 having been inserted in the chuck of a rapidly rotating electric, pneumatic or other motor, it is obvious that its rotation will be imparted to the beveled driving pinion 13, which latter will rotate the beveled driving gear 16 and the driving spur gear 20, the rotation of the latter being imparted to the driven spur gear 21 and therefrom to the reaming or boring tool 26, the high speed or rotation of the prime motor being, through the calculated dimensions of the gears, reduced and the torque created correspondingly increased at the desired point, as will be evident to those skilled in the art.

My device is especially applicable to the reamer 26 illustrated in Fig. 1, when it is desired to use it in close quarters or in inaccessible places where reaming has heretofore been done by hand, and I have found that it is especially adapted to many situations in shipyard work where the reaming has heretofore been done by hand, since the operation can be done mechanically with my novel device with a great saving of time and labor.

It will be understood, of course, that my novel driving and speed-reducing device is very light, durable, and self-contained, and that being portable it can be readily applied to reaming, boring and the like operations in many locations heretofore inaccessible for mechanically driven reamers. By the employment of the distance pieces 7, and the bolts 5, having the shoulders 6 thereon, in conjunction with the plates 2 and 3, a very light and rigid frame work is produced, which will cause the gears at all times properly to mesh and is portable and can be readily taken apart or dismantled when desired for the purpose of inspection or repairs, or to replace or inspect any members of the train of gearing, or their bearings or their adjuncts.

It will now be apparent that I have devised a novel and useful construction of a new and useful portable driving and speed reducing device for reamers, drills and the like, which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present instance, shown and described a preferred embodiment thereof which will be found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

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

1. In a device of the character stated, a framework having a spur gear rotatably mounted therein and having an axial polygonal socket extending therethrough for the reception of the shank of an implement to be rotated, a driving spindle extending at an angle to said gear and mounted in bearings on said framework, a bevel pinion on said driving spindle, and speed reducing gearing intermediate said bevel pinion and spur gear.

2. A driving and speed-reducing device, comprising a driving spindle, a beveled driving pinion thereon, a driving shaft at an angle to the axis of said pinion, a beveled driven pinion on said driving shaft engaged with and driven by the beveled driving pinion, a spur gear also on said driving shaft, a combined spur gear and driven shaft element interiorly bored to form a socket to receive and rotate a boring implement, said spur gear being engaged with and driven by the spur gear on the driving shaft.

3. In a device of the character stated, a framework composed of front and rear plates, fastening devices therefor, a driving spindle mounted in bearings on said framework, a bevel pinion thereon, a spur gear

extending at an angle to said spindle, a bevel gear rotatable in unison with said spur gear and in mesh with said bevel pinion, and a larger spur gear in mesh with said first mentioned gear and having a polygonal socket extending axially through it, for the reception of the implement to be rotated.

4. A portable driving and speed-reducing device for a reaming tool, which comprises in combination,—a driving spindle, a beveled driving pinion thereon, a driving shaft at an angle to the axis of said pinion, a beveled driven pinion on said driving shaft engaged with and driven by the beveled driving pinion, a spur gear also on said driving shaft, a combined spur gear and driven shaft element having a socket extending therethrough to receive and rotate a reaming tool, said spur gear being engaged with and driven by the spur gear on the driving shaft, a front and a rear plate between and within which both the driving shaft of the beveled driven pinion and the driving spur gear and the driven shaft are journaled, distance pieces having bolts therethrough, and rivet bolts for securing said plates together.

5. In a device of the character stated, a framework having a spur gear rotatably mounted therein, said gear having an axial polygonal socket located therein for the reception of the shank of the implement to be rotated, a driving spindle extending at an angle to said gear and mounted in bearings on said framework, and speed reducing gearing intermediate said driving spindle and spur gear.

MORTON C. HUTCHINSON.

Witnesses:
J. W. MEEKER,
WM. A. KREUSSER.