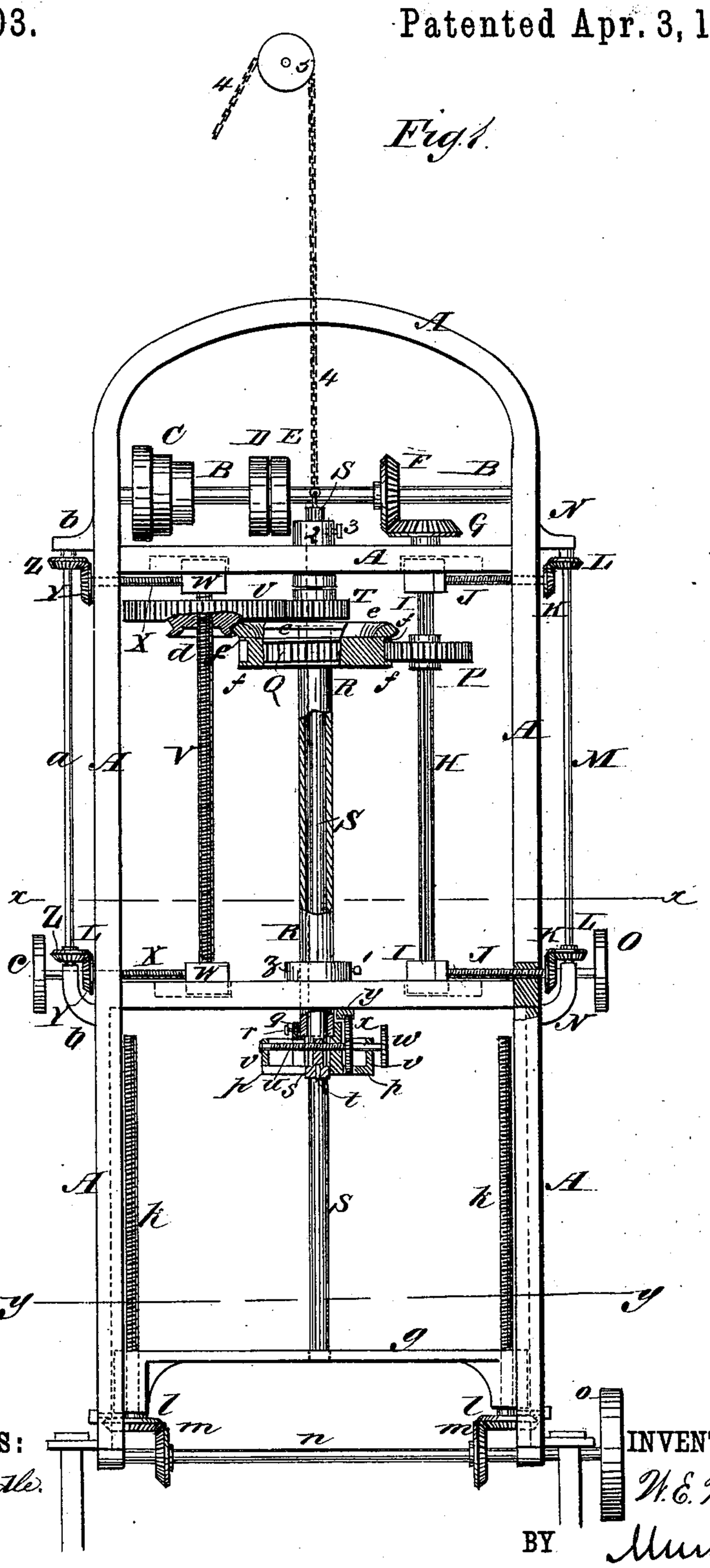
(No Model.) 2 Sheets—Sheet 1.

W. E. WILD.

BORING, DRILLING AND FACING MACHINE.

No. 275,103. Patented Apr. 3, 1883.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

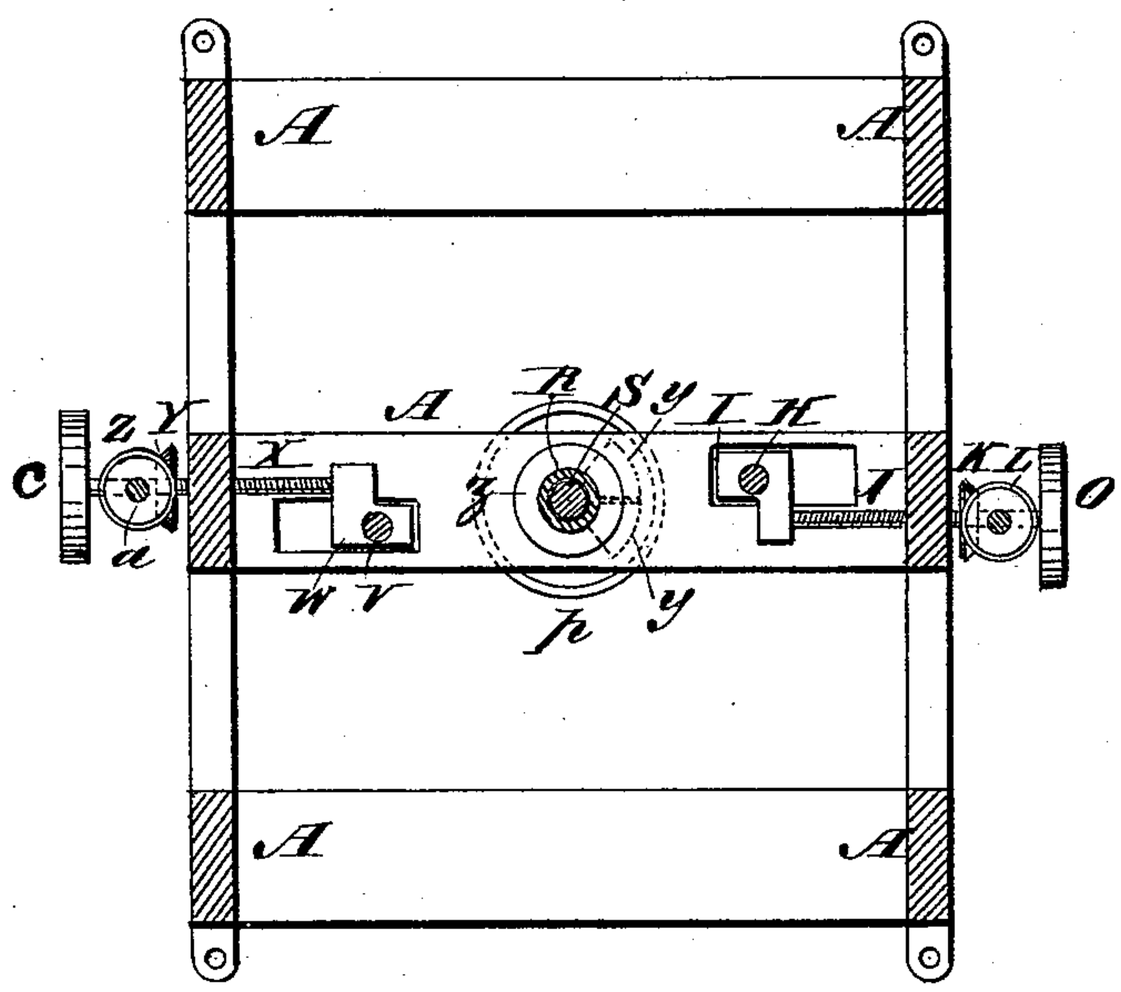


Fig. 3.

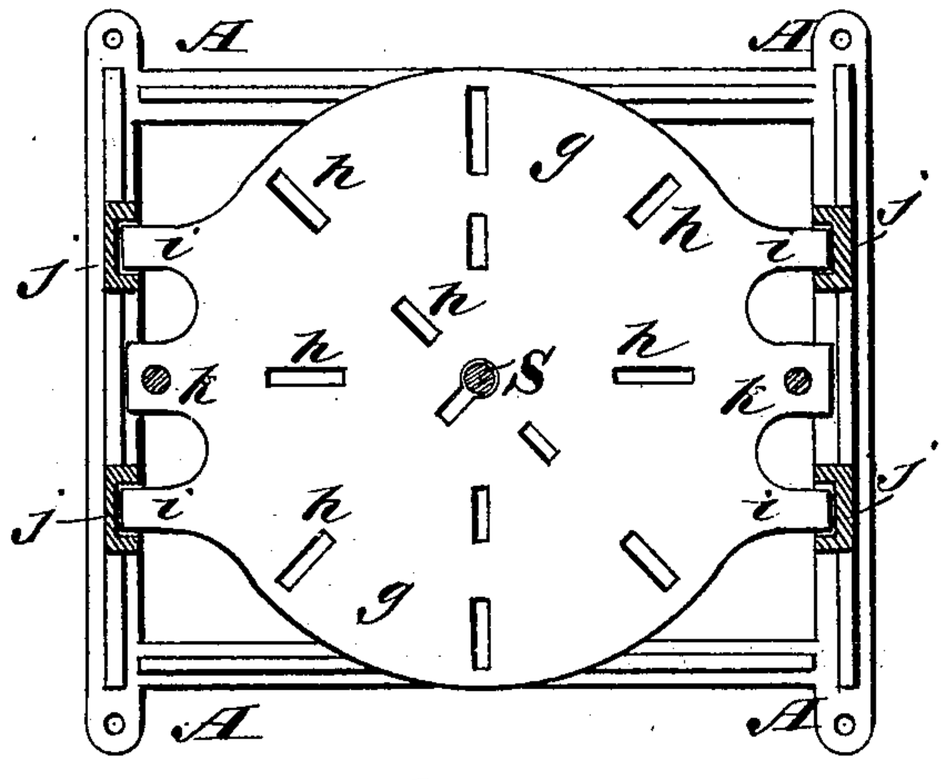
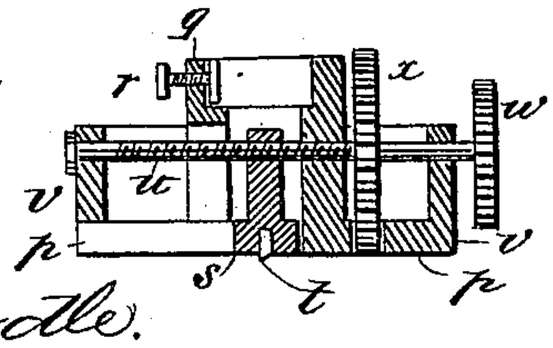


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM E. WILD, OF CANDALARA, NEVADA.

BORING, DRILLING, AND FACING MACHINE.

SPECIFICATION forming part of Letters Patent No. 275,103, dated April 3, 1883.

Application filed October 18, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EDWARD WILD, of Candalara, in the county of Esmeralda and State of Nevada, have invented a new and useful Improvement in Boring, Drilling, and Facing Machines, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1, Sheet 1, is a front elevation of my improvement, parts being broken away. Fig. 2, Sheet 2, is a sectional plan view of the same, taken through the line *x x*, Fig. 1. Fig. 3, Sheet 2, is a sectional plan view of the same, taken through the line *y y*, Fig. 1. Fig. 4, Sheet 2, is a sectional elevation of the tool-carrier enlarged.

The object of this invention is to facilitate the boring of cylinders and pulleys, the facing of disks, and the doing of other similar work.

The invention consists in a machine for boring, drilling, and facing metals, constructed with a hollow tool-carrying shaft rotating and sliding upon a guide-rod, and connected with the drive-shaft and the feed-screw by gearing. The gear-wheel working on the feed-screw is provided with a grooved pulley engaging with a flange upon the gear-wheel attached to the hollow shaft, so that the said feed-screw gear-wheel will carry the said hollow shaft with it in its up and down movements. The gear-wheel attached to the hollow tool-carrying shaft is provided with flanges to engage the driving gear-wheel, so that the said driving gear-wheel will move up and down with the said hollow shaft. To the lower end of the hollow shaft is attached a plate carrying the tool-holder and its feed-screw, and to the said feed-screw is attached a gear-wheel to mesh into a stationary gear-segment, so that the tool-holder and tool will be fed forward by the revolution of the said hollow shaft. The hollow tool-carrying shaft slides upon a rod attached at its lower end to the work-table to guide and support the said hollow shaft, as will be hereinafter fully described.

A is the frame of the machine, which is designed to be bolted to a floor or a suitable supporting-frame.

In bearings in the upper part of the frame A revolves the driving-shaft B, which is provided with a cone-pulley, C, to receive the driving-belt, so that the machine can be driven at a greater or less speed, as may be required. The shaft B is also provided with a fast pulley, D, and a loose pulley, E, to receive a belt for running the tool up from the work.

To the shaft B is attached a beveled-gear wheel, F, the teeth of which mesh into the teeth of a beveled-gear wheel, G, attached to the upper end of a shaft, H. The shaft H revolves in bearings I, which slide in grooves or slots in the central cross-bars of the frame A, and have projecting parts provided with screw-holes to receive the screws J. The screws J are swiveled in the frame A, and have small beveled-gear wheels K attached to them, the teeth of which mesh into the teeth of small beveled-gear wheels L, attached to a shaft, M, revolving in bearings in brackets N, attached to the frame A. One of the screws J projects, and to it is attached a hand-wheel, O, so that the said screws J can be readily turned to throw the shaft H into and out of gear.

Upon the shaft H is placed a gear-wheel, P, which is connected with the said shaft by a tongue and groove, so that it can slide up and down freely while being carried around by and with the said shaft in its revolution. The teeth of the gear-wheel P mesh into the sunken teeth of a gear-wheel, Q, attached to a hollow shaft, R, which revolves and slides upon a rod, S, passing through the central cross-bars of the frame A.

To the upper part of the hollow shaft R is attached a small gear-wheel, T, the teeth of which mesh into the teeth of a larger gear-wheel, U. The hub of the gear-wheel U is provided with a screw-thread to receive and fit upon the screw V, the ends of which are attached to bearings W, sliding in grooves in the central cross-bars of the frame A. The bearings W are made with projecting parts, in which are formed screw-holes to receive the screws X, swiveled in holes in the frame A, and having small beveled-gear wheels Y attached to their outer ends. The teeth of the gear-wheels Y mesh into the teeth of the gear-wheels Z, attached to the shaft *a*, which revolves in bearings in brackets *b*, attached to the frame A. The outer end of one of the screws X projects, and to it is attached a hand-

wheel, *c*, so that the said screws X can be readily turned to throw the gear-wheel U into and out of gear.

To the lower side of the gear-wheel U is attached, or upon it is formed, a grooved pulley, *d*, to engage with a pulley or flange, *e*, formed upon or attached to the upper side of the gear-wheel Q, so that as the gear-wheel U moves down and up upon the screw V it will carry the gear-wheel Q and the hollow shaft R with it.

To the lower sides of the gear-wheel Q are attached, or upon them are formed, flanges *f*, which engage the gear-wheel P, so that the said gear-wheel P will move down and up with the said gear-wheel Q.

The lower end of the rod S is attached to the center of the table *g*, to which the work is attached, and which is provided with a number of slots, *h*, to receive the bolts for securing the said work in place.

Upon the ends of the table *g* are formed guide-arms *i*, which enter guide-grooves *j* in the upright bars of the frame A, so that the said table will be kept in position as it moves up and down.

In the centers of the ends of the table *g*, or in arms formed upon the said ends, are formed screw-holes to receive the screws *k*, which are swiveled to the lower part of the frame A, and have small beveled-gear wheels *l* attached to their lower ends. The teeth of the gear-wheels *l* mesh into the teeth of the small beveled-gear wheels *m*, attached to the shaft *n*, which revolves in bearings in the lower part of the frame A, and has a hand-wheel, *o*, attached to its projecting end, so that the screws *k* can be readily turned to raise and lower the table *g*, as the height of the work may require.

p is a plate, which is provided with lugs *q* and a set-screw, *r*, for securing it to the lower end of the hollow shaft R, and which is slotted to receive the holder *s* for the tool *t*.

In the upper part of the tool-holder *s* is formed a screw-hole to receive a screw, *u*, which is swiveled to lugs *v*, formed upon the plate *p*, and has a hand-wheel, *w*, attached to its end, for convenience in adjusting the tool-holder *s* and the tool *t* by hand.

To the swiveled screw *u* is attached a small gear-wheel, *x*, the teeth of which mesh into the teeth of the segment *y* of a gear-wheel attached to the lower side of the lower central cross-bar of the frame A, so that the tool-holder *s* and the tool *t* will be moved outward automatically at each revolution of the hollow shaft R. I prefer to make the segments *y* in sections, as indicated in dotted lines in Fig. 2, so that the amount of feed at each revolution of the hollow shaft R can be increased or diminished by adding or taking away sections of the said segment *y*. The downward movement of the hollow shaft R is limited by a collar, *z*, placed upon the said hollow shaft, and secured to it, when required, by a set-screw, 1. The downward movement of the rod S and of the work-table *g* is limited by a collar, 2, placed upon the upper end of the said rod, and secured to it by a set-screw, 3.

The tool holding and adjusting mechanism herein shown and described are used for facing metal disks and other plates and doing other similar work requiring only a horizontal feed, and when used the gear-wheel U of the feed-screw V is thrown out of gear, and the collar *z* is secured to the hollow shaft R by the set-screw 1 to prevent the said hollow shaft from having a downward movement.

When the machine is used for boring or facing the inner surface of cylinders and doing other similar work requiring a vertical feed, the gear-wheel U of the screw V is thrown into gear and the collar *z* is loosened, so that the hollow shaft R and the tool connected with it will be fed down automatically. In this case the tool is attached to the end of the plate *p*, so as to act upon the inner surface of the work.

When the feed and adjusting screws are out of gear, the rod S and the table *g* can be raised quickly by means of a rope or chain, 4, attached to the upper end of the said rod S, and passing over a pulley, 5, pivoted to the frame of the building or some other suitable support.

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

1. A machine for boring, drilling, and facing metals, constructed substantially as herein shown and described, and consisting of the hollow tool-carrying shaft rotating and sliding upon a guide-rod, and connected with the drive-shaft and the feed-screw by gearing, as set forth.

2. In a machine for boring, drilling, and facing metals, the combination, with the gear-wheel U, working on a stationary feed-screw, V, and the gear-wheel Q, attached to the hollow tool-carrying shaft R, of the grooved pulley *d* and the flange *e*, substantially as herein shown and described, whereby the said feed-screw gear-wheel is made to carry the said tool-carrying hollow shaft up and down, as set forth.

3. In a machine for boring, drilling, and facing metals, the combination, with the hollow shaft R, the plate *p*, the tool-holder *s*, and the feed-screw *u*, of the gear-wheel *x* and the stationary gear-segment *y*, substantially as herein shown and described, whereby the rotation of the said shaft is made to feed the tool forward to its work, as set forth.

4. In a machine for boring, drilling, and facing metals, the combination, with the hollow tool-carrying shaft R and the work-table *g*, of the rod S, substantially as herein shown and described, whereby the said hollow shaft is guided and supported, as set forth.

WILLIAM EDWARD WILD.

Witnesses:
JAMES T. GRAHAM,
C. SEDGWICK.