

(No Model.)

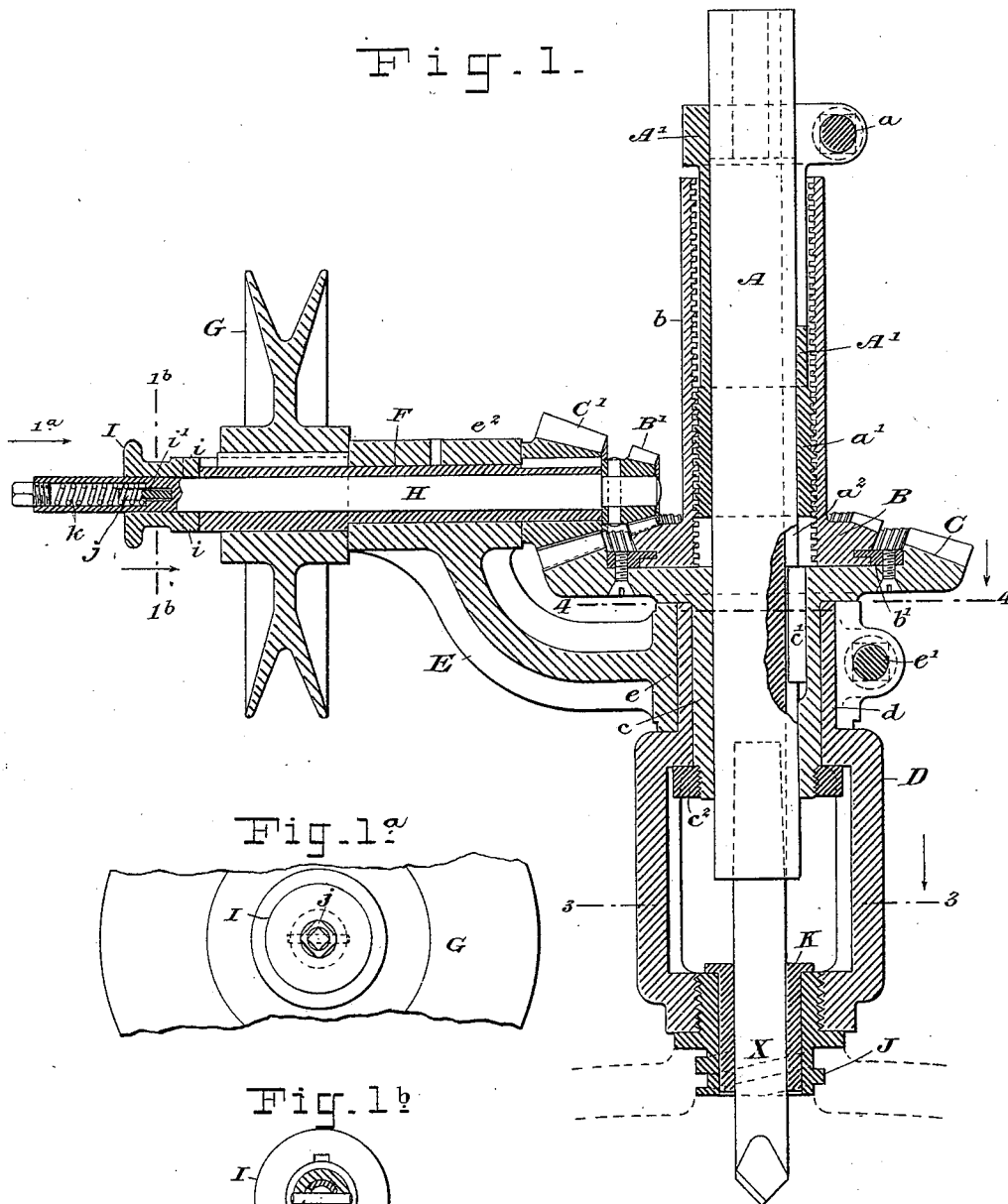
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J. T. HALSEY.
PORTABLE DRILLING MACHINE.

No. 402,924.

Patented May 7, 1889.

Fig. 1.



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(No Model.)

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Fig. 2.

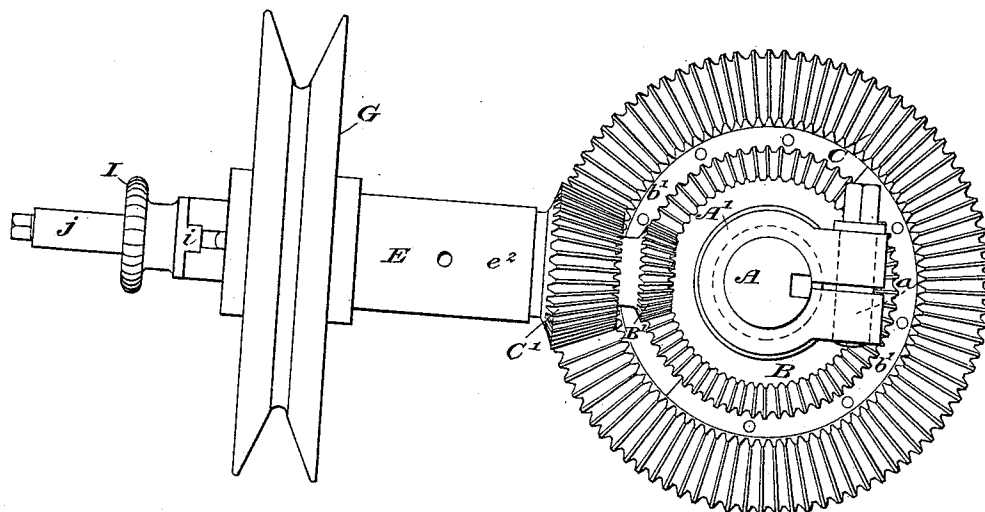


Fig. 3.

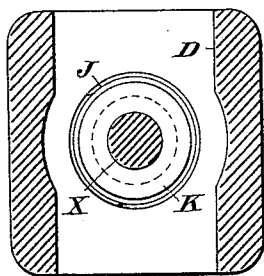
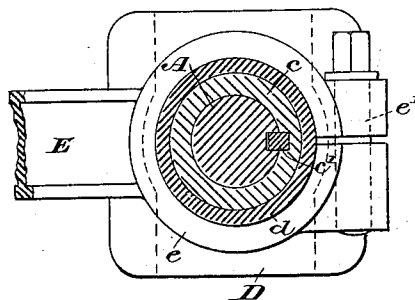


Fig. 4.



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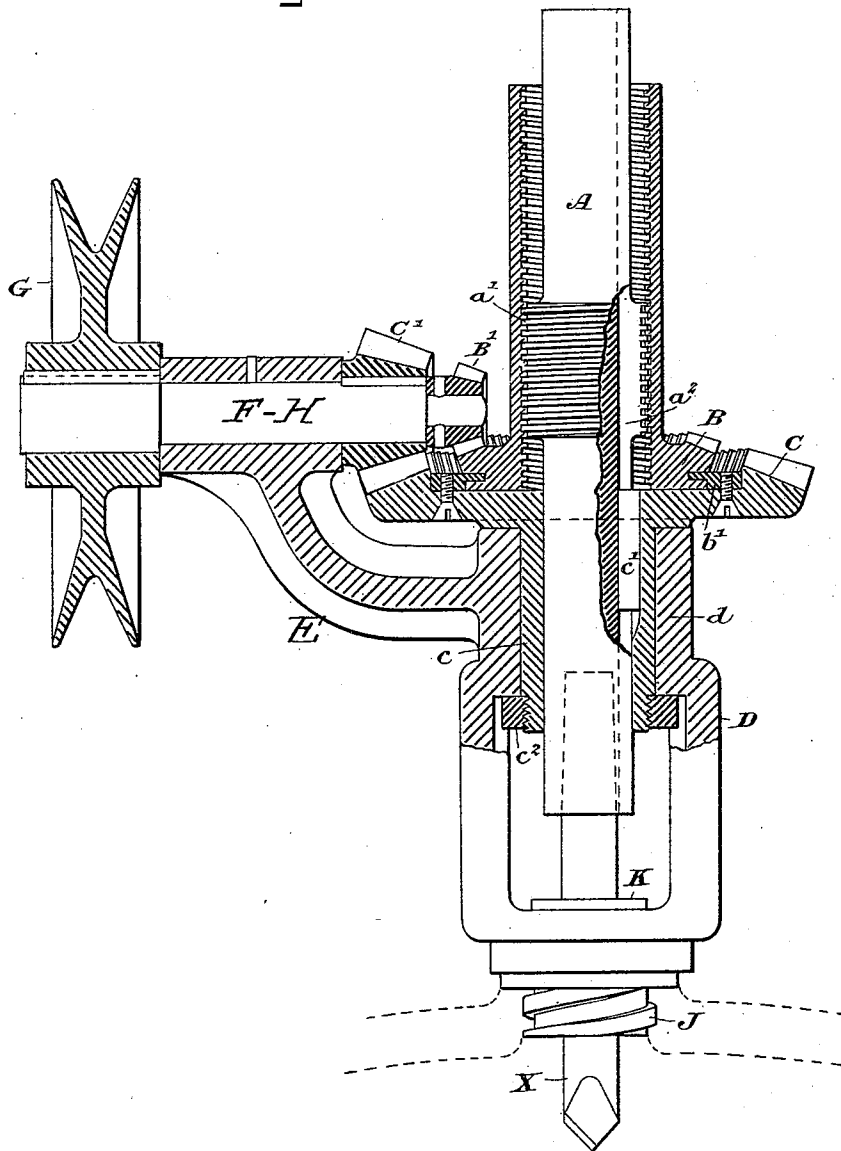
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Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES T. HALSEY, OF PATERSON, NEW JERSEY.

PORTABLE DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 402,924, dated May 7, 1889.

Application filed July 18, 1888. Serial No. 280,245. (No model.)

To all whom it may concern:

Be it known that I, JAMES T. HALSEY, a citizen of the United States, and a resident of Paterson, in the county of Passaic and State of New Jersey, have invented certain Improvements in Portable Drilling-Machines, of which the following is a specification.

My invention relates, in the main, to that class of drills or drill-presses used for boring or drilling metal; and the object of my invention is to provide a portable drill or drill-press with an automatic feed, and one having special advantages that adapt it for use with "jigs" or templets.

My invention will be fully described hereinafter, and its novel features carefully defined in the claims.

In the accompanying drawings, which serve to illustrate my invention, Figure 1 is a vertical axial section of a drill embodying my improvements. Fig. 1^a is an end view as seen from arrow 1^a in Fig. 1, and Fig. 1^b is a cross-section on line 1^b 1^b in Fig. 1. Fig. 2 is a plan view of the drill. Fig. 3 is a cross-section on line 3 3 in Fig. 1. Fig. 4 is a cross-section on line 4 4 in Fig. 1. Fig. 5 is a view similar to Fig. 1, illustrating a modified construction.

A is a holder, which is preferably cylindrical, provided with a socket in one or both ends to receive and hold any suitable or ordinary drill, as X in Fig. 1. On this holder is fitted a sleeve, A', which is split at its upper end and provided with a clamp-screw, a, whereby the sleeve is secured firmly but removably to the holder. These parts A and A' may be considered as one or integral, as they move together as one piece in the operation of the machine.

A portion, a', of the sleeve A' is provided with an external screw-thread, which engages an internal screw-thread on the elongated tubular boss b of a bevel-wheel, B. This bevel-wheel rotates on the face of a larger bevel-wheel, C, and is held down to the latter by clips b' b', which are secured to the wheel C and take over some part of the wheel B. The bevel-wheel C has a tubular boss, c, through which the drill-holder A plays longitudinally, and a spline, c', in this boss engages a spline-groove, a², in the holder A.

(See Fig. 5.) This spline c' compels the holder to rotate with wheel C. The boss c of wheel C is rotatively mounted in a base-piece, D, and is retained in place by a ring-like nut, c², or other like device.

On the base-piece D is a cylindrical neck, d, which is clamped by a split band, e, forming part of a bearing-bracket, E. The band e is provided with a clamp-screw, e', whereby said band may be securely clamped to the base-piece D. In the bracket E is formed a bearing, e², for a tubular shaft, F, on which is secured a bevel-pinion, C', which meshes with the bevel-wheel C. On shaft F is also mounted a driving-sheave or pulley, G, whereby rotary motion is imparted to said shaft. Mounted in the tubular shaft F is another shaft, H, on which is secured a bevel-pinion, B', which meshes with bevel-wheel B. The shafts F and H have a coupling device, illustrated in the first four figures of the drawings. On the projecting end of shaft H (seen at the left in Figs. 1 and 2) is a clutch-slide, I, which is provided with one or more teeth or projections, i, which engage corresponding recesses or notches in the end of the tubular shaft F. This slide I is compelled to rotate with the shaft H by means of a transverse bar, i', which extends diametrically through a slot, j, in shaft H, and is secured at its ends in the slide I. The slot in which bar i' plays is long enough to allow the slide to be drawn back far enough for the teeth i to disengage, and to keep the parts in engagement a spring, k, is arranged in a bore in shaft H behind the bar i', as seen in Fig. 1. The slot j is made a little wider than the bar i', in order that when the slide I is drawn back and disengaged it may be turned axially far enough to put the teeth i out of register with the recesses in the end of shaft F, and thus hold the slide out of engagement.

In the base-piece D is rigidly secured a screw, J, which is tubular for the passage of the drill. This screw is screwed into the jig or templet, a part of which is indicated in dotted lines in Fig. 1. This templet will be secured firmly to the piece to be drilled in a way well understood by machinists, and the setting of the screw J in said templet forms a firm and immovable support for the base-

piece D during the drilling operation. This screw attachment of the machine to the templet or fixed part enables the machine to be readily detached and moved about from place to place in the shop or yard where the work is to be done.

I have not deemed it necessary to illustrate the jig or templet more fully, as this is a common device well known to machinists and forms no part of the drilling-machine, properly speaking.

The principle upon which the feed operates is differential—that is to say, if the two wheels B and C were rotated with the same speed in the same direction there would be no feed, as the screws on the holder A and wheel B would rotate together; but if the wheel B were retarded and not permitted to revolve as fast as wheel C, then the feed would be measured by the difference between the speeds of the two wheels. For example, suppose the feed-screw has six threads to the inch. Then if wheel B were held against rotation the drill would be fed one inch in making six revolutions; but suppose the wheel B, carrying the knot of the feed-screw, is caused to make twenty-four revolutions while the wheel C, rotating the holder A, makes twenty-five revolutions, then the drill will advance one-sixth of an inch in making twenty-five revolutions.

The operation of the machine is as follows: By loosening the clamp-screw *a* the holder A may be drawn out of the sleeve A', or be set therein at any point and clamped fast. When the holder A is out, the screw-sleeve A' may be screwed up or down in the nut-boss *b* of wheel B. When the drill has been set in the holder and the latter clamped fast in sleeve A', the base-piece is screwed into the jig. By loosening clamp-screw *e* the bearing-bracket E may be swung around to any point most convenient for applying a driving-belt to sheave G.

The machine is adapted to be driven by a well-known form of driving-belt provided with tension-weight.

When the drill is set in motion, shafts F and H rotate together, the pinion B' driving wheel B and the pinion C' driving wheel C; but pinion B' does not drive the wheel B as fast as pinion C' drives wheel C, and this difference of speed effects and measures the feed. I prefer that wheel C should make twenty-five revolutions while wheel B makes twenty-four revolutions; but I do not limit myself to this proportion.

The boss *b* of wheel B forms the nut of the feed-screw, and the boss *c* of the wheel C forms the driver for rotating the holder A. In carrying out my invention, so far as the feed is concerned, it is only necessary that these parts *b* and *c* shall be rotated simultaneously in the same direction, but at different rates of speed. To effect this, I provide each of said parts with a toothed bevel-wheel—that is, the wheels B and C—and

drive these by means of the respective pinions B' and C', which, as they normally rotate in unison, might be on one shaft. By disengaging the shafts F and H, through the medium of the slide I, the holder A may be moved up or down by rotating the shafts independently.

In order to steady and guide the drill, I usually provide the base-piece with a removable tubular bush, K, which has a bore that fits the body of the drill. Where drills of different sizes are to be used, there may be a bush to fit each size.

My invention is susceptible of some modification without any material departure from the principles involved. For example, as has been stated, the holder or bar A might be integral with the screw-sleeve A'; but the construction shown has special advantages. The bracket E might also in some cases be made integral with the base-piece D. The advantages of the construction illustrated and described have been set forth. Good results might also be produced if the shafts F and H were integral or permanently connected together, as also stated. For convenience of construction, the holder A is made cylindrical and splined in the driver *c*; but a well-known equivalent of this feature may be employed—namely, the holder may be square or polygonal and the bore in the driver be of the same form so as to fit it. It is only essential that the holder shall rotate with its driver, but be free to play through it longitudinally in feeding.

The band *e* of the bracket E may be secured against rotation by any form of clamp or set-screw. Being mounted concentrically with the drill-holder and with wheels B and C, the bracket may be set in any desired position without disturbing the engagement of the driving-pinions with said wheels.

In Fig. 5, which is a view similar to Fig. 1, I have shown a construction wherein the shafts F and H are constructed in one and designated by F H. The clutch is of course omitted. This view also shows the portion *a'* of the sleeve A' (which bears the male screw) as formed integrally with the holder A and the bracket-band (*e* in Fig. 1) as formed integrally with the base-piece D.

Having thus described my invention, I claim—

1. In a drilling-machine, the combination, with a base-piece, as D, and a driver for the drill-holder mounted rotatively therein, of the said holder, as A, mounted in the driver, as described, and provided with a feed-screw, a feed-nut embracing said screw, and gears, substantially as described, driven from a common source for rotating said driver and nut simultaneously in the same direction but at different rates of speed.

2. In a portable drilling-machine, the combination, with the base-piece, as D, having a cylindrical neck, as *d*, of the bearing-bracket, as E, for the driving-shaft, provided with a

band, as *e*, which embraces the said neck on the base-piece, and with a securing-screw, as *e'*, substantially as set forth.

3. In a drilling-machine, the combination,
5 with a base-piece, as D, and a driver for the drill-holder rotatively mounted therein, of the said holder, as A, provided with a feed-screw, the feed-nut embracing said screw, the toothed wheel B, forming a part of said nut, the
10 toothed wheel C, forming a part of said driver, the driving-pinions, as B' and C', in mesh with said wheels, respectively, and the shafts, as H and F, of said pinions arranged one within the other, the driving-sheave, as G, on the ex-
15 terior shaft, and the clutch connecting said shafts, whereby they may be driven in unison or independently, all arranged to operate substantially as set forth.

4. A portable drilling-machine having its
20 base-piece, as D, provided with an aperture

for the passage of the drill, and provided also with a tubular male screw, as J, for securing the drill in the proper position for drilling, said tubular attaching-screw being adapted to embrace the drill, as set forth.

5. The combination, with a portable drill-
ing-machine having its base-piece or stock provided with a tubular male screw, J, for se-
curing the drill to a templet, of a templet pro-
vided with a female screw to receive the said
30 male screw on the drilling-machine, which lat-
ter screw embraces the drill and centers it, as set forth.

In witness whereof I have hereunto signed
my name in the presence of two subscribing
35 witnesses.

JAMES T. HALSEY.

Witnesses:

HENRY CONNETT,
J. D. CAPLINGER.