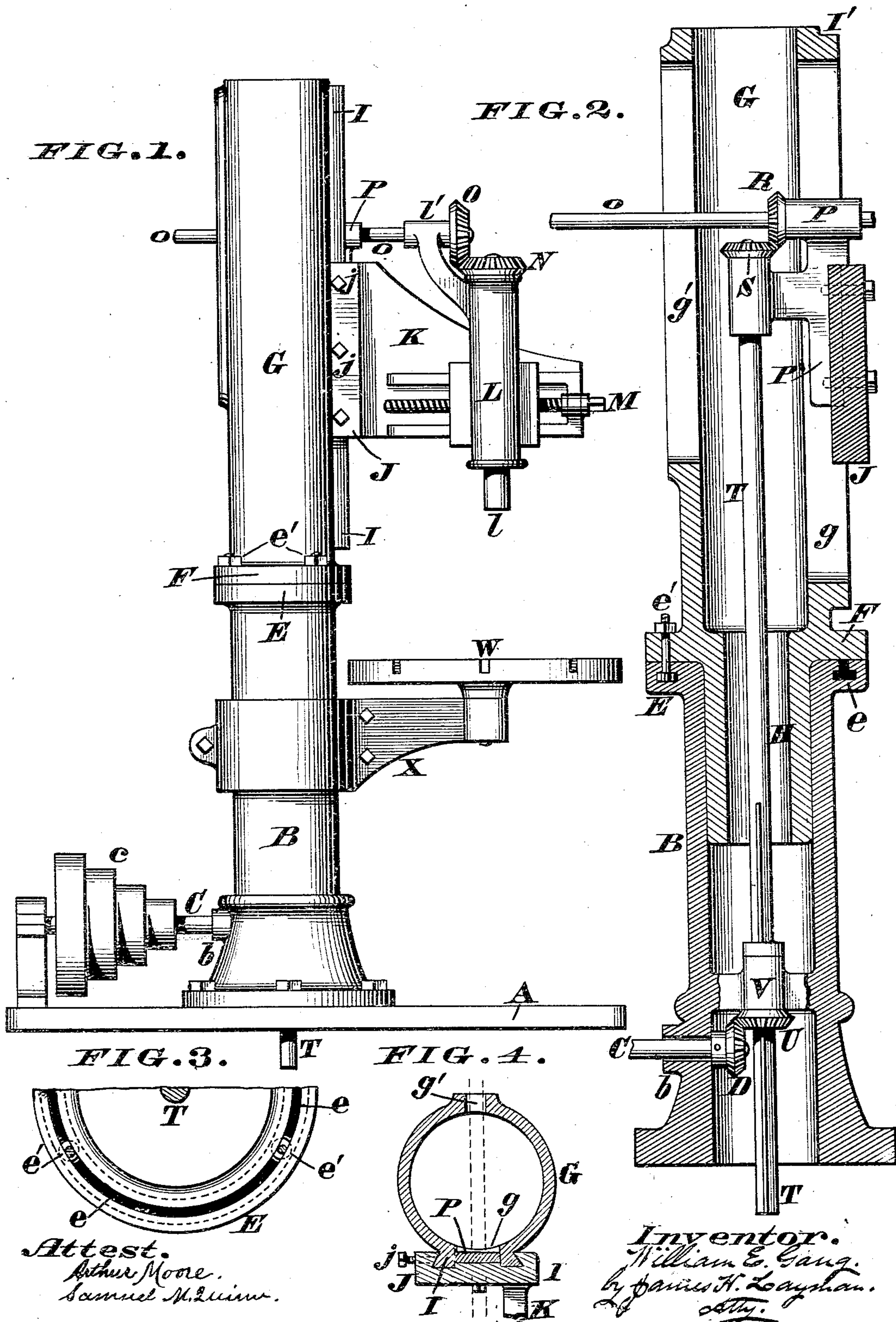


(No Model.)

W. E. GANG.
DRILL PRESS.

No. 462,309.

Patented Nov. 3, 1891.



UNITED STATES PATENT OFFICE.

WILLIAM E. GANG, OF CINCINNATI, OHIO.

DRILL-PRESS.

SPECIFICATION forming part of Letters Patent No. 462,309, dated November 3, 1891.

Application filed August 31, 1891. Serial No. 404,211. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. GANG, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Drill-Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the annexed drawings, which form part of this specification.

This invention relates to those machine-shop appliances commonly known as "radial" drill-presses; and the first part of my improvements consists in making the supporting column or posts of such presses of an upper and lower section, which latter is fixed to the bed-plate or other foundation, while the upper section is capable of being turned around on this stationary section. The upper section must be hollow or tubular and have two diametrically-opposite longitudinal slots to admit a horizontal shaft having bevel-gear connections with the drill-spindle, the stock of the latter, together with said shaft, being carried by a radial arm projecting from a slide that traverses one of said slots. This horizontal shaft has a bevel-gear connection with a vertical shaft housed within the upper or hollow section of the column; but in some cases the lower section may also be hollow and have said shaft carried down through it, as hereinafter more fully described. When the column is thus formed of two hollow sections or members, the driving-shaft is situated at the base of the same, and a system of bevel-gears is employed for communicating motion from said shaft to the drill-spindle, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a side elevation of my improved radial drill, the unimportant accessories thereof being omitted. Fig. 2 is an enlarged axial section of the two-part column and its immediate attachments. Fig. 3 is an enlarged plan of the coupling-flange at the upper end of the lower part of the column. Fig. 4 is a horizontal section of the upper member of said column.

A represents a bed-plate or other foundation, to which is secured the lower stationary section or member B of the supporting column or post, which section is a stout casting with a bearing *b* at one side thereof to admit a

driving-shaft C, the latter having a stepped pulley *c*, that provides for a variable speed in the usual manner, the concealed end of said shaft being furnished with a bevel-gear D, that operates the vertical shaft of the press, as will presently appear. The upper end of this fixed section B has an annular flange E, provided with an annular groove *e*, which is wider at bottom than at top, and is adapted to receive the heads of inverted bolts *e'*, said bolts being secured in a similar flange F of the upper column-section G, the lower portion of which takes the shape of a tubular extension H. This extension or neck projects down into the other section B a sufficient distance to afford the necessary rigidity of the column. Furthermore, this upper section G has on one side a wide longitudinal slot *g* and on the opposite side a relatively narrower longitudinal slot *g'*, the wide slot *g* being flanked with a pair of guides I I', having undercut edges, as seen in Fig. 4. Fitting snugly within this wide slot *g* is a stout slide J, preferably integral with a radial arm K, and having binding-screws *j*, that bear against the undercut edge of guide I and thereby retain said arm and its attachments at any appropriate elevation. The principal fixture to this arm is a drill-stock L, to whose spindle *l* any form of tool may be applied, said stock being advanced and retracted by a customary traversing-screw M, and the spindle being revolved by a bevel-gear N at its upper end. This gear N engages with a bevel-wheel O, attached to a horizontal shaft *o*, that passes through the diametrically-opposite slots *g g'*, and is journaled in a pair of bearings P, one of which P' is carried by the drill-stock L, while the other bearing P is fastened to the slide J, as more clearly seen in Fig. 2.

R is a bevel-gear that drives the shaft *o*, which gear receives its motion from a similar wheel S at the upper end of a vertical shaft T, that occupies an axial position within the tubular portion of the column, said shaft being confined to this position by the bearing P and the elongated hub of a bevel-gear U, situated near the base of section B. B is a bearing within which this hub is journaled.

W is a turn-table, whose supporting-bracket X is capable of being clamped to the stationary column B in the usual manner.

My machine is used in practically the same way as most drill-presses, the only material difference being the method of securing the radial arm K at the desired elevation, which attachment is readily effected by tightening the screw or screws *j*. This simple act so bends or springs the guides I I' inwardly or toward each other as to clamp the slide J immovably in place, and thereby prevent any vertical shifting of the arm, although the latter can be readily swung around in a horizontal plane to present the drill in the most effective position for doing its work; but this arm can swing only as the upper section G of the column turns on the lower or immovable section B, preparatory to which movement the nuts of bolts *e'* must be unslackened, and when the desired position has been reached said nuts are again tightened. Consequently these bolts, together with the neck II and flanges E F, coact in preserving the necessary rigidity of the supporting part of the press and render the column as firm as though it were a single casting from top to bottom. Motion is communicated from the driving-shaft C to the drill or other tool by means of the gears D U, vertical shaft T, gears S R, horizontal shaft *o*, gears N O, and spindle *l*, the proper shafts and gears being provided with tongues and grooves or other similar appliances that will enable said shafts to turn and be shifted longitudinally as occasion requires. Finally, it will be noticed that this drill-press has very few exposed gears, and being entirely free of overhead attachments it can be operated in many shops where the ordinary forms of such machines would be inadmissible.

I claim as my invention—

1. The combination, in a drill-press, of a lower stationary support and an upper tubu-

lar column turning thereon, said upper column being provided with two diametrically-opposite longitudinal slots for the passage of a shaft carried by a slide from which a radial arm projects, which slide traverses one of said slots and has a device for retaining it at any desired elevation, substantially as herein described.

2. The combination, in a drill-press, of the lower stationary tubular column B, the upper tubular column G, turning thereon, which column G has two diametrically-opposite longitudinal slots *g g'* for the passage of a shaft *o*, carried by a bearing P, and a slide J, from which latter projects the radial arm K, said arm being furnished with a shiftable tool-stock L, and gears N O R S being employed for driving the spindle *l* from a vertical shaft T, occupying an axial position within said column B G, all as herein described.

3. In a drill-press column provided with a longitudinal slot *g*, having undercut guides I I' on the sides thereof, the arm-slide J, traversing said slot and furnished with a screw *j*, that bears against the edge of one of said guides, for the purpose herein described.

4. A drill-press column composed of a hollow upper section turning on a fixed lower section, the upper section being provided with a pair of diametrically-opposite longitudinal slots for the passage of a shaft having geared connection with the drill-spindle, said shaft being geared to a shaft housed within said column, substantially as herein described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM E. GANG.

Witnesses:

JAMES H. LAYMAN,
SAMUEL M. QUINN.

Correction in Letters Patent No. 462,309.

It is hereby certified that in Letters Patent No. 462,309, granted November 3, 1891, upon the application of William E. Gang, of Cincinnati, Ohio, for an improvement in "Drill Presses," an error appears in the printed specification requiring correction as follows: In line 100, page 1, the reference letter "B" commencing the sentence, should read V; and that the Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 1st day of December, A. D. 1891.

[SEAL.]

CYRUS BUSSEY,

Assistant Secretary of the Interior.

Countersigned:

W. E. SIMONDS,

Commissioner of Patents.