(No Model.)

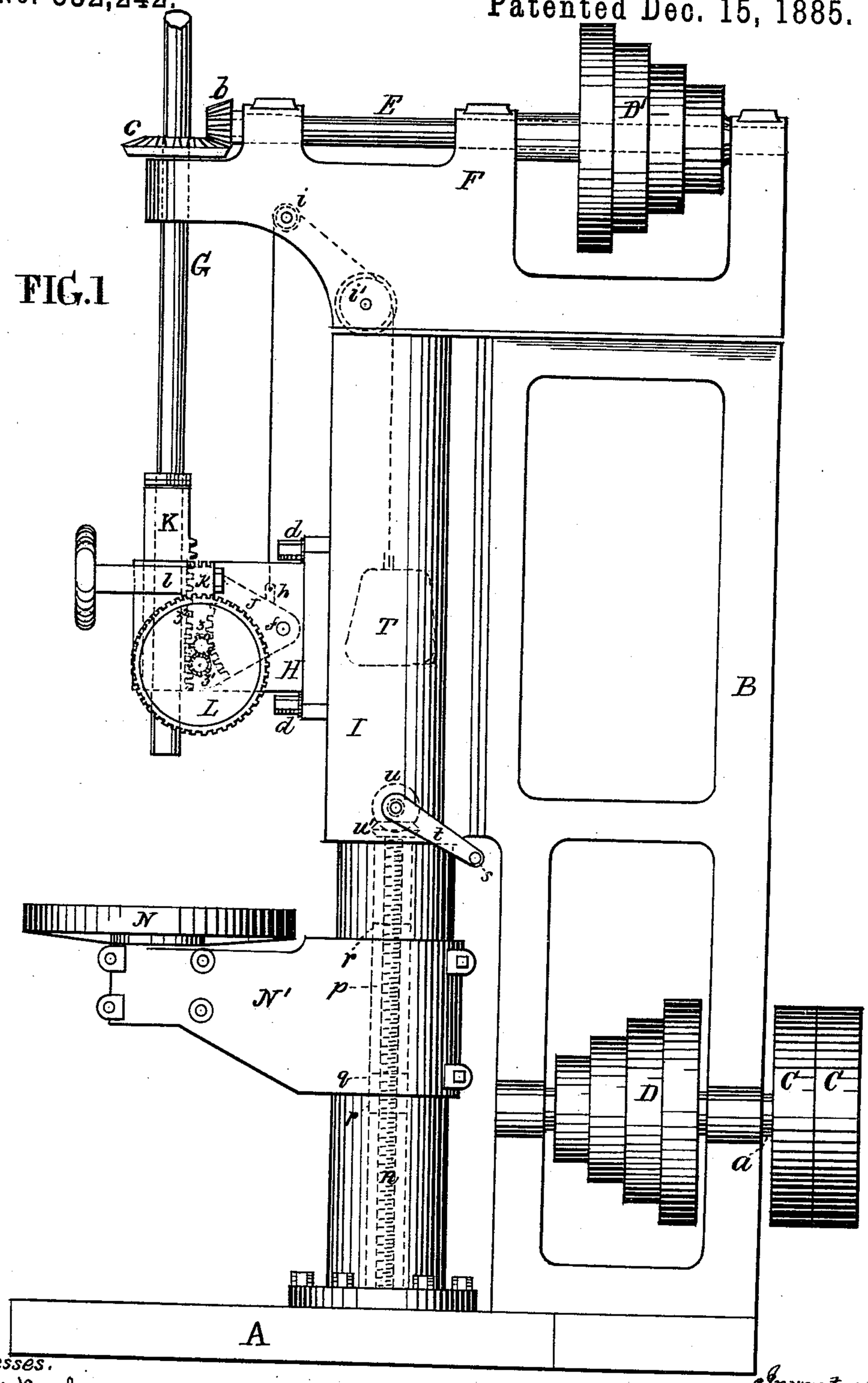
4 Sheets—Sheet 1.

W. EVANS.

DRILL PRESS.

No. 332,242. Patented Dec. 15, 1885.

FIG. 1



Witnesses.
S. E. W. Bewley.
James I. Smith

Inventor.
William Evans.
per Thomas J. Bewley, Att'y

(No Model.)

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FIG. 2

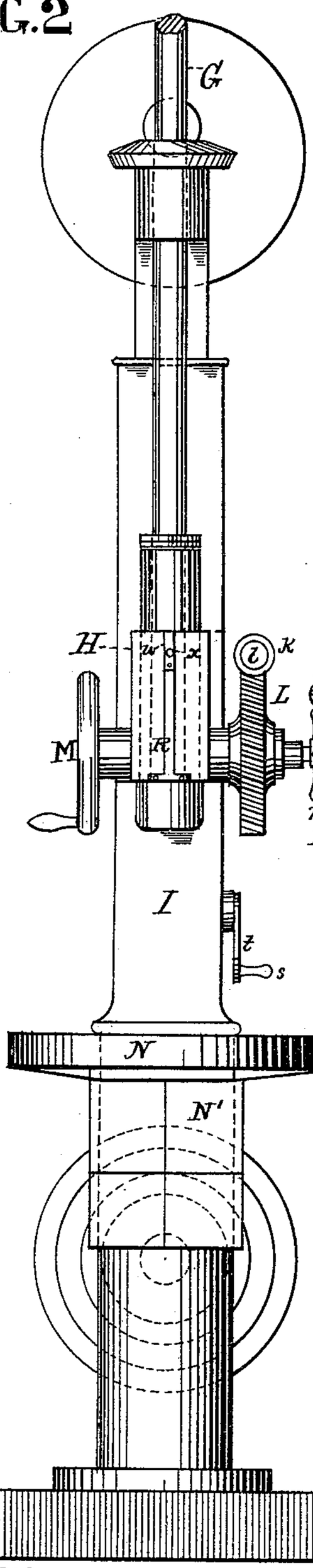
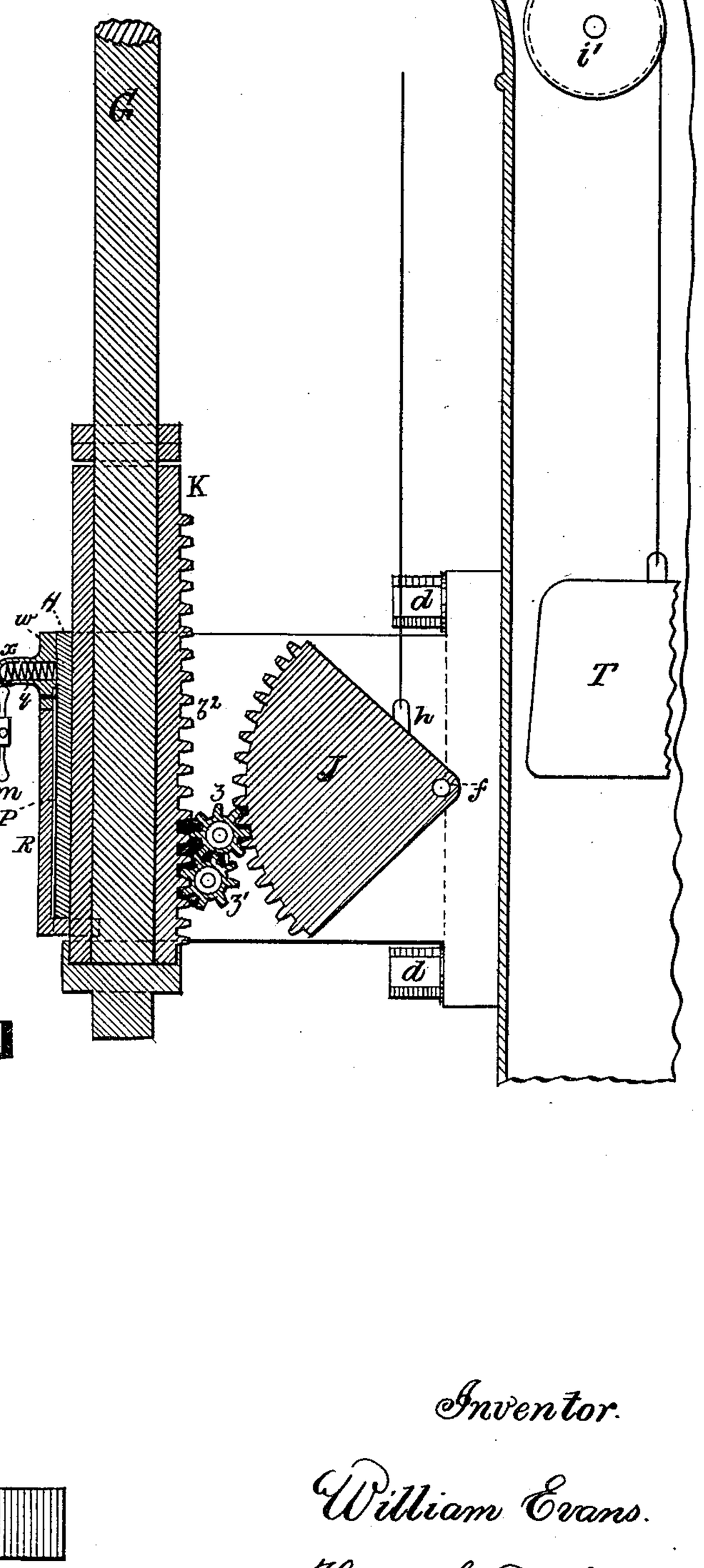


FIG. 3



Witnesses.
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James L. Smith

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William Evans.
per Thomas J. Bewley, atty.

(No Model.)

4 Sheets—Sheet 3.

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DRILL PRESS.

No. 332,242.

Patented Dec. 15, 1885.

FIG. 4

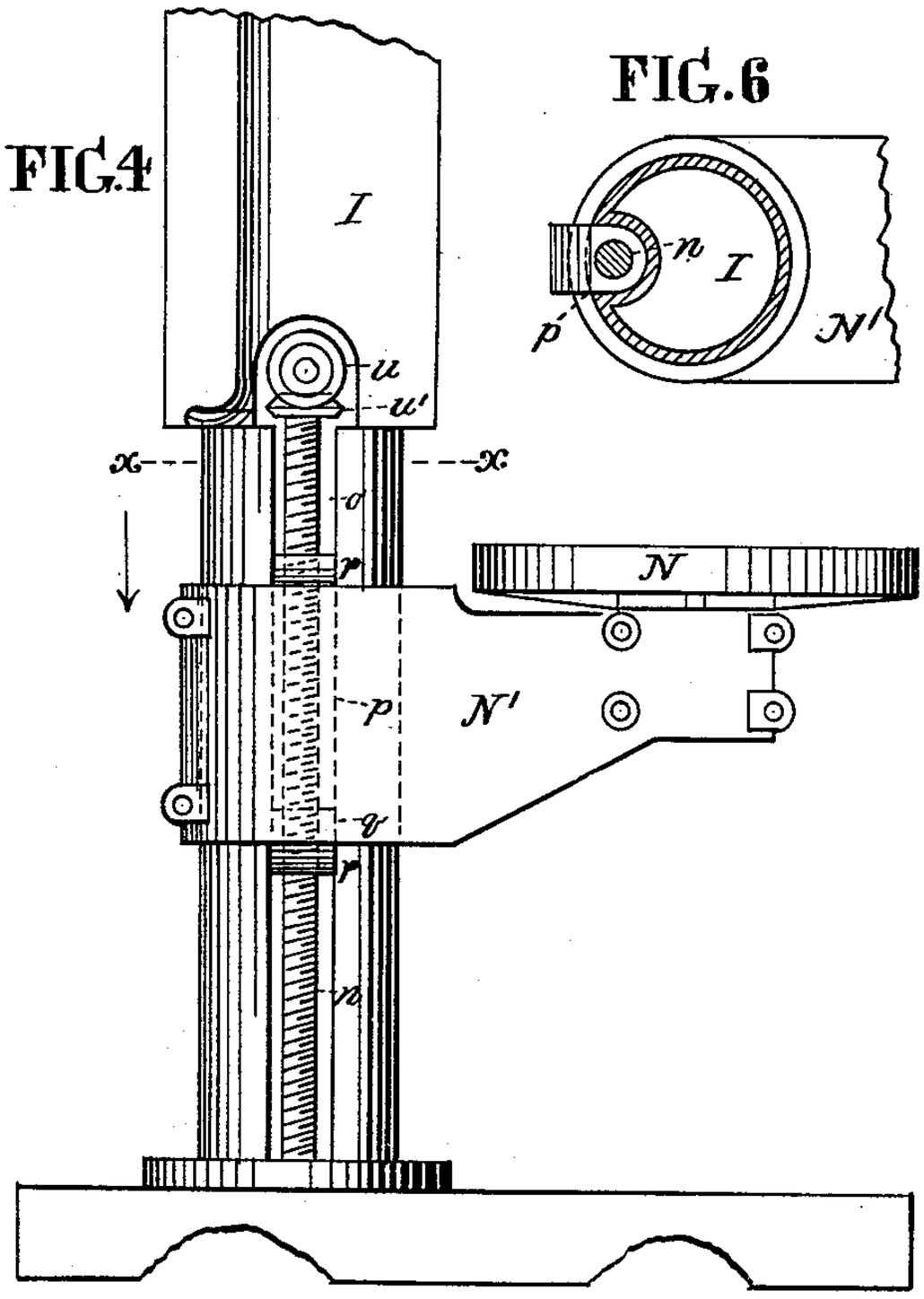


FIG. 6

FIG. 5

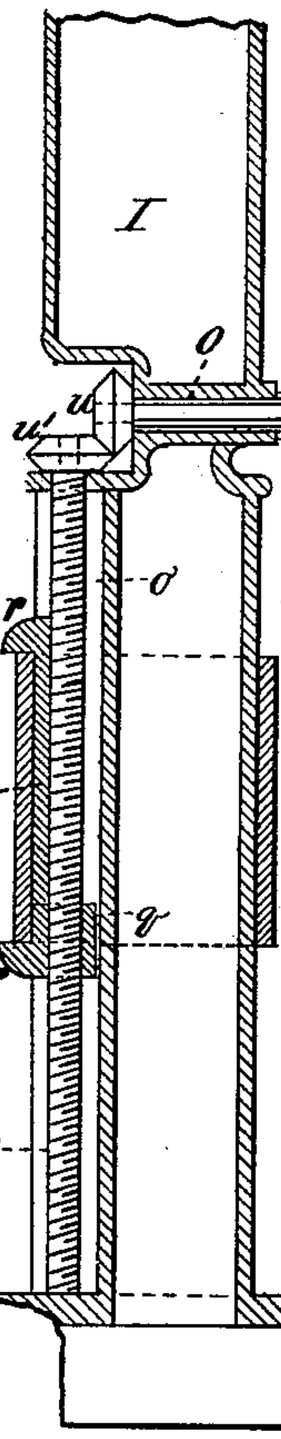
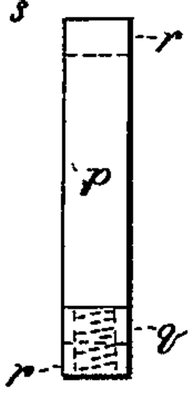


FIG. 7



Witnesses.

S. E. W. Bewley.

James L. Smith

Inventor

William Evans.

per Thomas J. Bewley, Atty

(No Model.)

4 Sheets—Sheet 4.

W. EVANS.

DRILL PRESS.

No. 332,242. Patented Dec. 15, 1885.

FIG. 8

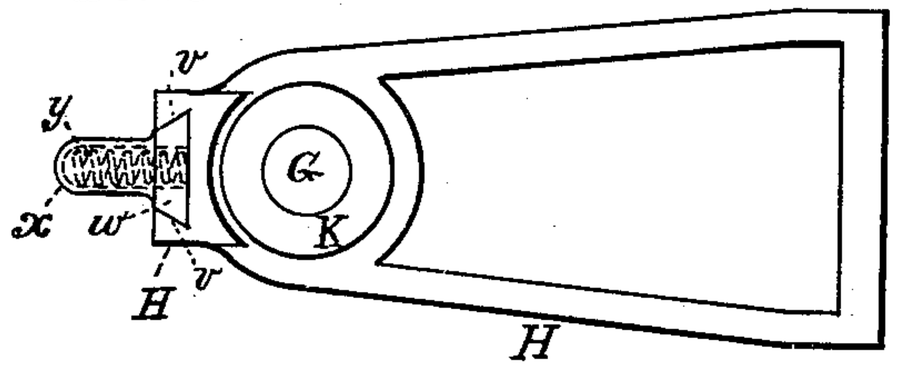


FIG. 9

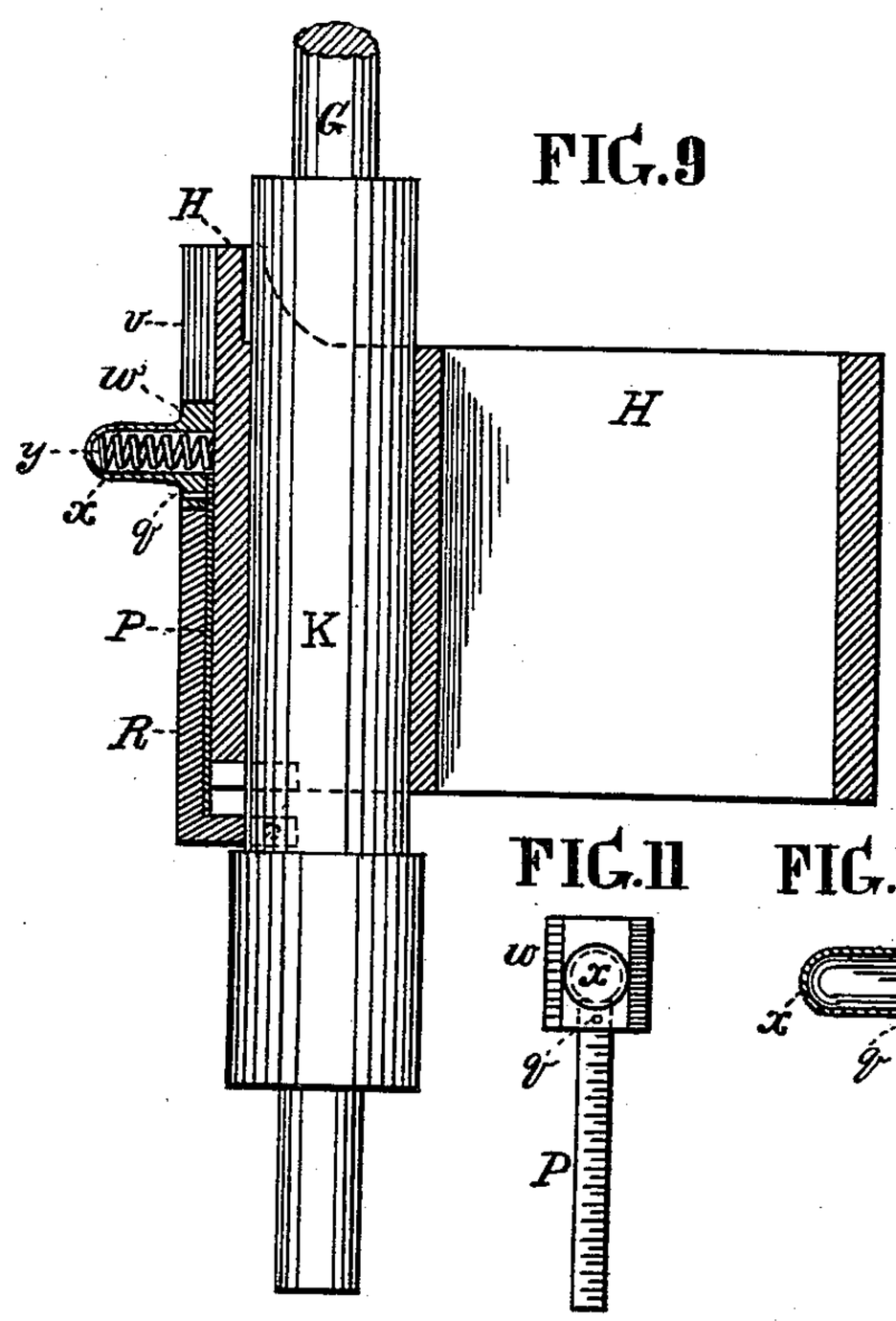


FIG. 10

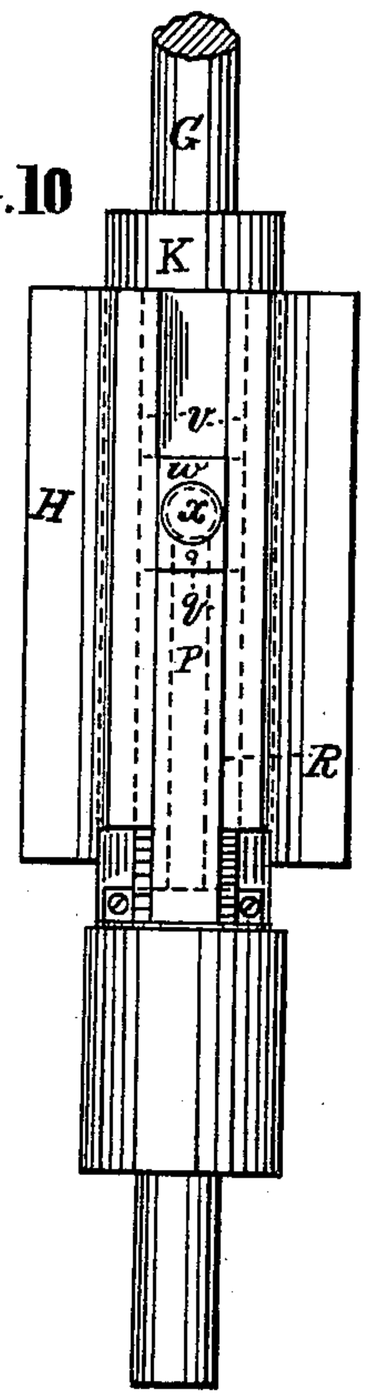


FIG. 11

FIG. 12

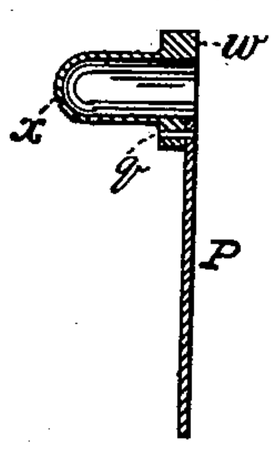


FIG. 13

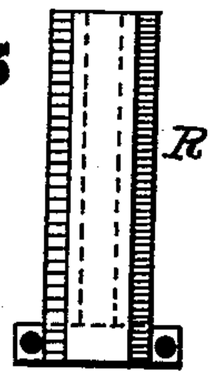
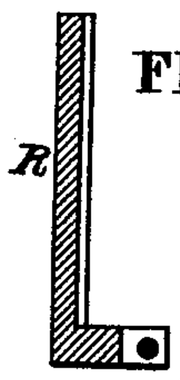


FIG. 14



Witnesses.

S. E. W. Bewley.

Thos. J. Bewley.

Inventor

William Evans.

per Thomas J. Bewley, atty

UNITED STATES PATENT OFFICE.

WILLIAM EVANS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO JOHN H. EVANS AND ROBERT EVANS, OF SAME PLACE.

DRILL-PRESS.

SPECIFICATION forming part of Letters Patent No. 332,242, dated December 15, 1885.

Application filed September 24, 1885. Serial No. 178,103. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EVANS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Drill-Presses, of which the following is a specification.

My invention relates in the first place to an improvement of the movable sliding head of a drill-press; and it consists of a toothed sector that engages by means of intermediate pinions with the teeth of a rack on the sleeve, said sector being provided with a lug upon its upper surface for the attachment thereto of a chain which extends upward, over and around pulleys, and down into the interior of the hollow column of the press, for the connection therewith of a counter-weight. The lug of the sector, to which the chain is attached, is placed in such a position that the counter-weight will always retain the sector in equilibrium with the sleeve, spindle, and drill, as also the head when loosened from its rigid connection with the column, for the purpose of changing the altitudinal position of the head to suit the character of the work to be drilled or bored.

The invention further relates to mechanism for raising and lowering the table and bracket of the press; and it consists of a stud-shaft passing through the column, operated by a crank or wheel, upon the end of which shaft is a miter-wheel which engages with another upon the upper end of a vertical screw-rod extending down to the bed-plate. This rod has a screw-connection with a lug on the nut on the inner surface of the bracket of the table, and by means of the revolutions of the rod the table and bracket are elevated or lowered. The column is recessed or coved at a point upon its periphery to receive the miter-wheels, the screw-rod, and its attachment, so as to present no obstacle to the free horizontal partial rotary movement of the table and bracket.

The invention also relates to an automatic vertical gage, which is attached to the front end of the sliding head in dovetailed grooves. The lower end of the cover of the gage is rigidly connected to the lower end of the sleeve K, by which means, as the drill, spindle, and sleeve fall as the drill bores, the gage is exposed to view, and accurately registers the depth of the bore, as more fully hereinafter described.

In the accompanying drawings, which make a part of this specification, Figure 1 is a side elevation of the press. Fig. 2 is a front elevation. Fig. 3 is a vertical section through the upper part of the column I and the sliding head H, showing the connection between the sector J, pinions $z\,z'$, and rack z^2 of the sleeve K on an enlarged scale. Fig. 4 is an elevation of a portion of the column I, in connection with the table N and bracket N′, taken upon the opposite side to that of Fig. 1. Fig. 5 is a vertical section of the same. Fig. 6 is an end view of the column I, screw-rod *n*, and nut *p*, in connection with the bracket N′. Fig. 7 is an inner face view of the nut *p*. Fig. 8 is a plan view of the head H, showing the piece *w* in the dovetailed grooves *v*. Fig. 9 is a vertical section of the head H, illustrating the mode of connection of the piece *w* and gage P and the sliding cover R in the grooves *v*. Fig. 10 is a front end view. Figs. 11 and 12 are respectively face and vertical sectional views of the piece *w* and gage P. Figs. 13 and 14 are like views of the sliding cover R.

Like letters of reference in all the figures indicate the same parts.

A is the bed-plate of the press; B, the housings. Upon shaft *a* are mounted the driving-pulleys C C and cone-pulleys D.

E is the countershaft, having bearings in the permanent head F. This shaft is also provided with cone-pulleys D′, which are connected to the cone-pulleys D by a belt. The shaft E has upon its forward end the toothed pinion *b*, which gears into the bevel-wheel *c* upon the upper end of the spindle G. As these parts are common to drill-presses, and the means employed for imparting rotary motion to the spindle being well understood, a particular description is deemed not necessary to be given.

H is a sliding head, connected to the face of the column I by means of the bolts *d*, (seen in Figs. 1 and 3,) and is caused to ascend or descend at pleasure on the face of the column when the bolts *d* are loosened. Centrally arranged in a lateral position within a slot of the head H is the sector J, hung upon the pin *f*, the teeth upon the edge of which mesh into

the pinion z, that mesh into the teeth of the pinion z', which in turn mesh into the teeth of the rack z^2 upon the sleeve K. This sleeve K has its vertical passage through an opening of the head H, common to all drill-presses. Upon the upper edge of the sector J is the lug h, to which is attached one end of a chain, that passes upward therefrom, over and around the pulleys i i', and down into the interior of the hollow column I, where it is connected to a counter-weight, T. This weight is sufficient to always maintain the equilibrium of the weight of the sleeve, spindle, and drill when the press is at rest. The lug h is placed in such a position between the fulcrum-pin f and the weight or leverage of the sector J that the counter-weight T will also hold in balance the entire weight of the head, sector, worm, and worm-wheel, and maintain the equipoise between the same and the sleeve and its spindle when the bolts are loosened that preserve the rigidity between the head and column of the press.

Upon the face of the head H (seen in Figs. 1 and 2) is the worm-wheel L, which engages with the worm k upon the stud-shaft l, which is for the purpose of imparting feed-motion to the sleeve, spindle, and drill.

The sleeve, spindle, and drill can be rapidly elevated or lowered at pleasure by turning the hand-wheel M. (Seen in Fig. 2.) The worm-wheel and worm are, however, common to drill-presses and their action well understood.

For the purpose of raising or lowering the table N and bracket N′, there is a vertical screw-rod, n, in the hollow or cove o of the column I, which has a threaded connection with the nut p, passing through the lug q. This nut p is maintained in place upon the inner edge of the side of the bracket N′ of the table N, directly in line with the cove o and screw-rod n, by the lips r r, passing over the edges of the bracket, and causes the elevation or depression of the bracket during the revolutions to the right or left of the screw-rod. The rod and connections are shown clearly in Figs. 4 and 5, and an inner face view of the nut in Fig. 7.

To elevate or depress the bracket N′ and table N, motion is imparted to the handle s on the crank t, (seen in Figs. 1 and 5,) which revolves the stud-shaft O and its miter-wheel u, which meshes with the miter-wheel u' on the upper end of the screw-rod n, whose threaded connection with the lug q of the nut p causes the table and bracket to raise or lower, as may be desired. The rod n and its connections are situated within the outer diameter of the column I, so as to present no obstacle to a horizontal rotating movement being given to the table and bracket.

To the outward end face of the head H is connected in dovetailed grooves v the gage P and its cover or slide R. The gage is riveted to the piece w by means of the pin q, the upper end of said gage extending only to the lower edge of the orifice of the horn x, and its inner surface in line with the inner surface of the head or piece w, and the sliding cover is secured to the lower end of the sleeve K, the head H being notched at the bottom, to allow the cover to come up over the gage the full extent.

The operation is as follows: In starting the press, and consequently the drill, the sleeve, with its spindle and drill, is lowered, with the point of the drill upon the object to be bored, which carries the cover of the gage with the sleeve, leaving the gage exposed to view. The piece w is then pushed down by its horn x, carrying the gage P with it, until its lower edge meets the upper end of the cover R, thus hiding the gage. The press is then started, and as the drill bores the sleeve drops therewith, carrying with it the cover R, which is secured to the sleeve K, exposing the gage to view and enabling the operator to determine the depth of bore, as registered by the distance between the lower end of the piece w and the upper end of the sliding cover R, the face of the gage being scored with division-marks similarly to a rule. The piece w is provided with the hollow horn x, in which is placed the spiral spring y, one end of which bears against the surface of the head, back of the groove v, contiguous to the inner face of the piece w, and the other end against the inner face of the outer end of the horn, the resiliency of the spring forcing the piece w and its connected gage P outward, causing the dovetailed edges of the piece to bear tightly against its corresponding grooves in the end or face of the head H, and to maintain the gage permanently where desired.

The piece w and gage P may be forged or cast in a single piece, if desired.

I claim as my invention and desire to secure by Letters Patent—

1. The sector J, hung upon the fulcrum-pin f, in combination with the pinions z z', rack z^2 of the sleeve K, and head H, all balanced by the counter-weight T, substantially in the manner shown and described.

2. The table N and bracket N′, in combination with stud-shaft O, screw-rod n, connected by the miter-wheels u u', and nut p, provided with the threaded lug q, all arranged within the cove o of the column I, for regulating the altitudinal position of the table and bracket, and permitting horizontal rotary movement of the same, substantially in the manner shown and described.

3. The gage P and piece w, provided with the hollow horn x, for the reception of the spring y, and the cover R, in combination with head H, provided with dovetailed groove v, the gage P and piece w riveted together, and the cover R rigidly connected to the lower end of the sleeve K, substantially in the manner and for the purpose shown and described.

WILLIAM EVANS.

Witnesses:
THOMAS J. BEWLEY,
ROBERT EVANS.