

No. 620,614.

Patented Mar. 7, 1899.

H. H. ROCKWELL & C. F. GERLACH.

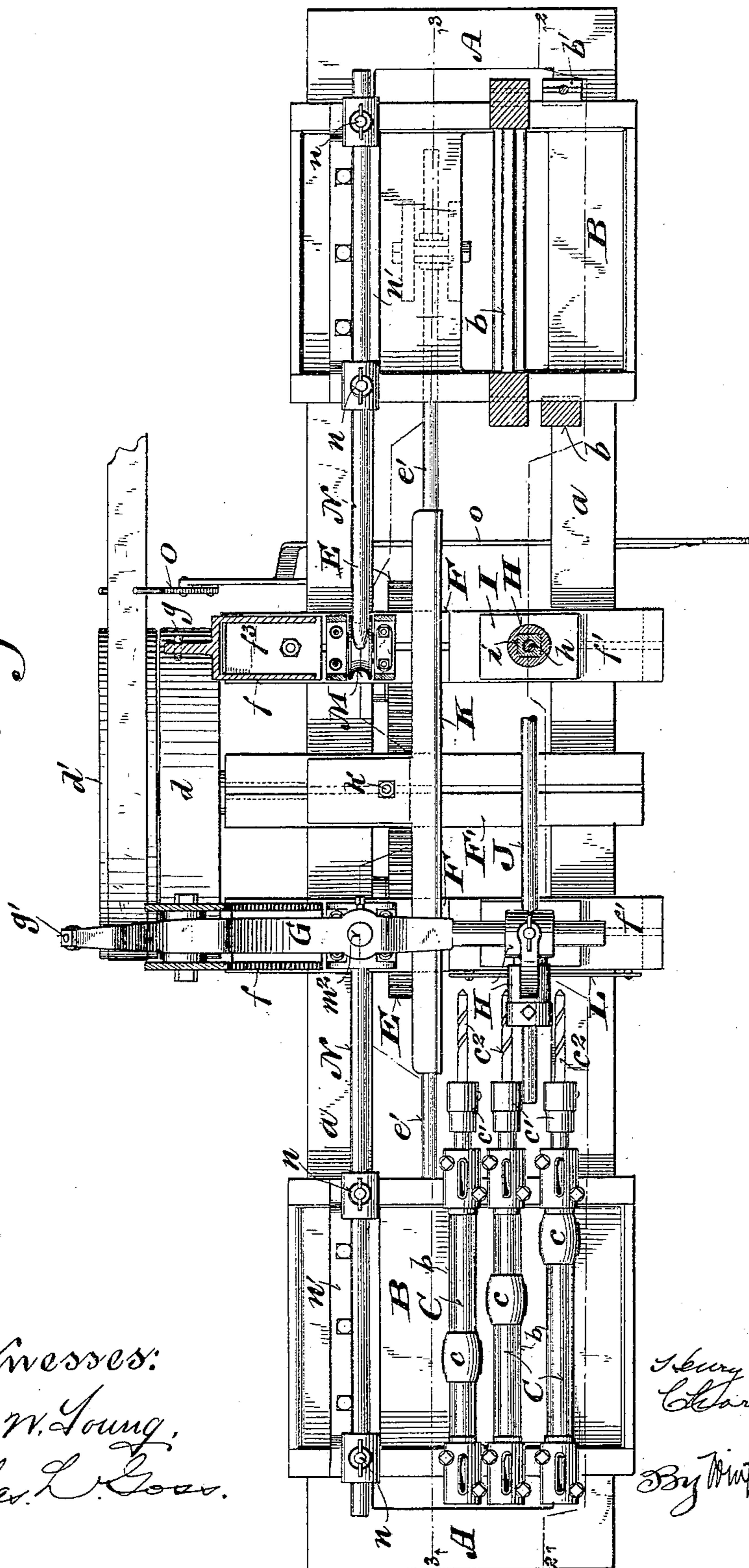
BORING MACHINE.

(Application filed Mar. 22, 1894.)

(No Model.)

4 Sheets—Sheet 1.

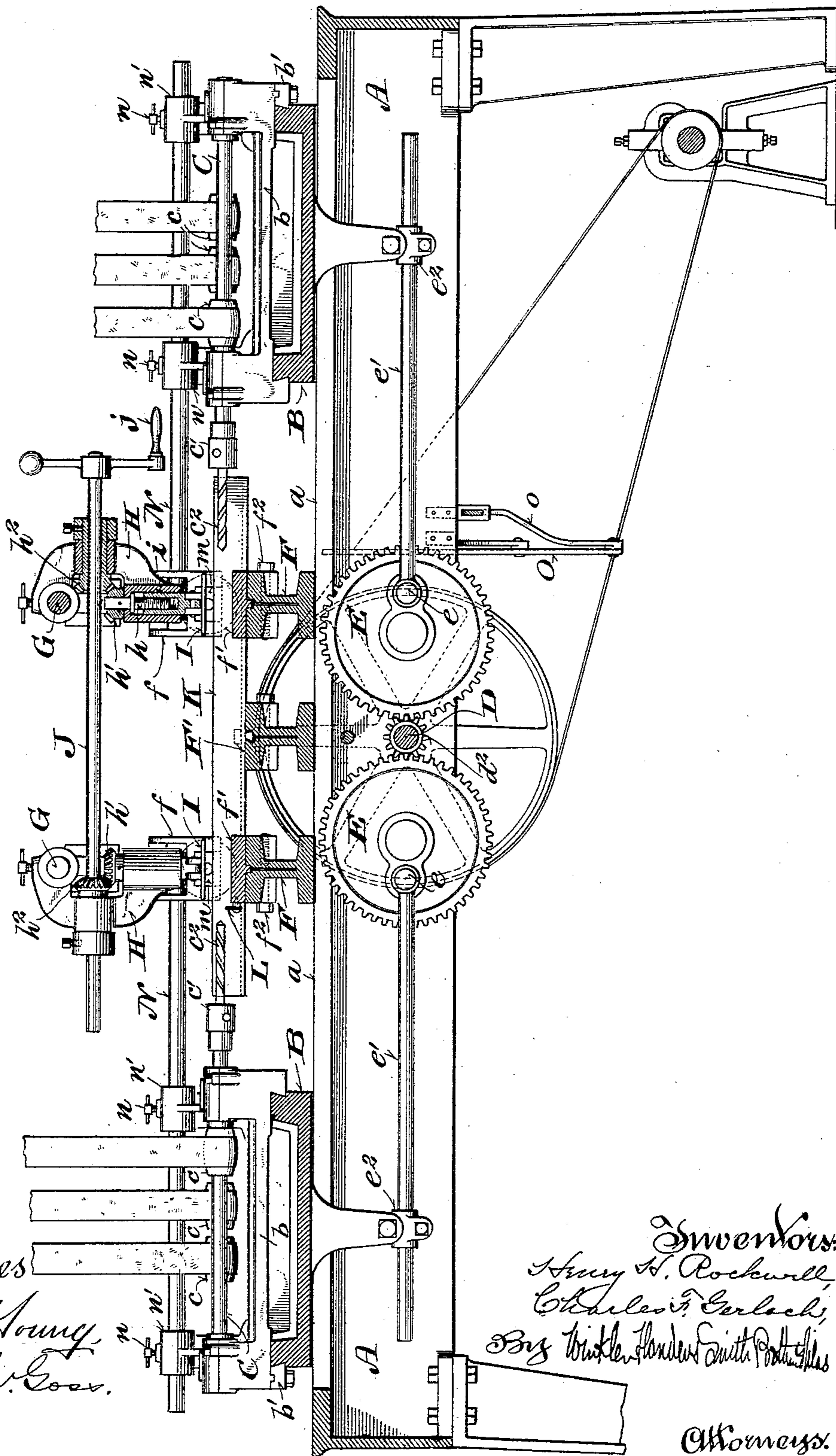
Fig. 1.



Witnesses:
Geo. W. Young,
Chas. L. Good.

Inventors:
Henry H. Rockwell,
Charles F. Gerlach,
By Wm. H. Anderson & Co.
Attorneys.

Fig. 2.



Witnesses
Geo. W. Young,
Chas. L. Goss.

Inventors:
Harry H. Rockwell,
Charles F. Gerlach,
By *Wm. H. Smith* Attorney

Attorneys.

H. H. ROCKWELL & C. F. GERLACH.

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Fig. 3.

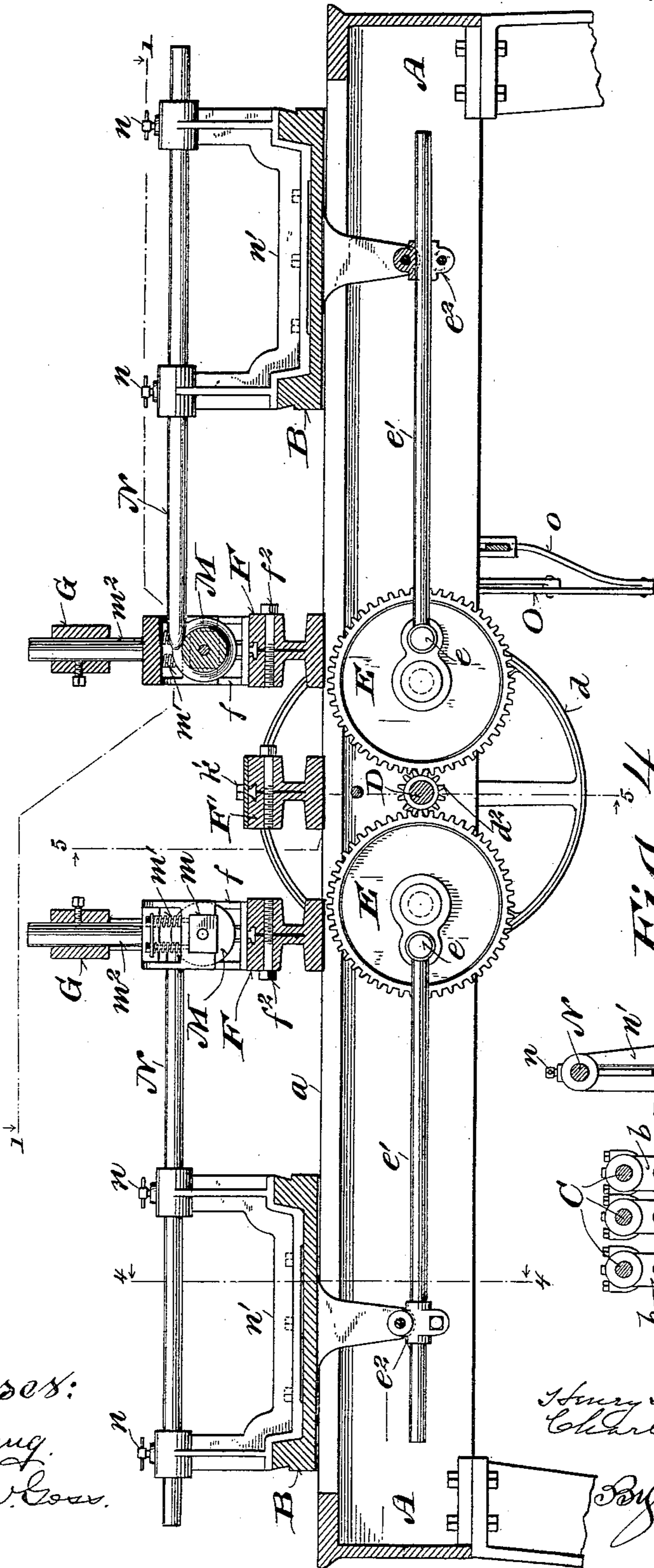
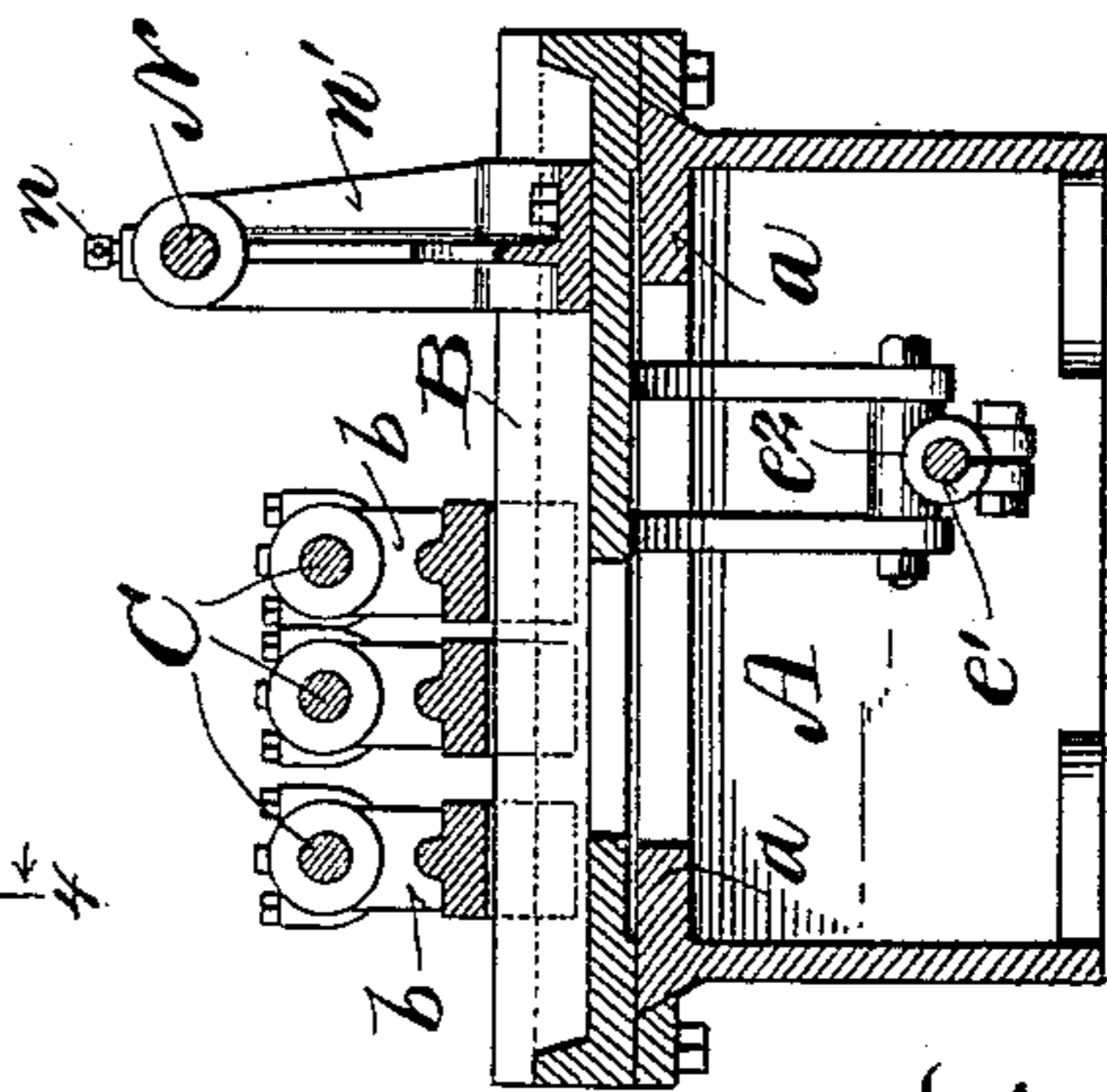


Fig. 4.



Witnesses:
Geo. W. Young.
Chas. L. Cox.

Inventors:
Henry H. Rockwell,
Charles F. Gerlach,
By *Walter H. Smith*
Attorneys

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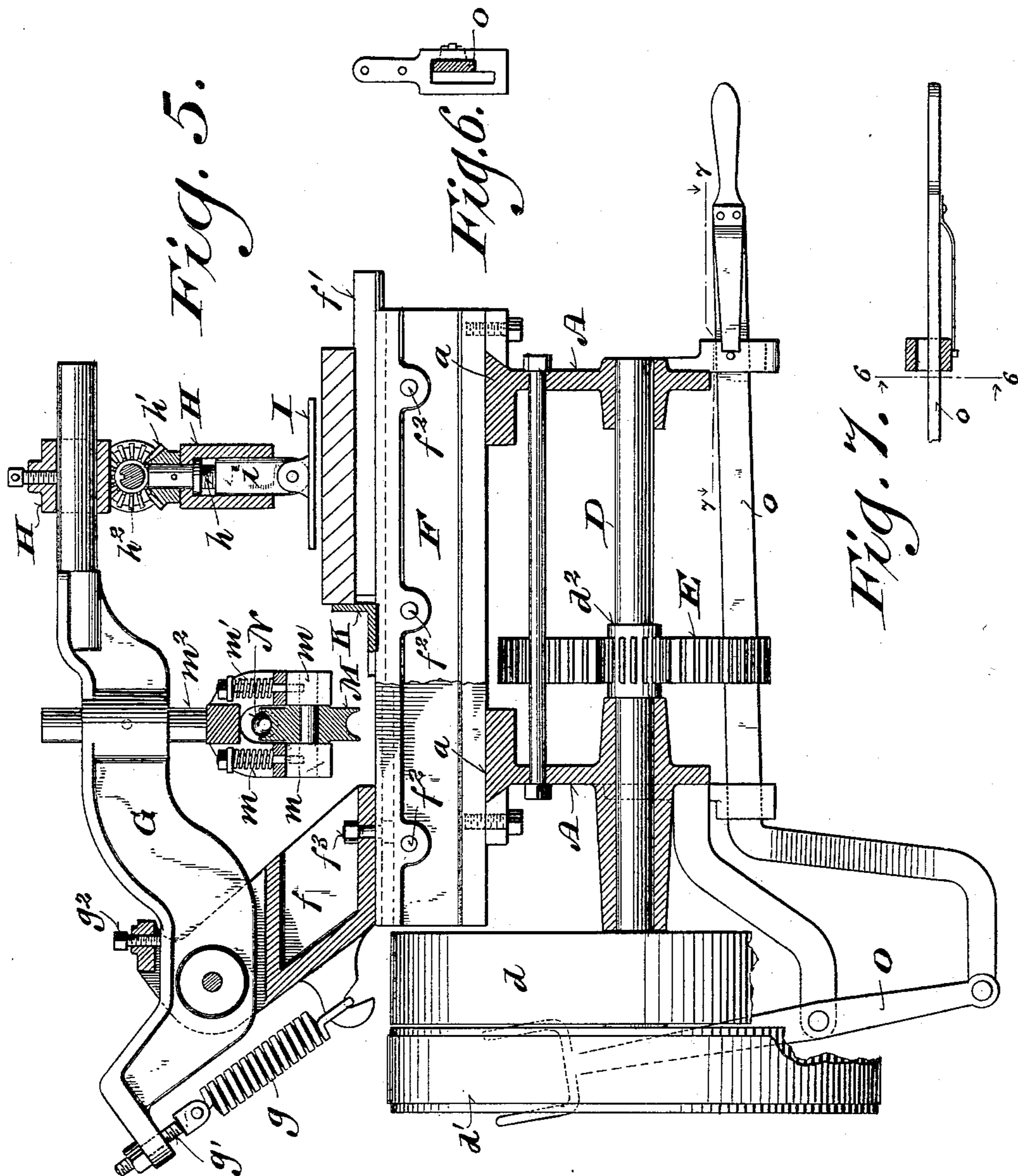
H. H. ROCKWELL & C. F. GERLACH.

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4 Sheets—Sheet 4.



Witnesses:
Geo. W. Young,
Chas. L. Goss.

Inventors:
Henry H. Rockwell,
Charles F. Gerlach,
By *Wm. H. Smith, Boston, Mass.*
Attorneys,

UNITED STATES PATENT OFFICE.

HENRY H. ROCKWELL AND CHARLES F. GERLACH, OF MILWAUKEE,
WISCONSIN, ASSIGNORS TO THE ROCKWELL MANUFACTURING
COMPANY, OF SAME PLACE.

BORING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 620,614, dated March 7, 1899.

Application filed March 22, 1894. Serial No. 504,634. (No model.)

To all whom it may concern:

Be it known that we, HENRY H. ROCKWELL and CHARLES F. GERLACH, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Boring-Machines; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to
10 which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The main objects of our invention are to
15 facilitate boring the ends of door-rails and similar articles for dowel-joints or other purposes and to adapt a machine for the purpose to operate upon stuff of different dimensions.

It consists of certain novel features in the
20 construction and arrangement of the component parts of the machine, as hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings like letters
25 designate the same parts in the several figures.

Figure 1 is a plan view and partial horizontal section, on the line 1 1, Fig. 3, of my improved machine. Fig. 2 is a vertical longitudinal section of the machine on the line
30 2 2, Fig. 1. Fig. 3 is a similar section on the line 3 3, Fig. 1. Fig. 4 is a vertical cross-section on the line 4 4, Fig. 3. Fig. 5 is a similar section, on an enlarged scale, on the line 5 5, Fig. 3; and Figs. 6 and 7 are detail views
35 of parts of the belt-shifter, Fig. 6 being a section on the line 6 6, Fig. 7, and Fig. 7 a section on the line 7 7, Fig. 5.

A is the frame of the machine, formed or provided with parallel horizontal ways *a a*,
40 upon which are mounted two reciprocating carriages B B. Upon these carriages are mounted a number of yokes or bit-supports *b b*, parallel with the ways *a a* and separately adjustable transversely thereto.

45 C C are rotary bit-stocks or mandrels supported in bearings provided therefor in said yokes and provided between said bearings with pulleys *c c*, by which they are belted to a suitably-located counter-shaft (not shown)

overhead. The several yokes *b b* are secured
50 in place when properly adjusted by gibs or beveled blocks *b' b'*. The bit-stocks or mandrels are provided at their inner ends, toward the center of the machine, with chucks or bit-holders *c' c'*, in which bits *c²* are removably
55 held.

D is a cross-shaft at or near the center of the machine, provided at the rear end with tight and loose pulleys *d* and *d'* and at an intermediate point therein with a pinion *d²*,
60 which meshes on opposite sides with gears E E, provided with crank-pins *e e*. The crank-pins *e e* are connected by rods *e' e'* with the carriages B B by split collars *e²*, which are pivoted to arms depending from said carriages
65 and are adjustably clamped upon said rods. By means of these connections the carriages may be set to operate upon stuff of different lengths.

F F are cross-supports adjustably mounted
70 upon the ways *a a* between the carriages and movable toward and from each other.

G G are levers fulcrumed to brackets *f f*, rising from the rear ends of the cross-supports F F. Upon their forwardly-projecting
75 arms are adjustably mounted cross-heads H H, which carry the presser-feet I I and are provided with adjusting-screws *h h*, having fixed bearings therein and engaging with the internally-screw-threaded stems *i i*, to which
80 said presser-feet are pivoted. The screws *h h* are provided with bevel-gears *h' h'*, which mesh with similar gears *h² h²*, journaled in said cross-heads. J is a horizontal shaft provided with a crank-handle *j* and passing loosely
85 through the gears *h² h²*, in which it is prevented from turning by keys or other suitable means. By means of these connections the presser-feet may be adjusted vertically with
90 reference to the levers G G, with which they are connected and by which they are operated. The cross-heads H H are formed with sleeves which are adjustably mounted and movable lengthwise upon the overhanging
95 arms of said levers G G, so as to carry the presser-feet forward or back, as may be desired, according to the width of stuff to be held thereby. The opposite arms of the levers

G are connected with hooks or projections on the brackets *ff* by springs *g g*, which tend to raise the front ends of said levers and the presser-feet attached thereto. The connections of these springs with said levers are made by threaded eyebolts *g'*, which afford means of adjusting the tension of the springs. The upward movement of the forward ends of said levers and the presser-feet is limited by stop-screws *g²*, threaded in overhanging parts of the brackets *f*, as shown in Fig. 5.

f' f' are removable bed-plates formed on the under side with longitudinal tongues which enter the corresponding grooves in the cross-supports *F F*, on which they are adjustably mounted, so as to be moved forward or back, according to the width of the stuff to be bored, interchangeable plates of various thickness being provided for boring stuff of different thicknesses and holding it at the proper elevation with relation to the bits. They afford supports for the work opposite the presser-feet *I I* and with said presser-feet hold the material to be bored in proper position for the simultaneous operation of the bits at both ends thereof. The cross-supports *F F* are slit longitudinally through the grooves therein and provided with clamping-screws *f² f²*, whereby the sides of the grooves in said supports are drawn firmly against the tongues on the plates *f'* and said plates are secured in place.

F' designates a cross-support like or similar in construction to the supports *F F*, between and parallel with which it is placed. To it is adjustably secured by a bolt *k*, as shown in Figs. 1, 2, and 3, the gage-stop *K*, parallel with the ways *a a* and adjustable transversely thereto.

L is a gage plate or stop attached to the outer edge of one of the bed-plates *f'* transversely to the gage-stop *K*. By means of these stops the placing of the stuff in the machine in proper position to be operated upon by the bits is facilitated. Between the presser-foot and fulcrum each lever *G* is provided with a grooved roller *M*, journaled in boxes *m m*, vertically movable and yieldingly held by springs *m' m'* in the forked head of a vertical stem *m²*, which is adjustably held by a set-screw in the lever *G*. To each carriage is attached a longitudinally-adjustable bar *N*, parallel with the ways *a a* and in range with the upper side of the adjacent roller *M*. The forwardly-projecting end of this bar is pointed or beveled, so as to readily enter the groove and in passing over depress said roller, the lever, and the presser-foot, with which it is connected. The bar *N* is adjustably held by screws *n n* in the sleeves of a yoke *n'*, attached to the carriage, as shown in Fig. 3. The brackets *f*, to which the levers *G* are fulcrumed, are adjustably attached to the supports *F* by bolts *f³*, the heads of which are held in undercut grooves in said supports, as shown in Fig. 3. By this means the roll-

ers *M M* may be moved forward or back into alinement with the bars *N*.

By means of a forked belt-shifting lever *O* and a sliding handle-bar *o*, connected therewith and extending to the front side of the machine, as shown in Fig. 5, where it is provided with a handle and locking device, (shown in detail in Figs. 6 and 7,) the machine may be promptly and conveniently stopped and started by the operator.

The operation of the machine may be explained, briefly, as follows: The bit-stocks or mandrels *C C* being provided with the required number and size of bits are set at the proper distances apart to bore holes in the desired positions by adjusting the yokes *b b* transversely upon the carriages, as hereinbefore described. The collars *e²* are clamped on the connecting-rods *e'* at the proper points to adjust the position and movement of the carriages for operation upon stuff of the given length. The cross-supports *F F*, together with the levers *G G* and presser-feet *I I*, carried by them, are also set to support and hold the stuff to be bored at or near its ends, and the bars *N N* are adjusted according to the position thus given the rollers *M M*, so as to depress the presser-feet as the carriages advance, just prior to the engagement of the bits with the work. Bed-plates *f' f'* of the required thickness to support the work in proper position with respect to its thickness are provided. The presser-feet are raised or lowered by means of the crank-shaft *J* and its connections, according to the thickness of the bed-plates and of the stuff to be bored, so as to exert the required pressure upon the work to hold it firmly in place. The gage-stop *K* and the bed-plates *f' f'* are adjusted according to the width of the stuff to be bored. The limit of the upward movement of the levers *G G* and presser-feet is regulated as desired by the stop-screws *g²*. The necessary adjustments having been made the machine is set in motion and the stuff to be bored is placed a simple piece at a time by the operator upon the bed-plates *f' f'* underneath the presser-feet *I* and against the gage-stops *K* and *L*. The carriages simultaneously advancing in opposite directions operate through the bars *N* and rollers *M* to force and hold the presser-feet *I* firmly down upon the stuff and clamp it between them and the bed-plates, upon which it rests. The bits now simultaneously bore one or more holes, properly spaced, in each end of the stuff while it is thus held in place. The carriages are withdrawn, and when the bits have cleared the stuff the bars *N* clear the rollers *M* and thereupon the springs *g* raise the presser-feet out of engagement with the stuff, which may be removed and its place supplied with another piece by the operator before the next advance movement of the carriages takes place.

The yielding connections of the rollers *M* with levers *G* and the pivot connections of

the presser-feet with said levers enable the presser-feet to adapt themselves to irregularities and variations in the thickness of the stuff upon which they bear, and by means of the adjustments of the supports F F the stuff may be held firmly close to the ends and accurate work thus insured.

Various changes in minor details of construction and arrangement of the component parts of the machine may be made within the contemplated scope of our invention.

End gages L may be applied, if desired, to both bed-plates *f'*, although one, as shown, is sufficient.

We claim—

1. In a boring-machine the combination of a frame provided with a work-support and with ways, reciprocating carriages mounted upon said ways on opposite sides of said work-support, and provided with rotary bit-stocks parallel with said ways, means for simultaneously advancing and withdrawing said carriages toward and from said work-support, a vertically-swinging lever fulcrumed to said frame and overhanging said work-support transversely to said ways, a presser-foot pivotally connected with and adjustable lengthwise of said lever over said work-support, and means for automatically depressing and raising said lever and presser-foot as said carriages are advanced and withdrawn, substantially as and for the purposes set forth.

2. In a boring-machine the combination of a frame provided with a vertically-adjustable work-support and with horizontal ways extending in opposite directions from said work-support, carriages mounted upon said ways and provided with rotary bit-stocks arranged parallel with said ways, means for simultaneously advancing and withdrawing said carriages toward and from said work-support, a vertically-swinging lever fulcrumed to said frame and overhanging said work-support transversely to said ways, a pivoted presser-foot having a vertically and horizontally adjustable connection with said lever and means for automatically depressing and raising said lever and presser-foot as said carriages are advanced and withdrawn, substantially as and for the purposes set forth.

3. In a boring-machine the combination of a frame provided with a work-support and ways extending horizontally in opposite directions therefrom, reciprocating carriages mounted upon said ways and provided with rotary bit-stocks parallel with said ways, parallel shafts arranged transversely to said ways and provided with cranks, an intermediate driving-shaft geared with said crank-shafts, and rods connecting said cranks with said carriages and adjustably secured to the latter by clamps whereby the limit of the advance movement of said carriages may be varied as desired for operating on stuff of different lengths, substantially as and for the purposes set forth.

4. In a boring-machine, the combination with a suitable frame provided with ways, of reciprocating carriages mounted on said ways and provided with bit-stocks or mandrels, cross-supports mounted on said ways transversely thereto and adjustable lengthwise thereof toward and from each other, levers fulcrumed to said supports parallel therewith and provided with cross-heads, vertically-adjustable presser-feet carried by said cross-heads and connected therewith by adjusting-screws, means for operating said levers and presser-feet, and a horizontal shaft passing loosely through and held from turning in bevel-gears which are journaled in said cross-heads and mesh with similar gears on said screws, substantially as and for the purposes set forth.

5. In a boring-machine, the combination with a suitable frame provided with ways, of reciprocating carriages mounted upon said ways and provided with bit-stocks or mandrels, cross-supports mounted upon said ways between said carriages and adjustable toward and from each other, levers fulcrumed to and overhanging said cross-supports, and presser-feet mounted upon and adjustable lengthwise of said levers, substantially as and for the purposes set forth.

6. In a boring-machine, the combination with a suitable frame provided with ways, of a reciprocating carriage mounted upon said ways and provided with one or more bit-stocks or mandrels, and a bar projecting forwardly therefrom parallel with said ways, a lever fulcrumed to said frame transversely to said ways, a vertically and horizontally adjustable presser-foot pivotally connected with the overhanging arm of said lever, and a roller yieldingly connected with said lever in range with the forwardly-projecting bar on said carriage, substantially as and for the purposes set forth.

7. In a boring-machine, the combination with a suitable frame provided with longitudinal ways, of reciprocating carriages mounted upon said ways and provided with bit-stocks or mandrels, supports mounted upon said ways transversely thereto between said carriages, a gage-stop mounted upon said supports parallel with said ways and adjustable transversely thereto, levers fulcrumed to said supports and provided over said bed-plates with presser-feet which are adjustable lengthwise of said levers and pivotally connected therewith, and means of swinging said levers vertically and lowering and raising the presser-feet as the carriages are advanced and withdrawn, substantially as and for the purposes set forth.

8. In a boring-machine, the combination with a suitable frame provided with horizontal ways and longitudinally grooved and slit cross-supports, of a reciprocating carriage mounted upon said ways and provided with one or more rotary bit-stocks parallel with

said ways, bed-plates having tongues on the
under side fitting the grooves in said cross-
supports in which they are detachably se-
cured by clamping-screws and vertically-mov-
5 able presser-feet overhangingsaid bed-plates,
substantially as and for the purposes set forth.

In testimony that we claim the foregoing as

our own we affix our signatures in presence of
two witnesses.

HENRY H. ROCKWELL.
CHARLES F. GERLACH.

Witnesses:

CHAS. L. GOSS,
F. W. ROCKWELL.