

No. 684,635.

Patented Oct. 15, 1901.

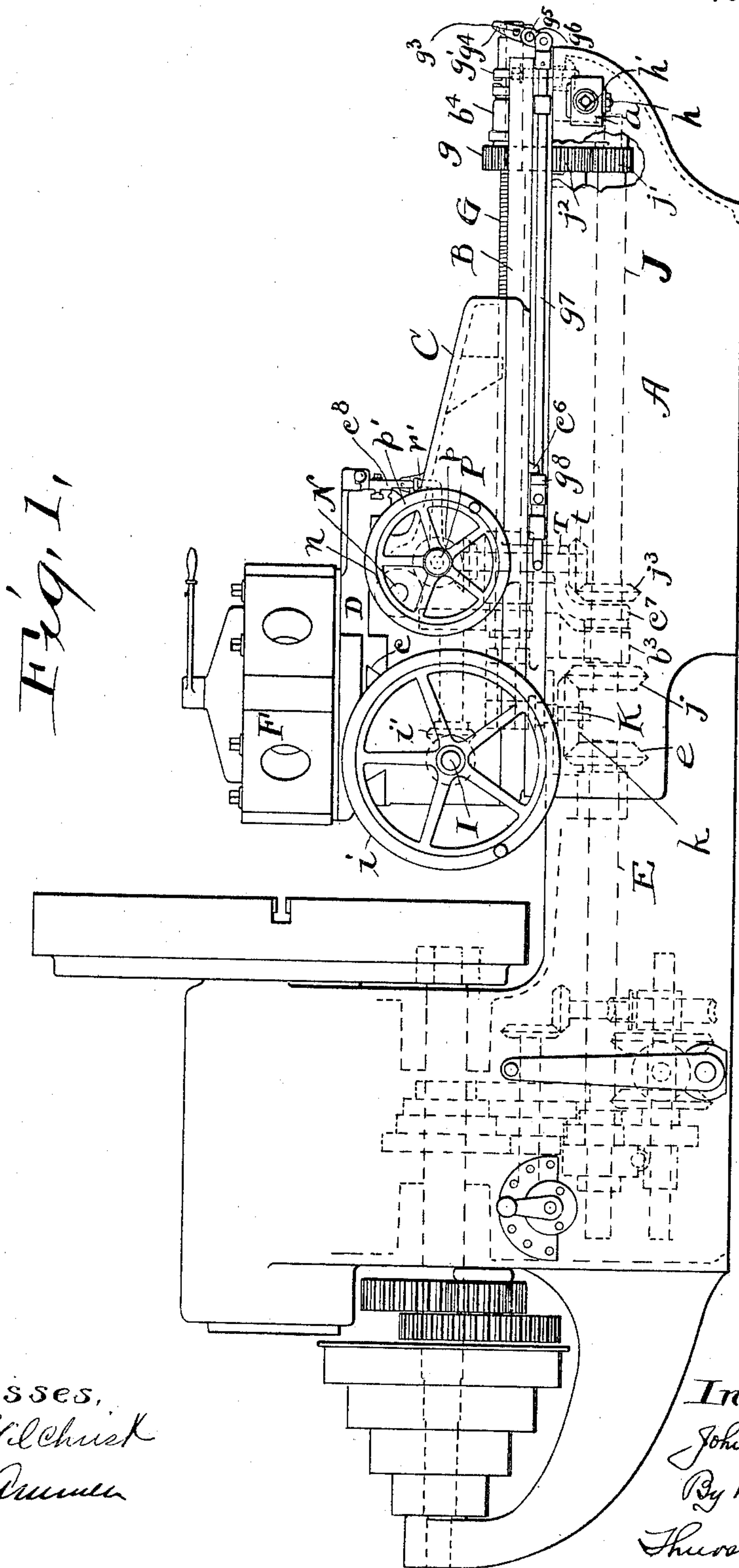
J. J. GRANT.

LATHE.

(Application filed Jan. 14, 1901.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses,
E. B. Gilchrist
F. D. Ammer

Inventor,
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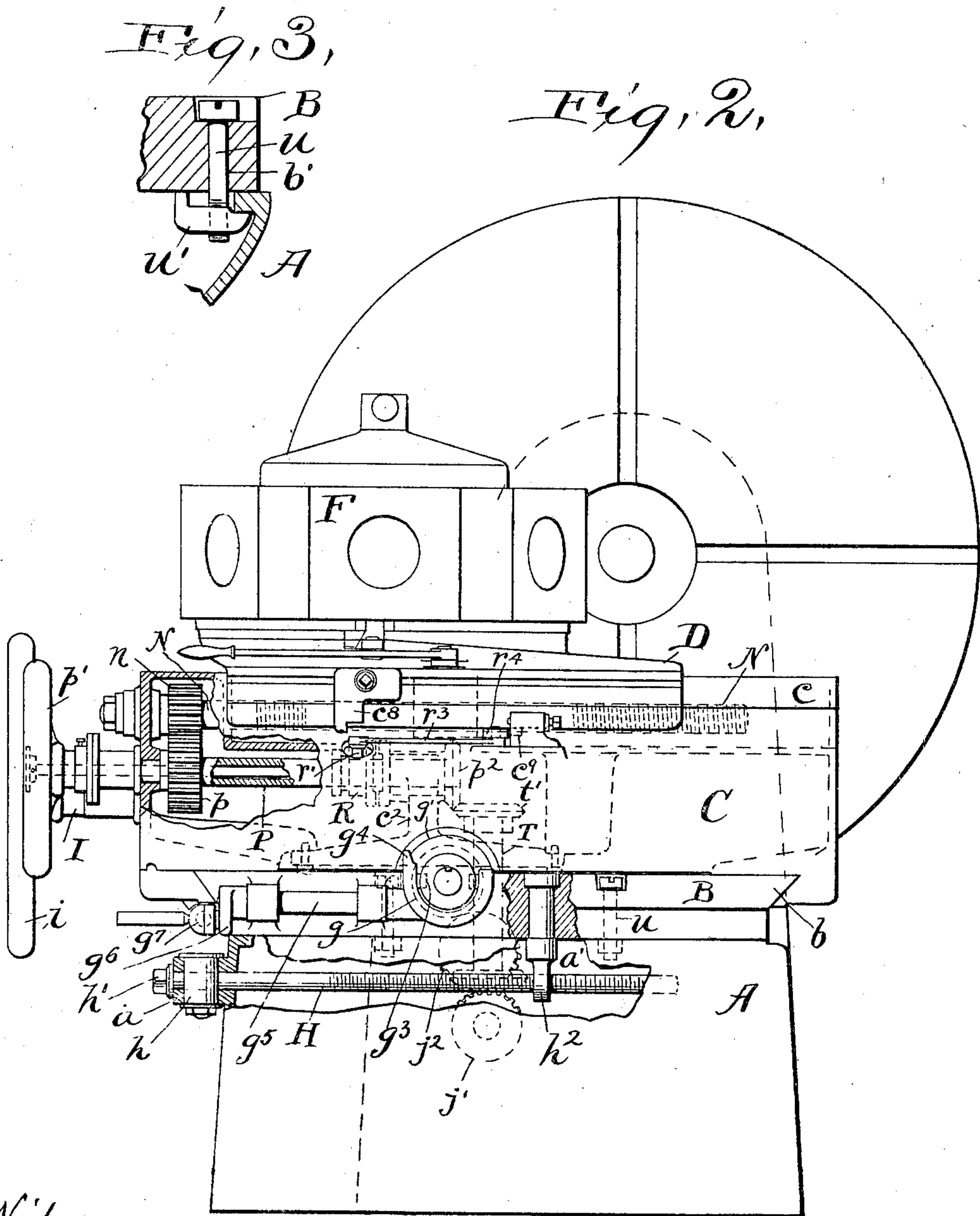
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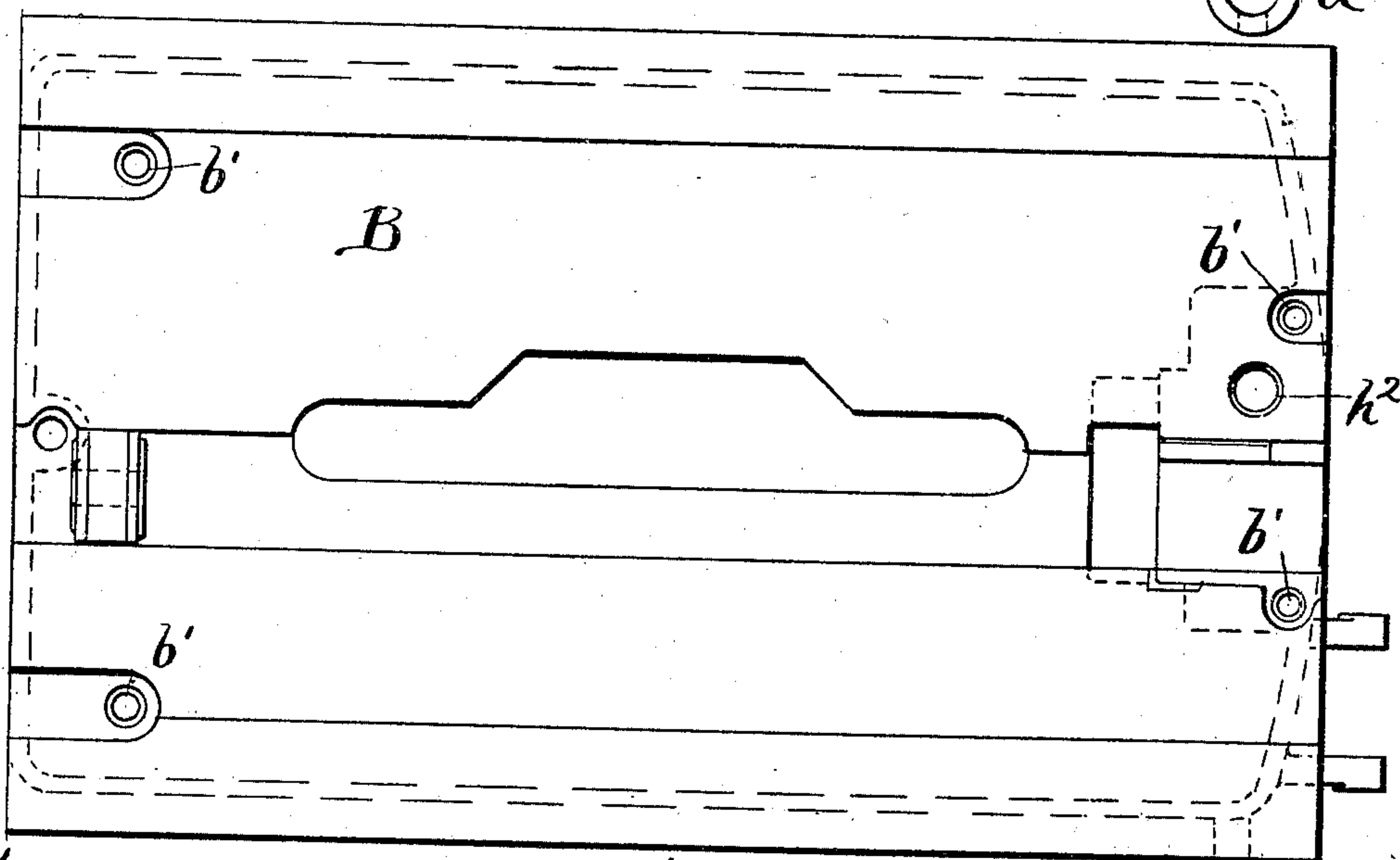
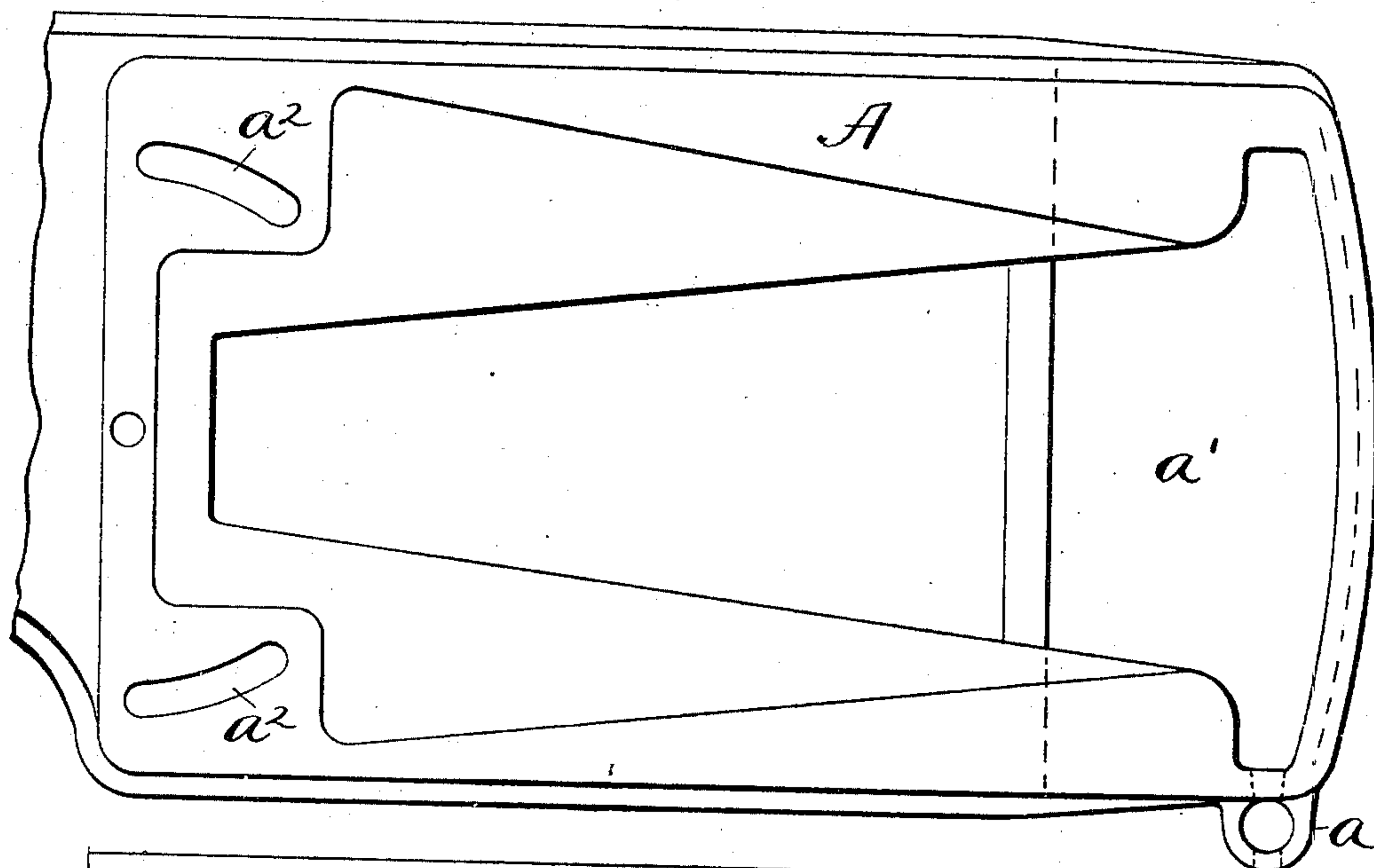
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Fig. 4,



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Fig. 5,

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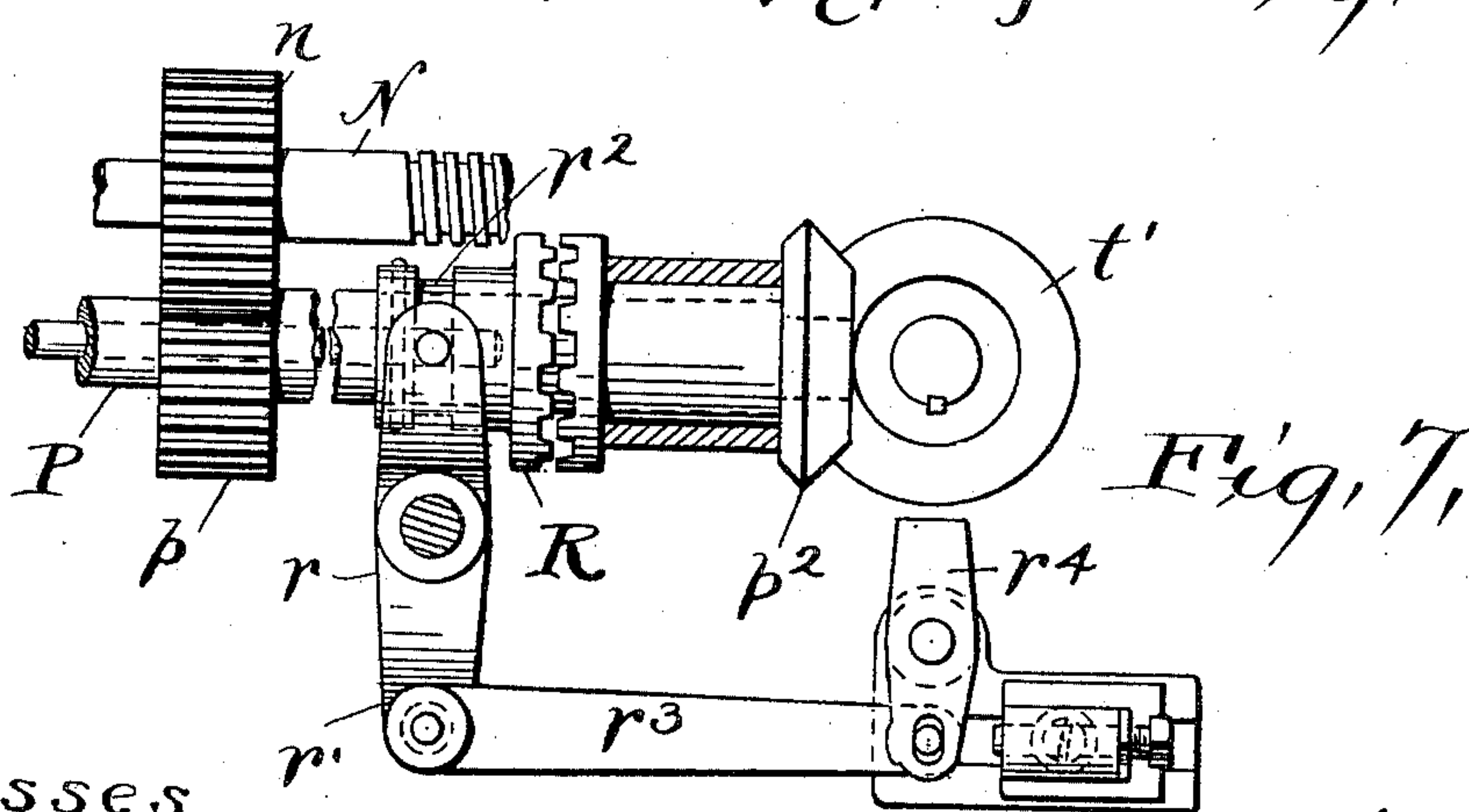
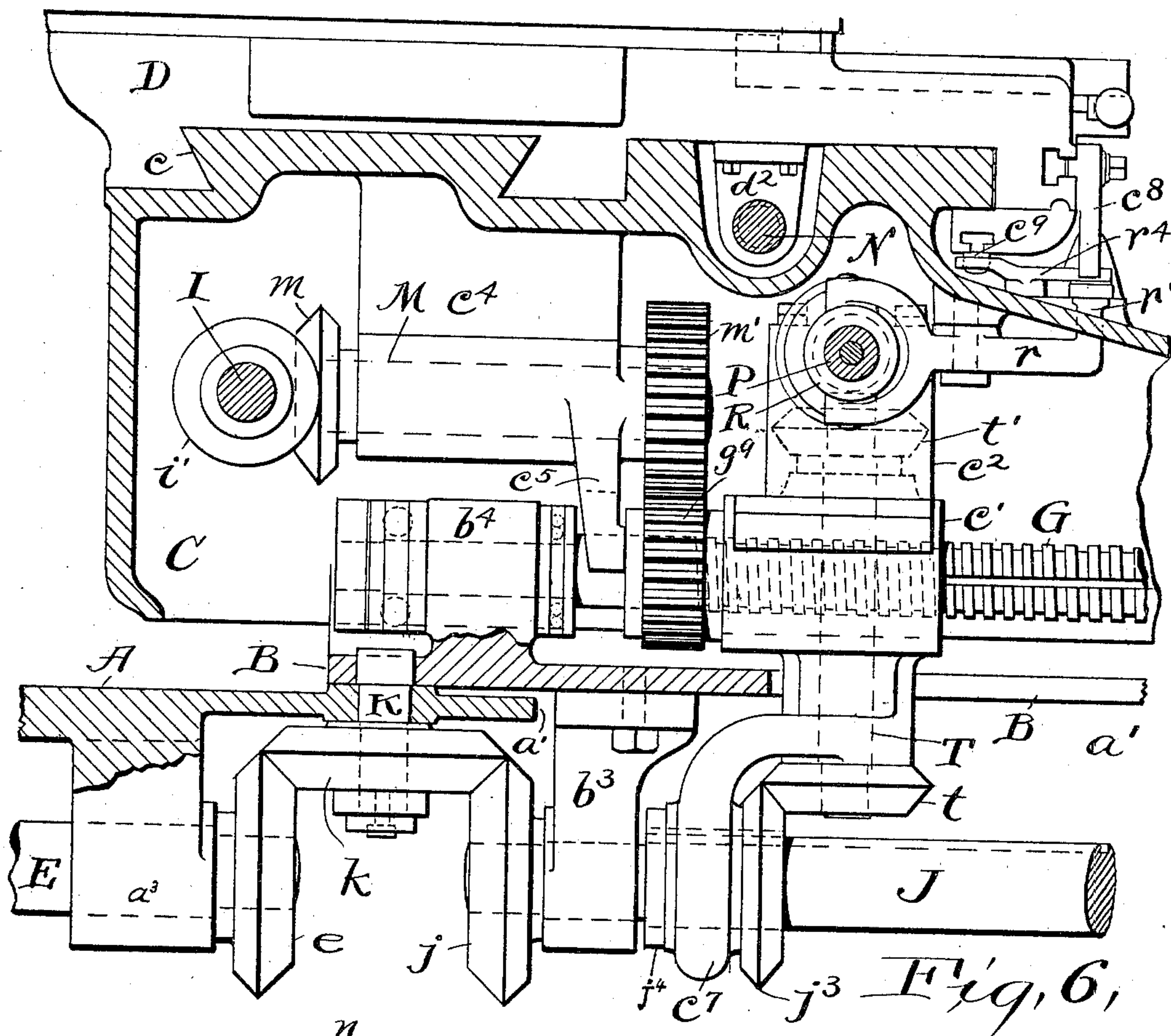
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

JOHN J. GRANT, OF CLEVELAND, OHIO.

LATHE.

SPECIFICATION forming part of Letters Patent No. 684,635, dated October 15, 1901.

Application filed January 14, 1901. Serial No. 43,186. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. GRANT, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Lathes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of the invention is to provide a lathe of simple and novel construction having greater capacities for usefulness than machines of this character generally have.

The invention consists in the construction and combination of parts hereinafter described, and pointed out definitely in the claims.

In the drawings, Figure 1 is a side elevation of a turret-lathe embodying my invention, a part of the table A being broken away to show some interior mechanism. Fig. 2 is an end view of said machine with portions broken away to show certain parts of the operating mechanism. Fig. 3 is a sectional view through the edge of the platen and table A, showing the clamping devices by which these parts are clamped together. Fig. 4 is a plan view of that part of the supporting-table on which the platen rests. Fig. 5 is a plan view of the platen. Fig. 6 is an enlarged side view with the carriage, platen, and transverse shafts in vertical section, intended to show the mechanism for feeding the carriage and slide; and Fig. 7 is a plan view of the clutch R and its operating mechanism.

The lathe shown is a turret-lathe; but the omission of the turret and the substitution of some other tool-holding device would not involve any change in the parts of the machine which embody my invention.

Referring to the parts by letters, A represents the table or top of the machine-frame, the same being, as shown, a bottomless box-like casting of appropriate shape. The mechanism at the head-stock end of the machine does not include any of the features of improvement which constitute the invention which this patent seeks to cover, and such mechanism may be of any well-known or suitable construction. A platen B rests upon the table A, to which it is pivotally connected by a vertical stud K. This platen may swing in a horizontal plane about the axis of this pivot.

This will throw the tool out of the axial line of the live-spindle, whereby tapered holes may be bored or finished. The mechanism shown for so swinging the platen consists of a screw H, which passes through a horizontal hole in a vertical stud *h*, which is rotatably mounted in a bracket *a* on the side of the table of the machine, and this screw has a head *h'*, by which it may be turned. The screw screws through the lower end of a stud *h''*, which is swiveled on a vertical axis to the platen and projects downward therefrom through a hole *a'* in the table. The platen may be fastened in any position into which it may be moved by suitable clamping devices, which, as shown, consist of bolts *u*, which pass down through the holes *b'* in the platen and through curved slots *a''* and the opening *a'* in the table and screw into clamping-plates *u'*, which engage with the lower surfaces of the table and platen B. A sliding carriage C is mounted on the platen B and is suitably guided thereon—as, for example, by the horizontal dovetailed ways *b*. A cross-slide D is mounted on the carriage C, being suitably guided thereon—as, for example, by dovetailed ways *c*. Turret F may be of a suitable construction, and it is mounted so as to be capable of rotation on a vertical axis on this slide D.

Power-feeding mechanisms for the carriage C and slide D are provided, and these mechanisms are of such construction that they will be operative regardless of the position of the platen. The precise construction of such power-feeding mechanisms, as shown, will now be described.

A shaft E is mounted in brackets *a''*, fixed to the frame beneath the table-top, and this shaft in so far as the power-feeding mechanism is concerned is the driving-shaft. As a matter of fact, this shaft in a machine of this character will generally be driven from another shaft which drives other mechanisms; but, as before stated, this shaft E may be regarded as the driving-shaft of the power-feeding devices. A shaft J is mounted in the same horizontal plane as the shaft E in brackets *b''*, secured to the platen and extending down through the opening *a'* in the table. The shafts E and J have secured to their proximate ends the bevel-gears *e* and *j*, re-

spectively, both of which mesh with a bevel-gear k , rotatively mounted on the stud K , which, it will be remembered, is the axis about which the platen turns. The shaft J may therefore be rotated by the shaft E whatever may be the position of the platen upon the frame.

The carriage C is caused to slide in its guideways upon the platen by means of a feed-screw G , mounted in bearings b^4 , projecting upward from the platen, which screw screws through a sleeve-nut c' , forming a part of a bracket c^2 , fastened to the carriage. Motion is transmitted from the shaft J to this feed-screw by the intermeshing gears j' g j^2 and a clutch g' on the feed-screw. The gear j' is attached to shaft J , the gear g is rotatably mounted on the screw G , and the gear j^2 is suitably mounted in bearings fixed to the platen. By means of the clutch, which may be of any suitable construction, the gear g may be connected at will to the screw G . The movable member g' of the clutch has a circumferential groove, into which projects two pins g^3 , which are attached to arms g^4 , said arms being rigid with the rock-shaft g^5 . This rock-shaft has an arm g^6 , which is connected with an operating sliding rod g^7 , supported in brackets on the side of the platen and by which the clutch may be operated by hand. A collar g^8 is adjustably secured to this rod in a position to be engaged by a finger c^6 on the carriage, whereby this rod may be moved and the clutch thrown out whenever the carriage has moved forward as far as desired. One of the arms g^4 has a finger which projects up into the path of the carriage, and when the carriage has moved rearward far enough it will strike this finger and throw out the clutch. The machine therefore acts automatically to throw out the clutch when the carriage has been fed forward or backward as far as desired. This feed-screw G may be turned by hand, if desired, when the clutch is thrown out through the following mechanisms, viz: the shaft I , which is mounted on the carriage, an operating-wheel i , secured to its outer end, the bevel-gears i' , secured to its inner end, a bevel-gear m , meshing with the bevel-gear i' and secured on a shaft M , which is mounted in a bracket c^4 on the under side of the carriage C , a pinion m' , which pinion is also secured to shaft M , and a pinion g^9 , connected with the feed-screw by a tongue-and-groove connection. This pinion g^9 lies between the end of the sleeve-nut c' and an arm c^5 , secured to the bracket c^4 , whereby as the carriage is moved this piston g^9 will be moved upon the feed-screw, and thus maintains its operative relation with the pinion m' . The turret-slide D is also moved by a feed-screw, (indicated by N ,) which is mounted in the front end of the carriage C and screws through a bracket d^2 , fixed to the slide. This feed-screw has a gear n fast to it, which gear meshes with a gear p , fast to a shaft P . This shaft P has at its outer end

a hand-wheel p' , by which it may be turned to feed the slide by hand. Loosely mounted on the shaft P is a bevel-gear p^2 , and a clutch R is provided for connecting this bevel-gear and shaft at will. The bevel-gear p^2 meshes with the bevel-gear t' on the upper end of the vertical shaft T , which is mounted in the bracket c^2 . On the lower end of this shaft a bevel-gear t is secured, and it meshes with a bevel-gear j^3 on the feed-shaft J . This gear is connected to said shaft J by a tongue and groove, and the hub j^4 of this gear has a circumferential groove which is embraced by an arm c^7 . This arm is a part of the bracket C^2 , and consequently the operative connection between the shafts P and J is maintained in all positions of carriage C .

Clutch-operating mechanism for the clutch R is provided. It consists of a lever r , having forks which take into a circumferential groove r^2 in the sliding clutch member. This lever is pivoted to the carriage and has an arm r' projecting out through the top of the carriage, which arm is connected by a link r^3 to a pivoted lever r^4 . The carriage has two trip-arms c^8 c^9 , adjustably secured to it in such positions that one, c^8 , will strike said lever r^4 on one side of its pivot when the slide has reached one end of its desired range of movement, and thereby the clutch will be thrown out. The other trip-arm c^9 will strike the lever on the opposite side of its pivot when the slide reaches the other end of its permitted travel, and thereby the clutch will be thrown out.

Having described my invention, I claim—

1. The combination of a table, a platen supported thereon and connected thereto by a vertical pivot, a sliding carriage mounted on said platen, a carriage-feeding mechanism supported on the platen, a driving-shaft supported by the table, and mechanism which includes a rotatable member mounted axially with respect to said platen, intermediate of said driving-shaft and carriage-feeding mechanism, substantially as specified.

2. The combination of a table, a platen supported thereon and connected thereto by a vertical pivot, a sliding carriage mounted on the platen, a feed-screw mounted on the platen, a nut secured to the carriage, a driving-shaft mounted in bearings secured to the machine-frame, mechanism for turning said feed-screw, and mechanism, including a gear mounted to rotate about the axis of the platen, for transmitting motion from the driving-shaft to the feed-screw-operating mechanism, substantially as specified.

3. The combination of a table, a platen supported thereon and connected thereto by a vertical pivot, a sliding carriage mounted on said platen, a feed-screw mounted in bearings on the platen, a nut fast to the carriage, a driving-shaft mounted in fixed bearings on the machine-frame and having a beveled gear secured to it, a shaft mounted in bearings secured to the platen and having a bevel-gear

secured to it, a bevel-gear meshing with said bevel-gears and mounted to rotate about the same axis as that upon which the platen turns, and mechanism intermediate of the last-named shaft and said feed-screw, substantially as specified.

4. The combination of a table, a platen supported thereon and connected thereto by a vertical pivot, a sliding carriage mounted on said platen, a feed-screw mounted upon the platen, a nut secured to the carriage, a gear mounted upon the feed-screw, a clutch for connecting said screw and gear, a driving-shaft supported by the table, a shaft mounted in bearings supported by the platen, beveled gears secured respectively to these two shafts, and an intermeshing bevel-gear mounted to rotate about the axis of the platen, mechanism transmitting motion from the shaft supported by the platen to the gear mounted on the feed-screw, clutch-operating mechanism having projections which are extended into the path of the carriage whereby the clutch is thrown out when the carriage reaches either end of its movement, substantially as specified.

5. The combination of a table, a platen supported thereon and connected thereto by a vertical pivot, a carriage mounted on the platen, a cross-slide mounted on the carriage, a feed-screw mounted on the carriage, a threaded bracket secured to the slide, a shaft mounted on the platen, a beveled gear embracing this shaft and connected thereto, by a tongue-and-groove connection, means attached to the carriage for moving said gear along said shaft concurrently with the movement of the carriage upon the platen, and mechanism supported by the carriage for transmitting motion from said gear to the

cross-slide feed-screw, substantially as specified.

6. The combination of a table, a platen supported thereon and connected thereto by a vertical pivot, a sliding carriage mounted on the platen, and a cross-slide mounted on said carriage, with a feed-screw mounted on the carriage, a threaded bracket secured to the slide, a vertical shaft supported by the carriage, mechanism intermediate of it and the feed-screw, a beveled gear secured to said vertical shaft, a shaft mounted on the platen, means for rotating it, a bevel-gear on said shaft and connected thereto by a tongue and groove, and means secured to the carriage for moving the gear along said feed-screw, substantially as specified.

7. The combination of a table, a platen supported thereon and connected thereto by a vertical pivot, a sliding carriage mounted on the platen, and a cross-slide mounted on said carriage, with a feed-screw mounted on the carriage, a threaded bracket secured to the slide, a vertical shaft supported by the carriage, mechanism intermediate of it and the feed-screw, a beveled gear secured to said vertical shaft, a shaft mounted on the platen, means for rotating it, a bevel-gear on said shaft and connected thereto by a tongue and groove, and having a circumferential groove in its hub, and an arm secured to the carriage embracing said circumferential groove, substantially as specified.

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

JOHN J. GRANT.

Witnesses:

ALBERT H. BATES,
E. B. GILCHRIST.