

No. 695,665.

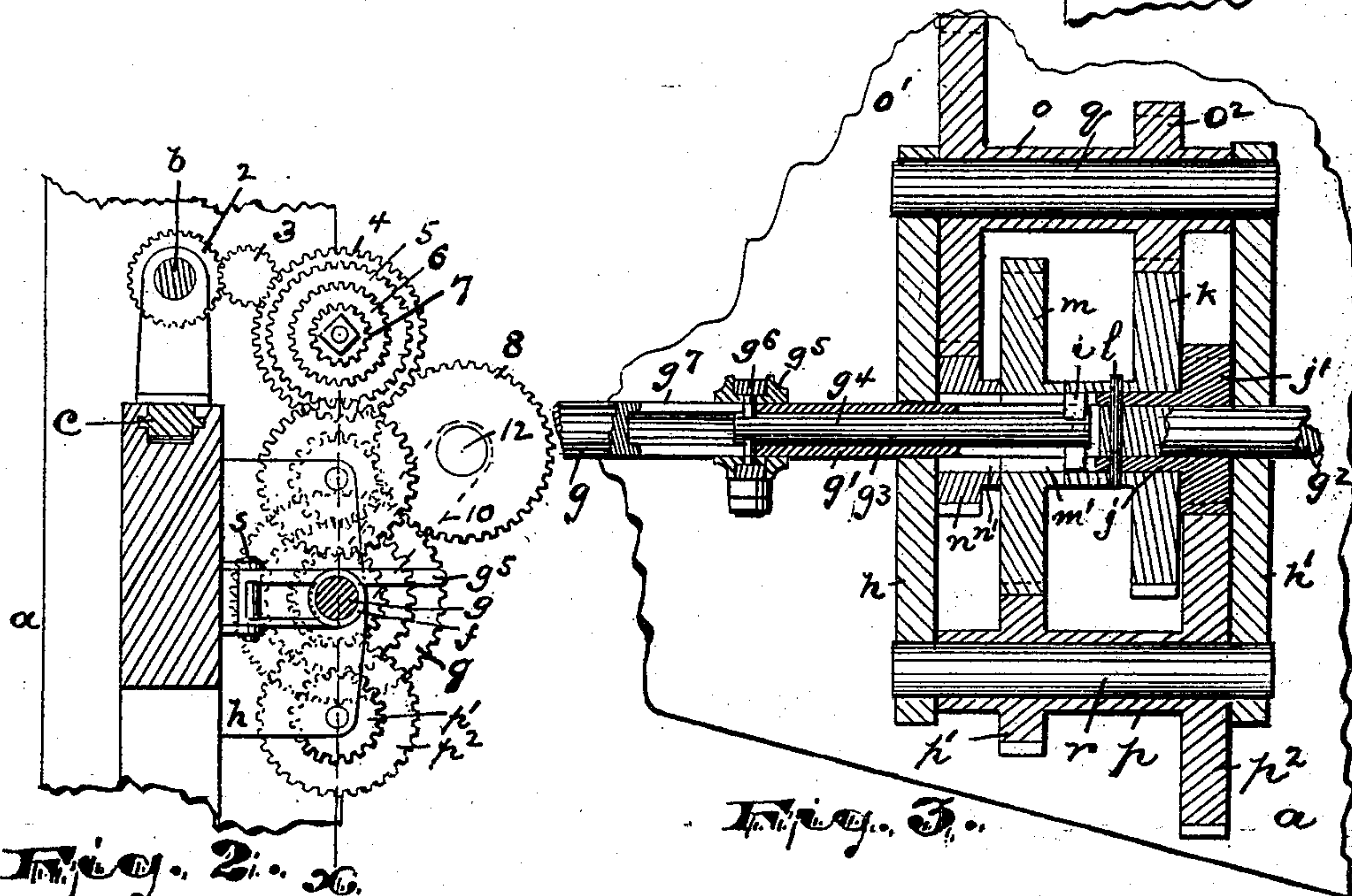
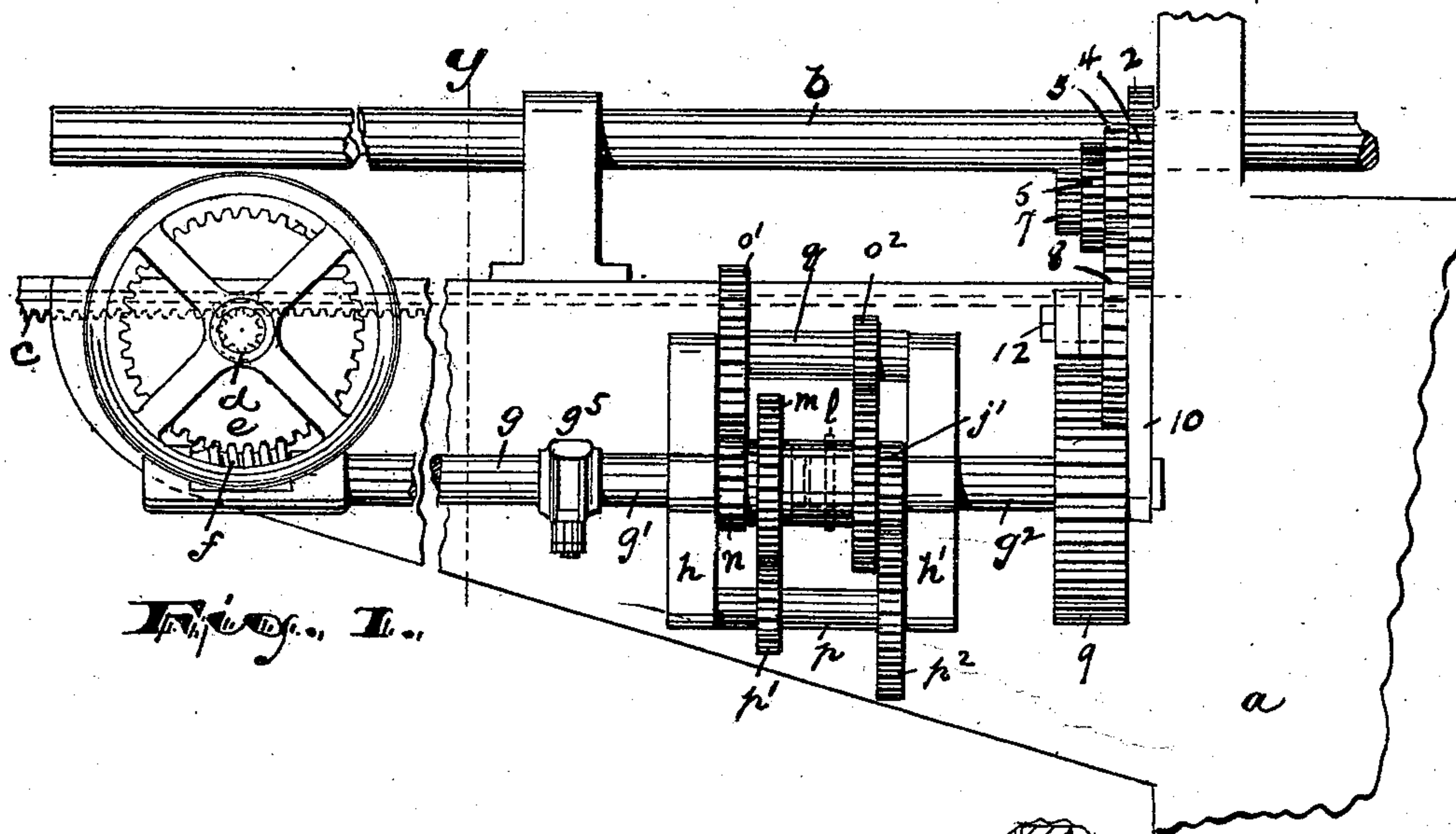
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H. B. BINSSE.

FEED MECHANISM FOR MACHINE TOOLS.

(Application filed Dec. 2, 1901.)

(No Model.)



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FEED MECHANISM FOR MACHINE-TOOLS.

SPECIFICATION forming part of Letters Patent No. 695,665, dated March 18, 1902.

Application filed December 2, 1901. Serial No. 84,366. (No model.)

To all whom it may concern:

Be it known that I, HENRY B. BINSSE, a citizen of the United States, residing at New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Feed Mechanism for Machine-Tools; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

The object of this invention is to enable in a machine-tool a greater variety of speed to be obtained in connection with the feed device thereof; and it consists in the improved feed mechanism for machine-tools and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like characters of reference indicate corresponding parts in each of the several figures, Figure 1 is a side elevation of my improvement as applied to a machine-tool. Fig. 2 is a section at line *y* of Fig. 1 of certain gearing employed in my improvement and in which the improvement is particularly embraced, and Fig. 3 is a section taken at line *x* of Fig. 2.

In said drawings, *a* indicates the frame, bed-plate, or casting of a machine or metal-working tool of any ordinary construction, although shown in the drawings as adapted especially for horizontal boring.

b is the bar, carried forward or fed by a rack *c* and pinion *d* in train with a worm-wheel *e* and screw *f* upon a shaft *g*, the rotary movements of which are controlled by the supplemental gearing interposed between the usual speed-gearing for transmitting power from the bar *b* to the worm-wheel, pinion, and rack. Said shaft *g*, contiguous to the supplemental gearing, is hollow and slotted, as shown in Fig. 3, and within the hollow bore or chamber *g*³ is a sliding rod or shaft *g*⁴, the movement of which is controlled by a shifter *g*⁵, the sliding shaft being connected

to the shifter by pins *g*⁶, which work in the longitudinal slots *g*⁷ of the shaft *g*.

The hollow end of the shaft *g* has bearings in a bracket *h*, formed on or secured to the frame or bed *a*, and between said bracket and another box *h'* on said frame said shaft *g* is again slotted to receive a key or spline *i*, attached to the sliding rod or shaft *g*⁴ and movable therewith. In alinement with said shaft *g* is another shaft *g*², on which is arranged a slotted sleeve *j*, having at one end a gear-wheel *j'*, and on said sleeve is arranged a larger gear-wheel *k*, the two gear-wheels *j'* *k* being held to said shaft *g*² by a pin *l*. Next to the sleeve *j* on said shaft *g*, between the brackets *h* *h'*, is a large loose cog-wheel *m*, having a keyway *m'*, and next said cog-wheel *m* is a small cog-wheel *n*, having another keyway *n'*, both of which keyways are adapted to receive the spline *i*. The parts are so disposed as that the shifter *g*⁵ and its connected sliding shaft *g*⁴ and spline *i* may be operated to transmit power.

Adjacent to the shafts and gear-wheels *g* *g*² *j* *k* *m* *n* are arranged, between the brackets *h* *h'*, sleeves *o* *p* on shafts *q* *r*, respectively. Each of said sleeves is provided with a large and small gear-wheel *o'* *o*² *p'* *p*². The gear-wheel *j'*, fixed to the shaft *g*², meshes with the cog-wheel *p*² and transmits power therefrom to the sleeve *p* and small cog-wheel *p'* to the loose cog-wheel *m*. The wheel *k* in like manner transmits power to the cog-wheel *o*², whence it is transmitted to the cog-wheel *o'*, sleeve *o*, cog-wheel *o'*, and to the loose cog-wheel *n*.

When the key *i* of the shifter shaft or rod *g*⁴ is in the slot of the sleeve *j*, as indicated in Fig. 3, the movement of the shaft *g*² will be transmitted directly to the shaft *g*, so that they will move together in unison, and the gearing in connection with the sleeves *o* and *p* will move idly on their bearings. I thus secure one speed of feed movement. By shifting the key *i* to the wheel *m* then will the power be transmitted to the shaft *g* through the gear-wheels *j'* *p*² *p'* *m* and another variety of speed will be gained, and by shifting the key *i* to the wheel *n* then will a third variety of speed be obtained through the wheels *k* *o*² *o'* *n*. The shifter *g*⁵ may be fulcrumed upon the bed-

frame, as at *s* in Fig. 2, or it may be arranged and operated in any suitable manner.

To transmit power from shaft *b* to the shaft g^2 , I prefer to employ the train of gear-wheels 2 3 4 5 6 7 8 9. The gear 4 is driven by gear 2, connected with the bar *b* through an intermediate gear 3. Attached suitably to gear 4 are the three gears of varying diameters 5 6 7. The wide-faced gear 9 may be brought into operative relation with either one of gears 5, 6, or 7 by means of the intermediate gear 8, carried by the arm 10, which is supported on and may be turned about the shaft g^2 as a center and held in any desired position. The intermediate gear 8, revolving loosely on a long pin 12 of said arm 10, is always in gear with the wide-faced gear 9 and can be put into engagement as desired with either cog-wheel 5, cog-wheel 6, or cog-wheel 7 by adjusting the cog or gear wheel 8 on the pin 12 so that it will lie in plane with the desired cog-wheel of the graduated series and then turning the arm 10 so that there will be a meshing engagement of said wheel 8 with the desired wheel of said series. Suitable washers or means of any other structure may be employed for holding the wheel 8 in proper relative position on said pin.

I am aware that various changes may be made in the relations of parts shown and in some cases positively described, and I do not wish to be understood as restricting myself by such positive descriptive terms employed, excepting as the state of the art may require. Having thus described the invention, what I claim as new—

1. The combination with the shaft or bar *b*, and feed-rack *c*, pinion *d*, and worm and screw shaft *g*, the last being slotted and hollow to receive the rod or shaft g^4 , a slotted shaft g^2 , in longitudinal alinement with the shaft *g*, and a train of gear-wheels for transmitting power from the shaft g^2 to said shaft or bar *b*, of said shaft g^4 , arranged in said hollow shaft

and having a key working in a slot in said shaft *g*, loose wheels *m*, *n*, having keyways and arranged on said shaft *g*, and meshing with trains of gear-wheels connecting with the shaft g^2 , and means for shifting the key rod or shaft and its key, substantially as set forth.

2. In a boring-machine, the combination with the bar or shaft *b*, shaft g^2 , and a train of gear-wheels for transmitting power from said bar or shaft to the shaft g^2 , of supplemental gearing, interposed between said shaft g^2 , and the screw-shaft *g*, whereby the speed of the said screw-shaft may be varied, a key for coupling said shaft g^2 , or one or another train of gear-wheels to the shaft *g*, a shifter for operating said key, said screw-shaft, a worm-wheel, pinion and feed-rack, all arranged and adapted to operate, substantially as set forth.

3. In a boring-machine, the combination with the bar or shaft *b*, slotted shaft g^2 , and a train of gear-wheels for transmitting power from said bar or shaft to the shaft g^2 , of supplemental gearing interposed between said shaft g^2 , and a hollow shaft *g*, said gearing comprising a sleeve *o*, having wheels *o'*, *o''*, a sleeve *p*, having wheels *p'*, *p''*, loose wheels *n*, *m*, having keyways and wheels *j'*, *k*, fixed to the shaft g^2 , said hollow shaft and means for rotating the same, a shaft or rod g^4 , movable in said hollow shaft and having a key to enter the keyway of either the wheel *m* or *n*, or the slot of the shaft g^2 , and means for shifting said rod, a feeding-rack and means for transmitting movement from said hollow shaft to the feeding-rack, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 13th day of August, 1901.

HENRY B. BINSSE.

Witnesses:

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C. B. PITNEY.