(No Model.)

2 Sheets—Sheet 1.

E. S. COBB.

LATHE.

No. 314,433.

Patented Mar. 24, 1885.

Fig. 1.

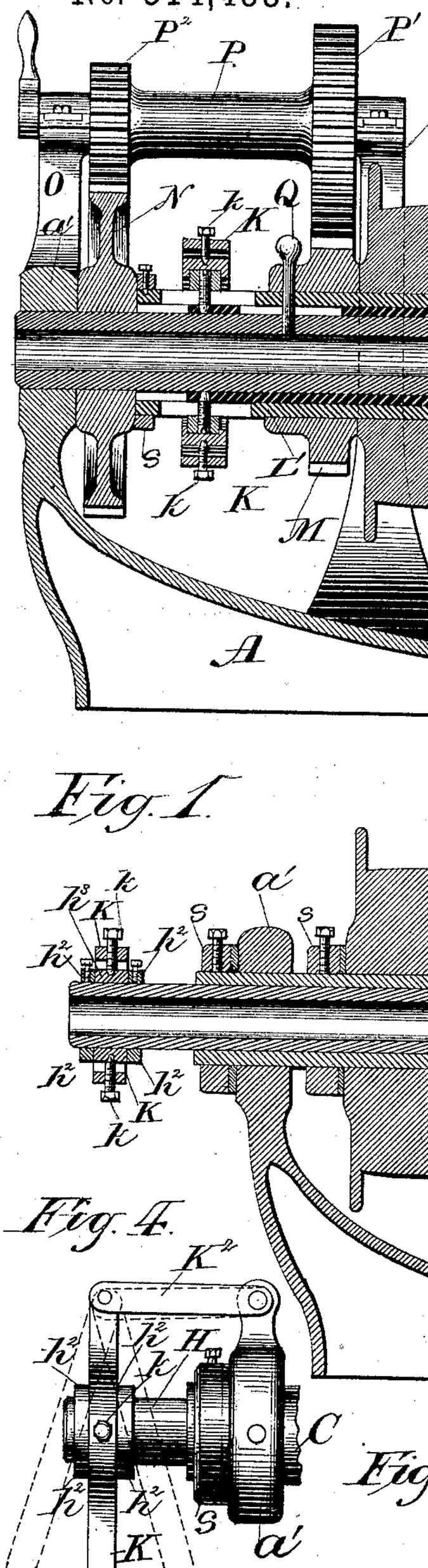


Fig. 2.

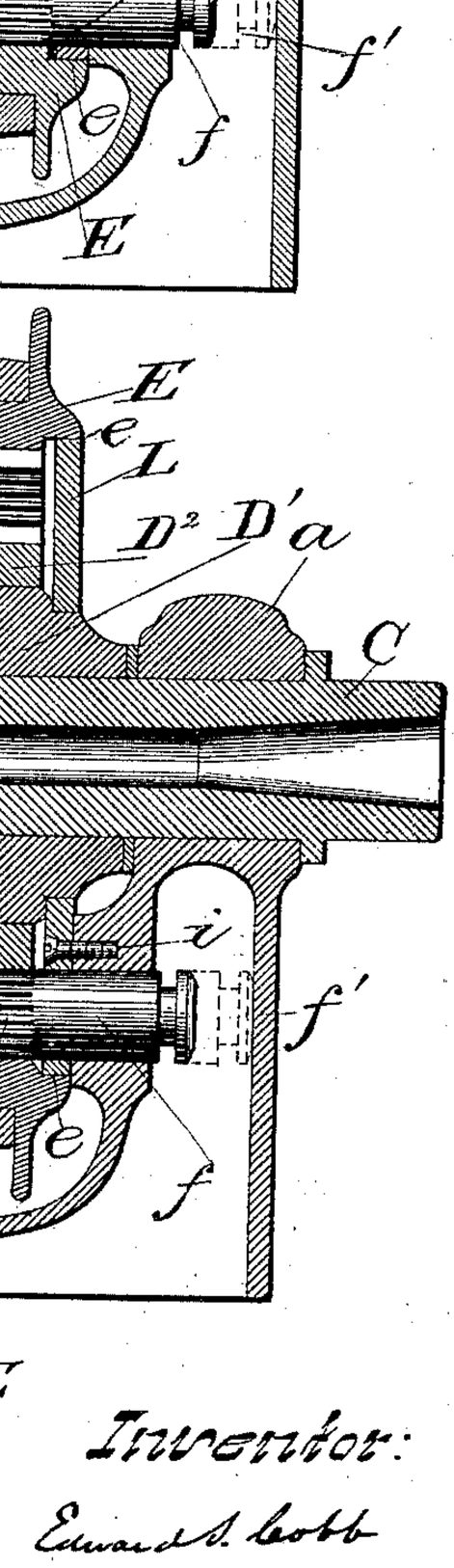
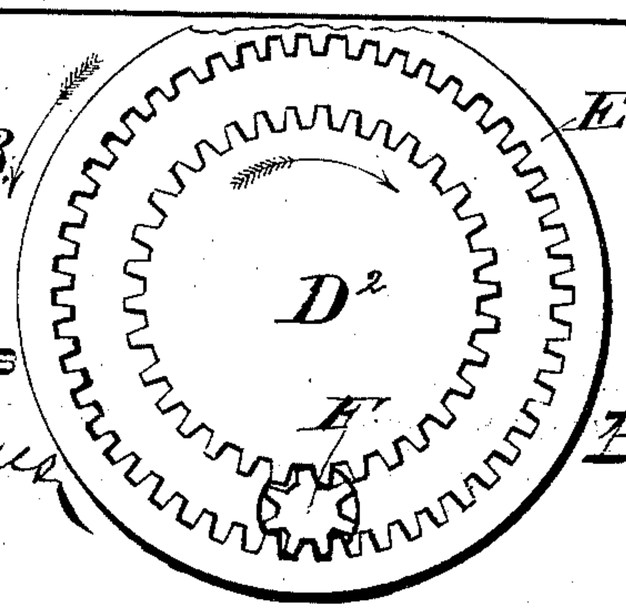


Fig. 4.

Fig. 3.



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(No Model.)

2 Sheets—Sheet 2.

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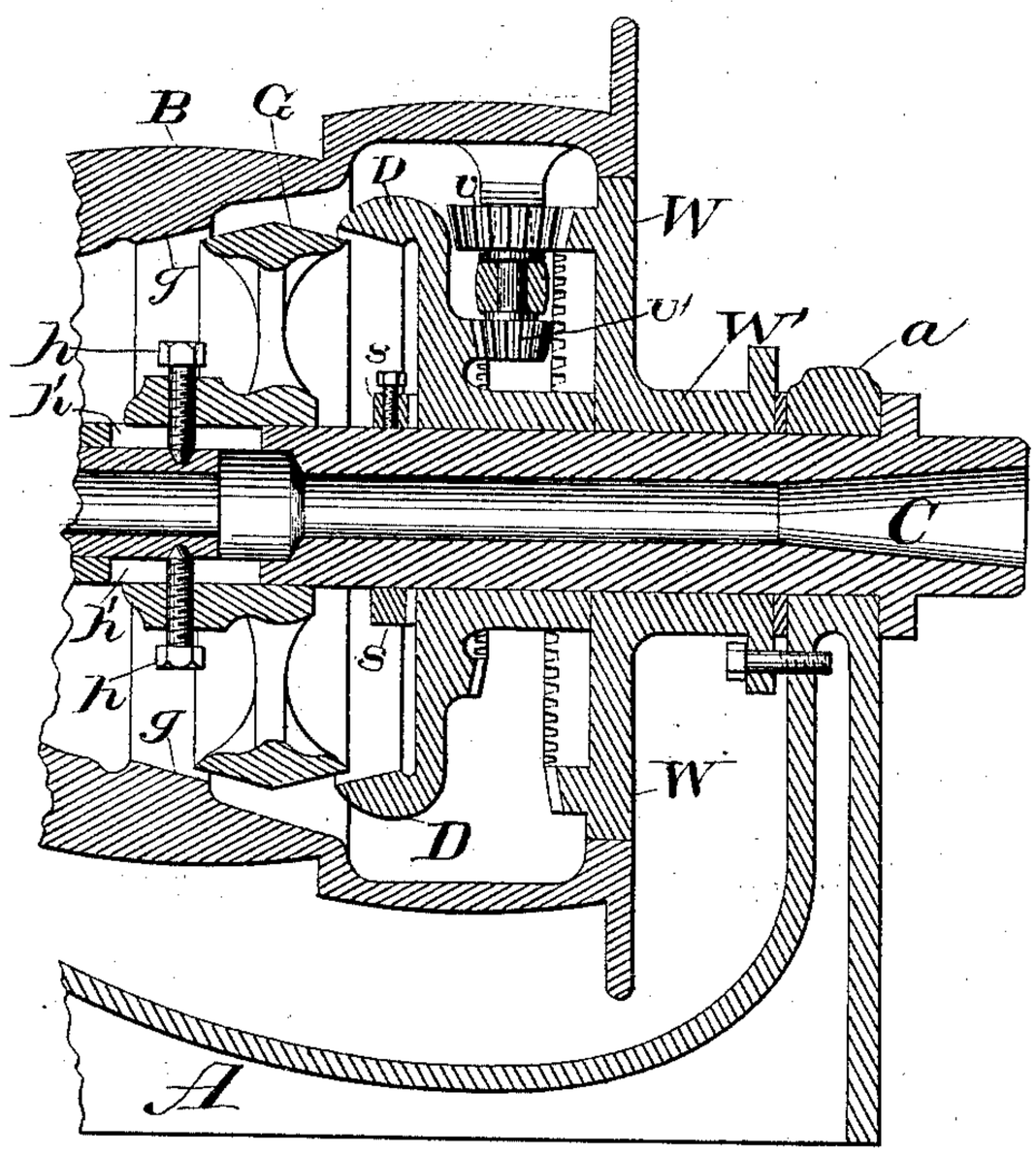
Fig. 5.



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UNITED STATES PATENT OFFICE.

EDWARD S. COBB, OF TERRE HAUTE, INDIANA.

LATHE.

SPECIFICATION forming part of Letters Patent No. 314,433, dated March 24, 1885.

Application filed March 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, EDWARD S. COBB, of Terre Haute, in the county of Vigo and in the State of Indiana, have invented certain new and useful Improvements in Lathes; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates, particularly, to turning-lathes, and will be fully described hereinafter.

In the drawings, Figure 1 is a vertical longitudinal section of a speed-lathe embodying my invention. Fig. 2 is a like view of an engine-lathe, also embodying my invention. Figs. 3 and 4 are details, and Fig. 5 is a modification.

A is the head-stock of my improved lathe. B is the driving-cone, which in its front is hollowed out to receive mechanism for communicating the power from the cone to the spindle C, which latter has bearings at *a a'* in the head-stock A.

D is a female friction-clutch wheel, the hub D' of which runs loosely on the spindle C, and about this hub D' is fixed an annulus, D^2, having cogged outer periphery. Another annulus, E, is fixed in the face of cone B, and the inner periphery of this annulus is cogged, a space being left between the two annuli for a pinion, F, the shaft *f* of which has a bearing in the face of the head-stock, in which bearing it is not only free to revolve, but in which it may be adjusted longitudinally by means of a suitable lever. The pinion F serves to connect the annulus E of cone B with the annulus D^2 of clutch-wheel D, so that the cone B will drive the clutch-wheel D in a direction opposite that in which the cone revolves. On its interior the cone B has steps that correspond with those on its exterior, and one of these interior steps is beveled to form a clutching-surface, *g*.

G, Fig. 1, is a double clutch-wheel that is keyed on the spindle C, its clutching-face extending up between the face of wheel D and the clutching-face *g* of the cone, and this clutch-wheel G has a limited play in the direction of the length of the spindle.

H is a rod or tube that fits loosely in the spindle, and the inner end of this rod is connected with the hub of clutch-wheel G by set-screws *h h*, that pass down through slots *h' h'* in the spindle, while the outer end of this rod or tube is provided with collars h^2 h^2, inclosing a ring, h^3, to which a bifurcated lever, K, is clamped near its center by screws *k k*. One end of lever K forms a handle, while the other end is connected with the frame of the machine by a link, k^2, and by means of this lever the rod or tube H may be moved back and forth to throw the male clutch-wheel G out of mesh with both of the clutch-members *g* and D, or into mesh with either, so as to start, stop, or reverse the spindle while the cone continues its travel in one direction. The front of the cone is closed by an annular plate, L, that fits about the hub D', and is secured to the frame A between it and the cone by screws, as at *i*.

So far I have described my invention as applied to what is known as a "speed-lathe;" but in Fig. 2 I show my invention applied to what is known as an "engine-lathe." As shown in this figure, a sleeve, H', is slipped onto spindle C, which latter is somewhat reduced in size to receive it, and over this sleeve H' another sleeve, L', is slipped, which sleeve L' extends inward to the hub of clutch-wheel D, and is slotted at *l l* to permit the passage of screws *h* through it into the sleeve H'. Just as in Fig. 1, they pass into rod H through the spindle. The cone B is slipped over sleeve L', which latter projects out beyond its rear end.

M, Fig. 2, is a pinion that is keyed to sleeve L' just back of cone B, and N is a gear-wheel that is keyed on the spindle just inside of its bearings *a'*.

O O are brackets that form bearings for the shaft upon which a spool, P, revolves, and this spool carries a gear-wheel, P', on one end and a pinion, P^2, on the other, the gear-wheel for meshing with pinion M, while the pinion P^2 is for meshing with gear-wheel N. The gear-wheel and pinion of the spool P may be thrown out of gear by any suitable mechanism; but when they are in mesh and the clutch-wheel G is thrown into one of the female clutches, then the spindle will get its motion through the sleeve H', and the greatest amount of power is obtained, but with a corresponding decrease in speed; but when I desire great speed, I throw

the gearing out of mesh and pass a pin, *q*, down through the hub of pinion M and the rear end of sleeve L′ into the spindle, and thus connect the sleeve L′ with the spindle, so that the latter will revolve with the sleeve and in a direction dependent upon whether the clutch G be in mesh with female clutch D or *g*.

In the drawings I have shown the annulus E as having a flange, *e*, that incloses the edge of annular plate L, and which forms an additional bearing for the cone; but this flange may be dispensed with as the main office of plate L is to close the opening between the annuli D^2 and E, to prevent dust from getting into the cone. I have also shown the clutches D *g* G as smooth; but it is obvious that they may be cogged without departing from the spirit of my invention.

For the purpose of taking up lost motion, washers *s* are provided at suitable points.

It will be observed that the cone B forms a complete housing for the mechanism that communicates its motion to the spindle, and that this mechanism does the additional duty of throwing the spindle out of gear as well as changing its direction of motion, and that the reversing and disconnecting can be accomplished without unbelting the cone or changing its direction of motion. When the male clutch-wheel G is in mesh, the female clutch-surface *g* and the work being done does not necessitate the frequent reversal of the spindle. The pinion F may be withdrawn from between the annuli E and D^2, so as to permit the clutch D to stand still.

In Fig. 5 I have shown a still further modification of my invention—*i. e.*, the cone is provided with hangers that project down from its interior, and the center of these hangers for bearings for the arbor of bevel gear-wheels *v* *v*′, and the annuli and connecting-pinion are dispensed with. In their stead I provide a plate, W, having an annular row of beveled teeth on its interior face for engagement with the upper bevel gear-wheels, *v*, while the lower bevel gear-wheels engage with the teeth of a circular rack on the rear of the hub of clutch D. This plate W has a hub, W′, that surrounds the spindle, and is suitably bolted to the headstock, so as to be immovable.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A cone having an internal friction or clutch surface, in combination with the spindle, a sliding male clutch-wheel carried by the spindle, and a female clutch-wheel, also carried by the spindle, and gearing connecting the female clutch-wheel with the interior of the cone, as set forth.

2. In combination with the spindle and double male clutch-wheel, the cone and its internally-cogged annulus E, the female clutch-wheel and its cogged annulus, and a pinion connecting the two annuli, as set forth.

3. The combination, with the cone-clutch mechanism and spindle, of sleeves H′ and L′, pinions M and P^2, gear-wheels N and P′, and pin Q, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence two witnesses.

EDWARD S. COBB.

Witnesses:
STANLEY S. STOUT,
H. G. UNDERWOOD.