(No Model.)

W. S. PHELPS.

COMPOUND FEED MOTION FOR BORING CYLINDERS.

No. 570,050. Patented Oct. 27, 1896.

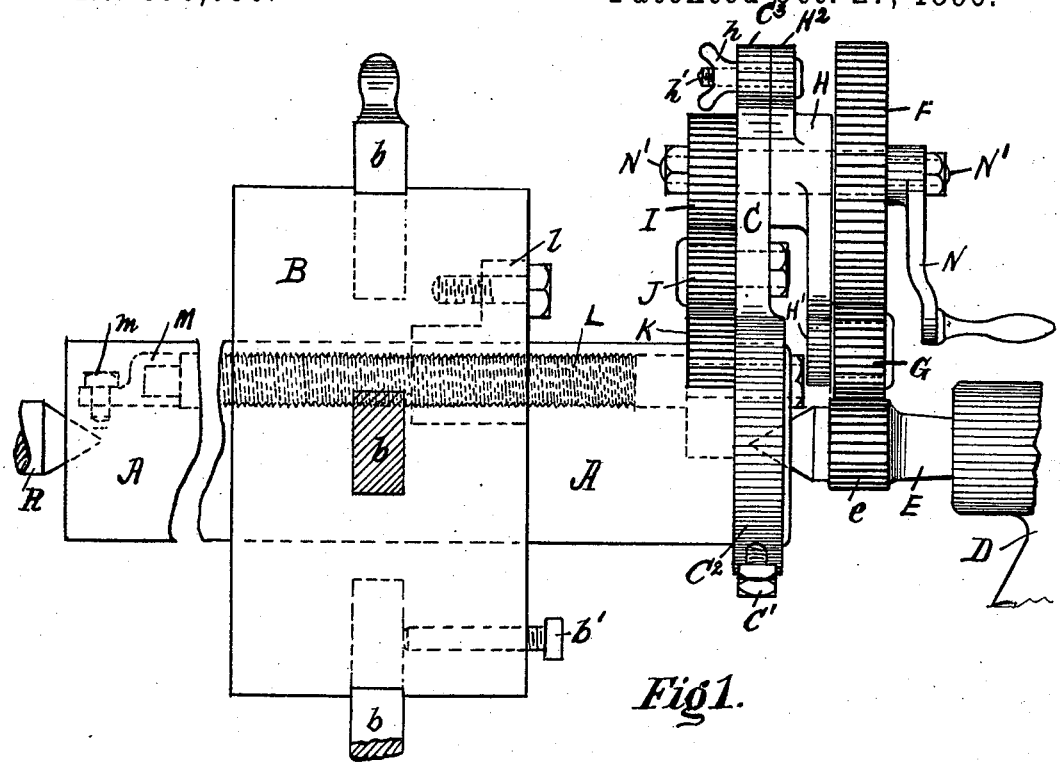

Fig 1.

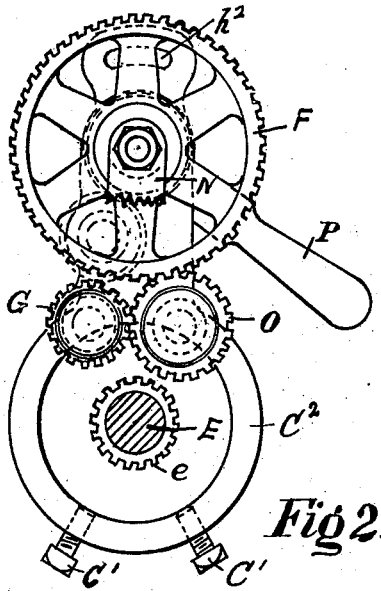

Fig 2.

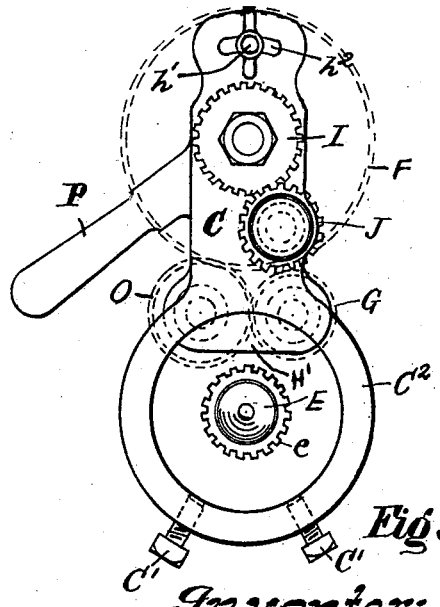

Fig 3.

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UNITED STATES PATENT OFFICE.

WALTER S. PHELPS, OF INDIANAPOLIS, INDIANA.

COMPOUND FEED-MOTION FOR BORING CYLINDERS.

SPECIFICATION forming part of Letters Patent No. 570,050, dated October 27, 1896.

Application filed February 5, 1896. Serial No. 578,121. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. PHELPS, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Compound Feed-Motions for Boring Cylinders; and I do 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 the letters of reference marked thereon, which form a part of this specification.

My invention relates to a device for actuating and reversing the feed-screw of a boring-bar revolving on centers, which may be used either in connection with a lathe, or portably, wherever desired, to bore out the inside of cylinders or tubes with a continuous spiral or serpentine movement; and it consists of a suitable frame supporting and carrying a series of gear-wheels controlled by a lever and novel actuating devices, as will be more fully described hereinafter.

The object of my invention is to provide a simple and inexpensive reversing motion, and I have constructed my apparatus of few parts, of simple design, and which is economical to manufacture and durable in use.

Referring to the drawings, Figure 1 represents a portion of a boring-bar and tool-head with my device attached. Fig. 2 is a front elevation, and Fig. 3 a reverse elevation, of my device disconnected from the bar.

In the drawings, A represents a boring-bar having a slidable head B, of any suitable size or design, carrying suitable boring-tools *b*, secured in sockets by means of set-screws *b'*, the head being moved along the bar in either direction by means of the feed-screw L, which is revoluble, lying in a groove in the side of the bar. The tool-head has a block *l*, having a thread engaging in the threads of the screw L. The bar is supported in a lathe or block, when desired, by the centers R and E.

M is a socket secured in the groove of a bar by a screw-bolt *m*. The end of the feed-screw L has a shank supported and revoluble in the socket. The feed-screw has keyed onto it or set-screwed a gear-wheel K, which may revolve in a recess cut into the side of the bar transversely with the groove containing the screw. The center E, fitting into the tail-stock D or any adjustable block at end of cylinder, is enlarged and has milled on the outside surface a series of teeth forming a gear *e*, or it may be fitted with an ordinary gear secured by usual devices known in mechanics.

C represents a frame the lower part of which has the form of a ring C^2, which is made to fit over the end of the bar, and is secured thereto by set-screws C'. Near the upper portion of the frame C is a shaft N', fitting and revoluble in a hole through the frame, to which is keyed the gear-wheel I, and an intermediate gear-wheel J is supported by a stud secured to the frame C. This intermediate gear engages with the gear I and the gear K, transmitting motion to the feed-screw. A hub H is supported by the shaft N', and has an arm H', having two or more studs at the end of the arm, on which are gear-wheels G and O, revoluble on the studs. To the shaft N' is keyed a larger gear-wheel F, which meshes and engages with the larger gear-wheel O. A lever P extends outward from the arm H' and is preferably made an integral part thereof.

The frame C has the end C^3, having the slot h^2, through which the screw-bolt *h'* may slide. The hub H has a short arm H^2, having a hole through which the bolt *h'* is inserted. The hub H being revoluble upon the shaft N', the two adjacent faces of the parts C^3 and H^2 are slidable and are secured from movement after being adjusted by means of a thumb-nut *h*. Attached to the shaft N' is a crank N, having a handle for rotating the shaft when thrown out of gear, by which the tool-head is moved by hand in either direction when necessary.

By means of the lever P the gear-wheels O and G are brought into contact with the gear *e* on the center E, so that a change of contact from one to the other reverses the motion of the feed-screw L, and a position midway disengages both gears, as shown in Fig. 2, when the feed-screw may be rotated by means of the crank N.

It is obvious that minor changes in detail of construction may be made without departing from the intent of my invention for a regular continuous spiral or serpentine feed with more or less pitch, as desired, by employing

a variety of wheels of different diameters and teeth.

When desirable to increase or decrease the feed of the tool-head with relation to the speed of the boring-bar, I use gear-wheels of different sizes instead of those represented as I, J, and K. The boring bar and head may be of any desired form or material in common use, which I do not claim as novel; but

What I do claim as new and novel, and desire to secure by Letters Patent of the United States, is—

1. A reversible gear for boring-bars having a continuous spiral or serpentine feed, comprising in combination a bar provided with a suitable slidable tool-head and a suitably-mounted screw to actuate said head, said screw having at or near one end a toothed wheel secured thereto, said wheel being situated near one end of said bar; a lathe-center supporting revolubly one end of said bar and having gear-teeth surrounding its periphery; a main frame having at one end a ring or collar surrounding the end of said bar and adjustably and detachably secured thereto adjacent to said toothed wheel, the opposite end of said frame having a curved concentric slot; a revoluble shaft suitably journaled in said frame, extending therethrough and having secured at one end adjacent to one side of said frame a toothed wheel; a toothed wheel revolubly supported on a stud and operatively connecting said toothed wheel and said toothed wheel of the feed-screw; an adjustable frame mounted at opposite side of said main frame by means of said shaft revoluble therein, said adjustable frame having at one end an opening registering with said curved slot and a securing-bolt therethrough, and at its opposite end a pair of studs having a revoluble toothed wheel on each, so situated that either wheel may be engaged with the gear-teeth of said center or both disengaged by the swinging of said adjustable frame; a toothed wheel secured to said shaft engaging one of said wheels on said pair of studs; a lever attached to said adjustable frame, and means for manually rotating said shaft, substantially as and for the purposes shown and described.

2. In a boring-bar, a reversible continuous feed mechanism comprising in combination with a bar having a feed-screw and the wheel K, the center E provided with the teeth *e;* the main frame C having at one end the ring or circular part C^2 and means for adjustably securing it to said bar, and having at the opposite end the slot h^2; the adjustable frame composed of the hub H, and arms H′ and H^2 mounted adjacent to said main frame, said arm H′ having the toothed wheels O and G revoluble on studs secured to said arm arranged so that either of said wheels may engage said teeth *e* or be disengaged by means of swinging the arm H′, and said arm H^2 having an opening registering with said slot h^2 and a binding-bolt therethrough; the shaft N′ passing through said frames revoluble in suitable openings therein; the toothed wheel F secured to said shaft and engaging with the said wheel O; the crank N secured to said shaft adjacent to said wheel F; the toothed wheel I secured to the opposite end of said shaft; the toothed wheel J mounted on a suitable stud and engaging said wheel I and said wheel K, and the lever P attached to said adjustable frame, substantially as shown and described.

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

WALTER S. PHELPS.

Witnesses:
ROBERT W. JORDAN,
JOHN LANGRIDGE.