No. 647,696. Patented Apr. 17, 1900.

B. L. CLOVER.

MACHINE FOR TURNING OFF CRANK PINS, &c.

(Application filed June 5, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

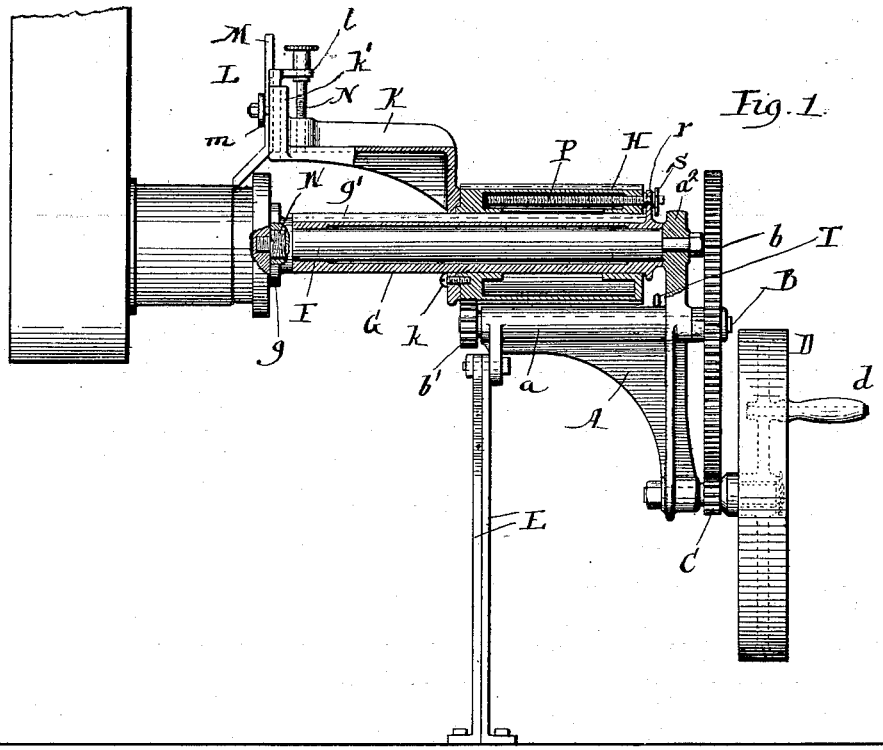
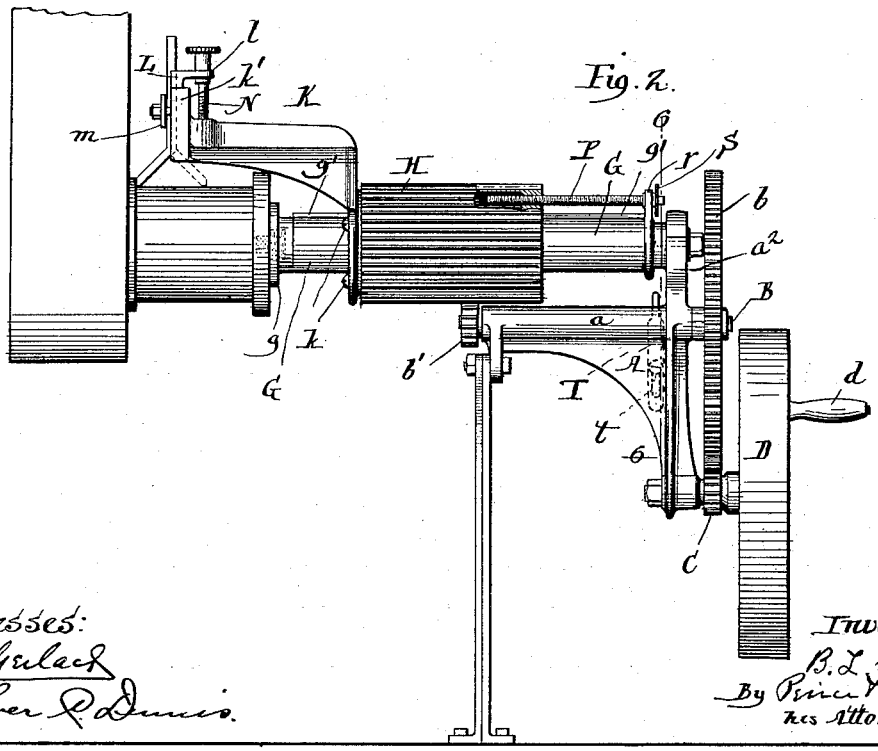


Fig. 2.



Witnesses:
Fred. Gerlach
Oliver P. Dennis.

Inventor:
B. L. Clover
By Prince & Fisher
his Attorneys.

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Fig. 3.

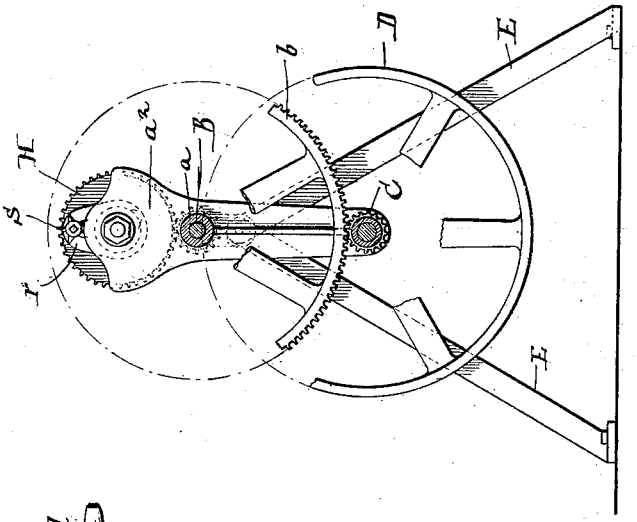


Fig. 4.

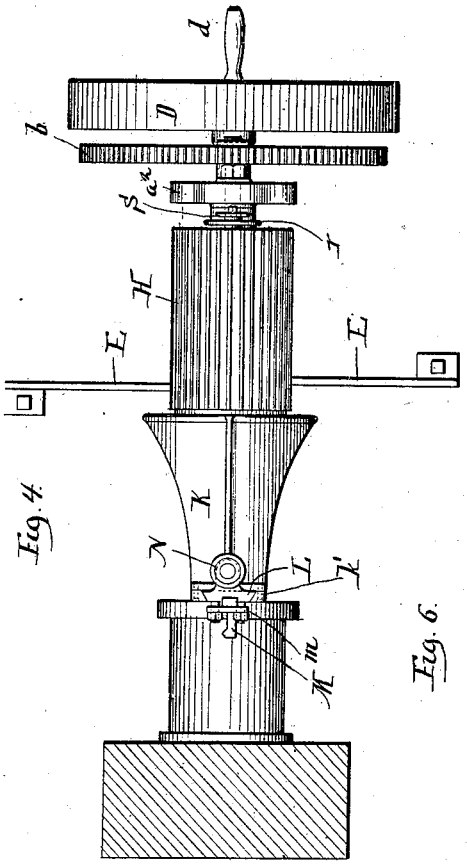


Fig. 5.

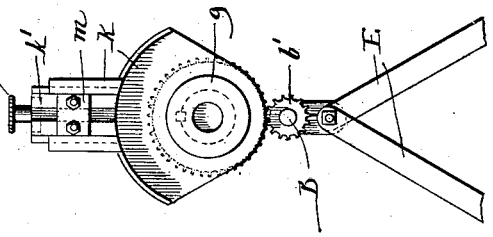
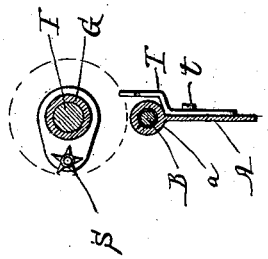


Fig. 6.



Witnesses:
Fred Gulack
Oliver P. Dennis

Inventor:
B. L. Clover
By Pierce & Fisher
his Attorneys.

UNITED STATES PATENT OFFICE.

BENTON L. CLOVER, OF CHICAGO, ILLINOIS.

MACHINE FOR TURNING OFF CRANK-PINS, &c.

SPECIFICATION forming part of Letters Patent No. 647,696, dated April 17, 1900.

Application filed June 5, 1899. Serial No. 719,351. (No model.)

To all whom it may concern:

Be it known that I, BENTON L. CLOVER, a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Turning Off Crank-Pins, Wrist-Pins, or the Like, of which the following is a full, clear, and exact description.

This invention has for its object to provide a simple, cheap, durable, and effective construction of machine whereby the crank-pins of engines may be quickly and accurately turned off or trued without the necessity of removing such part from the engine and without the necessity of putting the engine for any considerable length of time out of service. The invention, while especially applicable, however, to the turning off or truing of crank-pins, may be used with advantage in truing the ends of journals or shafts and in other situations.

The invention consists in the several features of improvement hereinafter described, illustrated in the accompanying drawings, and particularly defined at the end of this specification.

Figure 1 is a view in vertical section through my improved machine. Fig. 2 is a view in side elevation, parts being broken away. Fig. 3 is a view in front elevation, parts being broken away. Fig. 4 is a plan view. Fig. 5 is a rear end view. Fig. 6 is a view in vertical cross-section on line 6 6 of Fig. 2.

A designates the main frame of the machine, in the upper part of which frame is formed a long bearing *a* for the drive-shaft B, that carries at its front end the gear-wheel *b* and at its rear end the gear-pinion *b'*. Preferably, and as shown in the drawings, the frame A has a downward extension that is formed with a journal to receive a short shaft that carries the pinion C, this shaft having fixed thereto a hand-wheel D, that is provided with a crank-handle *d*, the gear-pinion C connecting with the teeth of the gear-wheel *b*. The frame A is also shown as formed with a depending lug to which are bolted the upper ends of the supporting-legs E, that serve to sustain in great part the weight of the machine. These legs may be adjustable or expansible, if desired. To the upwardly-extending part a^2 of the frame A is rigidly attached the projecting stud or shaft F, upon which is revolubly mounted the long sleeve G, one end of which is shown as abutting against the head *g* of the stud or shaft G, while the opposite end abuts against the raised portion a^2 of the frame. The sleeve G is provided with a spline or feather *g'*, extending lengthwise thereof and engaging a corresponding seat formed in the hub of the gear-cylinder H, that is mounted in manner free to slide lengthwise upon the sleeve G, while it revolves therewith by reason of the connecting spline or feather *g'*. The gear-cylinder H is provided throughout its length with teeth that engage with the corresponding teeth of the gear-pinion *b'* on the inner end of the drive-shaft B. To the rear end of the cylinder H is conveniently fastened, as by the screws *k*, a suitable tool-holding support or bracket K, the end of which is formed with a slide-rest *k'* to receive the slide L, that carries the tool M. The tool M may be held in the slide-rest by the clamping-plate *m* or in any other suitable or convenient manner. The slide L is shown as provided with a rearwardly-projecting arm *l*, through which passes a screw-rod N, the threaded lower end of which enters a correspondingly-threaded socket in the bracket K, the upper end of the rod N being furnished with a suitable thumb-wheel, whereby the rod can be conveniently turned in order to maintain the tool M at proper working position with respect to the crank-pin or like article to be trued.

The front end of the gear-cylinder H is provided with a threaded hole, through which passes a correspondingly-threaded feed-screw P, the outer end of this feed-screw being journaled in an arm *r*, formed on or projecting from the forward end of the sleeve G, and the feed-screw has fixed thereto a spur-wheel S, adapted to contact with a bar or finger T, that is fastened to the main frame A and extends into position to engage the spur-wheel S, so as to turn the spur-wheel to the extent of one tooth at each revolution of the gear-cylinder H around the stud or shaft F, and thus effect a corresponding advance feed of the cylinder and of the tool, as will presently more fully appear. The arm or finger T may be made adjustable by forming this finger with a slot, through which passes a set-screw

t, whereby the finger is held in desired position, and, if desired, several fingers or pins projecting from the frame may be used in order to act upon the spur-wheel and effect the more rapid advancement of the tool.

In order to enable the mechanism to be properly centered and rigidly secured with respect to a crank-pin or like part to be turned off, I have provided the end of the stud or shaft F with a screw W, that projects beyond the base of its head g. Preferably the screw W is formed separate from the stud or shaft F and has a threaded portion that enters a correspondingly-threaded socket or seat in the end of the stud or shaft F. The screw W not only enables the exact centering of the lathe with respect to the crank-pin or like part to be turned off, but also rigidly unites the end of the stud or shaft F to the crank-pin, and thus insures the accurate travel of the tool around the pin. By forming the centering-screw W separate from the stud or shaft F this screw can be replaced by screws of larger or smaller size, as may be desired.

From the foregoing description the operation of my improved machine will be seen to be as follows: When a crank-pin is to be turned, a screw-threaded socket will be first formed at the center of the pin to receive the outer end of the centering-screw W. The centering-screw W will then be screwed in such socket until the head G is brought to firm engagement with the end of the crank-pin. The legs E will then support the body of the machine. The tool M will be adjusted to proper working position with respect to the surface of the crank-pin X, the cylinder H being at such time in the position shown in Fig. 1 of the drawings. The operator will then turn the wheel D, and through the medium of the gear-wheel b, the drive-shaft B, and pinion b' will cause the gear-cylinder H to revolve about the fixed stud or shaft F, and as this gear-cylinder carries with it the tool-holding frame and tool it will be seen that the tool will be caused to travel around the surface of the crank-pin or like part being operated upon. At each revolution of the cylinder H an arm or tooth of the spur-wheel S will contact with the arm or finger T, and the feed-screw P will thus be turned so as to cause a corresponding advance feed of the cylinder H, and hence of the tool M; but the teeth of the cylinder H will remain in constant gear with the pinion b'. When the tool M has reached the limit of its travel in outward direction, the operator may reverse the position of the tool, as shown by dotted lines in Fig. 2, so as to enable the tool to operate close to the outer flange or rim of the crank-pin, and by then reversing the direction of the crank-wheel the tool may be caused to travel in the opposite direction or toward the operator. When required, the tool may be withdrawn from its initial position by means of a wrench engaging the squared front end p of the feed-screw P.

From the foregoing description it will be seen that my invention provides a very simple and effective means whereby crank-pins, wrist-pins, or like parts may be conveniently and quickly trued without the necessity of removing such parts from the engine, and it is manifest that the precise details of construction above set out may be varied by the skilled mechanic without departing from the scope of the invention.

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

1. In apparatus of the character described, the combination with a suitable frame, of a stud or shaft carried by said frame and provided at one end with a centering-screw adapted to engage a threaded perforation in the end of the pin or like part to be turned, a tool-holding support revolubly mounted upon said stud or shaft and suitable gear mechanism for effecting the revolution of said tool-holding support around said stud or shaft.

2. In apparatus of the character described, the combination with a suitable frame, of a non-revoluble stud or shaft carried by said frame and adapted to engage the pin or like part to be turned, a sleeve encircling said shaft and revoluble thereon, a tool-holder carried by said sleeve and movable longitudinally thereof, a suitable gear encircling said sleeve and movable longitudinally with the tool-holder lengthwise thereof and suitable means for imparting rotation and longitudinal movement to said gear.

3. In apparatus of the character described, the combination with a suitable frame, of a stud or shaft projecting therefrom and provided with a sleeve revolubly mounted thereon, a gear-cylinder keyed to said sleeve but movable longitudinally thereon, a tool-holder connected to said gear-cylinder, a drive-shaft in gear with said cylinder and suitable means for turning said drive-shaft.

4. In apparatus of the character described, the combination with a main frame, of a stud or shaft F projecting therefrom, a sleeve G revolubly mounted upon said stud or shaft, a gear-cylinder H keyed to said sleeve G but longitudinally movable thereon, a tool-support K connected to said cylinder H, a pinion b' engaging said cylinder H and a drive-shaft for operating said pinion.

5. In apparatus of the character described, the combination with a suitable frame, of a fixed stud or shaft projecting therefrom, a sleeve revolubly mounted upon said stud or shaft, a gear-cylinder keyed to said sleeve but longitudinally movable thereon and provided with a tool-holding support, a feed-screw connected to said sleeve and engaging said gear-cylinder, and suitable means for operating said screw to effect the advancement of said cylinder.

6. In apparatus of the character described, the combination with a suitable frame, of a fixed stud or shaft projecting therefrom, a

sleeve revolubly mounted upon said stud or shaft, a gear-cylinder keyed to said sleeve but longitudinally movable thereon and provided with a tool-holding support, a feed-screw connected to said sleeve and engaging said gear-cylinder, a spur-wheel fixed to said feed-screw, and a suitable finger or part adapted to engage said spur-wheel to effect the automatic advancement of said gear-cylinder.

BENTON L. CLOVER.

Witnesses:
GEO. P. FISHER, Jr.,
ALBERTA ADAMICK.