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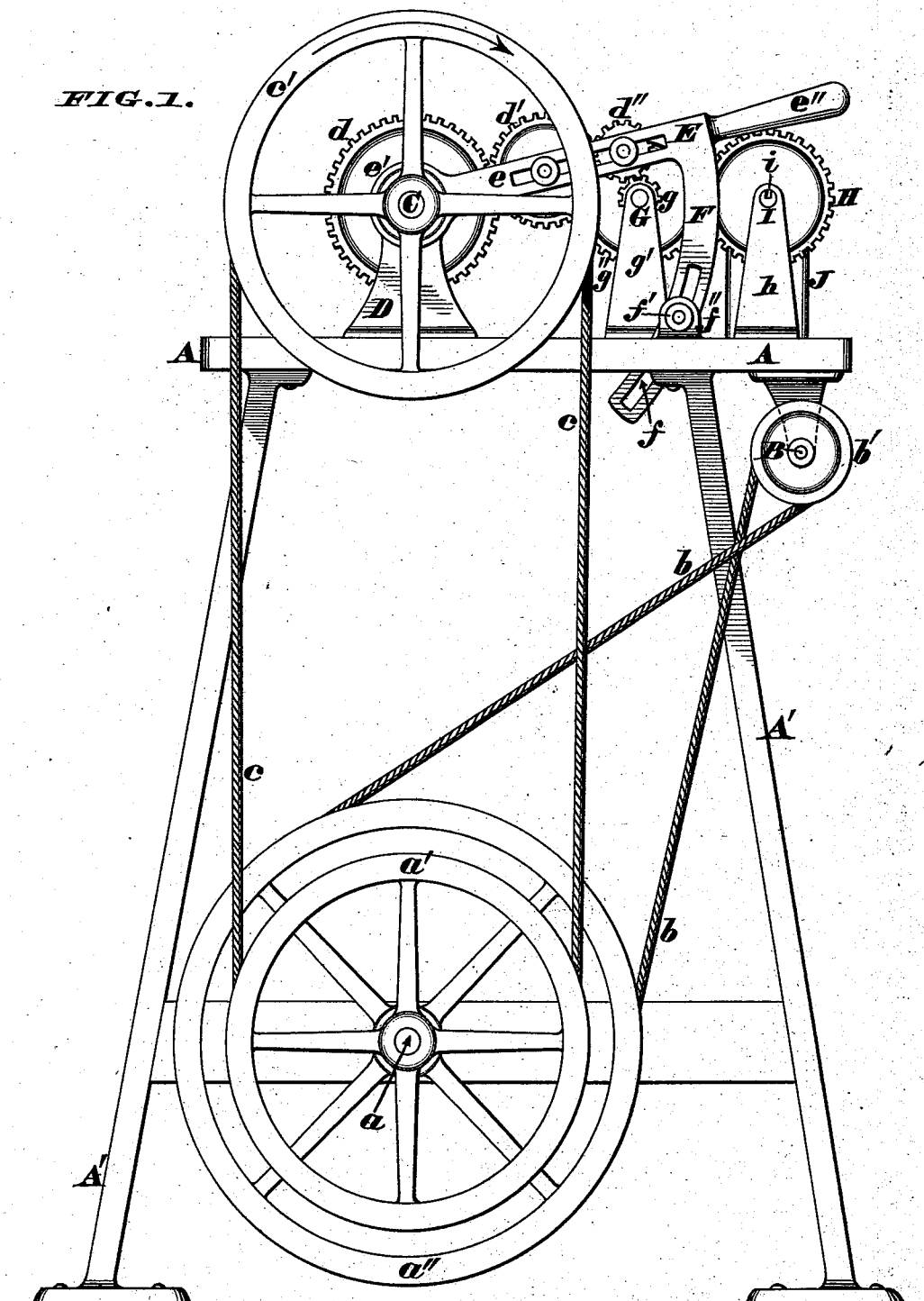
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J. A. COBURN.

ENGRAVING AND CHASING MACHINE.

No. 381,214.

Patented Apr. 17, 1888.



*Attest.*  
S. S. Carpenter  
L. & Layman.

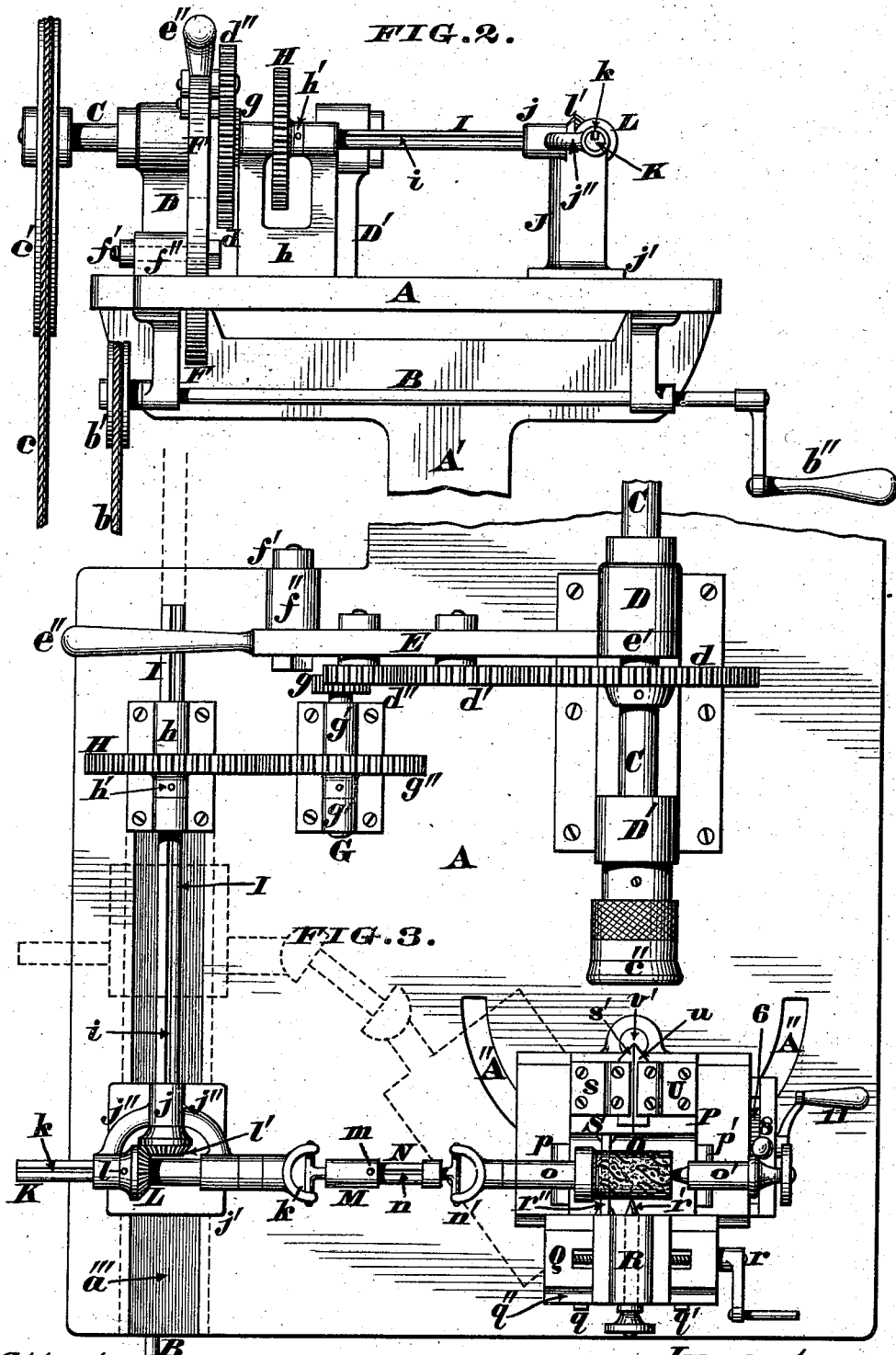
*Inventor.*  
*John A. Coburn.*  
*By James H. Layman,*  
*Att'y.*

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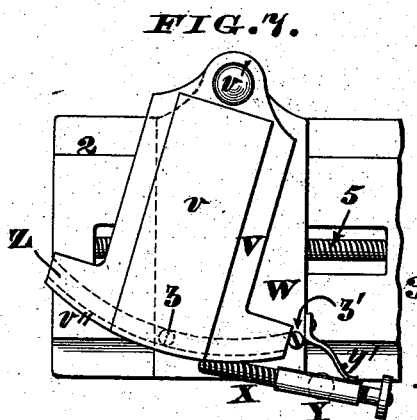
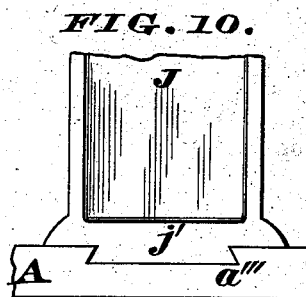
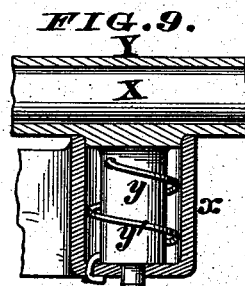
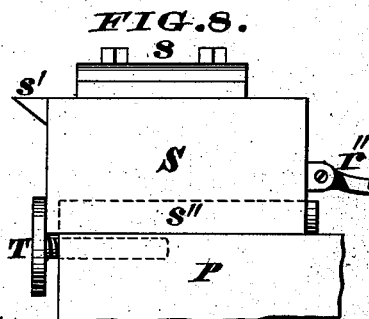
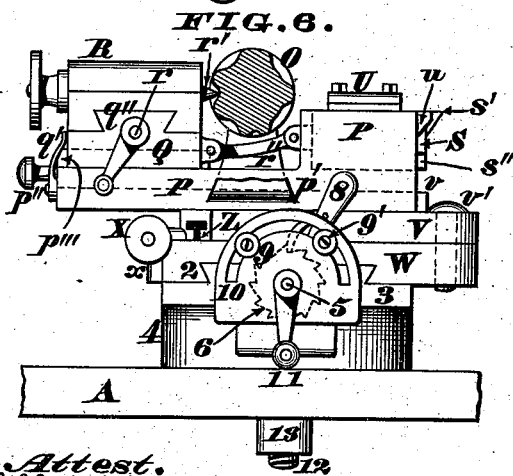
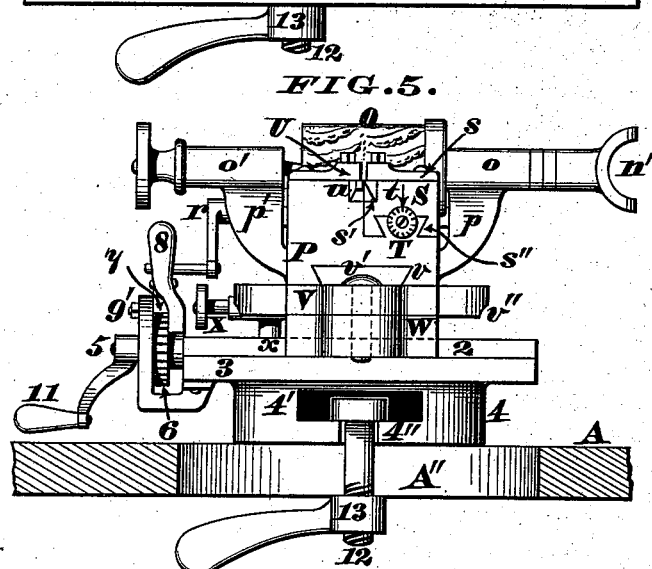
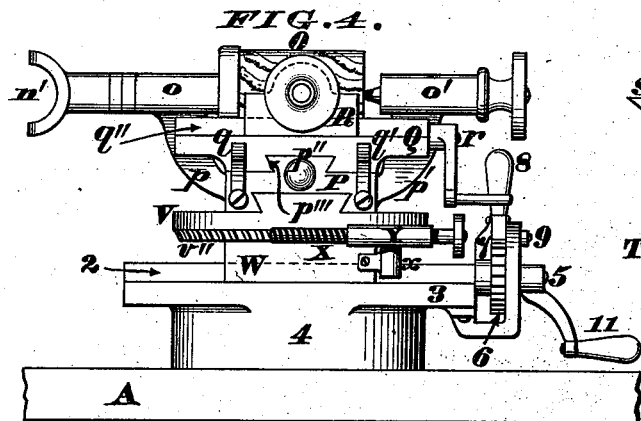
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by James H. Layman.  
Atty.

# UNITED STATES PATENT OFFICE.

JOHN A. COBURN, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO JOHN C. DUEBER, OF NEWPORT, KENTUCKY.

## ENGRAVING AND CHASING MACHINE.

SPECIFICATION forming part of Letters Patent No. 381,214, dated April 17, 1888.

Application filed December 20, 1887. Serial No. 253,421. (No model.)

### *To all whom it may concern:*

Be it known that I, JOHN A. COBURN, a citizen of the United States, residing at Springfield, in the county of Hampden, State of Massachusetts, have invented certain new and useful Improvements in Engraving and Chasing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention comprises a machine which is intended more especially for engraving and chasing the backs of watch-cases, although it can be readily used for ornamenting various other articles, the preferred construction of said machine being as follows:

A suitable bench or table has mounted upon it a main spindle, whose front end carries a chuck or other means of attaching the watch-back or other blank, said spindle having motion imparted to it by a shaft that is turned by the operator. Furthermore, this chuck-spindle carries a wheel that gears with a train of wheels for imparting motion to a flexible connection or connections, which latter drive the roll or other ornamented die or pattern. The exact number and arrangement of these gear-wheels is immaterial, as is also the construction of the flexible connection, although said connections usually consist of universal-joint couplings, the object of these couplings being to permit a great range of adjustment of a compound slide-rest that carries the tracer and cutter and has the ornamented pattern journaled upon it. This slide-rest is situated in front of the chuck and can be shifted in a variety of ways, so as to enable the cutter to operate either on flat or crowning or other peculiar-shaped backs or blanks. The chuck-spindle has a longitudinally-slotted lever pivoted to it, which lever affords journal-bearings for a train of gear-wheels and is capable of being readily swung up for the purpose of applying a large or small pinion to one of the counter-shafts, so as to vary the speed of the flexible connections that drive the pattern, as hereinafter more fully described.

Another feature of my invention consists in providing the slide-rest with a reciprocating slide operated by the tracer and having a connection wherewith every motion of said slide

is imparted to a carriage that is armed with a graver or other suitable cutting or chasing tool, as hereinafter more fully described.

Another feature of my invention consists in a novel construction of the compound slide-rest, the details of the same and the method of operating it being hereinafter more fully described.

Another feature of my invention consists in providing the slide-rest head with a screw having a graduated head, which screw is capable of being set so as to limit the advance of the tool-carriage and the consequent penetration of the graver secured to said carriage, as hereinafter more fully described.

Another feature of my invention consists in a novel combination of worm, tangent-screw, and pivoted housing for turning a swinging plate pivoted to a sliding plate of the rest, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a rear elevation of an engraving and chasing machine embodying my improvements. Fig. 2 is a side elevation of a portion of my machine, the upper part of the chuck-spindle pulley being broken away. Fig. 3 is a plan of the machine, said pulley being omitted. Fig. 4 is an enlarged front elevation of the compound slide-rest. Fig. 5 is a rear elevation of the same. Fig. 6 is a side elevation thereof, the engraved roll or die being sectioned, and a bracket that supports one of the bearings of said die being broken away. Fig. 7 is a plan of a portion of the slide-rest, the "head" of the same being removed. Fig. 8 is an enlarged side elevation of the tool-carriage, which carriage is shown in its advanced position. Fig. 9 is an axial section of the shank of the tangent screw-housing. Fig. 10 is a front elevation of the foot of the shiftable standard of the main counter-shaft.

Referring to Fig. 1, A represents a table supported upon a suitable frame, A', whose lower portion is provided with a shaft, *a*, running from the front to the rear of the same, said shaft being furnished with a pair of grooved pulleys, *a'* *a''*. The front pulley, *a'*, is driven by a crossed belt or band, *b*, from the grooved pulley *b'* at the rear end of shaft B, the latter being journaled under the table A and having

a crank,  $b''$ , convenient to the operator. The rear pulley,  $a'$ , has a straight belt or band,  $c$ , that drives the grooved pulley  $c'$  at the rear end of a spindle,  $C$ , the front end of the latter being provided with any approved form of chuck,  $c''$ . (Seen in Fig. 3.) This chuck-spindle is journaled in bearings  $D D'$ , projecting vertically from the table  $A$ , and carries a master-wheel,  $d$ , that communicates motion to a train of gear-pinions,  $d' d''$ , the stud-shafts of said pinions being secured within the longitudinal slot  $e$  of a swinging lever,  $E$ , whose hub  $e'$  turns on the spindle  $C$ . The opposite or free end of said lever takes the shape of a handle,  $e''$ . Projecting from the under side of this lever is an arm,  $F$ , having a curved slot,  $f$ , concentric with the chuck-spindle, said lever being held to any specific adjustment by a bolt,  $f'$ , secured to a lug,  $f''$ . Pinion  $d''$  engages with a pinion,  $g$ , on the rear end of a short shaft,  $G$ , journaled in bearings  $g'$  and carrying a gear-wheel,  $g''$ . This gear drives a wheel,  $H$ , journaled in a fixed bearing,  $h$ , the hub of said wheel being provided with a feather or pin,  $h'$ , that traverses the longitudinal groove  $i$  of the main counter-shaft  $I$ , which latter has its front end journaled in the bearing  $j$  of a shiftable standard,  $J$ , whose base has a dovetail foot,  $j'$ , adapted to readily traverse an undercut groove,  $a'''$ , in the upper surface of the table, said foot and groove being more clearly shown in Fig. 10.

Bearing  $j$  has branches  $j''$ , that support a secondary counter-shaft,  $K$ , grooved longitudinally at  $k$  to admit the feather or pin  $l$  of the hub of a bevel-pinion,  $L$ , that is driven by a similar pinion,  $l'$ , secured to the front end of shaft  $I$ . Shaft  $K$  has a universal-joint connection,  $k'$ , to which is attached a sleeve,  $M$ , whose feather or pin  $m$  traverses the longitudinal groove  $n$  of another shaft,  $N$ , which latter has a universal-joint connection,  $n'$ , with the bearing  $o$  of the engraved roll or other suitable die,  $O$ , the opposite end of said roll being journaled on a bearing,  $o'$ . These bearings are carried by brackets  $p p'$ , projecting from the opposite sides of the slide-rest head  $P$ , whose front end has a knob or handle,  $p''$ , wherewith it is readily advanced or retracted, as occasion may require. Furthermore, this head  $P$  has a tongue,  $p'''$ , fitting within a dovetailed groove on the under side of the head-slide  $Q$ , which latter is advanced toward the roll or die  $O$  by springs  $q q'$ , whose lower or fixed ends are secured to said head, as more clearly seen in Fig. 4. The upper surface of head-slide  $Q$  has a tongue,  $q''$ , fitting within an undercut groove on the under side of the traversing block  $R$ , which is moved along parallel with the die  $O$  by means of the feed-screw  $r$ .  $r'$  is a hardened point, stub, or tracer carried by this block and adapted to bear against the periphery of the engraved roll, as more clearly seen in Fig. 6.

$r''$  is a link or other suitable coupling that connects the head-slide  $Q$  with the tool-car-

riage  $S$ , in order that the reciprocating movements of said slide may be transferred directly to said carriage, the latter being provided with a clamp or holder,  $s$ , wherewith the graver, 70 chaser, or other cutting-tool,  $s'$ , is held in place. Carriage  $S$  is grooved on its under side, as at  $s''$ , to admit a tongue of the head  $P$ , which head has a screw,  $T$ , tapped in it. The head of this screw is graduated and can be set to 75 regulate the advance of the tool-carriage  $S$ , the latter having a mark on it whereby the turning of the screw is regulated. In Fig. 5 this mark is indicated by the arrow  $t$ .

$U$  is a clamp plate or holder serving to secure a guide,  $u$ , to the head  $P$ , the end of said guide being adapted to bear against the uncut portion of the watch-back or other piece of work applied to the chuck  $c''$ .

$V$  is a horizontally-swinging plate having on 85 its upper surface a tongue,  $v$ , that enters a dovetail groove on the under side of head  $P$ , the rear end of said plate being pivoted at  $v'$  to a sliding plate,  $W$ . The front end of plate  $V$  is circular, being concentric with the pivot 90  $v'$ , and has a worm,  $v''$ , cut in it, which worm engages with a tangent screw,  $X$ , that turns within a bearing,  $Y$ , said bearing having a vertical shank,  $y$ , journaled in a housing,  $x$ , attached to the sliding plate  $W$ .

$y'$  is a spring that maintains the tangent screw in gear with the worm-segment, which spring may be arranged as seen in Fig. 7 or as represented in Fig. 9; but the latter construction is preferred. 100

$Z$  is a T-shaped groove on the under side of the swinging plate  $V$ , said groove being concentric with the pivot  $v'$  and adapted to receive screws  $z z'$ , tapped into the plate  $W$ , for the purpose of preventing any lifting of the free end of said swinging plate  $V$ . Sliding plate  $W$  is grooved transversely on its under side to receive the dovetail tongue 2, running longitudinally of the bed-piece 3, said bed being usually integral with the base 4, and having a leading-screw, 5, wherewith said plate is shifted. This screw has a ratchet-wheel, 6, operated by the pawl 7 of lever 8, the swing of the latter being regulated by a pair of adjustable stop-pins, 9 9', engaged with the curved 115 slot 10.

11 is a crank wherewith the leading-screw 5 can be quickly operated after disengaging the pawl 7 from the ratchet-wheel 6. The base 4 is chambered out at 4' to receive the 120 head of a screw, 12, which passes through a slot, 4'', of said base, and also through a slot,  $A''$ , of the table, which latter slot is about semicircular, being struck from a center in line with the chuck-spindle. 125

13 is a nut that engages with the lower end of screw 12, and thus retains the base of the slide-rest in any desired position.

My machine is operated in the following manner: The engraved roll or die  $O$  is first 130 properly fitted to the bearings  $o o'$ , and the watch-back or other article to be engraved is

then applied to the chuck  $c''$  in the usual manner, after which act the nut 13 is loosened to permit the compound slide-rest being swung around to the position indicated by the dotted lines in Fig. 3, and said nut is then tightened for the purpose of clamping said rest immovably upon the table A. Simultaneous with this shifting of the slide-rest the standard J is shoved back within the groove  $a'''$  of the table, thereby causing the main counter-shaft I to project some distance beyond the rear of said table, as indicated by the dotted lines, the universal-joint connections  $k' n'$  permitting these changes to be readily effected and yet keeping the roll in gear with said shaft. Screw T is then adjusted to limit the advance stroke of tool-carriage S and the consequent depth of cut of the graver or chaser  $s'$ , and the slide-rest head P is also advanced to bring the guide  $u$  in contact with the surface of the work. The operator then turns the handle  $b''$  in such a manner as to revolve the chuck  $c''$  in the direction of the arrow seen on the pulley  $c'$  in Fig. 1, which turning of the handle sets the gear-wheels  $d, d', d'', g, g'', H, L$ , and  $I'$  in motion. This motion is accordingly transmitted to the roll O, and as the springs  $q q'$  force the head-slide Q forward it is apparent that the stub or tracer  $r'$  is constantly in contact with the engraved or otherwise ornamented periphery of said roll. Therefore as the roll revolves this tracer follows every elevation and indentation in the same, thereby producing a reciprocating motion of the slide Q, which motion is imparted to the tool-carriage S by means of the link  $r''$ .

It will thus be seen that the graver traces on the work an exact reproduction of the pattern on the roll or die, and as soon as the chuck has made one complete revolution the operator ceases to turn the handle  $b''$  and immediately retracts the head P. The leading-screw 5 is now turned for the purpose of advancing the sliding plate W and its attachments along the bed-piece 3, so as to bring the graver in front of another uncut surface of the work or blank. The feed-screw  $r$  is also turned to advance the traversing-block R, and thereby cause the tracer  $r'$  to operate against a new portion of the roll. The head P is again advanced and the above-described operations repeated until the graver reaches the position seen in Fig. 3, when the work will be finished. While these operations are being carried out it may be necessary to give a swinging motion to the slide-rest, so as to enable the graver to act on a crowning surface of the work, which motion is readily effected by turning the tangent-screw X. The proper turning of this screw swings the plate V horizontally on the pivot  $v'$ , and consequently the head P and all attachments to the same partake of this swinging movement. After this swinging movement has been accomplished, the housing Y can be turned on its pivot  $y$ , so as to disengage the screw X from the worm  $v''$ , and

thereby allow the plate V to be at once swung back to its normal position. It will thus be seen that my compound slide-rest is capable of being readily and securely adjusted in such a manner as to enable its graver or other cutting-tool to operate on crowning, flat, or any other shaped work or blank. Finally, by detaching the pinion  $g$  and substituting a larger or smaller pinion in its place the roll O will be driven at a greater or less velocity with reference to the speed of the chuck; but previous to making this change the nut  $f'$  must be slackened to enable the raising of lever E, so as to obtain convenient access to said pinion.

I claim as my invention—

1. The combination, in an engraving and chasing machine, of a spindle provided with a chuck or other means of attaching the blank, a slide-rest having the ornamented roll or die journaled in it and carrying the tracer and cutting-tool, a swinging lever provided with gears that communicate motion from said spindle to a counter-shaft, and a flexible coupling communicating motion from said shaft to said roll, substantially as described.

2. The combination, in an engraving and chasing machine, of a spindle provided with a chuck or other means of attaching the blank, a slide-rest having the ornamented roll or die journaled in it and carrying the tracer and cutting-tool, a train of gearing communicating motion from said spindle to a longitudinally-shiftable counter-shaft, and a flexible coupling communicating motion from said shaft to said roll, substantially as described.

3. The combination, in an engraving and chasing machine, of main spindle C, provided with a chuck,  $c''$ , an adjustable slide-rest having the ornamented roll or die O journaled in it and carrying the tracer  $r'$  and cutter  $s'$ ; a train of gear-wheels, as  $d, d', d'', g, g'',$  and H, that communicate motion from said spindle to the longitudinally-shiftable shaft I, and gears  $L, I',$  shafts  $K, N,$  and flexible couplings  $k', n'$ , that communicate motion from said shaft to said roll, substantially as described.

4. A slide-rest for an engraving and chasing machine, which rest combines the head P, carrying the roll-bearings  $o o'$ , reciprocating head-slide Q, traversing block R, feed-screw  $r$ , reciprocating tool-carriage S, link  $r''$ , and one or more springs,  $q$ , the swinging plate V, pivoted at  $v'$  to the sliding plate W and provided with a worm,  $v''$ , driven by a screw, X, applied to said plate W, and the bed 3, having a guide, 2, and leading-screw 5, as described.

5. The combination, in an engraving and chasing machine, of a slide-rest head, P, provided with roll-bearings  $o o'$ , a reciprocating head-slide, Q, a link,  $r''$ , that communicates motion from said slide to the tool-carriage S, a traversing block, R, mounted upon said slide, a feed-screw,  $r$ , for shifting said block, and one or more springs, as  $q$ , for advancing said slide, as herein described.

6. The combination, in an engraving and

4  
chasing machine, of the sliding plate W, swing-  
ing plate V *v v'*, worm *v''*, screw X, bearing Y,  
shank *y*, spring *y'*, and bearing *x*, which latter  
is secured to said sliding plate, for the purpose  
5 described.

7. The combination, in an engraving and  
chasing machine, of the slide-rest head P, re-  
ciprocating tool-carriage S, and stop-screw T,

the head of the latter being graduated, for the  
purpose described.

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

JOHN A. COBURN.

Witnesses:

H. J. CAIN,

ALLEN WEBSTER.