

No. 665,661.

Patented Jan. 8, 1901.

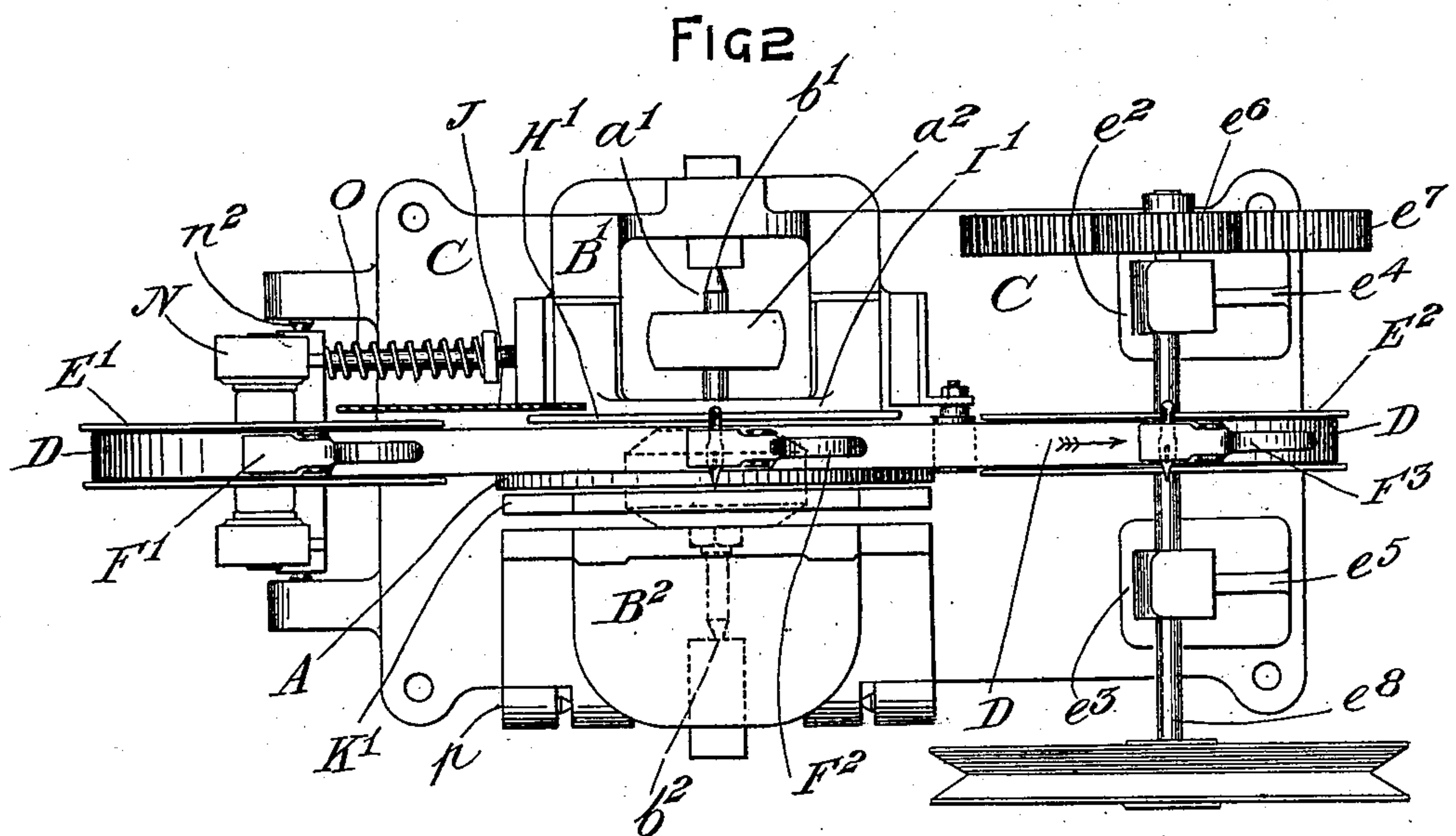
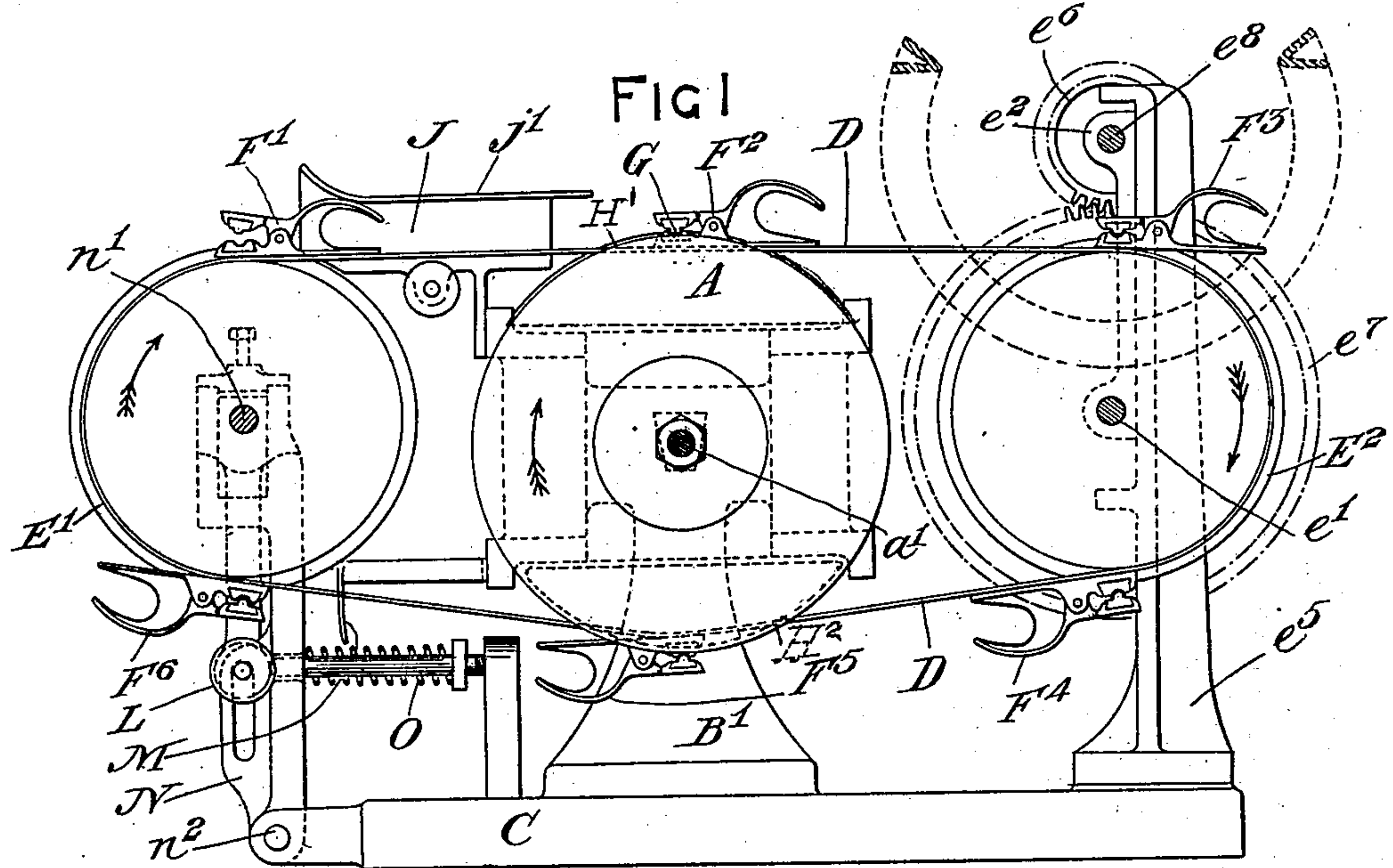
C. B. KETLEY & P. WIGLEY.

MACHINERY FOR GRINDING STEEL OR OTHER METALLIC PENS.

(Application filed Jan. 3, 1900.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES.

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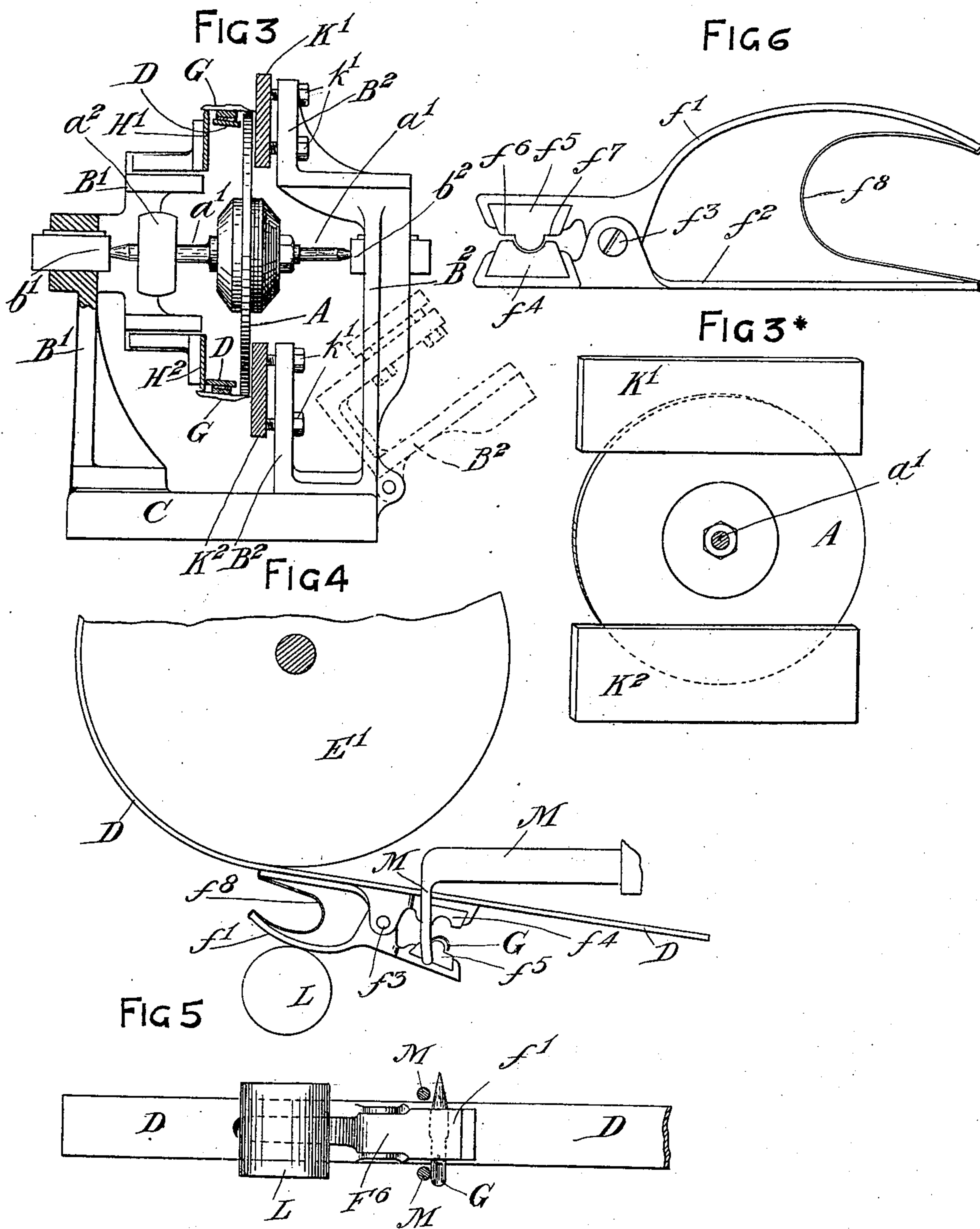
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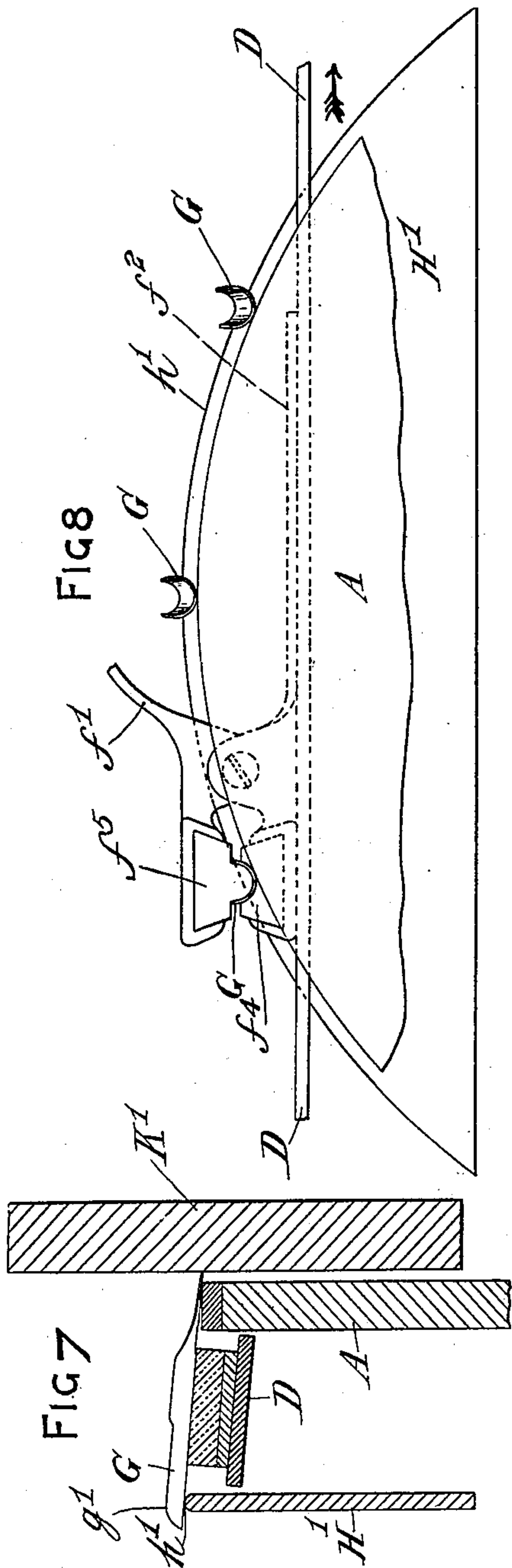


FIG 8

FIG 7

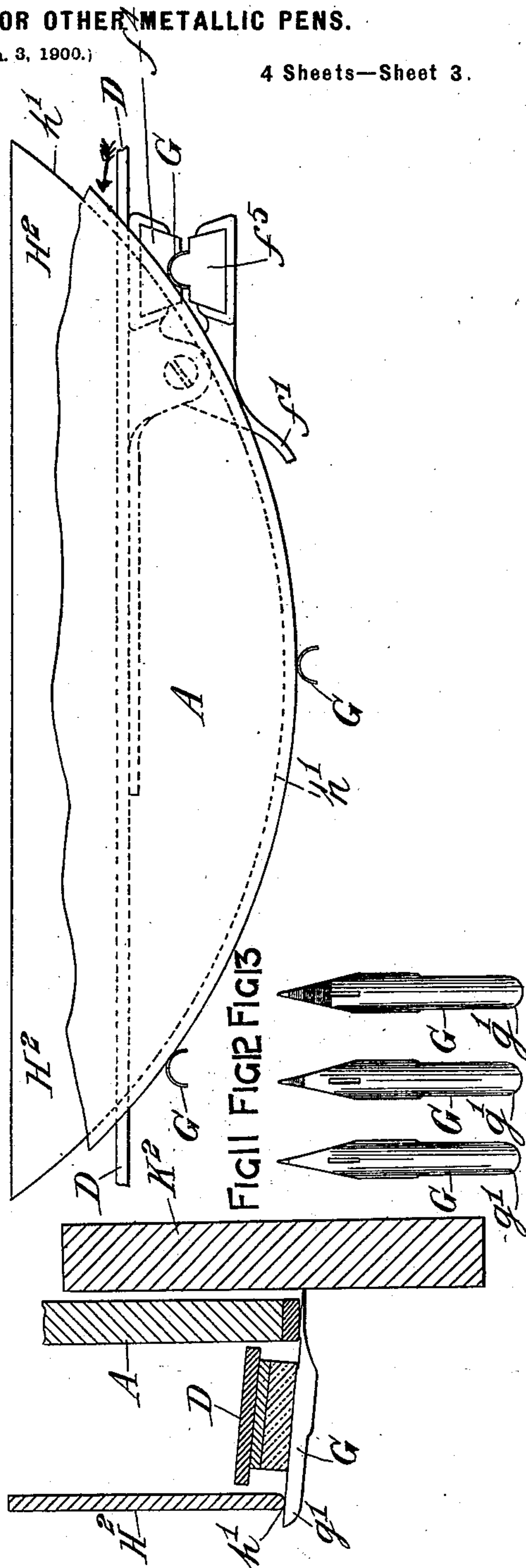


FIG 10

FIG 11

FIG 12

FIG 13

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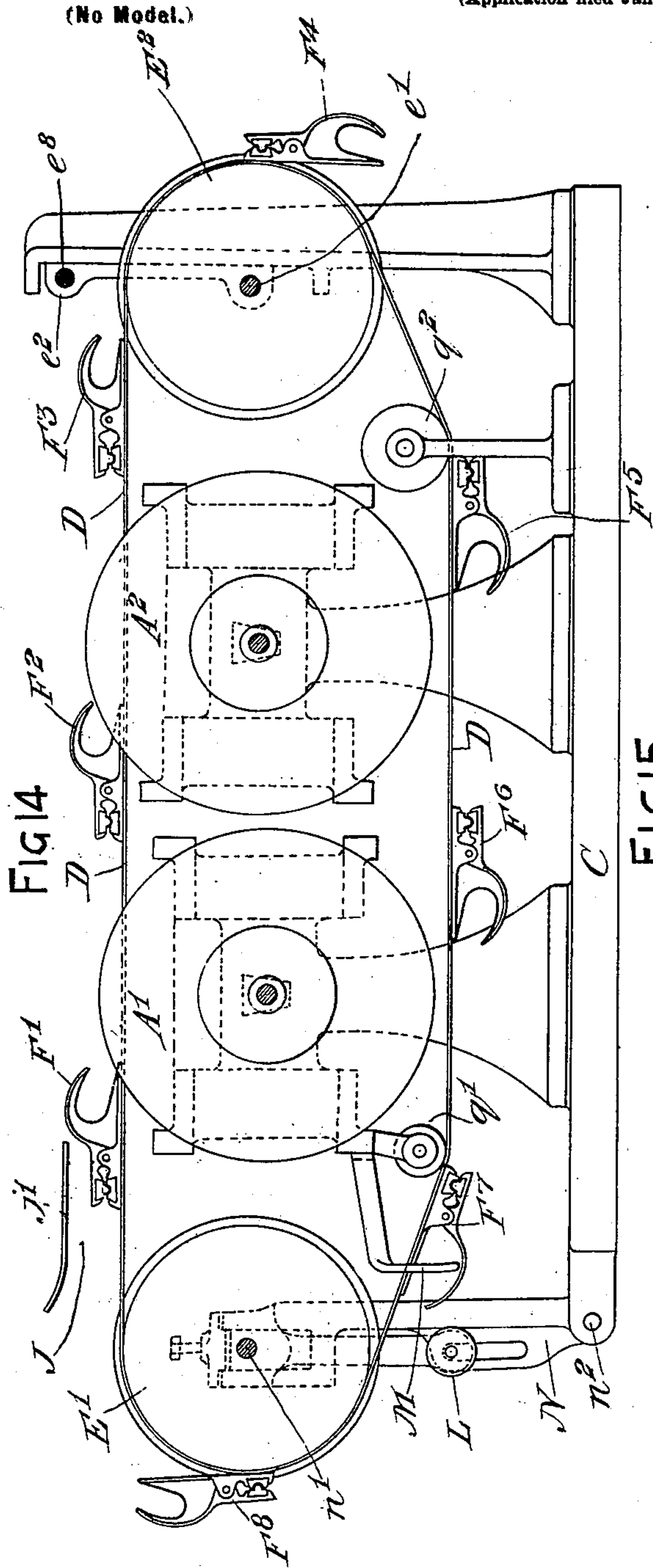


FIG 14

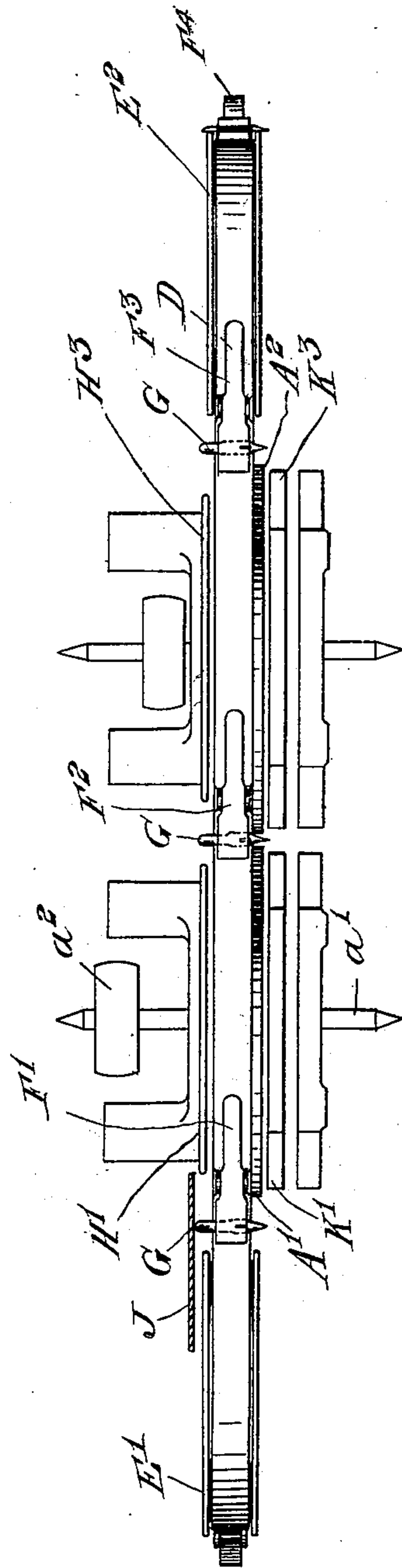


FIG 15

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# UNITED STATES PATENT OFFICE.

CHARLES BOSWORTH KETLEY AND PERCY WIGLEY, OF BIRMINGHAM,  
ENGLAND.

MACHINERY FOR GRINDING STEEL OR OTHER METALLIC PENS.

SPECIFICATION forming part of Letters Patent No. 665,661, dated January 8, 1901.

Application filed January 3, 1900. Serial No. 245. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES BOSWORTH KETLEY and PERCY WIGLEY, subjects of Her Majesty the Queen of Great Britain and Ireland, residing at Birmingham, in the county of Warwick, England, have invented certain new and useful Improvements in Machinery for Grinding Steel or other Metallic Pens, of which the following is a specification.

10 This invention consists of the herein-described improvements in machinery for cross-grinding steel and other metallic pens. Heretofore the cross-grinding has been effected by skilled labor, the operator holding the pen on  
15 a holder between the thumb and finger against a rapidly-revolving emery-bob, with the point of the pen against a gage-plate which regulates the distance from the point of the pen to the commencement of the cross-grinding.  
20 The operator then rolls the pen on the emery-bob, so as to cross-grind the rounded surface of the pen and make a definite commencement and finish to the cross-grinding.

Our invention enables skilled labor to be  
25 dispensed with, as our machinery is so arranged that an unskilled operator has merely to place the pens one at a time in clip-like holders on a moving band or the like which carries the pens in contact with and across a  
30 revolving emery-bob or emery-bobs in such a way that the cross-grinding is properly effected and the clips are afterward automatically opened and the cross-ground pens removed therefrom.

35 Our invention is illustrated by the accompanying drawings, on which—

Figure 1 is a front sectional elevation of a pen-grinding machine constructed according to this invention. Fig. 2 is a plan of the  
40 same. Fig. 3 is a cross-sectional elevation of the said machine. Fig. 3\* shows parts of the same. Fig. 4 shows in elevation, on a larger scale, the clip-opening and pen-removing mechanism. Fig. 5 is an inverted plan  
45 of the parts shown in Fig. 4. Fig. 6 is a side elevation of one of the clips full size. Fig. 7 is a full-size cross-section, and Fig. 8 is a front elevation, of parts of the said machine to illustrate the first stage in the cross-grind-  
50 ing. Fig. 9 is a full-size cross-section, and

Fig. 10 is a front elevation, of parts of the said machine to illustrate the second stage in the cross-grinding. Fig. 11 shows a pen before it is cross-ground. Fig. 12 shows the first stage of cross-grinding the same pen. 55 Fig. 13 shows the same pen with the cross-grinding finished. Fig. 14 is a front sectional elevation of another arrangement of our pen-grinding machine, and Fig. 15 is a plan of the machine shown in Fig. 14. 60

The same letters of reference indicate the same or corresponding parts in all the figures.

We will first describe the arrangement of our invention illustrated by Figs. 1 to 13, both inclusive. 65

A is an emery-bob of the kind commonly used for cross-grinding steel pens and mounted on the spindle  $a'$ , which revolves in bearings  $b' b^2$  in the standards  $B' B^2$ , fixed to the base-plate C. The emery-bob spindle  $a'$  is 70 driven from any convenient source by a band on the pulley  $a^2$ . Adjacent to the face of the emery-bob A is an endless leather or other band D, which passes around and is carried by the two pulleys  $E' E^2$ , which are by preference flanged to keep the band in place. The pulley  $E'$  is mounted on a spindle  $e'$ , revolving in the direction indicated by the arrows in Fig. 1 in bearings  $e^2 e^3$  on the standards  $e^4 e^5$ , fixed on the base-plate C, and is driven 80 through the wheels  $e^6 e^7$  from the first motion-shaft  $e^8$ . Fixed on the band D at regular intervals apart are any suitable number of clips—say six, as shown, and marked  $F' F^2 F^3 F^4 F^5 F^6$ —which are adapted to hold and 85 carry the pens crosswise on the band. The pulleys  $E' E^2$  are of smaller diameter than the emery-bob A, so that the band D passes across the same at some little distance within the periphery of the bob A. The band D is made 90 somewhat narrower than the length of the pens G to be ground, so that when the pens are held by the clips crosswise on the band they project at both ends beyond the sides of the band, as shown in Figs. 2, 3, 5, 7, and 95  
9. Fixed parallel with the face of the emery-bob A and at a short distance therefrom are two metal plates  $H' H^2$ , the edge  $h'$  of each being curved to about the same radius as the emery-bob A. The band D is situated be- 100



tween these curved plates  $H'$   $H^2$  and the face of the emery-bob A, and the object of these curved plates  $H'$   $H^2$  is to support the rounded or holder ends of the pens and give the proper inclination to the pens as they ride over the emery-bob A during the cross-grinding processes. The plates  $H'$   $H^2$  are bolted to angle-plates  $I'$   $I^2$  on the standard  $B'$  and are adjustable and can be so fixed as to tilt the pen slightly in the desired direction to cause the bob to grind the particular part of the pen required.

J is a stop-plate carried by the standard  $B'$ , parallel with the band D, against which the rounded or holder end  $g'$  of the pen is pressed by the operator when the pen is placed in the clip, and this stop-plate has a hanging-over flange  $j'$ , under which the clips have to pass and which opens the clips, as shown in Fig. 1, to enable the pen to be placed therein.

$K'$   $K^2$  are the gage-plates, fixed to the standards  $B'$   $B^2$ , parallel with the face of the emery-bob A and at a short distance therefrom equal to the distance from the point of the pen to the commencement of the cross-grinding. The screws  $k'$  enable the gage-plates  $K'$   $K^2$  to be adjusted nearer to or farther from the face of the bob.

Each of the clips  $F'$   $F^2$   $F^3$   $F^4$   $F^5$   $F^6$  is made of a lever  $f'$  and a base part  $f^2$ , jointed together at  $f^3$ . The base  $f^2$  carries a block  $f^4$ , which is hollowed out to suit the pen, and the lever  $f'$  carries a corresponding block  $f^5$ , shaped to fit in the trough of the pen. The shoulders  $f^6$   $f^7$  of the block  $f^5$  prevent the pen from turning around. The blocks  $f^4$   $f^5$  form the jaws of the clip, and they are closed together by the spring  $f^8$ , which acts between the tail end of the lever  $f'$  and the base  $f^2$ . The lever  $f'$  is carried upwardly from the base  $f^2$ , as shown, so as to be acted on by the flange  $j'$  and roller L, which open the clip, as hereinafter described. When the machine is in motion, with the band D moving in the direction indicated by the arrows in Figs. 1, 2, 8, and 10, the clips are opened one after the other, as shown in Fig. 1, by passing under the flange  $j'$  of the stop-plate J, and the pen is by the operator placed in the jaws of the clip, with the rounded or holder end  $j'$  of the pen against the stop-plate J. As the clip passes from under the flange  $j'$  the jaws of the clip close on and hold the pen, the pointed end of which now rides against the gage-plate  $K'$  and the overhanging parts of the pen come in contact with the grinding-surface of the bob A and the curved plate  $H'$ . (See Figs. 7 and 8.) The curved edge  $h'$  of this curved plate  $H'$  is set a little higher than the periphery of the bob A, so as to tilt the pen toward the point and give a definite commencement to the cross-grinding. The pen thus rides up the bob and curved plate at one side and down the other side of the same, as shown in Fig. 8, thus properly grinding across the rounded surface of the pen about as far along the pen as shown in Fig. 12. The clip

with the pen held therein then passes on and around the pulley  $E^2$  and back under the bob-spindle  $a'$  and comes in contact with and rides along the lower side of the bob and the lower curved plate  $H^2$ . This curved plate  $H^2$  is, as shown in Fig. 9, set so as to tilt the pen and cause the bob A to continue the cross-grinding farther along the pen and make a definite finish to the same, as shown in Fig. 13, and as this part of the pen has a larger rounded surface than the part nearer the point which was ground by passing over the top of the bob the lower part of the band D, Fig. 10, is rather nearer to the center of the bob A than is the upper part of the same, Fig. 8. The cross-grinding of the pen is now finished and the clip is opened by riding against the roller L under the pulley  $E'$ , which thus opens the jaws of the clip, and the pen G at the same time is arrested and removed from the clip by coming in contact with the forked knocker-off M, under which the band D passes and which is suitably fixed to the standard  $B'$ .

It will be seen that by carrying the pens on the band and arranging the band D in combination with the emery-bob, as above described, the cross-grinding of the rounded surface of the pen is effectually accomplished, because as the pen travels over the emery-bob A the latter commences to cross-grind at one edge of the pen and then as the pen rises up the emery-bob the grinding is continued across the rounded surface of the pen, which descends on the other side of the bob, thus completing the cross-grinding of the rounded surface of the pen as required.

In order to maintain an even tension on the band D, the spindle  $n'$  of the pulley E is carried by the forked bracket N, which is jointed to the base-plate C at  $n^2$  and is pressed outwardly away from the bob by the adjustable spring O.

In order to facilitate the removal of the bob A and its spindle, the standard  $B^2$  may be jointed at  $p$  to the base-plate C, so as to turn outwardly, as indicated by the dotted lines in Fig. 3.

Instead of arranging for the pens to be ground twice by one emery-bob, as above described, (and which we find gives the best results,) the pens may be ground only once, say, on the top of the bob and the two pulleys  $E'$   $E^2$  be made so large that the lower part of the band is below the bob A, or, as shown by Figs. 14 and 15, two emery-bobs (marked, respectively,  $A'$  and  $A^2$ ) mounted on separate spindles and provided with correspondingly curved plates  $H'$   $H^3$  and gage-plates  $K'$   $K^2$  may be used, the emery-bobs being set in a line, one behind the other, so that the first bob A commences to grind a short distance from the point of the pen and for a certain distance along the pen and the next bob  $A^2$  continues the grinding farther along the pen and gives a pronounced finish to the grinding, as in Fig. 13, the lower part of the



band D passing over the guide-rollers  $q'$   $q^2$ , so that the pens will clear the lower parts of the bobs.

It is important that the bob A should run at the proper speed relatively to the travel of the band D, so as to properly cross-grind the pens and not to burn them. We find that a speed of about twenty-eight feet per minute for the band D and about nineteen hundred feet per minute for the periphery of the bob A gives very good results and allows time for the operator to place the pens in the clips as they move along.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a machine for cross-grinding pens, a grinding bob or bobs adapted to revolve, an endless carrier arranged parallel with and crossing said bob or bobs and provided with clips adapted to hold the pens transversely of the line of movement and carry them in contact with and across the grinding face or faces of the bob or bobs so as to cross-grind the pens, substantially as set forth.

2. In a machine for cross-grinding pens, a grinding bob or bobs adapted to revolve, an endless carrier arranged parallel with and crossing said bob or bobs and provided with clips adapted to hold the pens and carry them in contact with and across the grinding-face of the bob or bobs and a curved plate for the bob or for each bob fixed adjacent to said carrier so as to support the rounded ends of the pens during the cross-grinding, substantially as set forth.

3. In a machine for cross-grinding pens, a

grinding bob or bobs adapted to revolve, an endless carrier arranged parallel with and crossing said bob or bobs and provided with clips adapted to hold the pens and carry them in contact with and across the grinding face or faces of the bob or bobs, a curved plate for the bob or for each bob fixed adjacent to said carrier so as to support the rounded ends of the pens and a gage-plate fixed adjacent to each bob for the points of the pens to ride against during the cross-grinding, substantially as set forth.

4. In a machine for cross-grinding pens a grinding bob or bobs adapted to revolve, an endless carrier arranged parallel with and crossing said bob or bobs and provided with clips adapted to hold the pens and carry them in contact with and across the grinding face or faces of the bob or bobs, a curved plate for the bob or for each bob fixed adjacent to said carrier so as to support the rounded ends of the pens, a gage-plate fixed adjacent to the bob or to each bob for the points of the pens to ride against during the cross-grinding, means for opening the clips and for regulating the position of the pens therein and means for opening the clips and removing the ground pens therefrom, substantially as set forth.

In witness whereof we have hereunto set our hands in presence of two witnesses.

CHARLES BOSWORTH KETLEY.  
PERCY WIGLEY.

Witnesses:

HERBERT WHITEHOUSE,  
JAMES BERNARD NICKLIN.