

(No Model.)

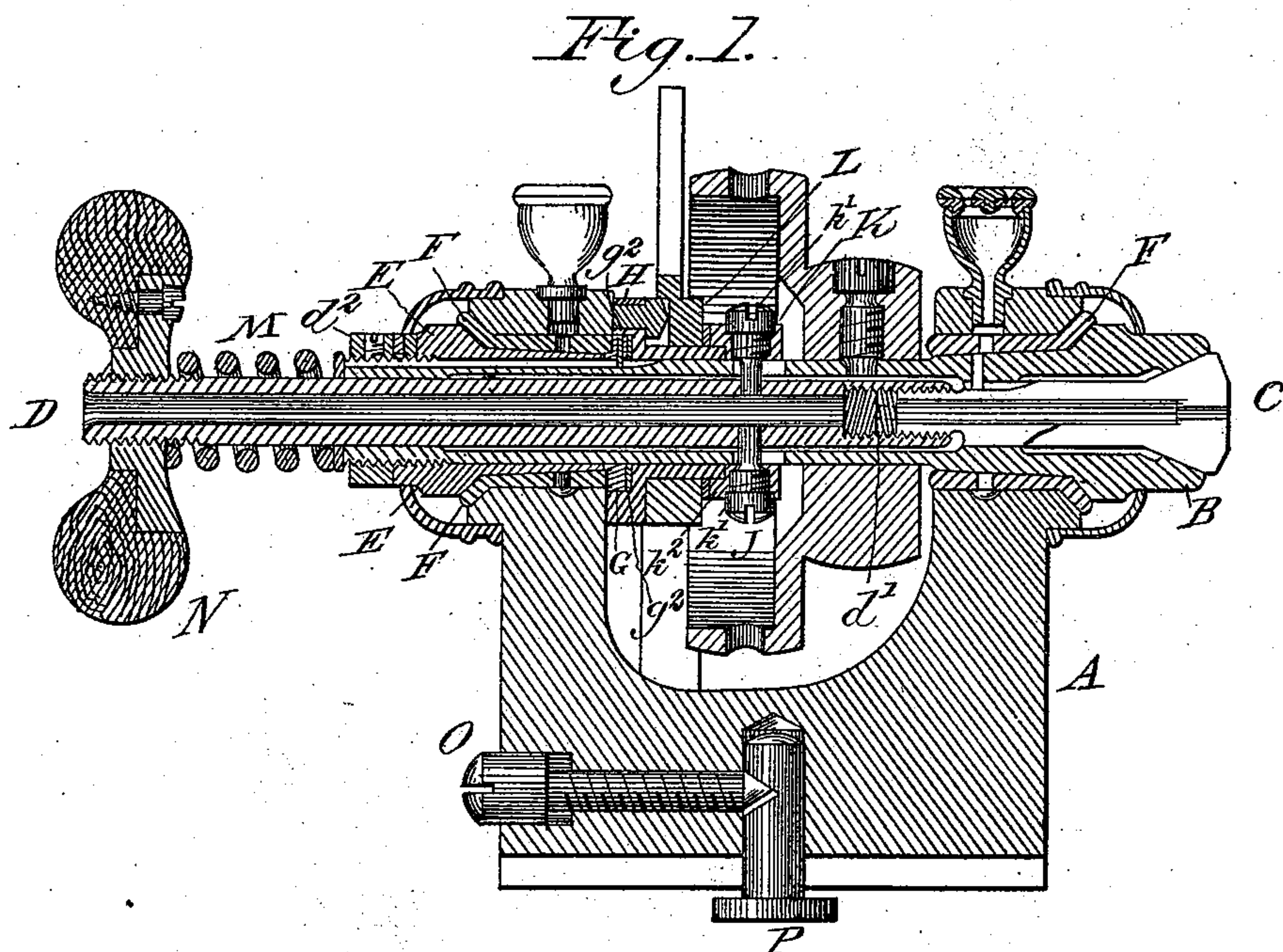
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C. H. RUSSOM.

LATHE.

No. 377,779.

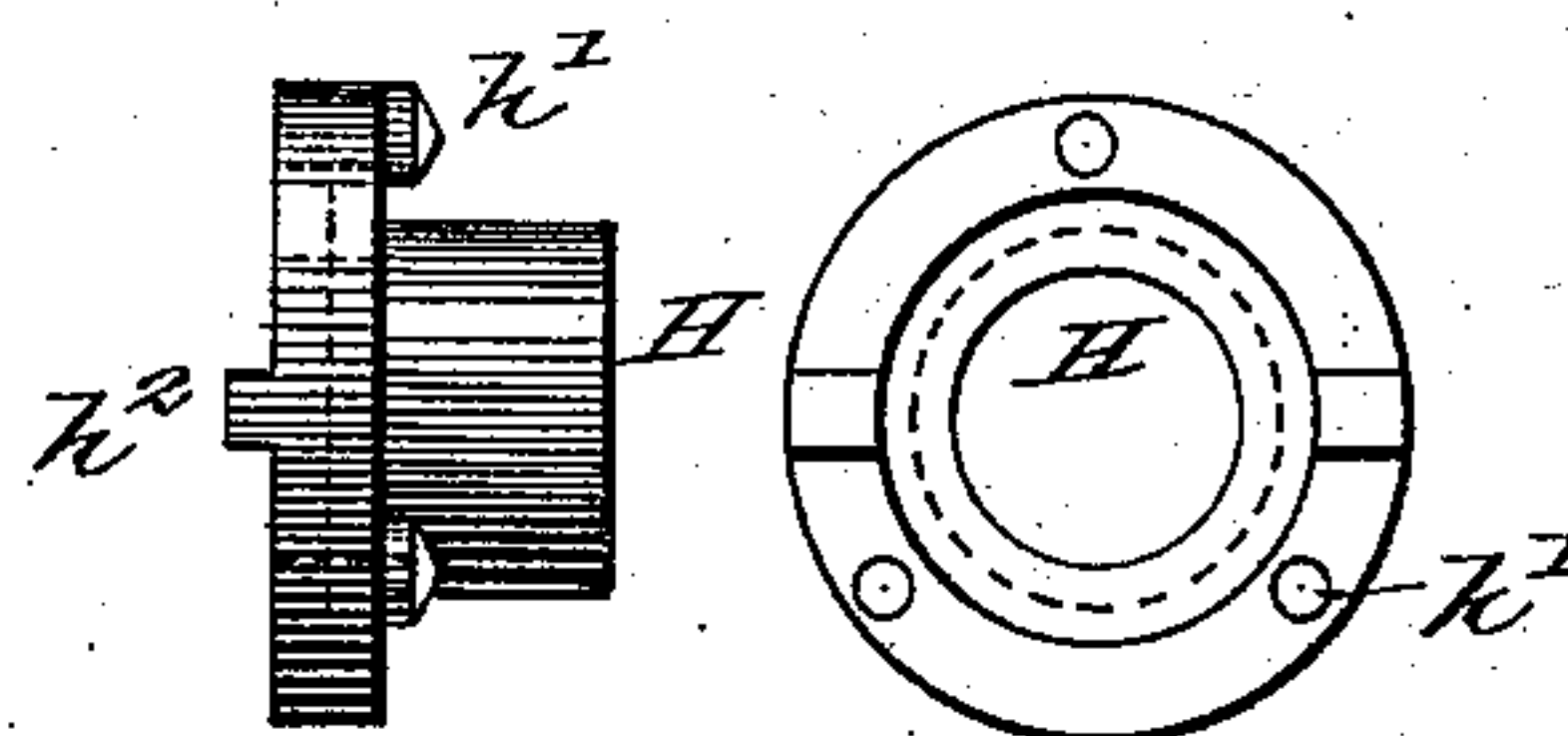
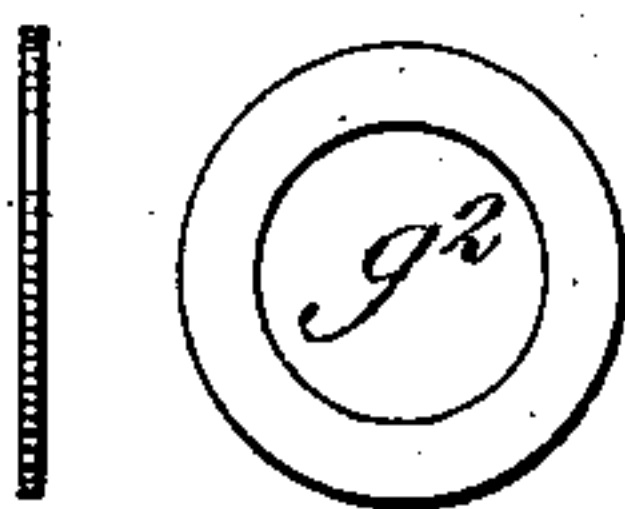
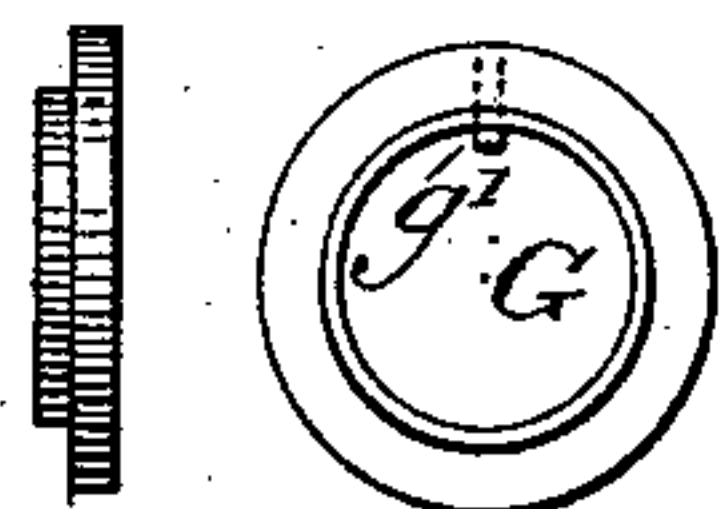
Patented Feb. 14, 1888.



*Fig. 4.*

*Fig. 5.*

*Fig. 6.*



Witnesses:

*H. F. Dikie*

*W. E. Shutt*

Inventor:

*Charles H. Russom*

*by N. Du Bois, his Atty*

(No Model.)

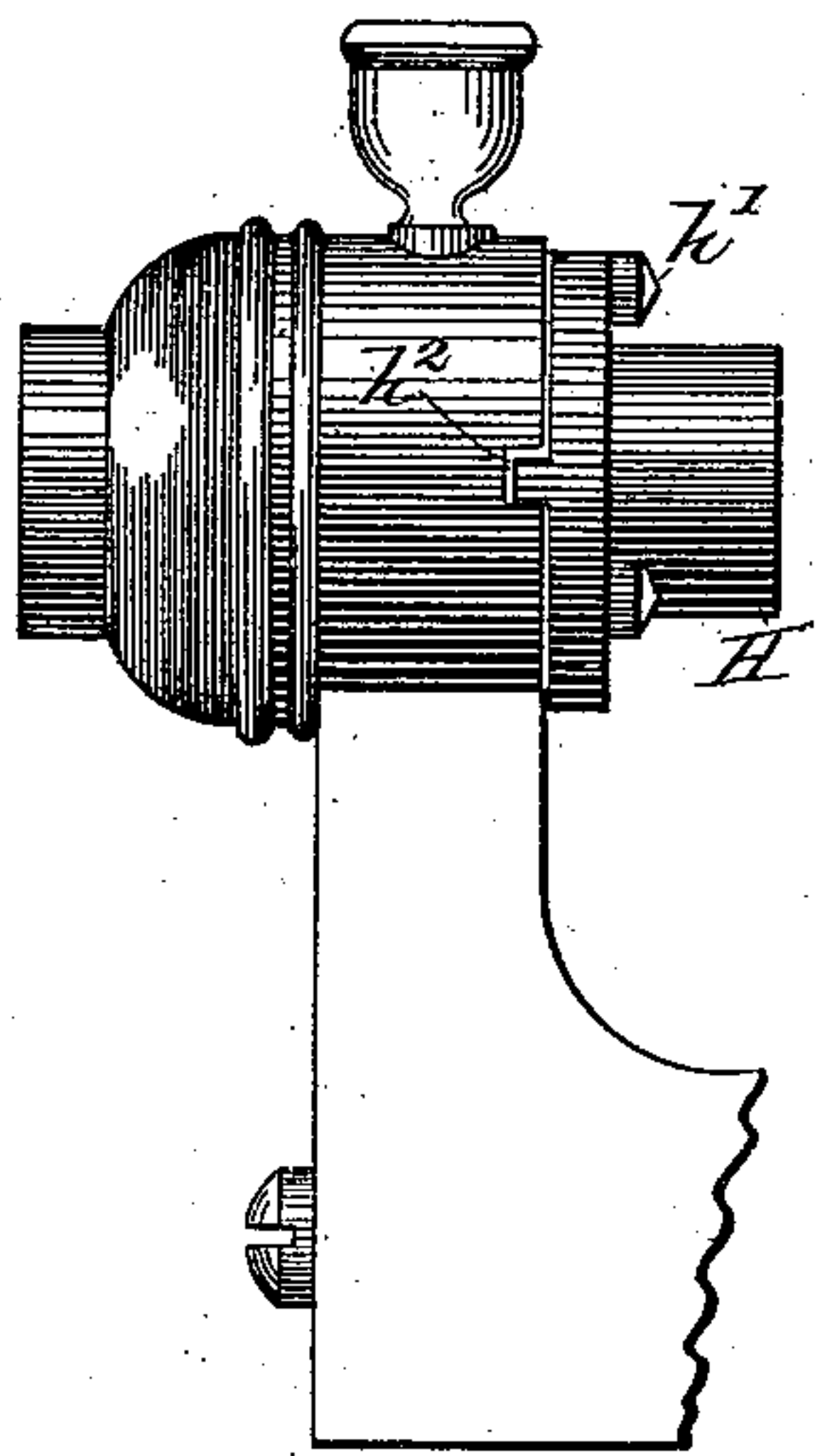
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C. H. RUSSOM.  
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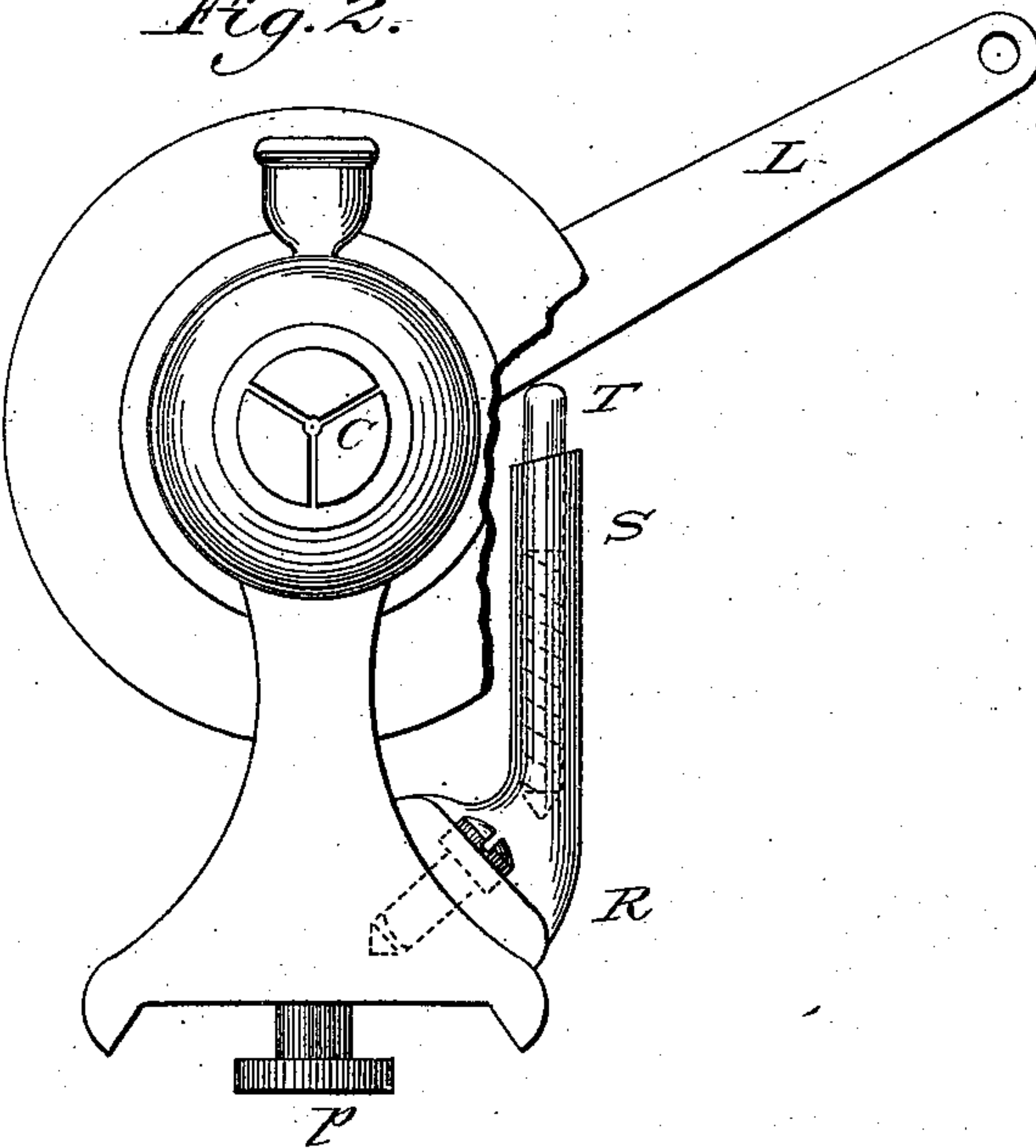
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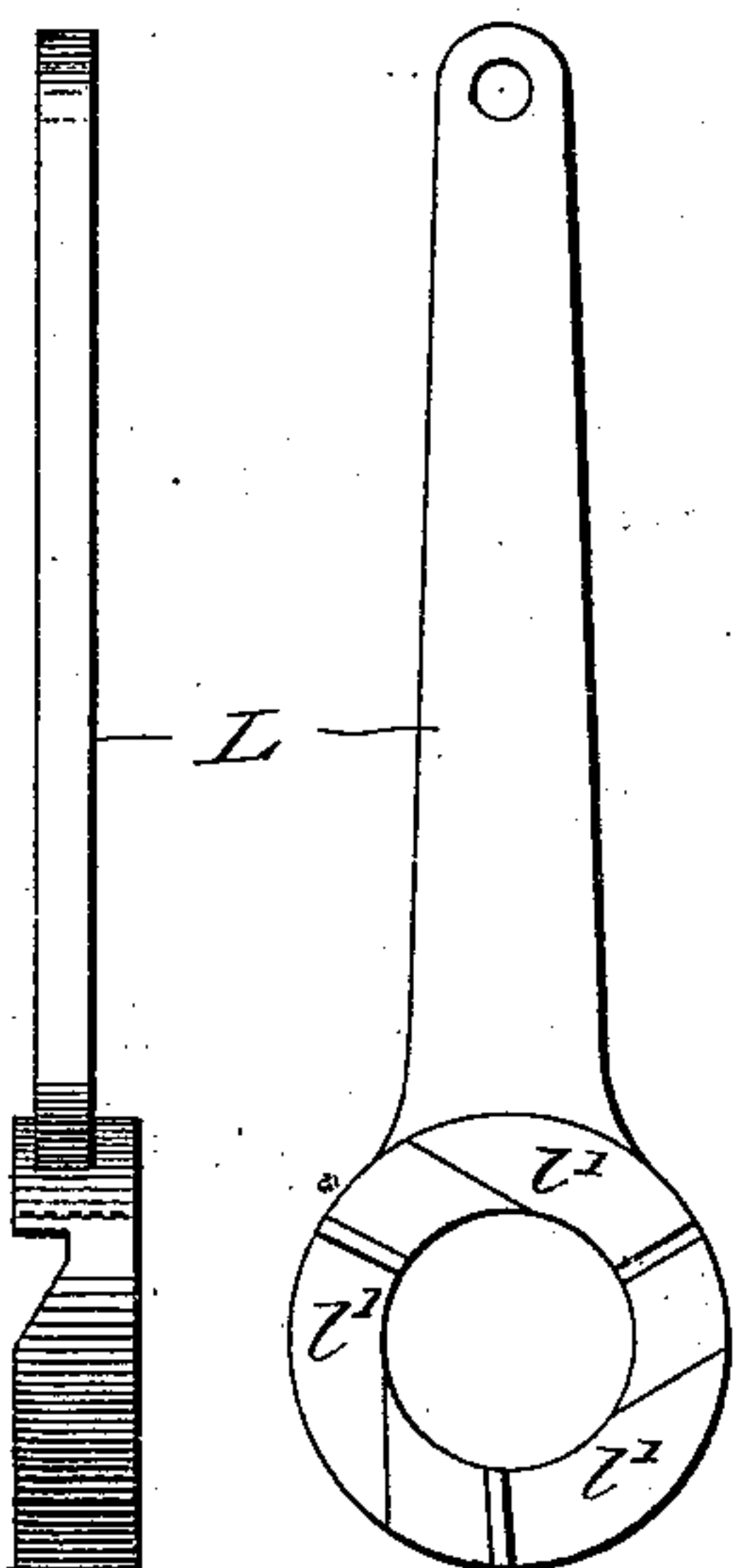
*Fig. 3.*



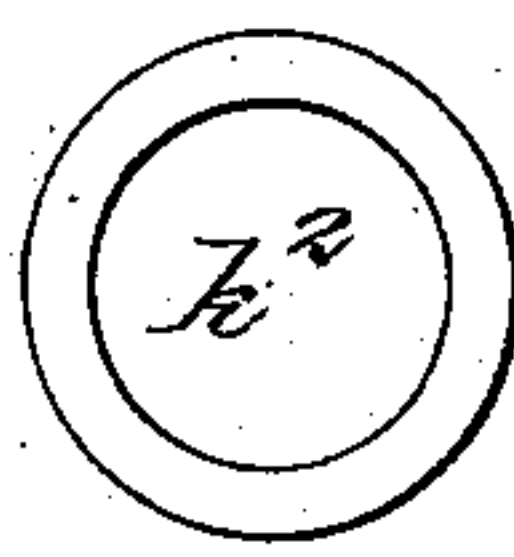
*Fig. 2.*



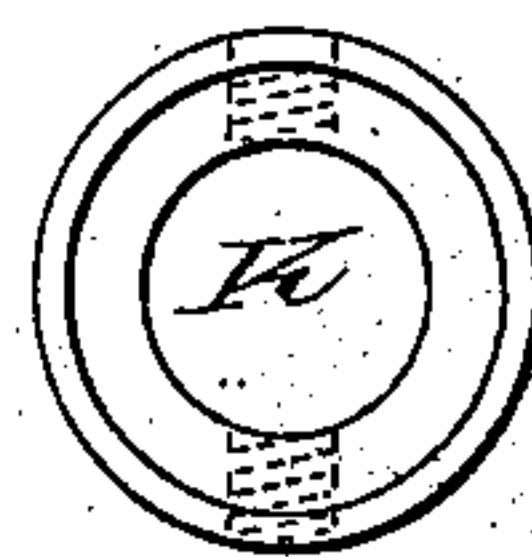
*Fig. 7.*



*Fig. 8.*



*Fig. 9.*



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# UNITED STATES PATENT OFFICE.

CHARLES H. RUSSOM, OF SPRINGFIELD, ILLINOIS.

## LATHE.

SPECIFICATION forming part of Letters Patent No. 377,779, dated February 14, 1888.

Application filed May 2, 1887. Serial No. 237,016. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. RUSSOM, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Lathes, of which the following is a description.

My invention relates to improvements in lathes of that class commonly known as "watch-factory lathes," which have a revolving taper bushing in the lathe-head, with a drawing-spindle, to one end of which is connected an adjustable chuck for holding the work. This invention is adaptable to either two-bearing or three-bearing lathes.

The purposes of my invention are to provide means for automatically closing the chuck by adjustable spring-pressure, so as to avoid injury to work or breaking of tools by too great pressure of the chuck; to provide a revolving taper bushing of improved construction; to provide means whereby the pressure of the spring which operates to close the chuck shall bear on the end of the revolving taper bushing and the end of the main spindle, respectively, so as to avoid needless friction or undue strain on the machine; to provide an effective brake for the lathe; to provide means for the operator to open and close the chuck and also to apply the brake by pressure of the foot, thus leaving both of his hands free for the manipulation of the work; to provide means to prevent the drawing-spindle from being thrown too far forward; to provide means to counterbalance the weight of the operator's foot, and thereby prevent pulling the lever down so far as to injure the machine, and to adapt the drawing-spindle to receive through either end the material to be operated upon, or the tools used in the chuck or employed in adjusting the chuck, and also to receive chucks of different lengths. I attain these purposes by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the machine through the axis of the main spindle. Fig. 2 is a front view of the machine, the edge of the pulley being broken away to show the position of the lever-standard and the method of attaching same. Fig. 3 is a side view of the rear arm of the lathe-head, showing the stationary collar in position. Figs. 4, 5, 6, 7, 8,

and 9 are front and side views of the flanged washer, (which forms part of the revolving taper bushing,) the thin washer, the stationary collar, the cam-faced lever, the friction-washer, and the ring, respectively.

The relative position of the various parts is clearly shown in Fig. 1.

A is the lathe-head, such as is in common use, and may be secured to the bench in any suitable manner, though I preferably use the bolt P, passing upward through the table and held in place by the set-screw O. The upper ends of the arms of the lathe-head are pierced by holes having their outer ends rimmed out to conform to the conical stationary bushings F.

B is the main spindle.

The drawing-spindle D is made hollow to permit the passage through it of tools or of the material being operated upon, and to its front end is screwed the chuck C. The movable nut  $d'$  on the inside of the hollow drawing-spindle is pierced by a square hole, in which a key passed endwise in the hollow drawing-spindle fits, so that the nut may be readily turned backward or forward, as may be necessary, to properly adjust the chuck.

J is the drive-pulley suitably secured to the main spindle.

M is a spring coiled around the rearward projecting end of the drawing-spindle and lying between a washer on the end of main spindle and the hand-wheel N. The hand-wheel screws on the end of the drawing-spindle, as shown, for the purpose of regulating the tension of the spring M, and through it the pressure on the jaws of the chuck.

The end of the main spindle B projecting rearward is provided with a check-nut,  $d^2$ , by turning which the revolving taper bushing E G may be moved forward or backward, as may be necessary for adjustment of the bushing. The check-nut, being in position, is secured by a set-screw, as shown. The flanged washer G, (shown in detail in Fig. 4,) and which forms a part of the revolving taper bushing, surrounds the main spindle and lies next to and its projecting flange bears against the forward end of the conical bushing E. The flanged washer has on its inner circumference a feather,  $g'$ , which slides in a corresponding groove in the main spindle and causes the washer to re-



volve with the main spindle. The conical bushing E is also provided with a similar feather or pin, and likewise revolves with the main spindle.

5 The conical bushing E and the flanged washer G together constitute the "revolving taper bushing" E G. Next to the flanged washer G, and between it and the collar H, is placed the thin washer  $g^2$ , for the purpose of equalizing  
10 the friction and the wear between the flanged washer G and the collar H. The collar H fits around the main spindle B, and has on one face a projecting lug,  $h^2$ , fitting loosely in a corresponding recess in the front face of the  
15 rear arm of the lathe-head. (Clearly shown in Fig. 3.) The cam-faced hub on the lower end of the lever L fits on the projecting end of the collar H, so that the cam-face of the lever lies next to the projecting pins  $h'$  on the front face  
20 of the collar. There are on the face of the lever three cams or inclines,  $l'$ , which, when the lever is turned, impinge against the pins  $h'$  on the face of the collar, thereby giving the lever a forward movement on the projecting  
25 end of the collar.

The ring K surrounds the main spindle, and has in one face a circular recess which fits over the projecting end of the collar H. This ring has a diametric hole, through which and  
30 through a corresponding slot in the main spindle the screws  $k'$  pass and connect the ring with the drawing-spindle, as shown.

On one side of the lathe-head, and directly under the lever L, is suitably secured the vertical hollow standard R. Within the bore of  
35 the standard is a coiled spring, S, on which rests the plunger T, which supports the projecting end of the lever L for the purpose of counterbalancing the weight of the operator's  
40 foot and returning the lever to position after it has been depressed. This lever-standard is adaptable to any lathe which has a projecting lever, either for operating the chuck or for applying the brake, and serves to sustain such  
45 lever and to keep the operating parts out of contact.

By substituting a ring of suitable length for the coiled spring M the main spindle B may be extended out to the hand-wheel N, and the  
50 chuck may be operated, as is now ordinarily done, independently of the lever L.

The operation of the machine is as follows: When it is desired to open the chuck for the purpose of receiving or discharging work, the  
55 operator presses with his foot on a treadle suitably connected to the projecting end of the lever L. As the lever is depressed it turns on its axis, and the cams  $l'$  on the face of the hub of lever bear against the pins  $h'$  on the collar  
60 H, causing the lever to slide forward on the collar and carry with it the ring K and the drawing-spindle D and connected parts, permitting the jaws of the chuck to spring open as it emerges from the end of the main spin-  
65 dle. When the pressure of the foot is removed, the recoil of the spring M pulls the

drawing-spindle D and connected parts back to its first position.

The method of applying the brake is as follows: When the hub of the lever L slides forward on the collar, it causes the connecting-  
70 screws  $k'$  to press against the ends of slots in the main spindle, and thus check the forward movement of the drawing-spindle D. Then the continued pressure on the lever causes the  
75 faces of the lever L and the ring K to press against the interlying washer  $k^2$  with force sufficient to stop the motion of the main spindle and cause the drive-belt to slip on the pulley J.

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

1. The arrangement, in a lathe, of the drawing-spindle, the revolving taper bushing, the coiled spring, the hand-wheel, the stationary  
85 collar, and the operating-lever, in such relation to each other that the force used in compressing the spring shall be equally borne by the rear end of the main spindle and the forward end of the revolving taper bushing, sub-  
90 stantially as shown, and for the purpose specified.

2. A revolving taper bushing for lathe-heads, consisting of two parts—viz., a conical ring or  
95 thimble and a flanged washer—substantially as shown, and for the purpose specified.

3. A cam-faced lever for lathes, adapted to the double purpose of operating the chuck and the brake, combined and coacting with the sta-  
100 tionary collar, the drawing-spindle and connected ring and chuck, and the main spindle and connected pulley, substantially as shown and described, and for the purpose stated.

4. A brake for lathes consisting of a cam-faced lever having a hub coaxial with and sup-  
105 ported by a stationary collar fitting loosely around the main spindle, a sliding ring fitting loosely around, and a pulley secured to said main spindle, all so arranged that downward pressure on the lever shall cause the ring to  
110 slide on the spindle, and the connecting-screws to press against the end of slot in main spindle, so as to retard or to stop the motion of said main spindle and connected pulley, sub-  
115 stantially as shown and described, and for the purpose stated.

5. A collar for lathe-heads having on one of its faces projecting lugs fitting loosely in  
120 recesses on the arm of the lathe-head and on its other face projecting pins, in combination with the lathe-head, the main spindle, the drawing-spindle and connected ring, and the cam-faced lever, substantially as shown, and for the purpose stated.

6. A brake-ring for lathes having in one of  
125 its faces a circular recess sliding on the main spindle and connected to the drawing-spindle, combined and coacting with the stationary collar, the cam-faced lever, and the drawing-spindle, substantially as shown and de-  
130 scribed, and for the purpose stated.

7. A lever-standard for lathes consisting of



a vertical stem and inclosed spring supporting a plunger, substantially as shown, and for the purpose stated.

5 8. The combination, in a lathe, of the main spindle, the hollow drawing-spindle, the coiled spring, and the hand-wheel, substantially as shown, and for the purpose stated.

9. The combination, in a lathe, of the main spindle, the hand-wheel, the hollow drawing-  
10 spindle, and the connected ring, substantially as shown and described, and for the purpose stated.

10. The combination, in a lathe, of the sta-

tionary collar and cam-faced lever, with the ring, the hollow drawing-spindle, and the 15 hand-wheel, substantially as shown, and for the purpose stated.

11. A hollow drawing-spindle for lathes having its forward end internally threaded and fitted with a perforated nut, substantially as 20 shown and described, and for the purpose stated.

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Witnesses:

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