

(No Model.)

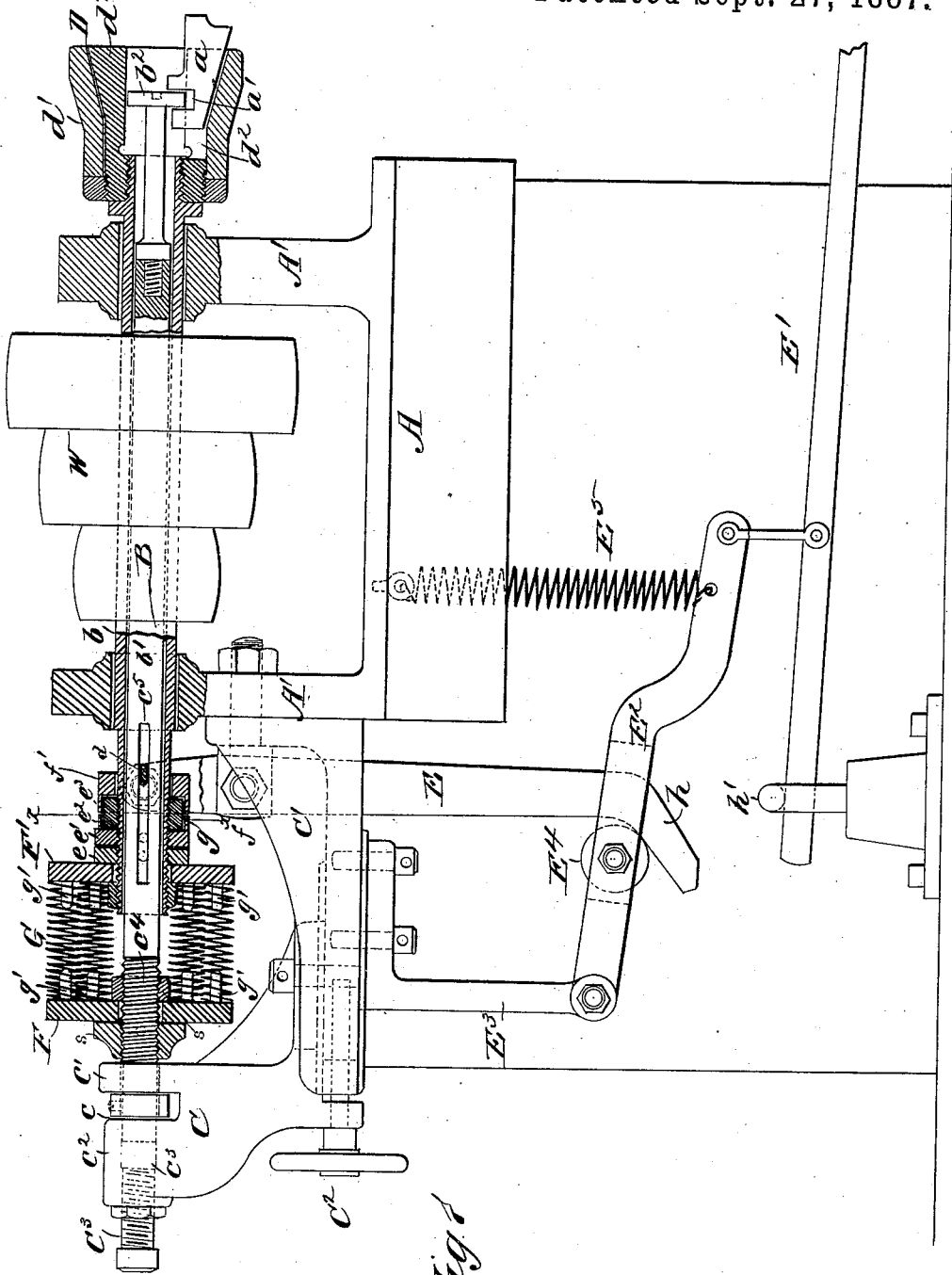
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P. J. CAHILL.

LATHE.

No. 370,604.

Patented Sept. 27, 1887.



WITNESSES:  
*Francis McArdle*  
*G. Sedgwick*

*Fig. 2*

INVENTOR:  
*P. J. Cahill*  
 BY *Munn & Co.*  
 ATTORNEYS.

(No Model.)

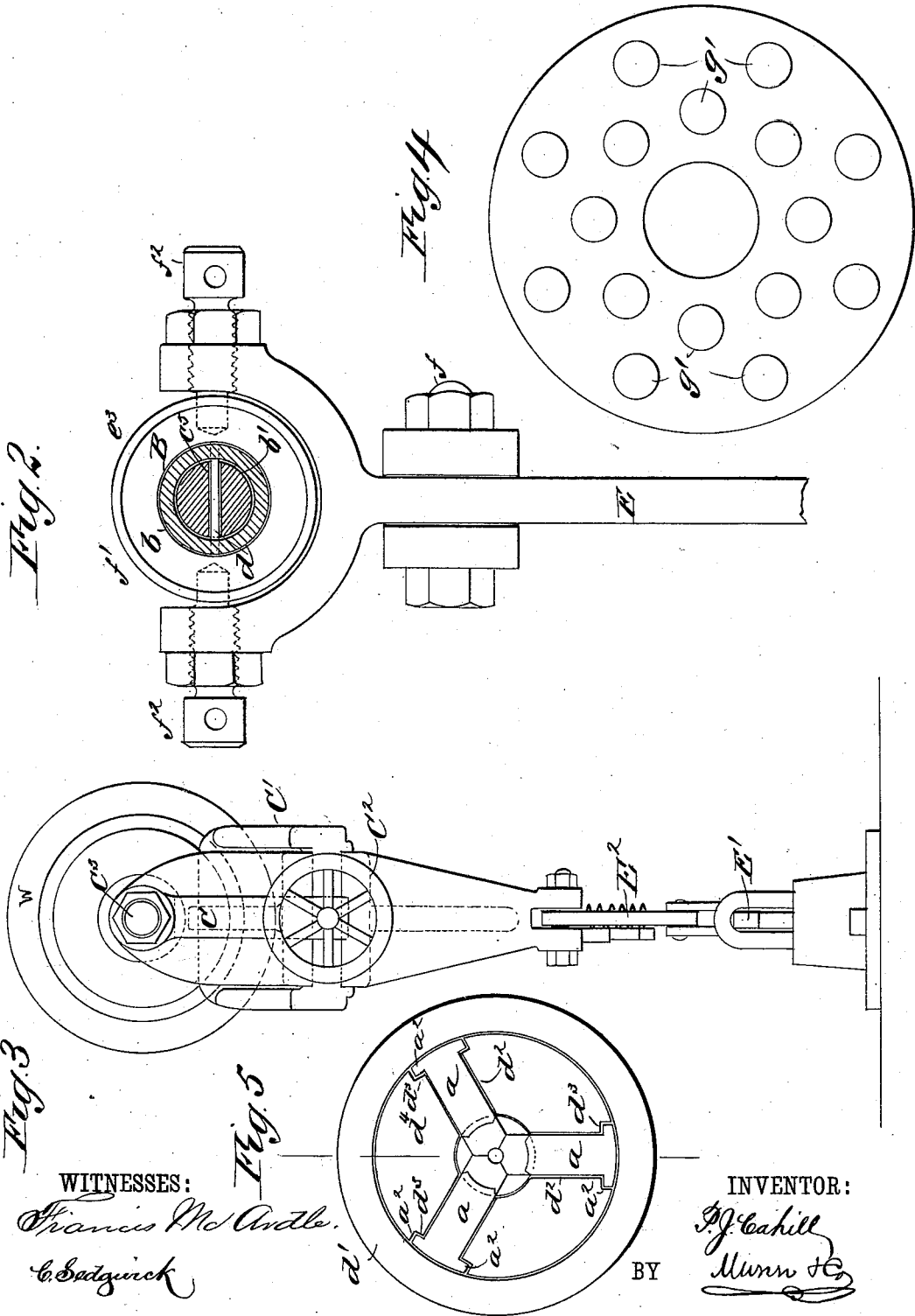
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*Fig. 2.*

*Fig. 4.*

*Fig. 3.*

*Fig. 5.*

WITNESSES:

*Francis McAuley.*  
*C. Badgerick*

INVENTOR:

*P. J. Cahill*  
*Munn & Co.*

BY

ATTORNEYS.

(No Model.)

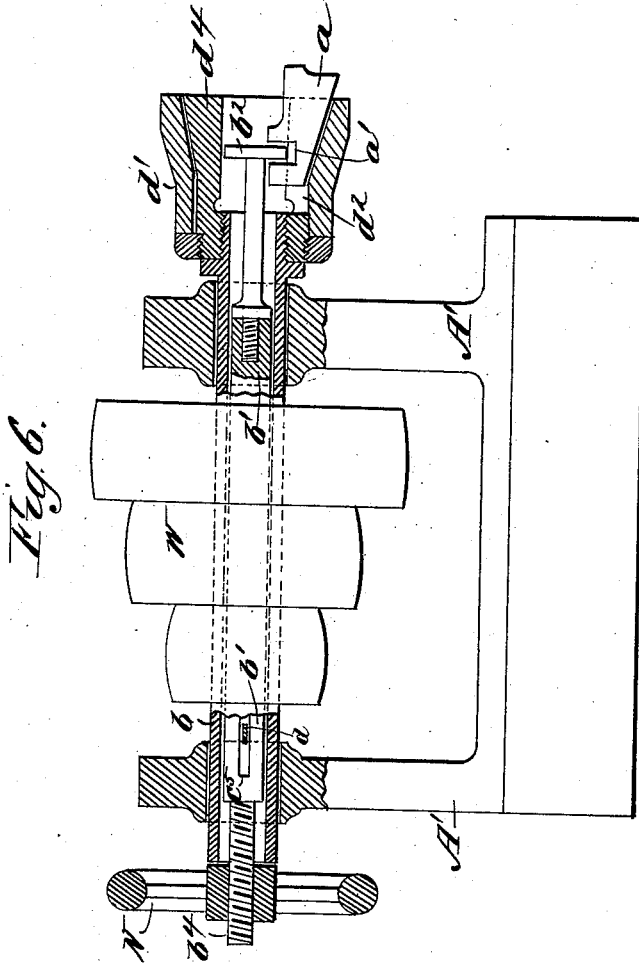
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WITNESSES:

*V. Mc Ardle*  
*G. Sedgwick*

INVENTOR:

*P. J. Cahill*

BY

*Munn & Co.*

ATTORNEYS.

# UNITED STATES PATENT OFFICE.

PATRICK J. CAHILL, OF LEEDS, MASSACHUSETTS.

## LATHE.

SPECIFICATION forming part of Letters Patent No. 370,604, dated September 27, 1887.

Application filed May 21, 1887. Serial No. 235,924. (No model.)

*To all whom it may concern:*

Be it known that I, PATRICK J. CAHILL, of Leeds, in the county of Hampshire and State of Massachusetts, have invented a new and improved Lathe, of which the following is a full, clear, and exact description.

My invention relates to the chuck and chuck-operating mechanism of lathes; and the invention consists, principally, of a sliding chuck-head operated by a hand-wheel or by a treadle and the springs for opening and closing the jaws of the chuck.

The invention also consists of a central spindle-shaft held from longitudinal movement, and to which the jaws are connected, combined with a sleeve placed on said spindle and carrying the chuck-head and acted upon by springs for closing the chuck-jaws.

The invention further consists of the special construction of the chuck and jaws, and of an adjustable rear bearing for the spindle-shaft, whereby the distance of radial movement of the jaws may be varied to suit different-sized work; and, finally, the invention consists of the construction, arrangement, and combination of parts, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of my new and improved lathe. Fig. 2 is an enlarged transverse sectional elevation taken on line *x* of Fig. 1. Fig. 3 is a rear elevation of the lathe. Fig. 4 is an enlarged view of one of the spring-plates. Fig. 5 is a front elevation of the chuck, and Fig. 6 is a sectional elevation showing a hand-wheel applied for operating the jaws of the chuck.

A represents the main part of the frame of the lathe, formed with the uprights A' A', in which the spindle B takes its bearing. An extension, C', is formed upon or attached to the main frame A, and to this extension is secured the rear bearing, C, for the spindle B, and this rear bearing is adapted to be adjusted upon the extension C' by the screw C<sup>2</sup>, for regulating the extent which the jaws *a a* of the chuck will be opened or closed by the movement of the chuck-head D, produced by

the lever E, tube *b*, and springs G, as herein-after described.

The spindle B is composed of the rod or shaft *b'* and the said tube *b*, through which the said shaft passes. The shaft *b'* is formed or provided at its front end with a head or flange, *b*<sup>2</sup>, with which the jaws *a* engage, the jaws being provided with recesses *a'* for that purpose, as shown in Fig. 1. The rear end of the shaft *b'* is held in its bearing C by the collar *c*, held between separate rigid parts *c'* *c*<sup>2</sup> of the bearing C, and said shaft is prevented from end-wise movement, also, by the tail-screw C<sup>3</sup>, screwed into the bearing C, and between the inner end of this screw and the rear end of the shaft *b'* is placed the plug *c*<sup>5</sup>, of lignum-vitæ or other hard wood, to prevent friction and heating. At *c'* the shaft *b'* is screw-threaded to receive the nuts *s s* for holding the flange F, and it is slotted at *c*<sup>6</sup> to receive the key *d*, which locks the tube *b* and shaft *b'* together, so that rotary motion imparted to the tube *b* by the pulleys W will be communicated to the shaft *b'*. The slot *c*<sup>6</sup> also permits the tube *b* to be moved longitudinally upon the shaft *b'* by the above-mentioned lever E, the treadle E', and the intermediate lever, E<sup>2</sup>, as below described.

The lever E is fulcrumed at *f*, and is connected to the collar *f'* by the side screws, *f*<sup>2</sup> *f*<sup>2</sup>. (Shown in Fig. 2.) In the collar *f'* works freely the tubular externally-screw-threaded tube *b*. On the rear end of the tube *b* is secured the plate F'. Between this plate F' and the collar *f'* are placed the two jam-nuts *e e'*, the latter being rabbeted to form the flange *e*<sup>2</sup>. The adjacent face of the collar *f'* is also recessed to form the flange *e*<sup>2</sup>, and between the said nut and collar in said recess is placed the collar *g*, of lignum-vitæ, to prevent heating and sticking of the parts when the treadle E' is depressed to draw back the tube *b*. Between the plates F and F' are placed the heavy coiled springs G, which exert a powerful forward pressure upon the tube *b* and chuck-head D, causing the latter to close the jaws *a* upon the work with sufficient power to hold it for turning. The springs are held in place between the plates F F' by the nipples *g'*. (Shown clearly in Figs. 1 and 4.)

The chuck-head D is screwed to the outer

end of the tube *b*, and is made hollow to in-  
 close the flange *b*<sup>2</sup> of the shaft *b*<sup>1</sup>, and the said  
 head moves with the tube *b*, while the flange  
*b*<sup>2</sup> and jaws *a* remain stationary, except that  
 5 said jaws are given an out-and-in radial move-  
 ment—that is to say, when no pressure is ex-  
 erted on the treadle *E*<sup>1</sup> the jaws are forced to-  
 gether by the action of the springs *G*—so that  
 they will close upon any work placed between  
 10 the jaws. When the pressure is exerted upon  
 the treadle *E*<sup>1</sup>, the springs will be compressed  
 and the tube *b* and chuck-head *D* forced back-  
 ward, causing the jaws *a* to be moved outward  
 to release the work. In this manner, if the  
 15 work be round, it can be placed in the chuck  
 and removed without stopping the lathe,  
 which is one of the important features of my  
 invention. The jaws of the chuck are practi-  
 cally automatic, and by operating them by a  
 20 treadle both hands of the turner are free to  
 handle the work. The inner casing, *d*<sup>1</sup>, of the  
 chuck-head is formed with the three radial slots  
*d*<sup>2</sup> *d*<sup>3</sup>, to permit the insertion of the jaws *a* to  
 engage the recesses *a*<sup>1</sup> thereof with the flange  
 25 *b*<sup>2</sup>, and at each side of each slot *d*<sup>2</sup> is formed  
 the recess *d*<sup>3</sup> *d*<sup>3</sup> for the side flanges, *a*<sup>2</sup> *a*<sup>2</sup>, of the  
 jaws *a* to rest in, as shown in Fig. 5, and the  
 said inner casing, *d*<sup>1</sup>, of the chuck is screwed  
 directly to the tube, and its outer surface is  
 30 made slightly conical, as shown, to spread the  
 jaws *a* when the chuck is carried backward.  
 The outer casing, *d*<sup>2</sup>, is screwed to the inner  
 casing, *d*<sup>1</sup>, and is made flaring, to correspond  
 with the conical shape of the inner casing, *d*<sup>1</sup>,  
 35 and this outer casing being made flaring per-  
 mits outward movement of the jaws *a* when  
 drawn backward, and when forced forward  
 acts to force the jaws together to grasp the  
 work.  
 40 By turning the screw *C*<sup>2</sup> to force the bearing  
*C* and shaft *b*<sup>1</sup> forward the jaws *a* may be set to  
 grasp large work, and by reversing said screw  
 and drawing the bearing and shaft *b*<sup>1</sup> backward  
 the jaws may be set for small work.  
 45 The lever *E* is bent at its lower end, as  
 shown at *h*, and the intermediate lever, *E*<sup>2</sup>, is  
 fulcrumed in the hanger *E*<sup>3</sup>, and is provided  
 with the anti-friction wheel *E*<sup>4</sup>, to run in con-  
 tact with the bent portion *h* of the lever *E* to  
 50 operate the latter. The lever *E*<sup>2</sup> is held out  
 of action by the spring *E*<sup>5</sup>. The treadle *E*<sup>1</sup> is  
 fulcrumed at *h*<sup>1</sup> and is linked to the interme-  
 diate lever, *E*<sup>2</sup>, so that said treadle and the le-  
 vers constitute a compound leverage for oper-  
 ating the tube *b* and chuck.

In Fig. 6 I have shown the jaws *a* and shaft  
 or spindle *b*<sup>1</sup> arranged to be operated by a  
 hand-wheel, *N*, applied to the end of the shaft  
*b*<sup>1</sup>, which is screw-threaded, as shown at *b*<sup>4</sup>, to  
 50 receive the hand-wheel. By this arrangement  
 I dispense with the treadle and the mechanism  
 intermediate between it and the lathe. By  
 turning the hand-wheel *N* the spindle *b*<sup>1</sup> may  
 be moved longitudinally for opening and clos-  
 65 ing the jaws *a* for grasping and releasing the  
 work.

Having thus fully described my invention,  
 I claim as new and desire to secure by Let-  
 ters Patent—

1. In a lathe, the chuck-spindle composed 70  
 of a shaft and tube, in combination with the  
 chuck-head attached to the tube, and the  
 springs arranged to force the tube forward,  
 substantially as described.
2. In a lathe, a chuck-spindle composed of 75  
 a shaft and longitudinally-movable tube, in  
 combination with a chuck-head, springs, and  
 treadle, arranged to operate substantially as  
 described.
3. In a lathe, the shaft *b*<sup>1</sup>, provided with the 80  
 plate *F*, in combination with the tube *b*, plate  
*F*<sup>1</sup>, and the springs *G*, placed between the said  
 plates, substantially as and for the purposes  
 set forth.
4. The chuck-head attached to a longitudi- 85  
 nally-movable tube, in combination with the  
 jaws *a*, flange *b*<sup>2</sup>, and springs for forcing the  
 tube and chuck-head forward, substantially as  
 shown and described.
5. The tube *b*, placed upon the shaft *b*<sup>1</sup>, in 90  
 combination with the springs *G*, acting in op-  
 posite directions on the said tube and shaft,  
 substantially as described.
6. The tube *b*, placed upon the shaft *b*<sup>1</sup>, in  
 combination with the springs *G*, collar *f*<sup>1</sup>, 95  
 lever *E*, nut *c*<sup>1</sup>, and block *e*<sup>2</sup>, of lignum-vitæ,  
 substantially as described.
7. The tube *b* and shaft *b*<sup>1</sup>, in combination  
 with the springs *G*, acting in opposite direc-  
 tions upon the tube and shaft, and the block 100  
*c*<sup>1</sup>, of lignum-vitæ, held at the rear end of the  
 shaft, substantially as described.
8. The shaft *b*<sup>1</sup> and jaws *a*, attached to the  
 front end of said shaft, in combination with  
 the longitudinally-movable tube *b* and chuck- 105  
 head *D*, substantially as described.
9. The shaft *b*<sup>1</sup>, holding the jaws *a*, in com-  
 bination with the longitudinally-movable tube  
*b*, chuck-head *D*, and springs *G*, acting in op-  
 posite directions upon the shaft and tube, sub- 110  
 stantially as described.
10. The shaft *b*<sup>1</sup>, held in an adjustable bear-  
 ing, *C*, in combination with the tube *b*, chuck-  
 head *D*, and springs *G*, acting in opposite di-  
 rections upon the shaft and tube, substantially 115  
 as described.
11. The jaws *a*, notched to engage with the  
 flange *b*<sup>2</sup> and formed with side flanges, *a*<sup>2</sup>, in  
 combination with the inner slotted conical  
 casing, *d*<sup>1</sup>, and the outer flaring casing, *d*<sup>2</sup>, sub- 120  
 stantially as and for the purposes set forth.
12. The jaws *a*, slotted to engage with a  
 fixed flange, in combination with the movable  
 inner conical block, *d*<sup>1</sup>, and outer flaring casing,  
*d*<sup>2</sup>, substantially as described.

PATRICK J. CAHILL.

Witnesses:

S. M. HILDRETH,  
 J. C. CLARKE.