4 Sheets--Sheet 1.

L. H. DWELLEY.

Lathes.

No. 151,208. Patented May 26, 1874.

Fig. 1.

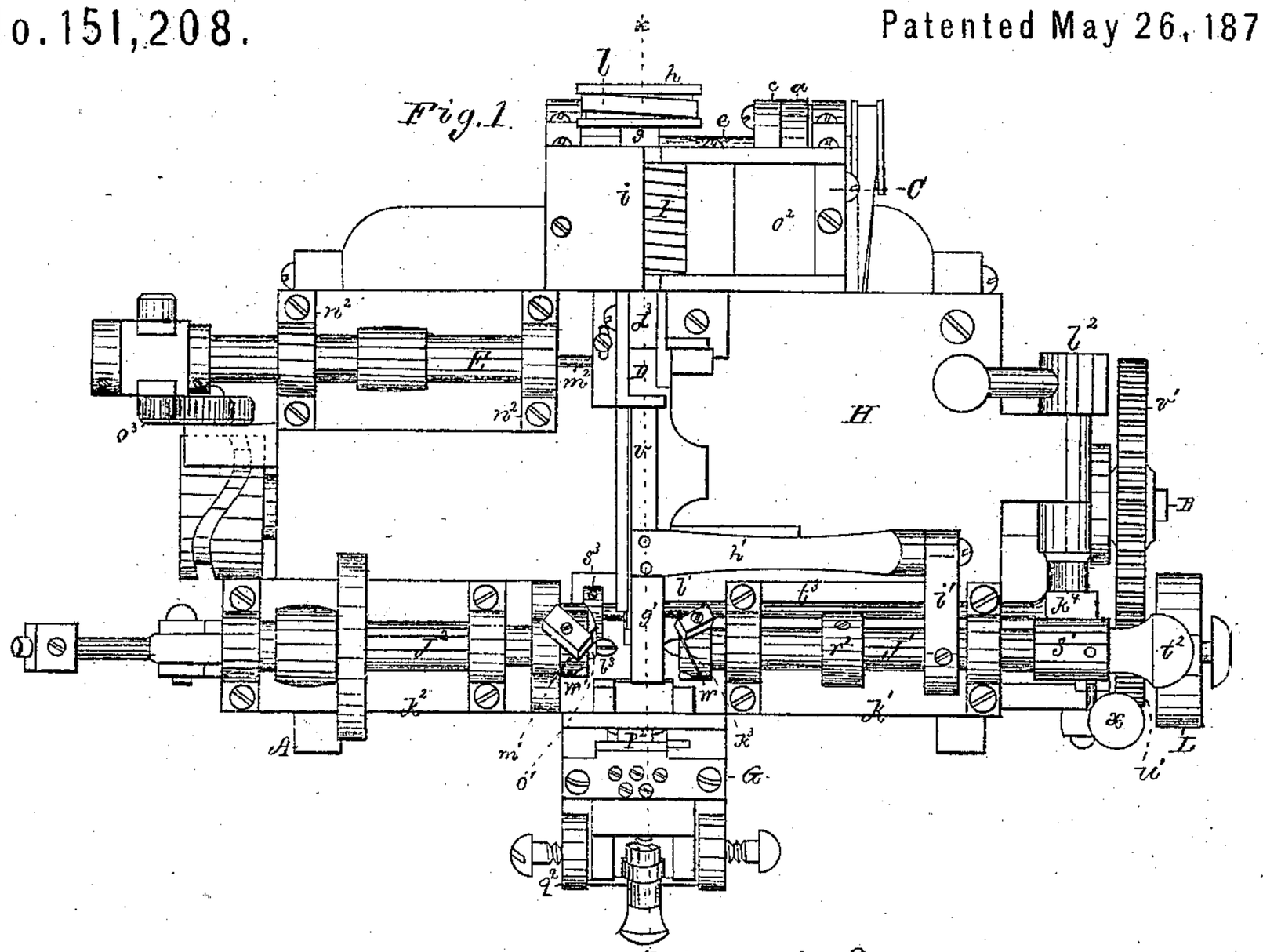
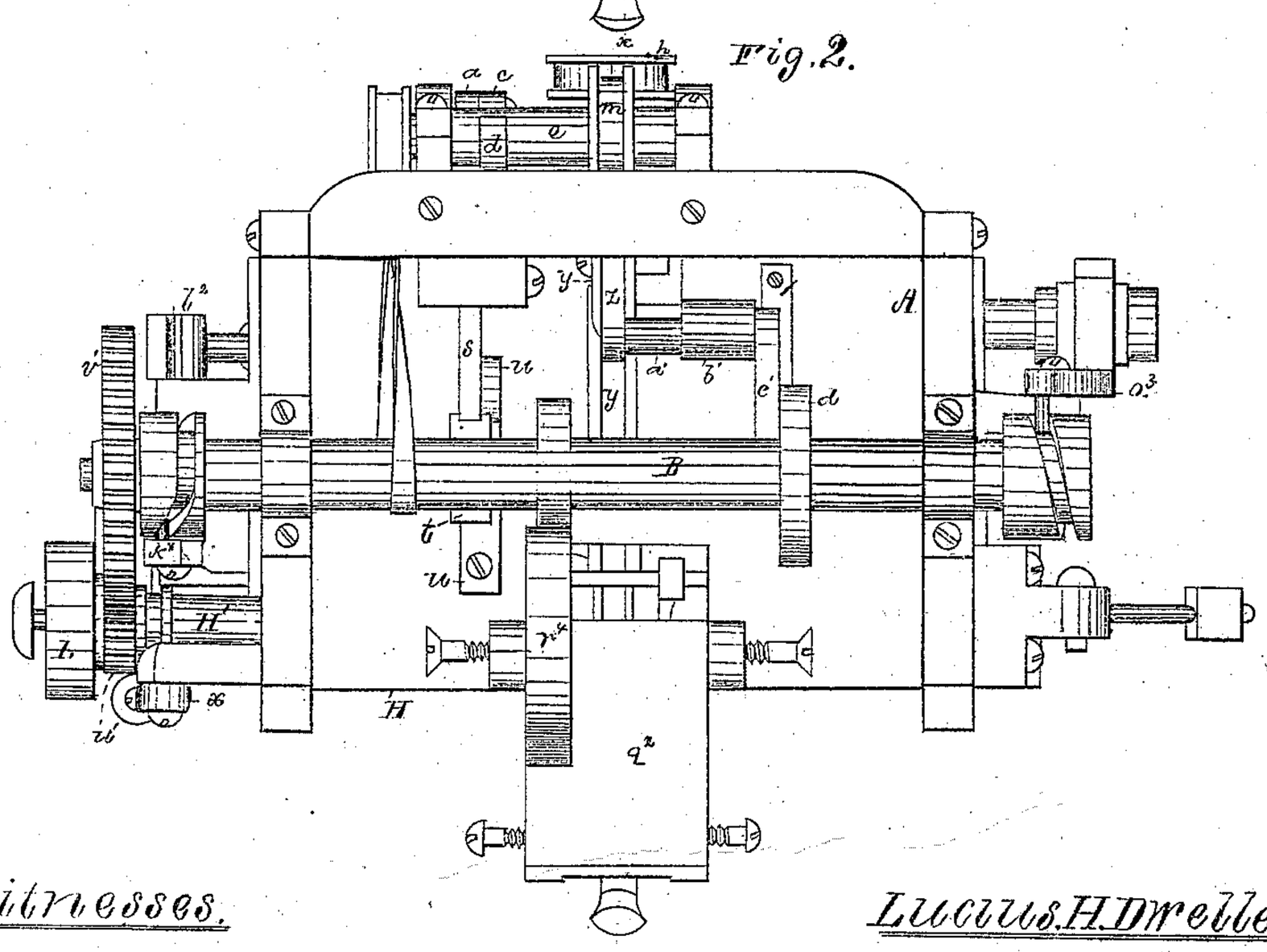


Fig. 2.



Witnesses.

Geo. Gray.

L. C. Hall

Lucius H. Dwelley.

by his attorney.

A. P. Hall

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Fig. 3.

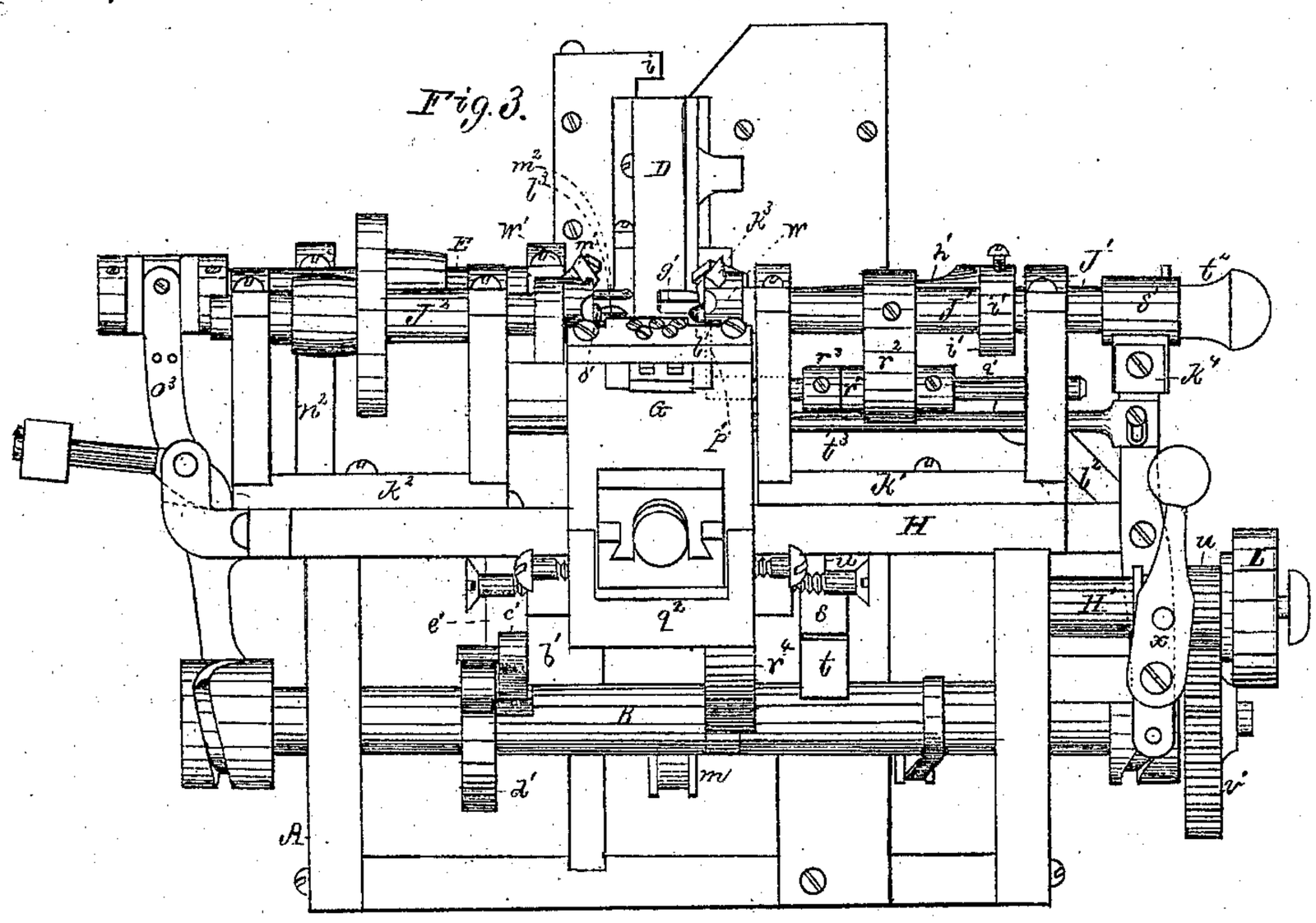
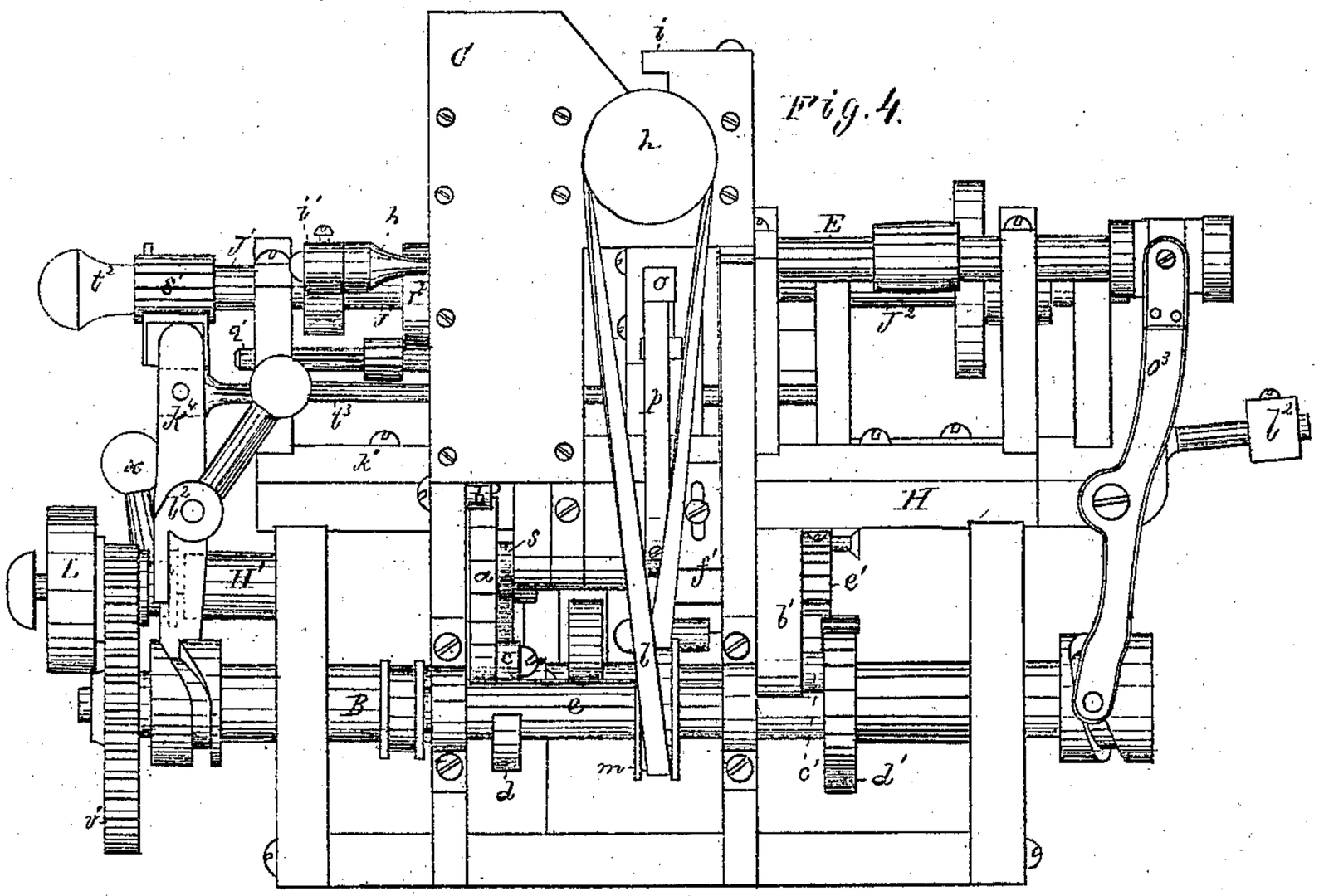


Fig. 4.



Witnesses.

Geo Gray

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by his attorney.

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Fig. 5.

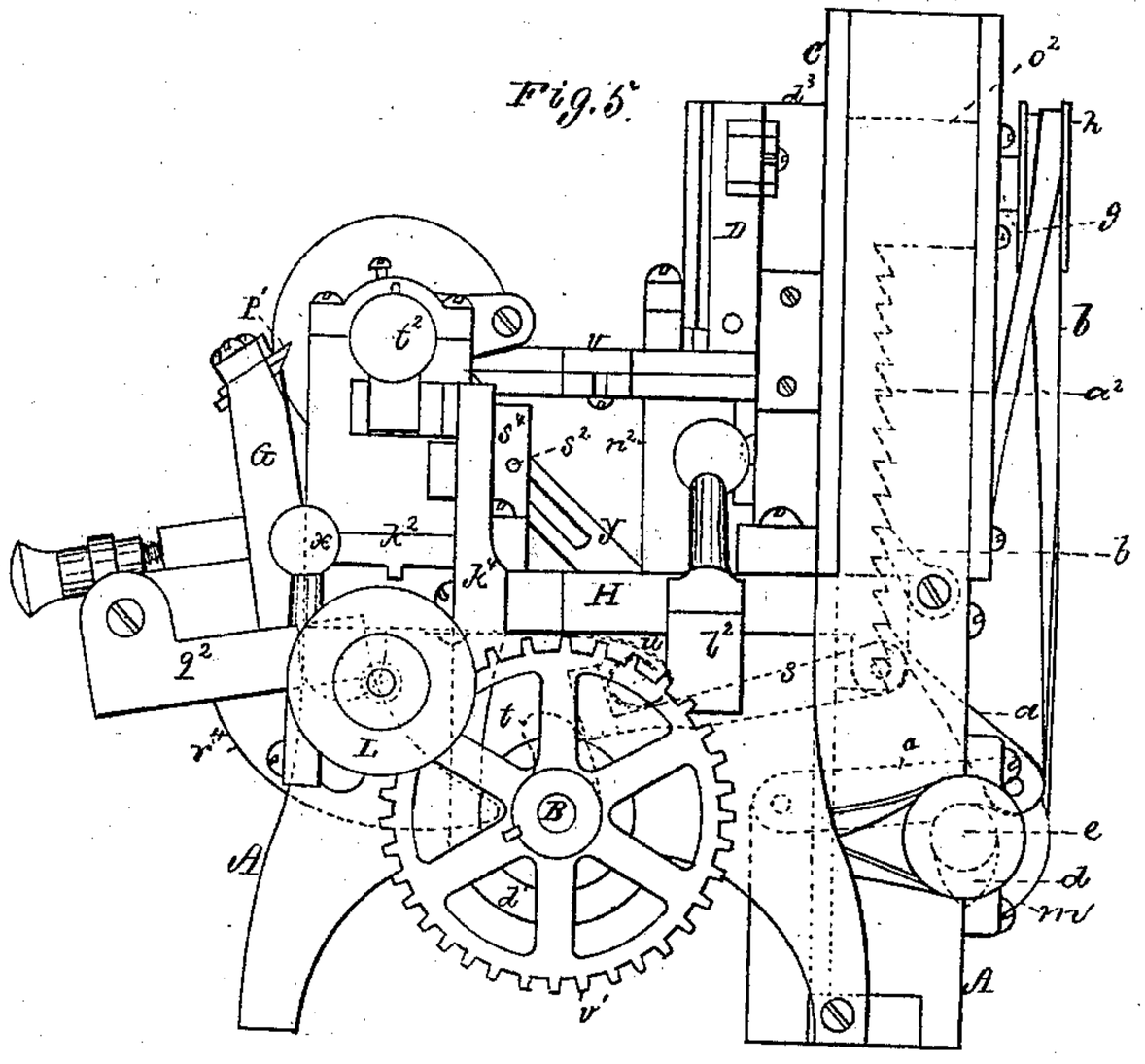
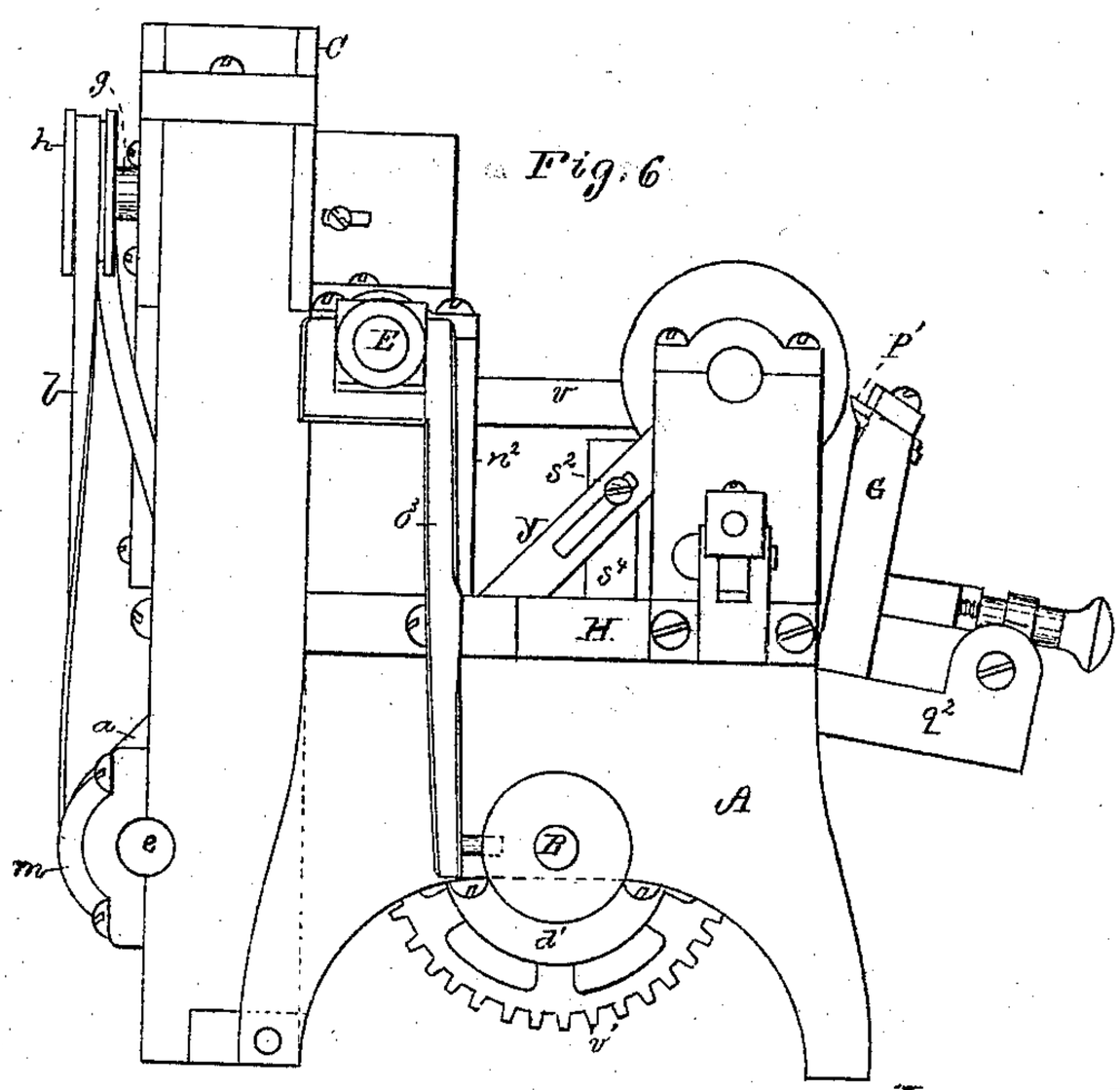


Fig. 6



Witnesses.

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by his attorney

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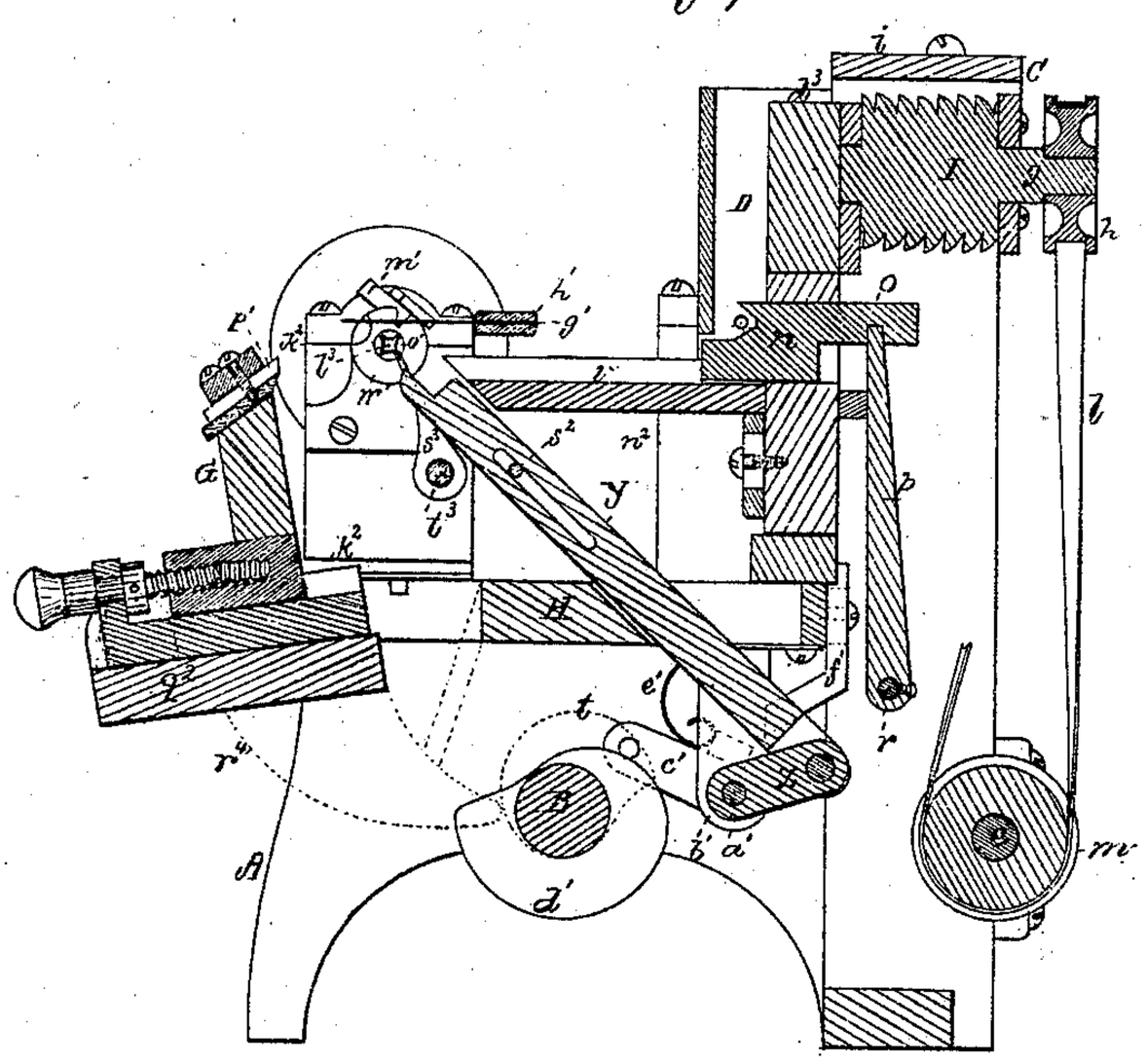
4 Sheets--Sheet 4.

L. H. DWELLEY.

Lathes.

No. 151,208. Patented May, 26, 1874.

Fig. 7.



Witnesses.

Geo Gray.

F. C. Hale.

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by his attorney.

F. P. Hale.

UNITED STATES PATENT OFFICE.

LUCIUS H. DWELLEY, OF SOUTH BOSTON, MASSACHUSETTS.

IMPROVEMENT IN LATHES.

Specification forming part of Letters Patent No. **151,208**, dated May 26, 1874; application filed July 26, 1872.

To all whom it may concern:

Be it known that I, LUCIUS H. DWELLEY, of South Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Lathes; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, in which—

Figure 1 denotes a top view, Fig. 2 a bottom view, Figs. 3 and 4 front and rear elevations, and Figs. 5 and 6 right and left end elevations, of a machine constructed in accordance with my invention. Fig. 7 is a transverse section thereof taken on the line *x x* of Fig. 1.

Similar letters denote like parts in all the said figures.

The object of my invention is to provide a simple, effective, and automatic machine for the manufacture of spools, bobbins, &c., whereby the same may be produced with far greater facility and dispatch than by the methods heretofore adopted. My invention may be found in a machine containing the following elements, viz: A receptacle or hopper for receiving the spool-blanks; mechanism for consecutively conveying the blanks from the hopper; mechanism or means for arranging each blank as it comes from the hopper and transferring it to the boring-chamber; mechanism for centralizing and holding the blank while being bored; a drill or boring-tool; mechanism or means for discharging the blank after being bored and moving it toward the pivotal head-stocks; mechanism for centralizing and supporting the blank while being pivoted or centered between the head-stocks; mechanism for planing or smoothing the ends of the spool-blanks; mechanism for forming the heads and barrel of the spool, and mechanism for discharging the spool from the machine when finished.

The manner in which my invention is or may be carried out will be readily understood from the following description and the accompanying drawings.

In the said drawings, A is the frame for supporting the operating parts. B is the main driving-shaft, which extends longitudinally of the machine, and is suitably supported in boxes affixed in the frame. C is a receptacle or hopper for receiving the cylindrical blocks of wood, which are to be of the desired diameter and length for the spools. This hopper is of a rectangular or other desirable shape, and extends up vertically from the frame of the machine, and may have any desirable capacity. Within this hopper is a piston, o^2, (shown in dotted lines in Fig. 5,) having a rack plate or bar, a^2, affixed to its lower end. With this rack-bar an impelling-pawl, *a*, and a retaining-pawl, *b*, engage, the latter being pivoted to the hopper-frame and the former to the outer end of a rocker-arm, *c*, whose inner end is pivoted to a standard extending up from the frame A. The impelling-pawl is actuated by a cam, *d*, disposed upon a short horizontal shaft, *e*, as shown in Fig. 4. This cam serves to elevate the rack-plate, and consequently the piston, one tooth at each revolution of the shaft, the latter receiving its rotation by means of an endless band from the main driving-shaft. The hopper being filled with spool-blanks, thrown in promiscuously, they are, by the mechanism just described, forced successively upward and over the open inclined side of the hopper, and received upon the mechanism for arranging the blank and conveying it in its proper position into the boring-chamber. This mechanism consists of a rotating screw, I, mounted upon a shaft, *g*, one end of which extends through the side of its supporting-frame, and carries a pulley, *h*, on its outer end. This screw is to have its threads made a distance apart equal to or a little greater than the diameter of the blanks, so as to render it impossible for the blank to pass under the cap *i* of the screw otherwise than in the proper direction, or with its axis at nearly a right angle to that of the screw-shaft. The screw-cap is made adjustable to correspond with the diameter of the blank, and, when arranged, to allow it to pass under the same. By forming the threads of the screw inclined toward the passage to the boring-chamber D, the rotation of the screw serves to advance the blank and force it into the passage d^3, from which it is impelled into the boring-chamber by the impingement of the succeeding blanks. The screw is put in rotation by means of a band, *l*, working around the pulley *h* and a pulley, *m*, disposed on the

shaft *e*, the latter receiving its motion from the main driving-shaft. The boring-chamber D, which is of a rectangular shape, and arranged in front of the screw I, is provided with adjustable sides and ends, by which it can readily be adapted to fit and receive blanks of different diameters and lengths. The blank having been received into the boring-chamber, the mechanism I employ for centering and holding it while being bored consists of a notched or forked sliding block, *n*, disposed upon an arm, *o*, which is connected by a pitman, *p*, to one end of a rocker-shaft, *r*, whose opposite end carries a lever, *s*, against the free end of which a cam, *t*, disposed on the main driving-shaft, as shown in Fig. 2, operates, and serves, through the medium of the mechanism last described, to retract the block after the blank has been bored, a spring, *u*, bearing against the outer end of the lever, serving to impel forward and hold the forked slider or block, the front portion of the block serving as a rest to support the blank, while the furcated end of the slider, acting in conjunction with the contiguous face of the chamber, centralizes and holds the blank while being drilled or bored. After the blank has been bored, the rest-block, by the action of the cam *t*, is drawn back, and the bored blank falls, by the action of gravity, upon the bottom of the conveying-race *v*, when, by the next forward movement of the block, the blank is forced on toward the cutter heads or stocks *w w'*. This race-way is also so made as to be adjustable to different lengths of blanks or spools. The mechanism or means for receiving the blanks from the said race-way, feeding, centralizing, and supporting them while being centered upon the pivotal axes of the head-stocks *w w'*, consists of the shouldered lever *y*, whose lower end is connected by a pitman, *z*, to a rocker-shaft, a^1, journaled in a bracket or post, *b'*, as shown in Figs. 2 and 7. The said lever is disposed at an angle to the plane of the race-way *v*, and is so actuated that, after having moved forward and held the blank until the pivots have commenced to enter its bore, it is immediately drawn back, so as to offer no impediment to the rotation of the blank, and allow it to be discharged from the machine when the spool is finished. The said shaft carries on its opposite end a lever, *c'*, having a stud projecting from it, and operating with a cam, d^1, disposed on the main driving-shaft, as shown in Figs. 2, 3, and 4. *e'* is a spring, one end of which is affixed to the under side of the table H. Its free end, bearing against the lever *c'*, serves to retain the stud in contact with the cam. The said lever *y* has a compound adjustment, so as to duly embrace, support, and hold blanks of different diameters, the limit of its longitudinal movement being determined by means of a stop, *f'*, acting in conjunction with a stud projecting from the lower end of the lever *y*. The said lever *y* is guided in its longitudinal movements by means of a stud, s^2, working within a slot formed in the lever, as shown in Fig. 5. The standard s^4, carrying the stud s^2, is so applied to the frame as to be moved either toward or away from the cutter-stocks *w w'*, and thereby elevate or depress the lever *y*, as circumstances may require. *g'* is a spring, whose function is to bear against the top surface of the blank and co-operate with the furcated lever *y* in maintaining the blank in its due position while being centered or affixed to the pivotal head-stocks. This spring also aids in discharging the spool when finished. This spring is affixed to one end of an adjustable arm, *h'*, which, in turn, is connected to another adjustable arm, *i'*, which is affixed to a spindle, J^1, of the movable head-stock *w*. By this construction and connection of the parts the spring is rendered capable of a compound adjustment, in accordance with the diameter of the blank. The spindles J^1 J^2, carrying the cutter-heads *w w'*, are supported upon adjustable frames k^1 k^2, which are capable of being moved toward or away from each other, as circumstances may require. Furthermore, in order to produce a nicer adjustment of the working distances of the said cutter-heads or cutters, the spindle of the sliding cutter-head *w* carries on its outer end a screw, t^2, by turning which in the proper direction the required degree of adjustment may be readily attained.

I would remark that, if desirable, instead of the spindle of cutter-head *w*, its fellow cutter-head spindle may be provided with a similar screw.

l^1 is a center or pivot disposed upon the inner end of the sliding cutter-spindle. The head-stock *w* is provided with a knife, k^3, projecting from its inner face, the same being to smooth or finish one end of the spool. The head-stock *w'* is stationary, and also has a knife, m^1, affixed to it, as shown in Figs. 1 and 3. J^2 is a rotary spindle suitably supported in bearings, the same having upon its inner end a flanged center or pivot, l^3, to enter the axial hole of the blank, and cause rotation of the latter when the shaft is put in rotation. The head-stock *w'* is provided with a tubular projection, o^1, to receive and support one end of the spool while being reduced. The blank having been brought into the proper position by mechanism hereinbefore described, so that its bore is in the same axial line with the centers projecting from the cutter-heads *w w'*, the sliding center is moved forward, and, entering the bore of the blank, forces the latter upon the flanged center and the supporting-shoulder o^1, when the blank will have become duly centralized and ready for the action of the barrel-cutter.

In order to prevent the knife of the sliding cutter-head from coming into action too soon, or before that of the other can take place, I employ a dog or guard, *p'*, which is disposed on the inner end of a horizontal rod, q^1, which is supported in the frame k^1, so as to be capable of having a slight longitudinal movement.

This rod extends through a yoke, r^2, which connects with the shaft J^1, said shaft having two rigid washers and one flexible or yielding washer r^1, the function of the latter being to maintain the outer face of the guard or dog in a vertical plane beyond the edge of the sliding cutter, so that no action of the latter can take place until the blank has been forced in contact with the cutter-head w', when, the spring-washer yielding to the crowding action of the stop or washer r^3, the dog is forced back into line with the face of the cutter-head, when both cutters commence to plane the heads or ends of the blank simultaneously.

The mechanism for effecting the reciprocating automatic movements of the sliding head-stock and center is as follows: s^1 is a sleeve, which is affixed to the shaft J^1 near its outer end. To a projection from the said sleeve one end of a lever, k^4, is pivoted, the said lever also being pivoted to an eccentric weighted cam shaft or lever, l^2, the lower end of such lever carrying a pin or stud, which works within a cam-groove formed within a drum disposed on the main driving-shaft, as shown in Fig. 2, the object of this weighted lever being to allow the parts to slightly yield in case the blanks should fail to turn or become split, and thus prevent any undue strain upon the parts, the weight serving to restore it again to its normal position. E is a drill or boring-tool shaft, carrying on its inner end a drill or boring-tool, m^2, such shaft being supported in an adjustable frame, n^2 n^2, disposed on the main table of the machine. This shaft carries a drum or pulley, by means of which rotary motion may be imparted to the drill or boring-tool from any suitable motor. The mechanism for imparting to the drill-stock and drill its proper reciprocating movements consists of the two-armed lever o^3, which is pivoted near its center to a projection from the machine, as shown in Fig. 4, one arm of the lever being connected with a sleeve embracing the shaft, and the other carrying on its lower end a stud, which works in a cam-groove formed in a drum on the main driving-shaft, as shown in Fig. 4. G is a carriage, which bears the cutter P^2, for forming the barrel and inner faces of the heads of the spool. This carrier is supported and pivoted on a rocker-frame, q^2, which, in turn, is pivoted to the main frame A, as shown in Fig. 3. The said carriage is so constructed and arranged as to be capable of being adjusted at any desirable distance from the wood to be reduced, it being so weighted that when the cutters are not in action it shall, by the action of gravity, recede from the spool, and allow the latter to be ejected from the machine. The carriage G is pivoted to the frame q^2 in order to allow it to rock and yield should any unyielding matter present itself to the cutter, or should the spool become split. From the rocker-stand q^2 a curved arm, r^4, extends downward, its lower end resting upon a cam disposed on the main driving-shaft, such serving to advance the cutter up to the wood to be reduced at the proper time, while gravity operates to throw the cutter backward or away from the spool after the cutting is effected, in order to allow the spool to be discharged when finished. For the purpose of discharging the spool when perfected, I employ the arm or dog s^3, which is arrayed upon a slide-rod, t^3, one end of which is affixed to the lever k^4, hereinbefore described. The spring g' also aids in discharging the spool. L is a driving friction drum or pulley, which is arranged upon a short horizontal shaft, H', such pulley receiving its motion by means of any suitable motor. The male or entering portion of the pulley carries upon it a spur-gear, u', which engages with a larger gear, v', disposed on the end of the main driving-shaft. x' is a shipping-lever, by which the pulley is thrown into or out of action, as may be desirable.

I would remark that, if desirable, the head-stock w', instead of the stock w, may be provided with mechanism by which any undue strain upon the working parts may be counteracted.

The drawing shows a weighted lever, which may be affixed to mechanism like that described as applied to the stock w, or any other suitable for the purpose.

From the above, it will be seen that my machine is perfectly automatic in its operation, and that the blanks, having been put into the hopper, are transferred therefrom, and pass through the machine, receiving their appropriate reduction, and, when finished, are ejected therefrom.

Having described my invention, what I claim is as follows:

1. In an automatic machine for making spools, &c., the receptacle or hopper C, in combination with the piston and its operating mechanism, substantially as and for the purpose set forth.

2. In an automatic machine for making spools, &c., the screw I and its cap i, for arranging the blanks, as and for the purpose set forth.

3. The combination of the hopper and its actuating mechanism with the screw I, substantially as above set forth.

4. The sliding block n, when constructed, arranged, and provided with actuating mechanism substantially as shown and described, in combination with the boring-chamber, for the object stated.

5. The yielding guard or dog p', in combination with the cutter-heads w w' and their cutters, as and for the purpose set forth.

6. The mechanism, substantially as shown and described, for receiving, feeding, and holding the blank while being centered between the head or cutter stocks w w'.

7. The spring g', in combination with the reciprocating center l^1 and the flanged center l^3, and the tubular support o^1, as and for the purpose set forth.

8. In combination with the reciprocating

center l^1, the flanged center l^3, and the tubular support o^1, the dog s^3 and the spring g', or its equivalent, as and for the purpose set forth.

9. In combination with the cutters k^3 and m^1, the automatic yielding and adjusting device, substantially as shown and described, for the purpose set forth.

10. The feeding and retaining lever y, arranged as described, and provided with means of adjustment, substantially as and for the purpose set forth.

11. The above-described automatic machine or spool-lathe, consisting of the following elements: A hopper for receiving the spool-blanks; mechanism for consecutively conveying the blanks from the hopper; mechanism or means for receiving and arranging each blank as it comes from the hopper, and transferring it to the boring-chamber; mechanism for centralizing and holding the blank while being bored; mechanism for boring the blank; mechanism for discharging the blank from the boring-chamber; mechanism for feeding the blank, holding and centralizing it while being pivoted between the head-stocks $w\,w'$; mechanism for planing the ends of the heads; mechanism for forming the heads and the barrel of the spool, and mechanism for discharging the latter from the machine when finished, the whole being constructed and arranged for conjoint operation as shown and described.

L. H. DWELLEY.

Witnesses:
F. P. HALE,
J. O. SMITH.