

L. H. Duvelley, 4. Sheets, Sheet. 1.

Wood Lathe.

No. 103033.

Patented May 17. 1870.

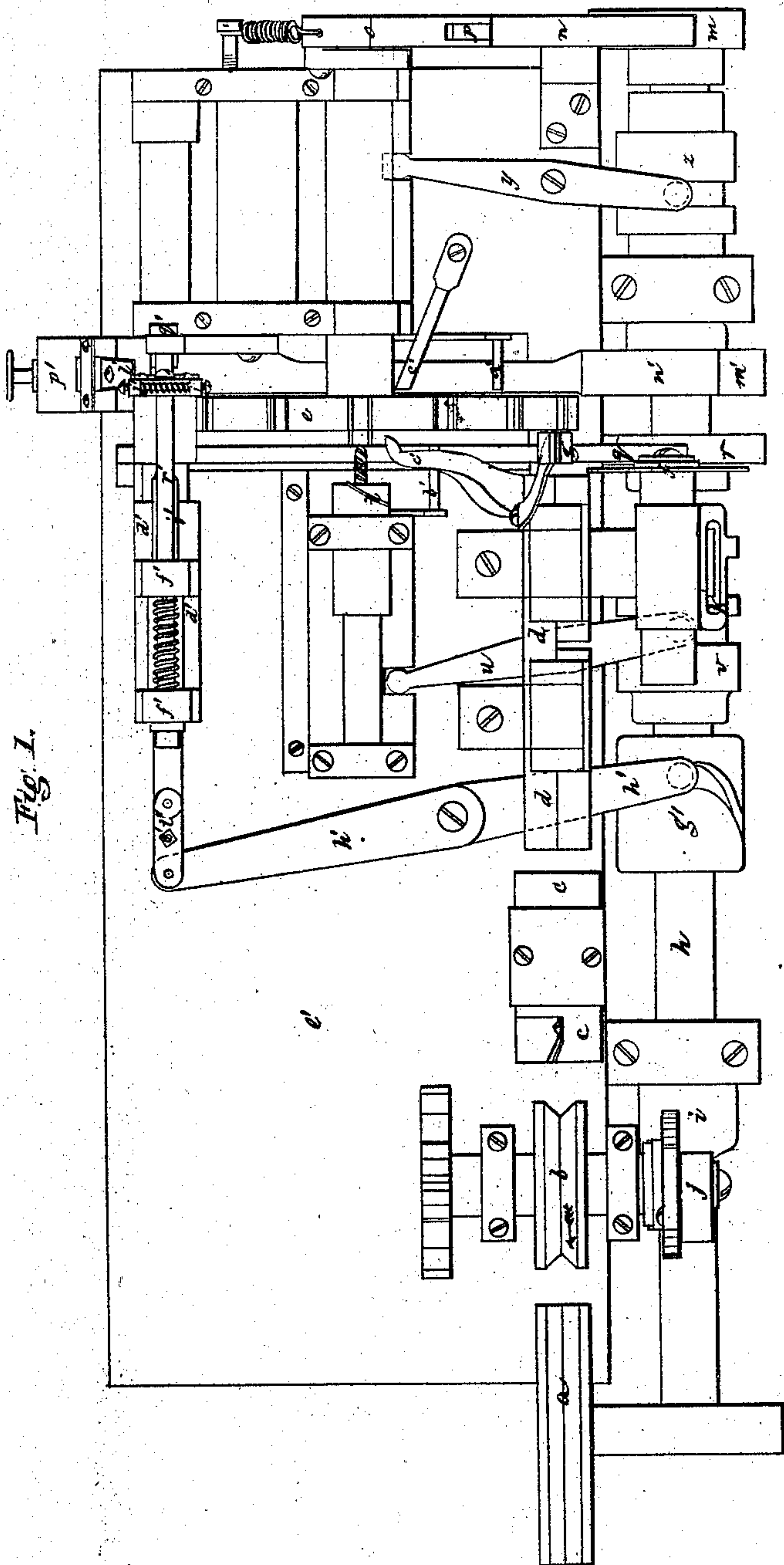


Fig. 1.

*Witnesses, } J. B. Crosby,
 } L. Warren Brown.*

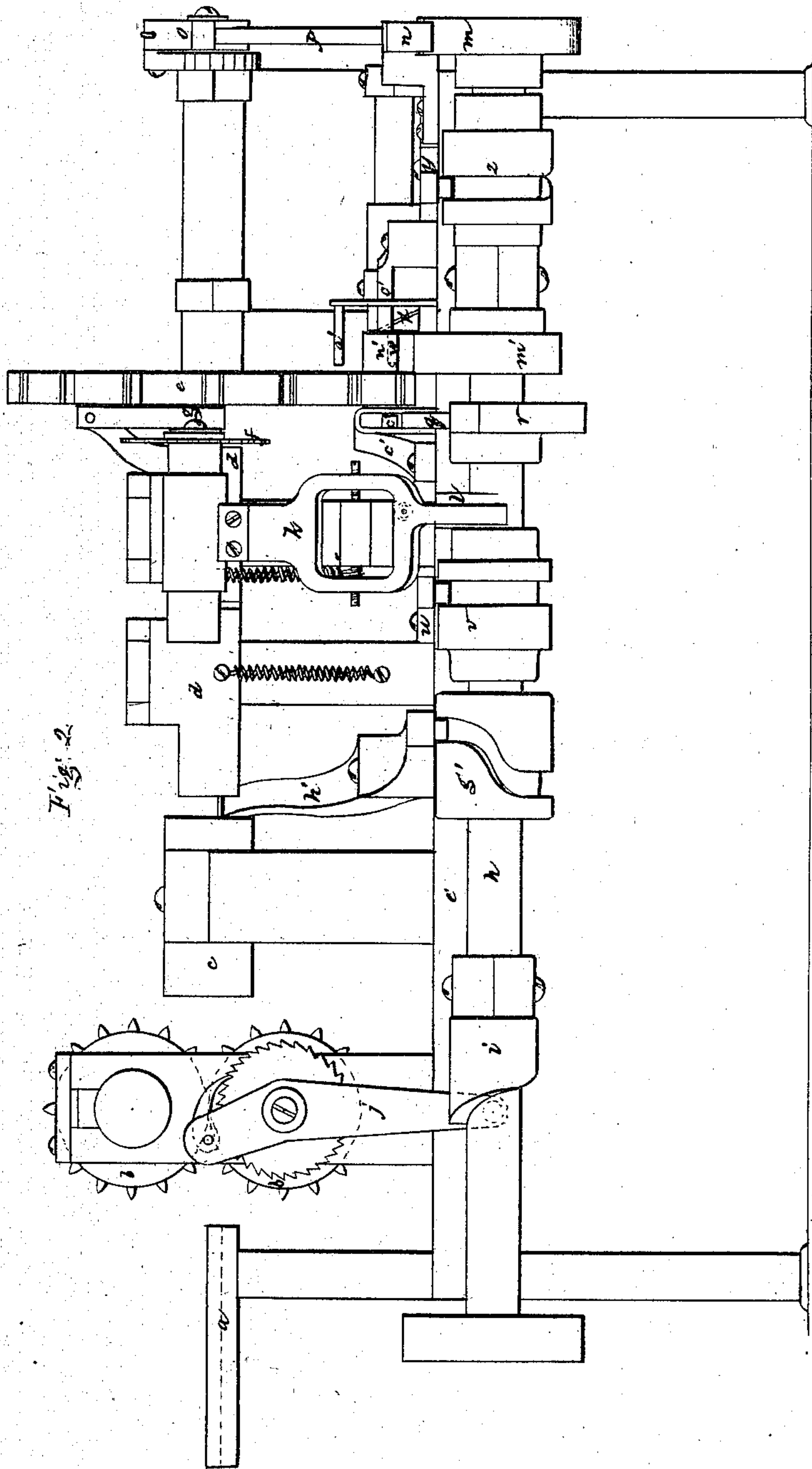
Lucius H. Duvelley Inventor

4. Sheets, Sheet 2,
L. H. Dwelley,

Wood Lathe.

No. 103033.

Patented May 17. 1870.



Witnesses { *W. B. Crosby.*
L. Warren Brown

Lucius H. Dwelley

4. Sheets, Sheet. 3.

Wood Lathe.

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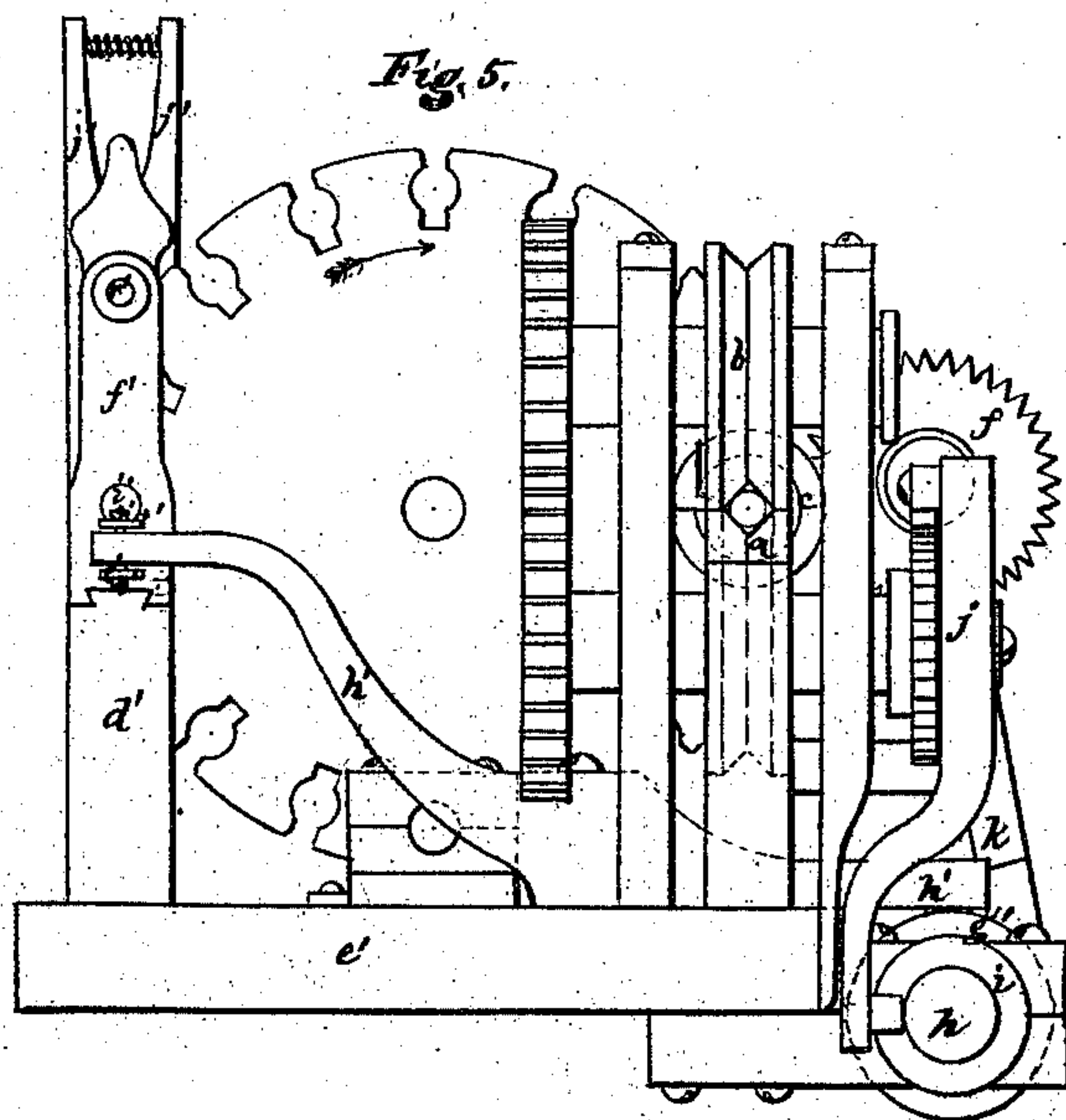
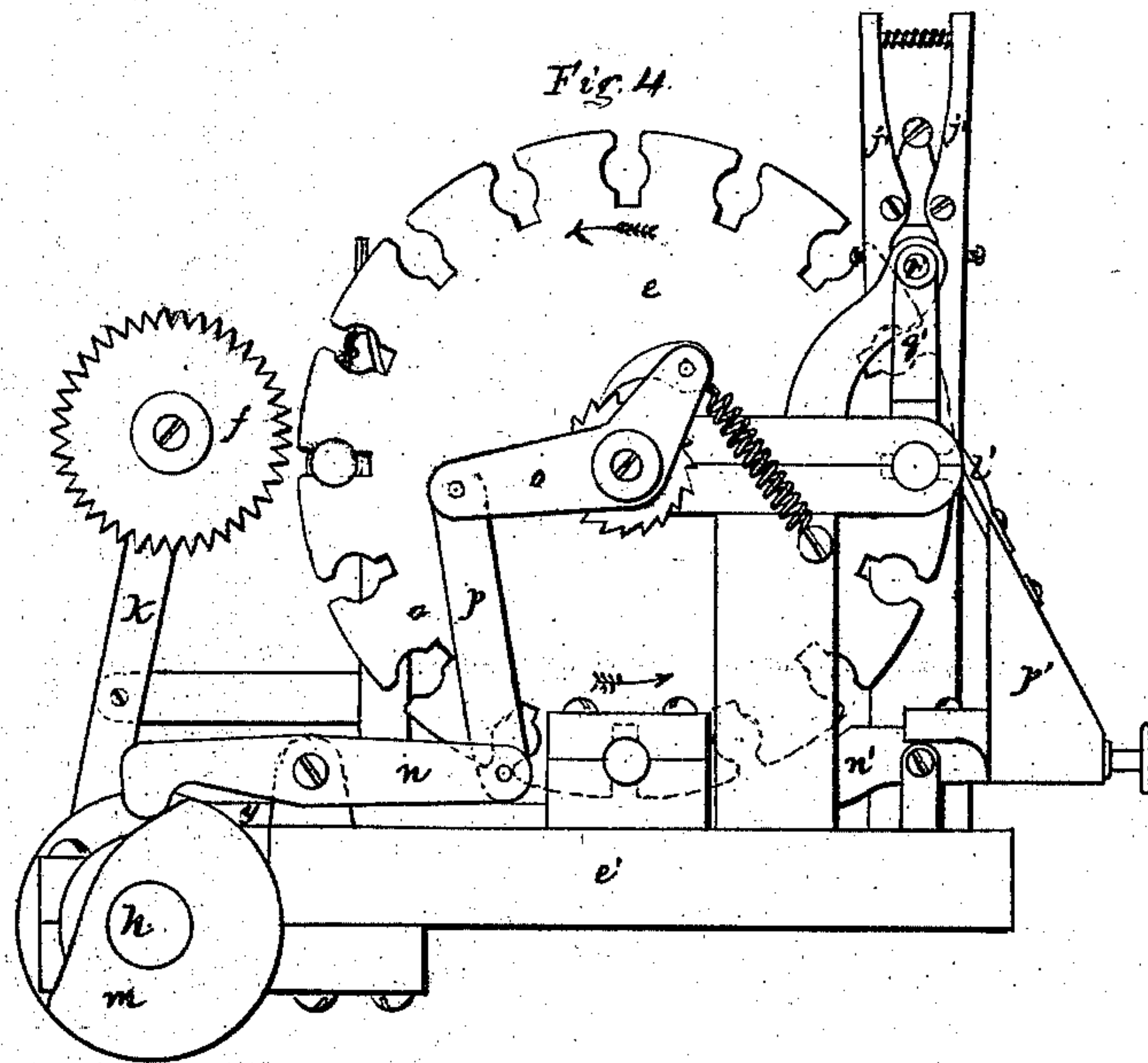
Lucius H. Durellay

L. H. Twelley, 4. Sheets, Sheet. 4.

Wood Lathe.

No. 103033.

Patented May 17, 1870.



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 { L. Warren Brown. Lucius H. Twelley*

UNITED STATES PATENT OFFICE.

LUCIUS H. DWELLEY, OF DORCHESTER, MASSACHUSETTS.

IMPROVEMENT IN WOOD-LATHES.

Specification forming part of Letters Patent No. 103,033, dated May 17, 1870; antedated May 9, 1870.

To all whom it may concern:

Be it known that I, L. H. DWELLEY, of Dorchester, in the county of Norfolk and State of Massachusetts, have invented Improvements in Machines for Forming and Turning Articles from Wood, &c.; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

This invention relates to certain novel constructions, combinations, and arrangements, which are described and set forth in this specification, and are shown in the accompanying drawings, by which I produce a machine which is capable of receiving material in an elongated form—such, for example, as bars or strips of wood—and severing from such bars or strips short pieces, which are formed in and by the machine into ornamental or useful shapes, the operations being automatic after the material is once seized upon by the mechanism.

The machine shown in the drawings as an illustration of an embodiment of my invention is arranged to produce from long strips of wood of rectangular cross-section such spools as common sewing-threads are wound upon for sale in the market.

Figure 1 is a plan of the machine; Fig. 2, a rear elevation; Fig. 3, a front elevation, and Figs. 4 and 5 elevations of the ends of the machine.

The bars of material are laid in a guide-trough, *a*, by hand; or they may be presented or laid therein from a bundle or pile by a suitable automatically-operating mechanism not herein described, or shown in the drawings. The ends of said bars, being presented to suitable feeding-rolls, *b b*, rotated in the direction indicated thereon, present and carry the strips to and through a hollow cutter-carrying arbor, *c*, by which the bars are reduced to cylindrical form, and are carried onward through guides *d d*, each one of which is preferably made in halves kept together by the action of springs or weights, which, by yielding, prevent the cylindrical bars from binding or becoming jammed in cases where they are not quite straight. The feeding operation is made continuous by introducing bar after bar with

their ends abutting. The bars are fed onward toward a wheel, *e*, which is made to rotate in the direction indicated, cavities or openings being made in the wheel, as shown in Figs. 4 and 5, to receive pieces cut off from the bars by the saw or cutter *f*. The cutter *f* operates between the end of one guide, *d*, and the adjacent end of a spring-holder, *g*, which is attached to the stationary part of said guide *d*, the function of said holder *g* being to receive and support the pieces cut off from the cylindrical bars, and to guide them into the openings in wheel *e*, into which they are pushed by the advance of the material operated on by the feed-wheels *b b*. The movement of the feed-wheels *b b* is intermittent, as is also the movement of the carrying-wheel *e* and the cutter *f*, and said movements are more or less directly effected from the constantly-rotating shaft *h*, a cam, *i*, on which and a co-operating spring works the pawl-carrying lever *j* to turn a ratchet-wheel on the shaft of one of the feed-wheels, the shafts of said feed-wheels being geared directly together. The cutter *f* is hung in a vibrating piece, *k*, which is moved by cam *l* and a co-operating spring, and the carrying-wheel *e* is worked from cam *m* by a pawl operating a ratchet-wheel on the shaft of wheel *e* through the medium of levers *n o*, link *p*, and a spring. (Best seen in Fig. 4.) Rapid rotation is given to the hollow cutter-carrying arbor *c* and to the cutter or saw *f* by means of belting. (Not shown.)

As the short cylinders or blanks of wood or other material are fed into the openings in the wheel *e*, they are carried to any desirable location, where they are clamped one after the other by the action of a piece on lever *q*, which lever is actuated by cam *r* and a co-operating spring, the clamping taking place while the wheel *e* is at rest, the clamping or gripping action on the blanks carried by wheel *e* being released at such times as the wheel is moving. When the wheel *e* is locked and one of the blanks is clamped therein, an arbor provided with a boring-tool, *s*, and a facing-cutter, *t*, is moved by means of lever *u* and cam *v* to bore and face one end of the clamped blank, the bored hole therein being immediately afterward reamed by reamer *w*, and the other end of the blank being faced by cutter

x , said reamer w and cutter x being carried by an arbor, which is moved by the lever y and cam z . The arbors carrying the said cutters and the boring and reaming tools are rapidly rotated by means of belting. (Not shown.)

In running the machine it is evident that two short cylindrical pieces, each less in length than the regular blanks, will generally be formed by the abuttal of two long bars of material, and will both be fed at the same time into one of the openings of the conveying-wheel e . It is important to the free and continuous working of the machine that the shorter, or at least one, of these pieces be removed from the wheel before they are brought to the action of the boring, reaming, or facing tools, as the hold of the gripper upon two pieces at the same time might not in all cases prevent one being wrested from the clamping action of the gripper by one of the tools, in which case, being revolved with the tool, the revolving short piece might either clog the machine or prevent the proper action of the tools on succeeding blanks of the regular length. Whenever one of such abutting short pieces is very much shorter than the other, it is evident that it may drop from the wheel by its own weight; but in order to insure the removal of one of them in all cases plungers a' b' are attached to the carriages in which the above-mentioned arbors are mounted, which carry the boring and reaming tools s and w , on which levers u and y act, the function of said plungers being to move the blanks endwise in the openings back and forth, so that when two pieces are in one opening, the shorter or one of them may be removed from the wheel. It is evident that neither of the two pieces formed by the abuttal of two long bars will be of any use to form a finished article, the design of the plungers being simply to get rid of the short pieces, or one of each pair, without stopping or clogging the machine.

Instead of the plungers, other devices could be employed to give the proper endwise motion to the blanks, or by giving a proper bevel to a part of the opening in the wheel one or both of the pieces would fall from the wheel before the opening into which they were fed is brought opposite to the boring or facing tool. The length of the regular blanks is considerably greater than the thickness of the wheel, in order to allow the ends to be faced without danger of bringing the facing-tool into contact with the wheel.

To properly locate the blanks in the wheel e before they are clamped, bored, reamed, and end-faced, pieces c' c' are so located and arranged that, as the wheel e in moving brings the blanks of material into contact with said pieces c' c' , the blanks are moved endwise in wheel e from the position in which they are left by the action of the plungers a' or b' , and are left projecting at both ends beyond the sides of the wheel, as may be desired. Instead of the pieces c' c' , plungers similar to those described or rollers could be used. The guide

and receiver g is made like a pair of spring-nippers, opening below, so that as wheel e turns the jaws of the receiver g will open and allow any piece of the material to be carried downward, if for any reason such piece should be left partially in one of the openings in wheel e , and partially in said guide, thus preventing breakage of the machine, and allowing the movement of such misplaced piece of material to a location where the attendant can readily remove it, the snap of the spring-jaws upon releasing such piece warning the operator to attend to irregularity in the working of the machine.

In a convenient location beyond the place where the short pieces of material are clamped and end-faced is the mechanism by which said pieces are transferred from the carrying-wheel e , and are rapidly rotated on their axes, subject to the action of a suitable cutting tool or tools, by which any desired finished shape is given to the pieces. On a support, d' , located on the main bed e' , is arranged a sliding carriage, f' , which is made to move back and forth at suitable intervals by the action of cam g' through the medium of lever h' and a link of peculiar construction, to be described hereinafter. This carriage is provided with a centering-arbor, i' , which is in line with the axis of one of the openings in wheel e , when said wheel is locked by the action of the piece on lever q , which clamps the short cylindrical pieces of material to be bored and end-faced, or either bored or end-faced. The center, carried by the centering-arbor i' , is of the same diameter with the hole bored in each blank, and as the arbor i' is advanced the center is pushed into said hole, there being a device arranged to keep the short cylinder from being forced out of the carrying-wheel prematurely. This device consists of a pair of levers, j' j' , pivoted near the centers of their length to a piece fixed to the support d' , the lower ends of said levers being kept closed together by a spring acting on the upper ends. These levers j' j' , being located at the side of the wheel opposite that where the arbor i' is located, hold the perforated blank in the wheel e until the enlargement of said arbor presses said blank so hard against the sides of levers j' j' (which are beveled on the side receiving the pressure) as to cause the beveled ends to spring apart, and then the said blank is carried on the centering-arbor, out of the opening in wheel e , and toward and upon the spurred or fluted center k' , which is made to rotate rapidly by means of a belt, (not shown,) said live center k' being mounted in a suitable arbor arranged in bearings in a well-known manner, as shown in the drawings. The short cylinder being fairly fixed on and between centers and in rapid rotation, a cutting-tool, l' , of any suitable shape, is made to advance into contact with the rotating body, to be shaped by the tool.

The tool-holder p' is mounted on a lever, n' , which is worked at the proper intervals by the cam m' , and a co-operating spring or weigh

to move tool *l'* to and from its work. The cutting-tool having performed its function and having retreated from the work, the sliding carriage *f'* draws away from the wheel *e*, the levers *j' j''* preventing the finished article from following, and the piece *q'* acting to strip the finished article from the live center *k*. The stripper *q'* is attached to a rod, *r'*, borne by the carriage *f'*, there being a head on said rod, by which the stripper is drawn against the finished article, to cause its detachment from the live center. The movement of the carriage *f'* is in excess of the movement of the stripper, which is checked by coming into contact with one of the bearings of the live-center spindle, the movement of the stripper *q'* away from the work being caused by the action of one of the vertical bars of carriage *f'* on the rod *r'*, through the medium of a spring placed against a stop on the rod *r'*, which spring yields as soon as the stripper is checked, and thus allows the carriage *f'* to complete its full movement.

The openings near the periphery of the carrying-wheel *e* in the present illustrations are first made cylindrical and of the desired size, and besides being slotted outward to form an opening for the gripper are also slotted inward toward the center of wheel *e*, which, by presenting three lines of bearing, prevent any liability of yielding material like wood being crushed or split in the openings by the pressure of the clamp. It is not necessary, however, that the openings in the wheel should be of the precise form and construction herein shown. The inner slots may be omitted and the three lines or surfaces of bearing on the blank be still secured by having two of them on the end of the gripper. Neither do I wish to confine myself to circular openings in the wheel, as it is evident that they may be made square, triangular, oval, or indeed in any other shape which will afford a firm bearing or bearings for the blanks to be pressed against. I prefer, however, the openings made as shown in the drawings, as they are easy of construction and satisfactory in action.

The link which connects lever *h'* with the sliding carriage *f'* is made of two plates, *t' t''*, each having a pivot-point in each end, which points fit in countersinks made in the pieces to be connected, and the plates are drawn toward each other by one or more bolts, *s'*, placed between the pivot-points, so that by taking out the bolt the parts are quickly disconnected, and by tightening the bolt all wear of the pivots is compensated for, and lost motion or backlash prevented.

In describing my machine it has been convenient to illustrate it by reference to its adaptation for the manufacture of a specific article; but it is capable by slight changes of producing many different articles of different forms and of different materials.

I have also, by way of mere illustration, referred to special devices shown in the drawings as means for imparting the proper times and distances of movement to the instrumen-

talities directly operative on the material to be wrought, but do not wish to be understood as confining my invention to said special devices. Many articles also can be made upon it not requiring the entire combination of all the mechanism used in making spools.

Long bars, already reduced to the cylindrical form, could be used in the machine, and the hollow cutter-carrying arbor be omitted; but this would be an unnecessary waste of time, as no time is lost in this machine in rounding the stock, this work being done at the same time with other parts of the work. The blank may also be severed from the bar by the vibrating cutter after the end of the bar has been fed into the wheel; but I prefer cutting it off first, as shown in the drawings, as I am thereby enabled to save time by feeding forward the wheel while the vibrating cutter is severing a succeeding blank.

It is evident that the facing-knife may be removed from its stock when required, that the boring and reaming bits may be removed when the work does not require them, and that these parts may be of different forms adapted to the different varieties of work.

I claim—

1. The combination of an intermittent feeding device with a hollow cutter-carrying arbor, through which the work is fed, and a stationary guide, as described.

2. The combination of an intermittent feeding device, a hollow cutter-carrying arbor, through which the work is fed, a stationary guide, and a vibrating or reciprocating circular cutter, *f*, substantially as herein shown and described.

3. The conveying-wheel *e*, made with openings, as described, to receive the blanks, as and for the purpose set forth.

4. The stationary yielding receiver *g*, constructed and arranged to operate in conjunction with the carrier-wheel, substantially as described.

5. The combination of an intermittent feeding device, hollow cutter-carrying arbor, guide, and circular cutter *f*, with a conveying-wheel, substantially as herein described.

6. In a wood-turning machine, the process herein described of first feeding forward and turning a bar to a cylindrical form, then severing from it short pieces or blanks by means of a vibrating or reciprocating rotary cutter, and then pushing forward such severed pieces by means of end pressure of the automatically-advanced bar, into a revolving conveyer or transferer.

7. The combination of an intermittent feeding device, a revolving cutter having also a reciprocating or vibrating motion, a hollow cutter-carrying arbor, stationary guide, and a conveying-wheel, substantially as set forth.

8. The combination of the intermittently-operating conveying-wheel, with the tools *s*, *t*, and *w*, constructed and arranged to operate substantially as described, and for the purpose specified.

9. The combination of the intermittently-operating conveying-wheel with a wheel-checking or locking device, which also serves as a grip for the material operated upon, substantially as shown and described.

10. The method herein described of automatically removing from the series of blanks the short pieces formed at or by the juncture of two bars from which the blanks are made.

11. The method herein described of adjusting the lateral position of the blanks while within the openings of the wheel by means of inclined guides.

12. The combination of an intermittently-operating conveying-wheel with a sliding centering-arbor, *i'*, arranged to operate, substantially as described.

13. The combination of the arbor *i'* with the resisting and stripping levers *j' j'*.

14. The combination of the arbor *i'*, the resisting and stripping levers *j' j'*, and the conveying-wheel, substantially as described.

15. The combination, with a revolving and vibrating cutter, *f*, for severing the blanks from the bar, of the conveyer-wheel, and the round and spur or chuck centers, substantially as shown and described.

16. The combination of the sliding carriage *f'* with the stripper *q'* by means of the headed rod *r'*, and the spring thereon, arranged to operate substantially as set forth.

17. The combination, with a revolving and vibrating cutter for severing the blanks from the bar, of the conveyer-wheel, the round center, the revolving spurred or chuck center, and the automatically-moved turning cutter *i'*, substantially as shown and described.

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