

J. F. C. RIDER.

Machines for Making Spools.

No. 135,443.

Patented Feb. 4, 1873.

Fig. 7.

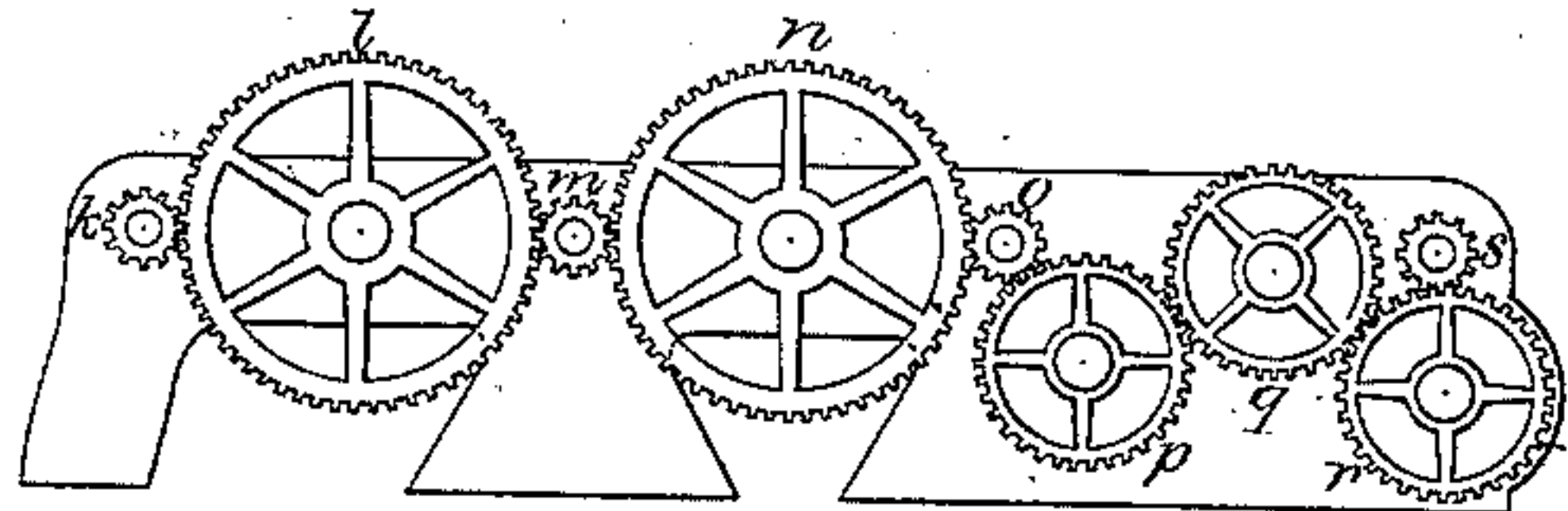


Fig. 6.

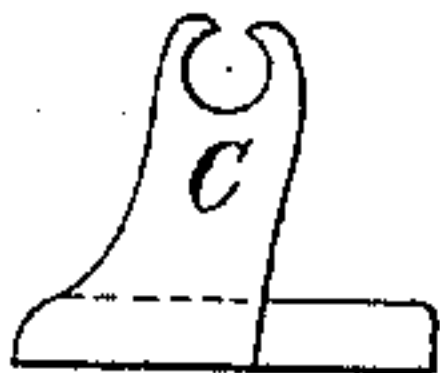


Fig. 8.

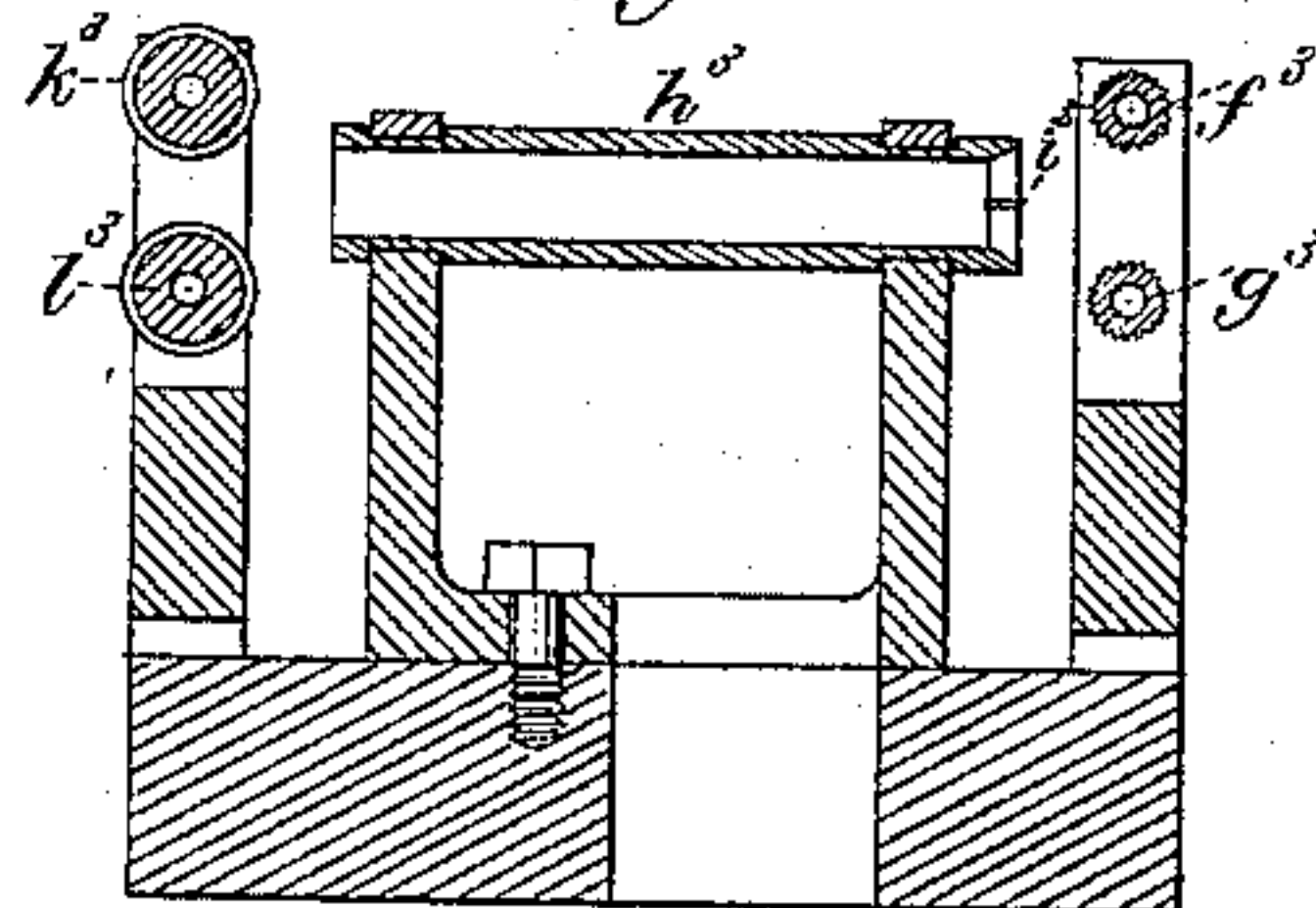
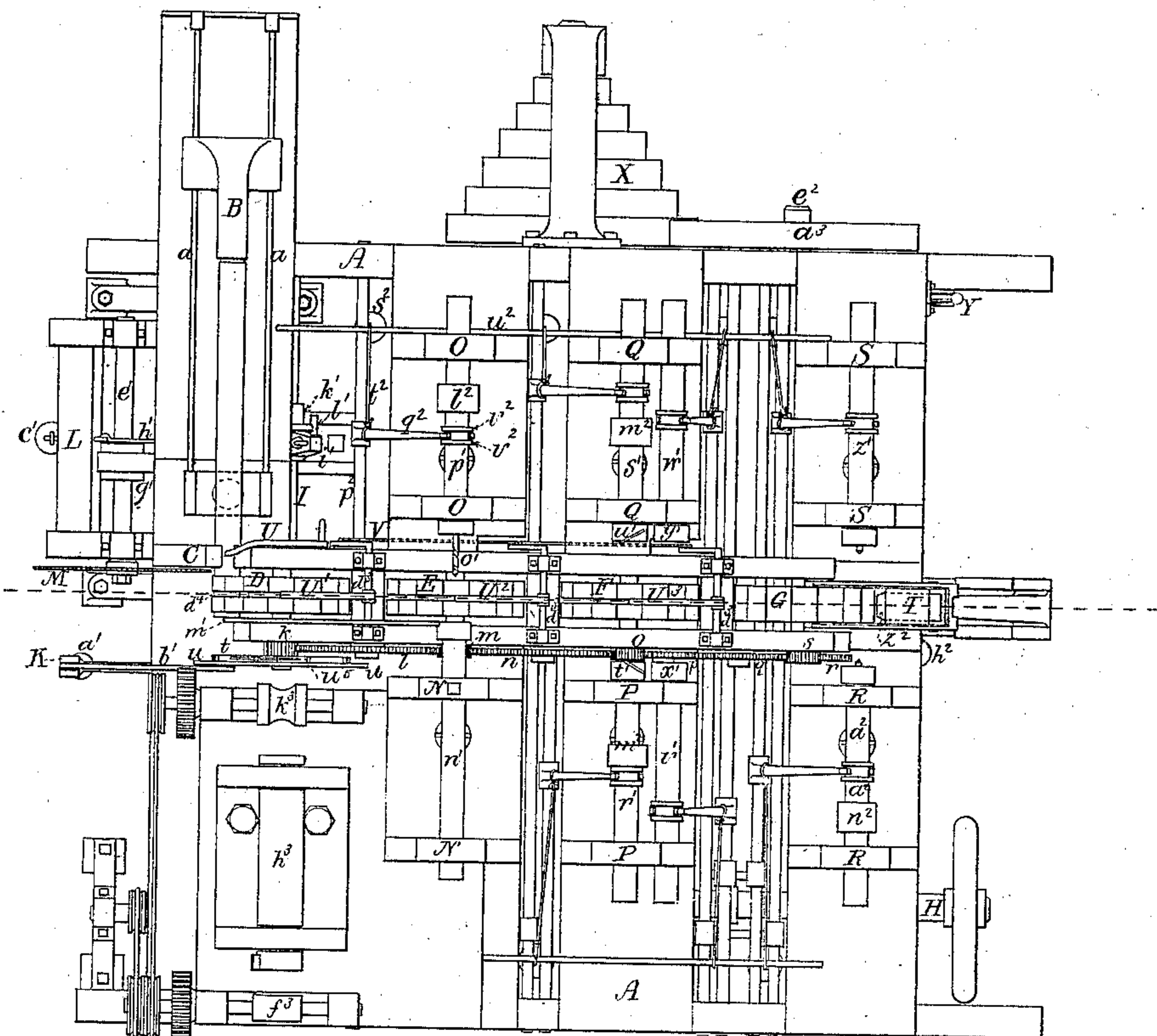


Fig. 1.



Witnesses.

S. W. Piper

L. W. Höller

John F. C. Rider

by his attorney.

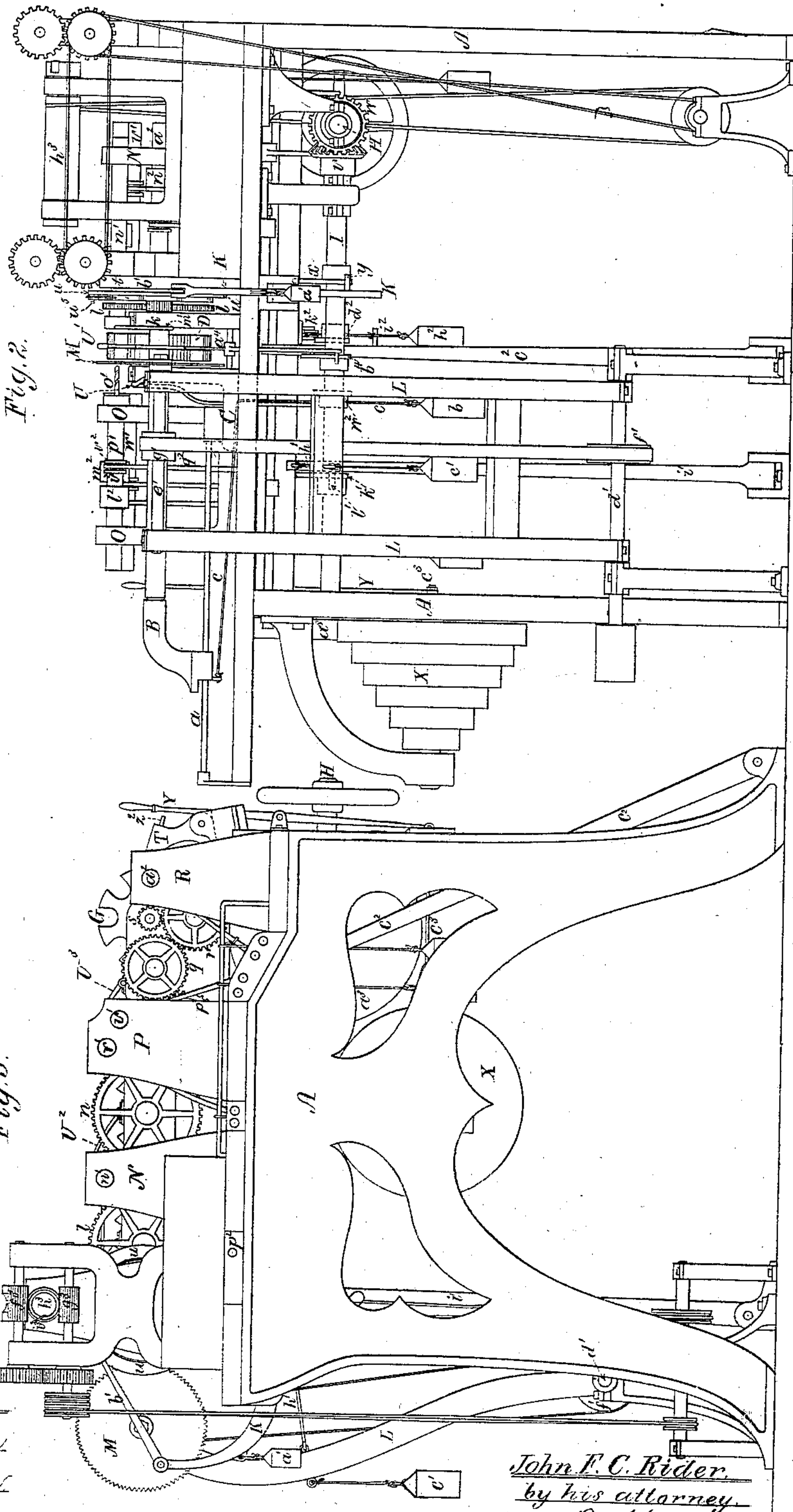
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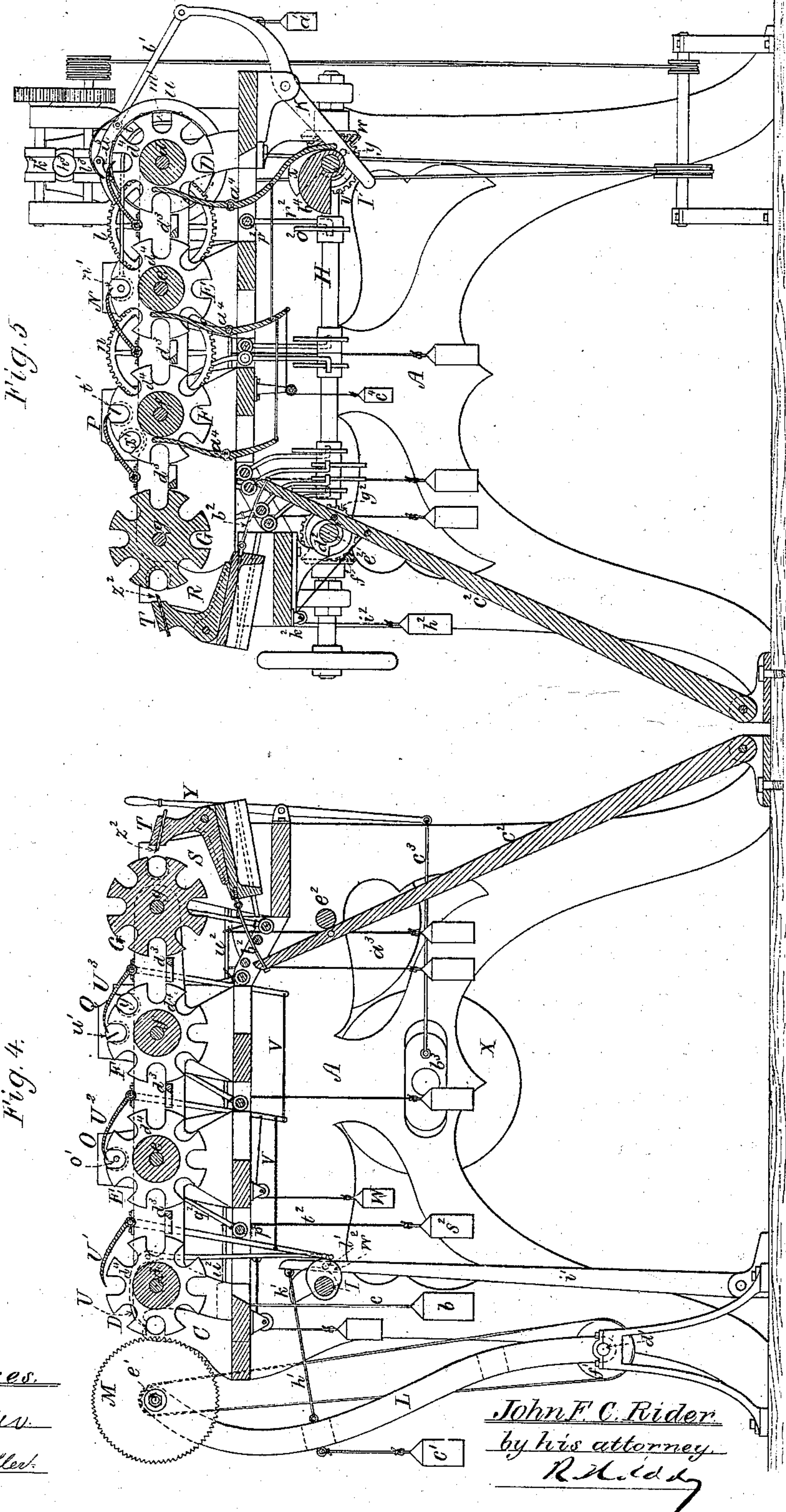


Fig. 5

Fig. 4.

Witnesses.  
S. W. Piper.  
L. N. Holler.

John F. C. Rider  
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R. H. Ledy



# UNITED STATES PATENT OFFICE.

JOHN F. C. RIDER, OF SOUTH NEW MARKET, NEW HAMPSHIRE.

## IMPROVEMENT IN MACHINES FOR MAKING SPOOLS.

Specification forming part of Letters Patent No. 135,443, dated February 4, 1873.

*To all whom it may concern:*

Be it known that I, JOHN F. C. RIDER, of South New Market, of the county of Rockingham and State of New Hampshire, have invented a new and useful Machine for Making Spools, Bobbins, or various other articles of like nature; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawing, of which—

Figure 1 is a top view; Fig. 2, a rear elevation; Fig. 3, a side elevation; and Fig. 4, a longitudinal section, of it. Fig. 5 is another longitudinal section. The plane of section of Figs. 4 and 5 is through the several rotary receivers, one section exhibiting the mechanism to the right, and the other to the left of such plane.

The machine proper is to cut a long stick into sections or blanks of the proper length for being reduced to spools. Each blank after being severed from the stick will be transferred to a rotary receiver, and by it will be conveyed and presented to mechanism for boring it lengthwise, after which the blank will be discharged into another rotary receiver, and by it will be conveyed and presented to mechanism for reducing the blank on its ends to the proper length. Next, the blank will be transferred to another rotary receiver, and by it will be carried to mechanism for revolving it, and reducing it circumferentially, and also, if necessary, for stamping or ornamenting it on either or both of its ends. The several rotary receivers have, while the machine is in operation, intermittent rotary motions, such as will enable the above-mentioned operations to be performed. Furthermore, I have combined with the spool-making machine a mechanism for rounding the stick, or reducing it to a cylindrical form, preparatory to the introduction of it into such machine. The rounding-machine is so arranged as to save labor, or be very convenient for an attendant in applying the stick to the main machine, for after having inserted the stick in the rounding-machine he receives such stick as it passes therefrom over the receiving part of the spooling-machine, and at the proper time places the stick in the latter, and while the latter is in operation on the stick the workman has time to in-

troduce into the rounding-machine and receive from it another stick.

In the drawing, A denotes the frame of the spooling-machine, which, at its rear, has two parallel and horizontal ways or rails, *a a*, on which is placed a movable poppet or head, B, to slide freely on the rails longitudinally thereof. A weight, *b*, connected with the poppet B by a cord, *c*, duly arranged, serves to draw the poppet toward a notched rest or stationary poppet, C, arranged as shown, it being represented in end elevation in Fig. 6. The first rotary receiver is seen at D, it consisting of a wheel having a series of notches in it at its periphery, they being arranged at equal distances apart. All the rotary receivers, of which there are three more, E, F, and G, are alike, and are arranged one in advance of the other, in manner as exhibited, and on separate shafts, *d, e, f*, and *g*, furnished with a connecting train of gears, *k l m n o p q r s*, all being as shown in side elevation in Fig. 7. A ratchet-wheel, *t*, fixed on the first shaft, *d*, receives intermittent rotary motion from a pawl, *w*, pivoted to the side of a wheel, *u*, arranged on the shaft *d*, and provided with mechanism for imparting to it a reciprocating intermittent rotary motion, all of which will be hereinafter explained. The secondary driving-shaft of the machine is shown at H as geared to another or auxiliary shaft, I, by means of bevel-gears *v w*. The shaft I carries a cam or wiper, *x*, to work against a stud, *y*, projecting from one arm of a lever, K, arranged as shown, and provided with a weight, *a*<sup>1</sup>, suspended from its upper arm, such arm being connected with the wheel *u* by a rod, *b*<sup>1</sup>, pivoted to the two. The cam, by having a continuous rotary motion, will impart to the lever a movement one way on its fulcrum, the weight causing it to move at the proper time in the opposite direction. The pawl *w*, in the meantime, will be advanced and retracted, and by its advance will turn the ratchet-wheel the necessary distance, whereby each of the rotary receivers will be revolved a like distance or number of degrees, and will remain at rest until the next advance movement of the lever takes place. A vibratory arm or frame, L, arranged and provided with a weight, *c*<sup>1</sup>, for retracting it, turns at its foot on a shaft, *d*<sup>1</sup>, and at its upper part sup-



ports another shaft,  $e^1$ , carrying at one end a circular saw, M, which is to derive rotary motion from an endless belt going around two pulleys,  $f^1 g^1$ , fixed on the shafts  $d^1 e^1$ . The shaft  $d^1$  is to be revolved by suitable means. A rod,  $h^1$ , connects the saw-frame L with a vibratory arm,  $i^1$ , arranged as shown. A cam or wiper,  $k^1$ , on the shaft I, by acting against a stud,  $l^1$ , projecting from the arm  $i^1$ , serves, at the proper time, to effect the advance of the saw-frame, whereby the saw will be caused to perform its duty of severing a blank from the stick supported in and by the two poppets, and extended into one of the notches of the rotary receiver D. Alongside of the said receiver D is a curved arm or stop,  $m^1$ , which projects from a shaft,  $n^1$ , arranged as shown. The stop is not only to arrest the stick after being forced into the receiver D, but to guide the blank in its passage to and against the inner end of the shaft  $n^1$ , which is to constitute an abutment for the blank to rest against while it may be in the act of being bored lengthwise by a boring-tool,  $o^1$ , carried by a rotary arbor,  $p^1$ , arranged as shown. The second of the rotary receivers is placed between the said arbor and the shaft  $n^1$ . This latter at its inner end may be tubular or recessed, to enable the boring-tool to pass entirely through the blank while it is within the receiver E. The two shafts  $n^1 p^1$  are supported by lathe-heads N O, besides which there are other pairs of such lathe-heads, arranged as shown at P Q R S. The second pair P Q support arbors  $r^1 s^1$ , having cutter-heads  $t^1 u^1$  for reducing the blank on its two opposite edges, so as to square and finish it to the required length. The lathe-heads P Q also carry two other arbors,  $v^1 w^1$ , having heads  $x^1 y^1$ , for stamping or ornamenting or beading the ends of the blank or spool. The other pair R S of lathe-heads support arbors  $z^1 a^2$  for seizing and revolving the blank preparatory to and while it may be in the act of being reduced circumferentially by a cutter,  $z^2$ , supported in and by a movable carrier, T, arranged as shown, and to slide longitudinally or toward and from the blank. A rod,  $b^2$ , connects the carrier T with a lever or arm,  $c^2$ , against a stud, from whose side a cam or wiper,  $d^2$ , fixed on a shaft,  $e^2$ , acts. The shaft  $e^2$  will be revolved by bevel-gears  $f^2 g^2$  applied to it and the secondary driving-shaft H. A weight,  $h^2$ , attached to a line,  $i^2$ , going through a stationary eye or over a pulley,  $k^2$ , and fixed to the lever  $c^2$ , serves to effect the retreat or back movement of the cutter-carrier. The arbors of the boring-tool  $o^1$  and the spool-end-trimming cutter-heads  $t^1 u^1$ , and also the arbor  $a^2$ , are provided with pulleys, as shown at  $l^2, m^2, m^2$ , and  $n^2$ , which are to receive belts for effecting the revolutions of such arbors. Furthermore, each of the arbors  $p^1 r^1 s^1 v^1 w^1$  has a mechanism applied to it for advancing and retracting it longitudinally.

This mechanism consists or may consist of a cam or wiper,  $o^2$ , fixed upon the driving-shaft H, a slide-rod,  $p^2$ , provided with two arms,  $q^2$

$r^2$ , and a weight,  $s^2$ , suspended from one of the arms, and having its suspension-line  $t^2$  going around a guide,  $u^2$ , arranged as shown. The upper arm of the slide-rod extends up to the arbor and between collars  $v^2 v^2$  fixed thereon, as shown, all being arranged as represented in the drawing.

The rest or poppet C has applied to it what I term a retainer, such being a mechanism for holding the stick stationary or from revolving while in the act of being cut by the saw. The retainer is composed of a bent lever, U. There is also another such retainer to each of the rotary receivers D, E, and F, the same being shown at  $U^1 U^2 U^3$ . The longer arms of these levers  $U U^1 U^2 U^3$  extend downward and are connected by a rod, V, provided with a suspended weight, W, for retracting it. A cam,  $W^2$ , on the shaft I, by its action against the retainers  $U U^1$ , serves to move all the retainers at once, so as to force their upper arms downward upon the blanks when in the several rotary receivers.

In order that the machine may be run at different speeds by a driving-belt, there is fixed upon the shaft  $e^2$  a friction-wheel,  $a^3$ ; to run against the largest of a series or cone of pulleys, arranged as shown at X, the same to be forced into contact with the wheel  $a^3$  by a lever, Y, connected by a rod,  $c^3$ , with the movable box  $b^3$  of the cone-pulley arbor. Inclined planes or guides  $d^3$ , arranged in the manner as shown between the rotary receivers, serve to guide the blank from one to the other of them; it at the proper period being forced out of one into the next of such receivers by a suitable mechanism, which, as shown in Fig. 5, may be a lever,  $a^4$ , to extend into the receivers D E F, and be moved one way by a cam,  $b^4$ , and drawn back by a weight,  $c^4$ , the whole being so as to drive the blank from one receiver into the next, as may be required.

In order that the lever may operate to advantage I prefer to arrange its upper arm in a groove,  $d^4$ , cut around in the receiver to a depth somewhat greater than that of each of the notches of the receiver. These several levers  $a^4$  may be so connected that one cam and one weight will suffice for their simultaneous operations.

The machine for rounding the stick may be described as follows: It is arranged to the right of the first rotary receiver D, in manner as shown, it being represented in longitudinal section in Fig. 8. It consists, mainly, of a pair of feed-wheels,  $f^3 g^3$ , a tubular arbor,  $h^3$ , provided with one or more rounding-cutters,  $i^3$ , and a pair of draft-rollers,  $k^3 l^3$ , all arranged, supported, and provided with operative mechanism or gears, pulleys and belts, and driving-shaft, all as represented.

I claim—

1. In combination with mechanism, substantially as described, for supporting and advancing the stick, (viz., the stationary rests C  $m^1$ , and the movable poppet B, and its operative mechanism,) the circular saw M, the se-



ries of rotary receivers D E F G, the boring mechanism, (viz., the stop-shaft  $n^1$ , and the boring tool  $o^1$ , and its operative mechanism,) the mechanism for dressing the ends of the blank, (viz., the rotary cutter-heads  $t^1 u^1$  and their operative mechanism,) and the mechanism for reducing such blank circumferentially, (viz., the arbors  $z^1 a^2$  and the carrier T, provided with a cutter and mechanism, as described, for operating them as explained,) the said saw and rotary receivers being provided with mechanism for operating them, essentially as set forth.

2. In combination with the combination or mechanism herein first claimed, one or more retainers, U  $U^1$   $U^2$   $U^3$ , arranged and applied in manner and for the purpose, and provided with mechanism for operating it, as set forth.

3. In combination with the combination or

mechanism herein first claimed, mechanism as described, or its equivalent, for stamping the ends of the blanks, such consisting of the stamping-heads  $x^1 y^1$ , arranged and provided with operative mechanism, as described.

4. In combination with the mechanism herein first claimed, the series of inclined guides  $d^3$ , arranged relatively to the rotary retainers D E F G, substantially as set forth.

5. In combination with the mechanism or spooling-machine herein first claimed, and as arranged therewith, the machine for rounding the stick preparatory to its introduction into the said spooling-machine.

JOHN F. C. RIDER.

Witnesses:

R. H. EDDY,  
J. R. SNOW.