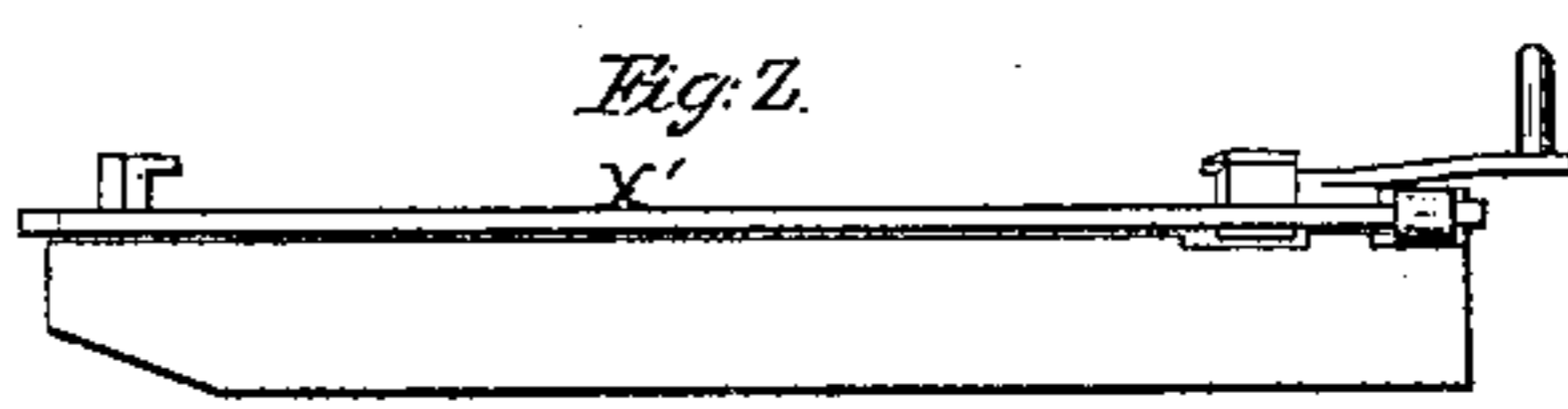
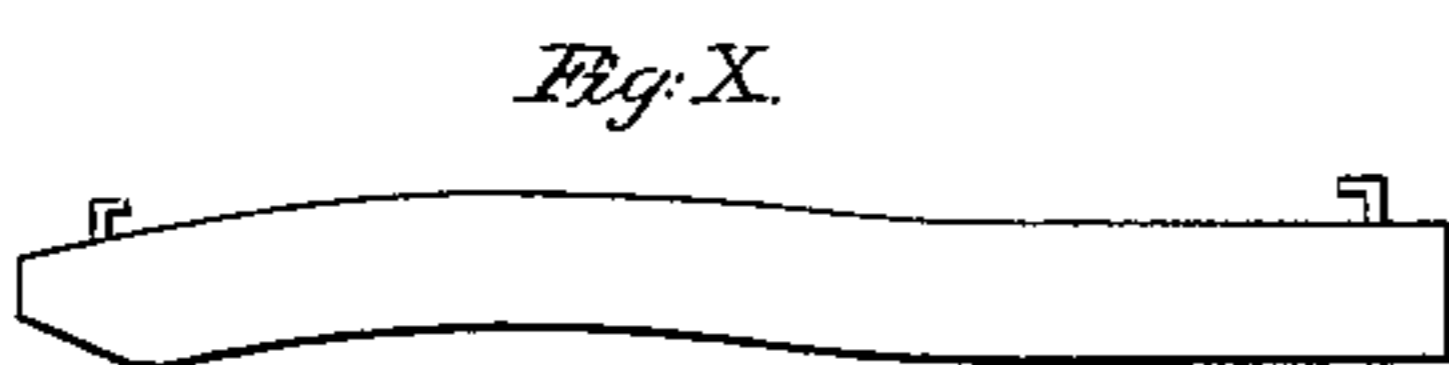
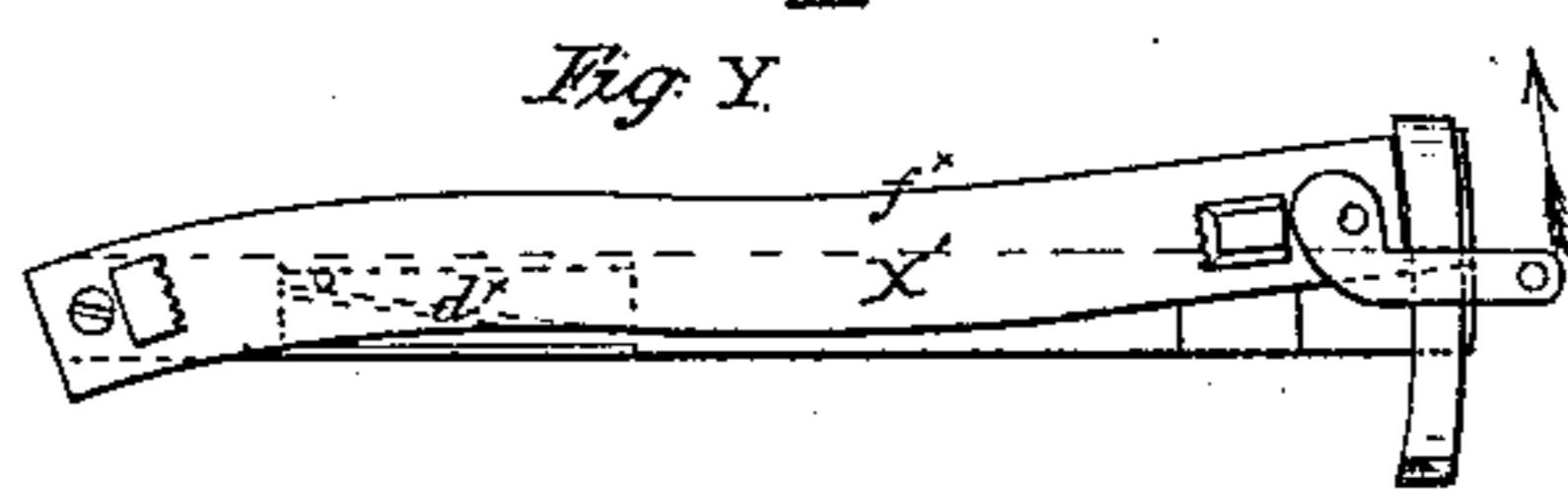
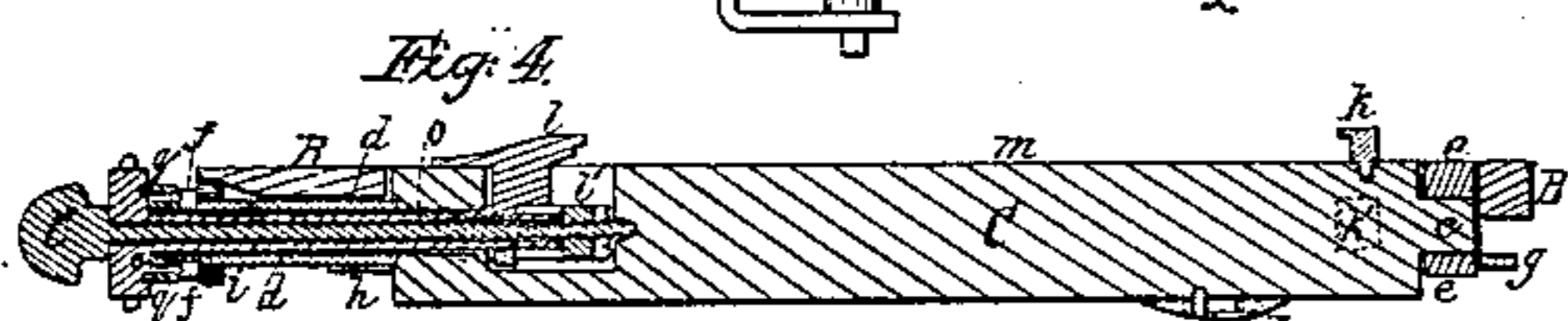
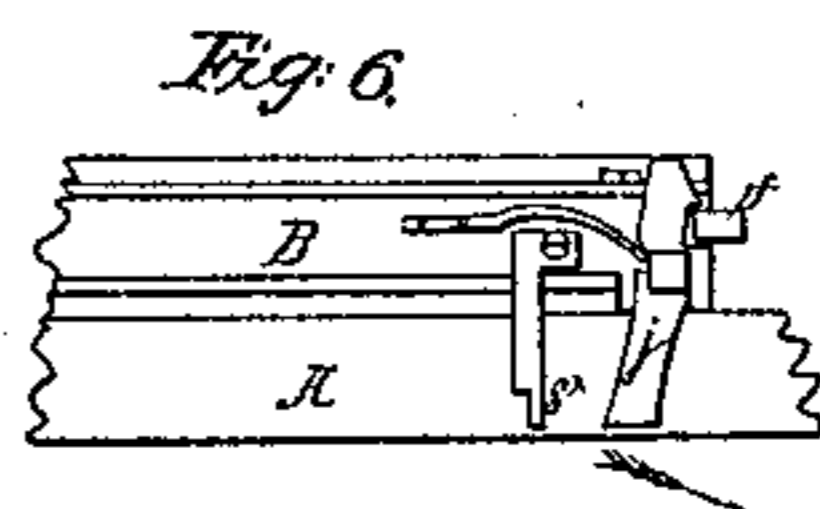
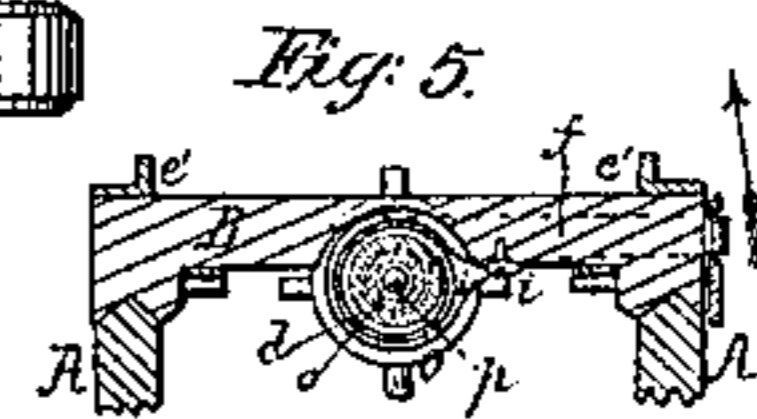
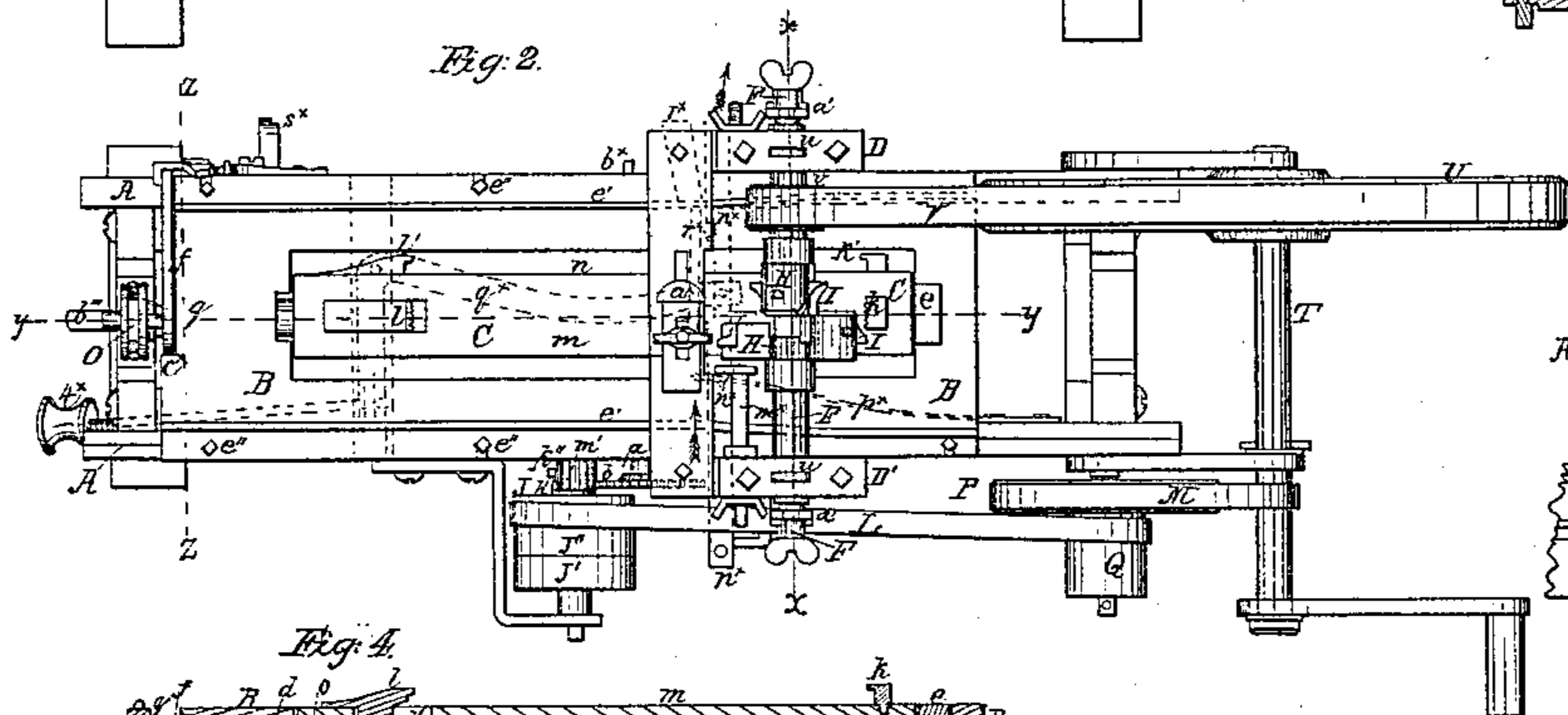
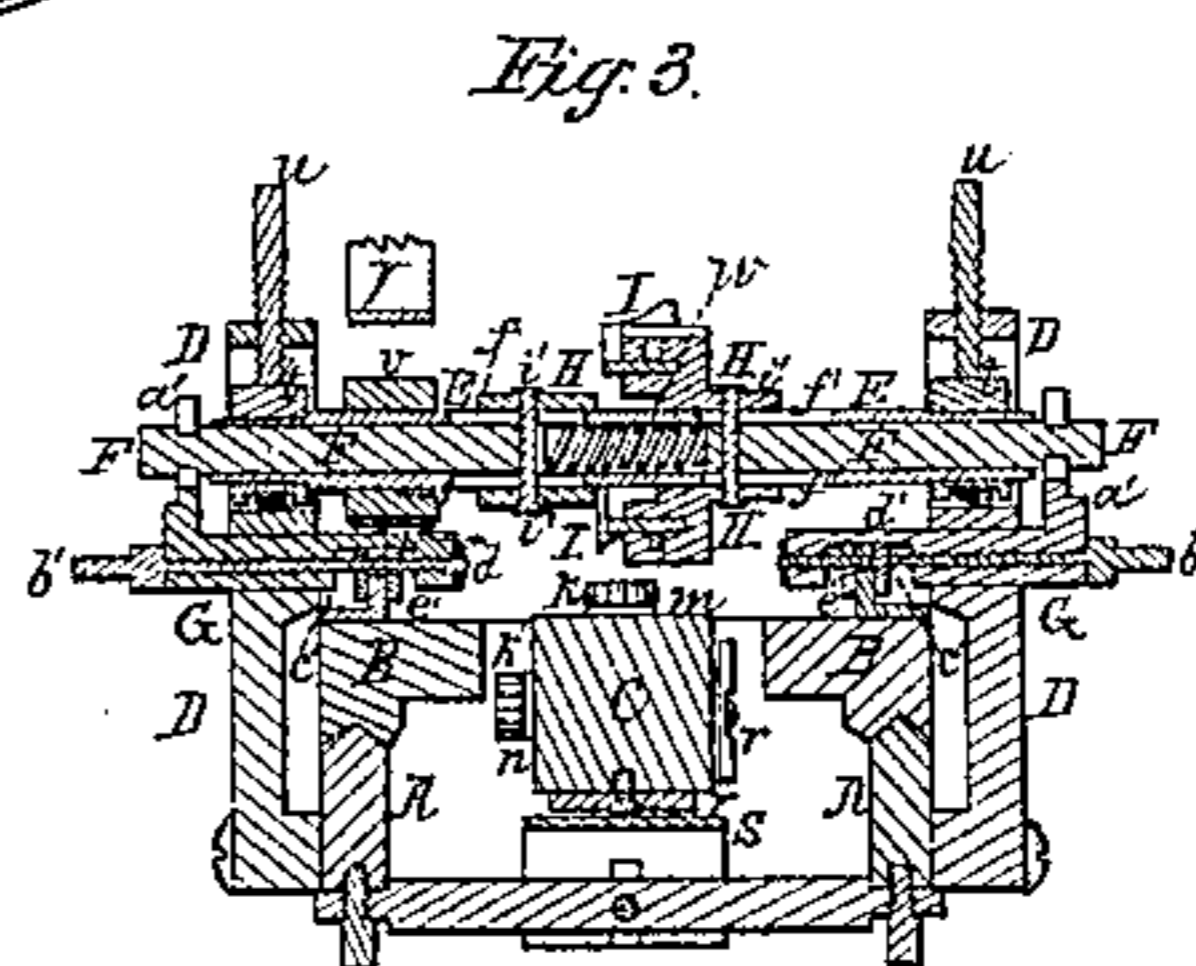
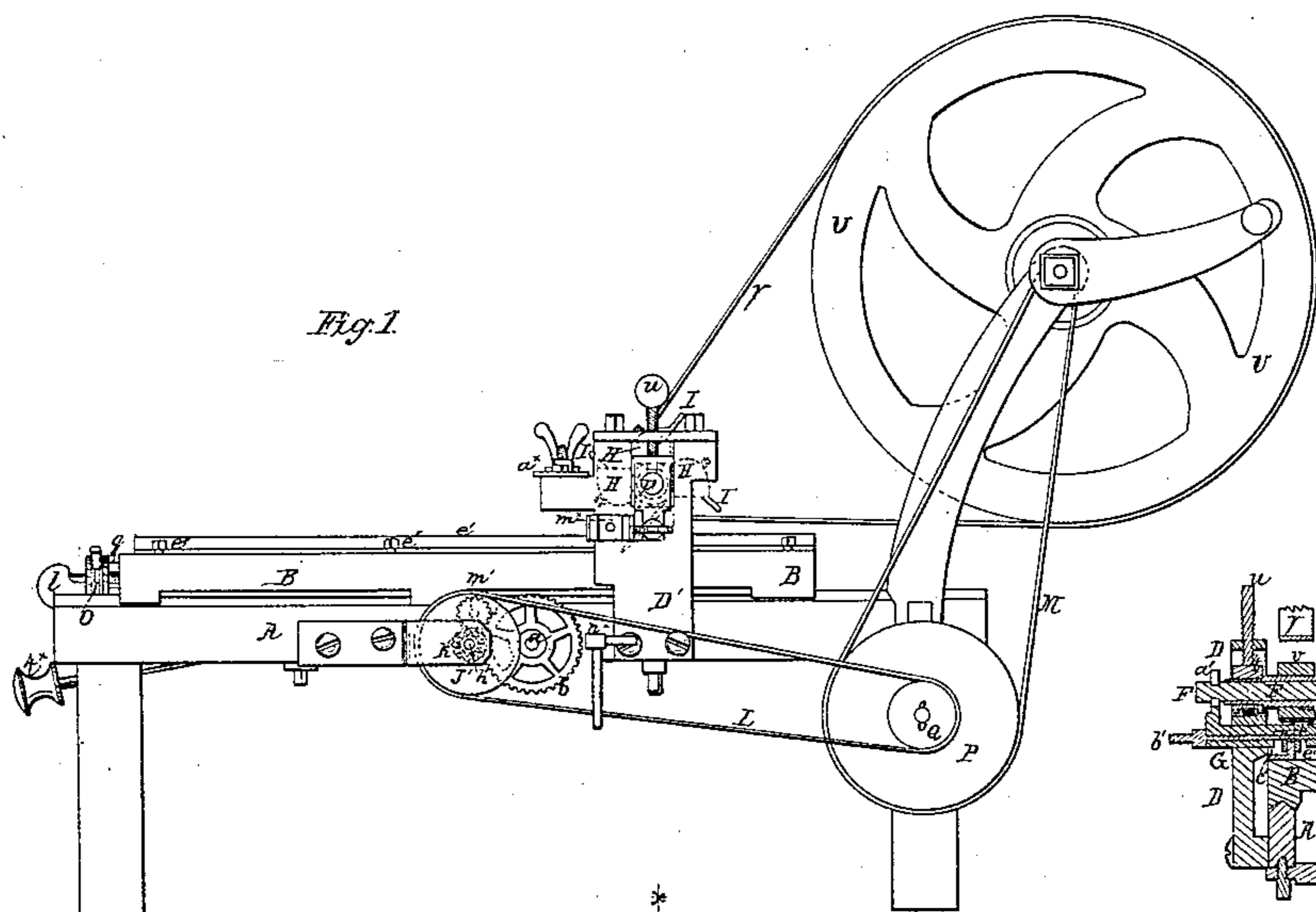


*O. Redmond,  
Spoke Machine,*

*Nº 13,731,*

*Patented Oct. 30, 1855.*



# UNITED STATES PATENT OFFICE.

OWEN REDMOND, OF ROCHESTER, NEW YORK.

## SPOKE AND AX-HELVE MACHINE.

Specification of Letters Patent No. 13,731, dated October 30, 1855.

*To all whom it may concern:*

Be it known that I, OWEN REDMOND, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Machinery for Cutting Spokes and Ax-Handles; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, forming part of this specification, in which—

Figure 1 is a side elevation of the machine. Fig. 2 is a plan of same. Fig. 3 is a vertical section on line *x x* of Fig. 2. Fig. 4 is a vertical section on line *y y* of Fig. 2. Fig. 5 is a vertical section on line *z z* of Fig. 2 looking toward foot of machine. Fig. 6 is a side view of catch holding bed, and parts adjacent thereto.

Similar characters of reference in the several figures denote the same part of the machine.

The character of spoke cutting machine to which my invention refers, is that where the cutting is performed in direction of the grain of the piece operated upon, by means of rotary cutters, above the bed to which the piece is secured. It is designed to effect the shaping of a semi-spoke both at the forward and back movement of the bed, without stopping the machine, or the removal of the piece first operated upon. The nature of the invention consists in constructing the reciprocating portion of the machine of a traversing table having suspended longitudinally within its middle portion, a bed of square cross section, susceptible of a partial rotation on its bearings, sufficient to bring two adjacent faces alternately flush with the upper surface of the table; these faces being provided with holdfasts for securing the material to be operated upon, this bed being carried by the table under rotary cutters with expanding heads, which impart the desired form to the upper part of the piece secured on the upper face of the bed, aided by a suitable vertical motion possessed by the bed during a portion of its translation, a partial revolution of the bed bringing its former side face with attached material in a horizontal position at the time of finishing the first piece, while the reversing of the motion of the table submits this piece to the action of the cutters during the backward motion of the bed.

By this operation one half of each of the two pieces secured to the bed is fashioned in the form desired and the pieces require to be secured anew to their respective faces of the bed, and the table made to traverse forward and back, in order that two finished spokes may be produced by the machine during two reciprocations of the table.

The details of construction and operation will be readily understood from the following description and annexed drawing, where the several parts are thus represented.

A, frame, sides having beveled upper edges to form guides for the traversing table B.

B, table, movable longitudinally on side pieces of frame A, by reason of the meshing of a rack on its under surface with a pinion on shaft *a* of wheel *b*, the direction of motion of this table being governed by wheel *b*. The middle of this table is open as seen in Fig. 2, and in this opening is hung upon journals *c* and *d* a bed C. The head bearing supporting journal *c* is in a vertically moving slide *e*, (Figs. 2 and 4), whose upward movements is limited by the striking of pin *g* against the under surface of table B. The bearing of journal *d* is a strap *h*, secured to the under surface of the table B, which is there hollowed out for the passage of said journal, as seen in Fig. 4. On the under surface of table are grooves fitting the beveled upper edges of frame A, (Fig. 3).

C, bed, supported by journals *c* and *d* as above set forth. The journal *d* is wrapped with a spring *i* fastened at its outer extremity to the bottom of table; the inner end secured to the spindle, so as to give the spindle *d* and with it the bed C a tendency as indicated by arrow 1 Fig. 5. To this spindle is also rigidly attached an arm *f*, in direction of face *m* of bed and perpendicular to face *n*, the face *m* being uppermost and the spring *i* tightened, when this arm has the position shown in the drawing, the spring catch *j* holding the arm in this position (Fig. 6). The movement of the lower part of said catch *j*, as shown by arrow in Fig. 6, releases the arm, and permits the full action of spring *i* on the bed, carrying it around until face *w* is flush with the table B. These faces are provided with clamps for holding the wood to be operated upon. At the head of the bed are the fixed

holders  $k$   $k'$ , and at the foot are the movable ones  $l$   $l'$ , each movable in slots in their respective faces, by reason of the two screws  $o$  and  $p$ . The screw  $o$  is hollow, and passes through journal  $d$ , (which, it should have been stated, is also hollow) and engages the foot of holder  $l$ , the ears  $q$ , entering a groove in spindle  $d$  and preventing the longitudinal movement of this screw. The screw  $p$  passes through screw  $o$  and works in the foot of holder  $l'$  being turned by its head  $l''$ , a pin through this screw against the inner end of screw  $o$  preventing longitudinal movement. Upon the faces of the bed opposite to those to which the material is secured, are adjustable lifting pieces  $r$ , for raising the head of bed C when passing over a guide piece  $s$ , the slide  $e$  moving up with the journal  $c$  when this lifting takes place. These pieces  $r$  are slotted so as to be adjustable; moreover the piece  $s$  over which they pass is adjustable vertically (Fig. 3).

D D', standards supporting cutter shaft secured to sides of frame A.

25 E, hollow shaft, resting in boxes  $t$ , which rest on springs and are held in position by screws  $u$ . This shaft is rotated by band V passing over pulley  $v$  and wheel U, power being applied to shaft T.

30 F F', solid bars running through hollow shaft E, and having between their inner ends a spiral spring  $w$ , so as to give said bars an outward tendency. The protruding extremities of these bars have each a groove by which they are connected with uprights  $a'$  of slides G, slots of said uprights passing over the groove as shown in Fig. 3. By this connection of the bars F with slides G, a longitudinal movement of said slides will produce a longitudinal movement of the bars F within the hollow shaft E.

40 G G, slides working through standards D D', and having each a screw  $b'$  passing longitudinally through it, for moving within the cavity  $e'$  a grooved slide  $d'$  which embraces a guide  $e'$  on the upper surface of table B.

50 H H, cutter heads to which are secured the cutters I. These heads are secured to the bars F by bolts  $i'$  which pass through slots  $f'$  of hollow shaft E, so that as the said bars are moved longitudinally the cutter heads will move upon the hollow shaft.

55 I I, cutters bolted to head H, and having edges as shown in Fig. 2, of a form to fashion the surface of a spoke. Gage  $a^x$  serves to aid their adjustment.

60 J J', pulleys moving table B. The former upon a hollow shaft carrying pinion  $h'$  which gearing into wheel  $b$  produces the backward motion of table. The pulley J' is keyed to a shaft which runs through the hollow shaft of pulley J and has upon its inner extremity a pinion  $h''$  of larger diameter than  $h'$ . This last pinion gears into

pinion  $m'$  supported upon side of frame A and meshing with wheel  $b$ , the effect of these two pulleys being to rotate wheel  $b$  in opposite directions.

J'' loose pulley.

The operation of this machine is as follows: Two pieces of timber, of sufficient dimensions for forming spokes, are secured to the table by means of the holders  $k$   $k'$ ,  $l$   $l'$ , operating by screws  $o$  and  $p$ , as above set forth. The arm  $f$  is then secured in a horizontal position by catch  $j$ , as in Figs. 2 and 5, the bed being at that time entirely from under the cutters. The machine is now ready for operation, provided the following preliminary adjustments have been performed, viz: The guides  $e'$  on table B are adjusted laterally by screws  $e''$ , and the distance between the cutter heads H H regulated by screws  $b'$  which pass through the slides G. These adjustments determine the size of the spoke. The lifting pieces  $r$ , and guide  $s$ , are next regulated to give the proper hollow to the portion of the spoke near the hub end. These several adjustments being governed by the results of experiments, no exact amount of movement of the said parts need be here specified. The band L being over pulley J', power is applied to shaft T, rapidly rotating the cutters, through wheel U, pulley  $v$  and belt V, and moving the table B forward by reason of belt connection between wheel P and pulleys J' and Q, the communication of motion from pulley J' to wheel  $b$  being as above set forth. During the forward movement of the table B its guides  $e'$  pass through the grooved guide  $d'$  of slides G, (Fig. 3), causing the cutter heads H H to conform in separation to the increase or diminution of the distance between the guides  $e'$ , the bed C rising toward the cutters during the passage of the lifting piece  $r$  over the lifting guide  $s$ . These movements of the cutter heads and of the bed cause the cutters to impart to the upper portion of the piece of timber secured to the bed, the form of one side of a spoke. By this time, the forward movement of table B has brought the lower end of catch  $j$  in contact with stud  $b^x$ , on the side of the frame A, moving it in direction of arrow, (Fig. 6) and releasing arm  $f$ ; which by action of spring  $i$  as above set forth, flies up until it strikes shoulder  $c^x$  (Fig. 2); and bringing face  $u$  of bed C flush with the upper face of table B, so that the timber secured thereto occupies the position of that previously operated upon. The band L is at this moment shifted to pulley J reversing the motion of table B, and submitting the timber on face  $u$  of bed C, to the action of the cutters during this backward motion, converting it, as was the first one, into a half finished spoke. This piece is now secured with its finished face down-

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ward, and the arm  $f$  again secured by catch  $j$ , bringing face  $m$  uppermost, when the piece of timber secured thereto is adjusted anew, and the machine again set in motion, 5 with the same effect as above described, so that on the completion of the second back motion of the table, two finished spokes are removed from the bed.

Ax handles may be shaped upon thus machine by removing bed C and inserting in 10 the table B either of the beds figured at X, Y, Z, instead thereof, the timber to be first sawn in the curved form required for the ax handle, and secured upon one of its 15 curved edges when bed X is employed. When bed Y Z is used, the timber is secured on a flat side to the swinging plate X'. This plate is acted upon by a spring  $d^x$  so as to have a tendency in direction of arrow, 20 and when moving with table B has its edge  $f^x$  pressed upon by the adjustable guide  $m^x$ , (Fig. 2) so that the timber shall pass under the cutters in a serpentine direction. The beds here represented will fashion but one 25 side or edge of the handle, others the reverse in form being required for forming the opposite side or edge. The bed X rests on the lifting guide so that the several parts of the piece secured to it, are at the time of 30 cutting the same distance from the cutters.

The shifting of band L from the pulley J' to pulley J, is effected by the mechanism shown in red ink in Fig. 2. The slide  $n^x$  through the protruding extremity of which 35 band L passes, has a tendency in the direction of arrow, by reason of spring  $p^x$ , and is moved in the reverse direction by lever  $q^x$ , where it is held by dog  $r^x$ , which is pressed against it by a spring. In this position the 40 band is on pulley J'. The striking of stud  $s^x$  on table B, against protruding extremity

of dog  $r^x$  at the termination of the forward movement of table, lifts dog  $r^x$  from the notch in bar  $n^x$ , and permits it to be carried in the direction of arrow by spring  $p^x$ , shifting the belt to pulley J. The lever  $q^x$  is 45 operated by power applied to draw rod by knob  $t^x$ . This arrangement for shifting the belt may be changed if desired and any of the other known and ordinary contrivances 50 made use of, to change the motion of the table B.

In adapting the machine to the manufacture of ax handles, the cutters may be changed, as the curve of the handle need not 55 be as great as that required for a spoke; that is, if bed Y Z be used. If bed X be employed then the curvature of the cutters should be greater.

What I claim as new and of my own 60 invention is—

1. The partially revolving bed C, constructed, arranged and operating substantially as described, so as to submit different 65 pieces of wood to the action of the cutters, at its forward and backward movements, substantially in the manner set forth.

2. The bed Y Z, having a laterally swinging spring plate X', in combination with the adjustable guide  $m^x$ , for submitting 70 curved timber to the action of rotary cutters, in direction of its curve, substantially as specified.

3. The curved bed X traversing with an undulating movement, for submitting curved 75 timber to the action of rotary cutters, as herein set forth.

OWEN REDMOND.

Witnesses:

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JAS. MAGOWEN.