

Sheet 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

P. E. Lachrange.
Knitting Mach.

No 3798.

Patented Oct. 16, 1844.

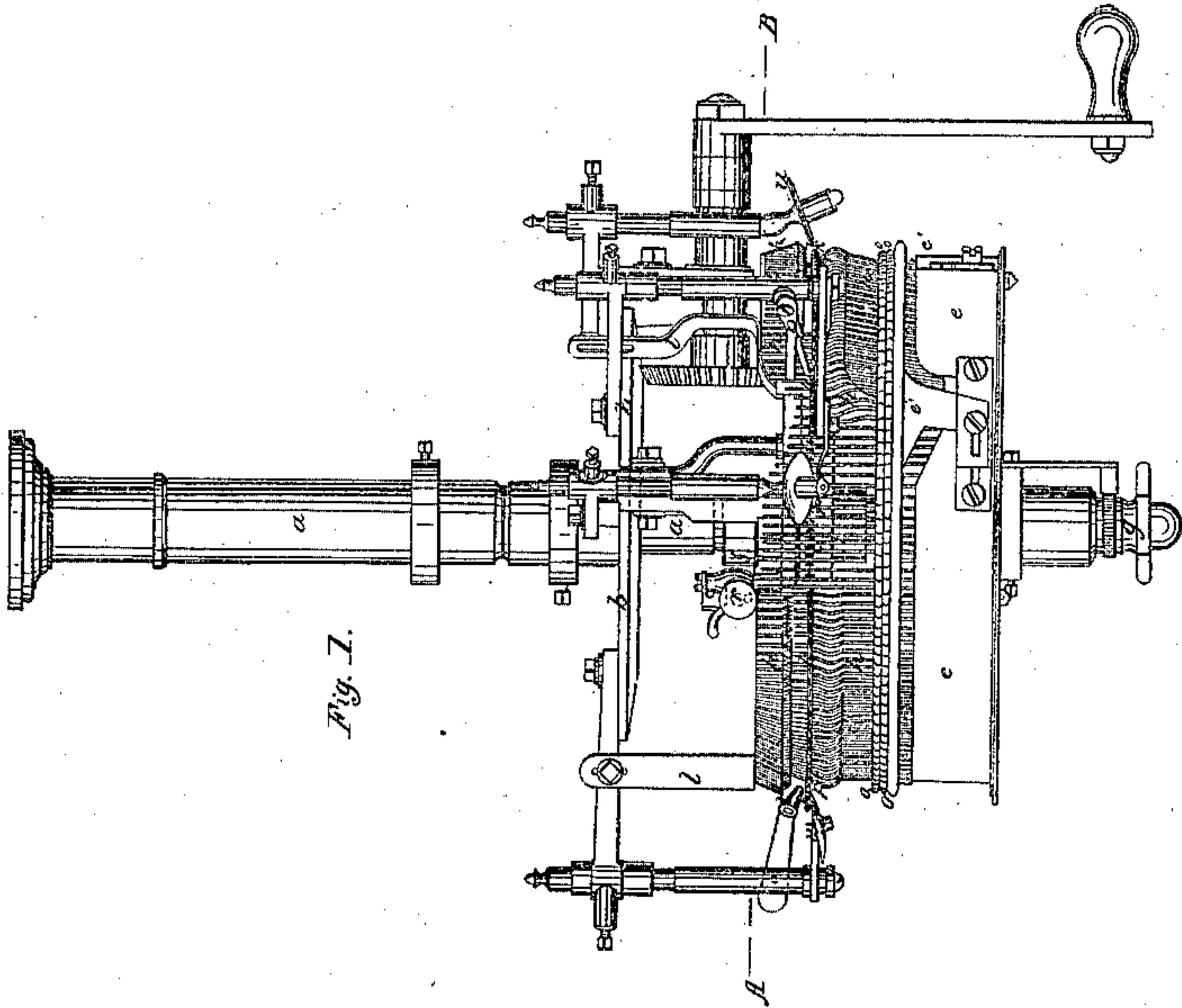


Fig. 1.

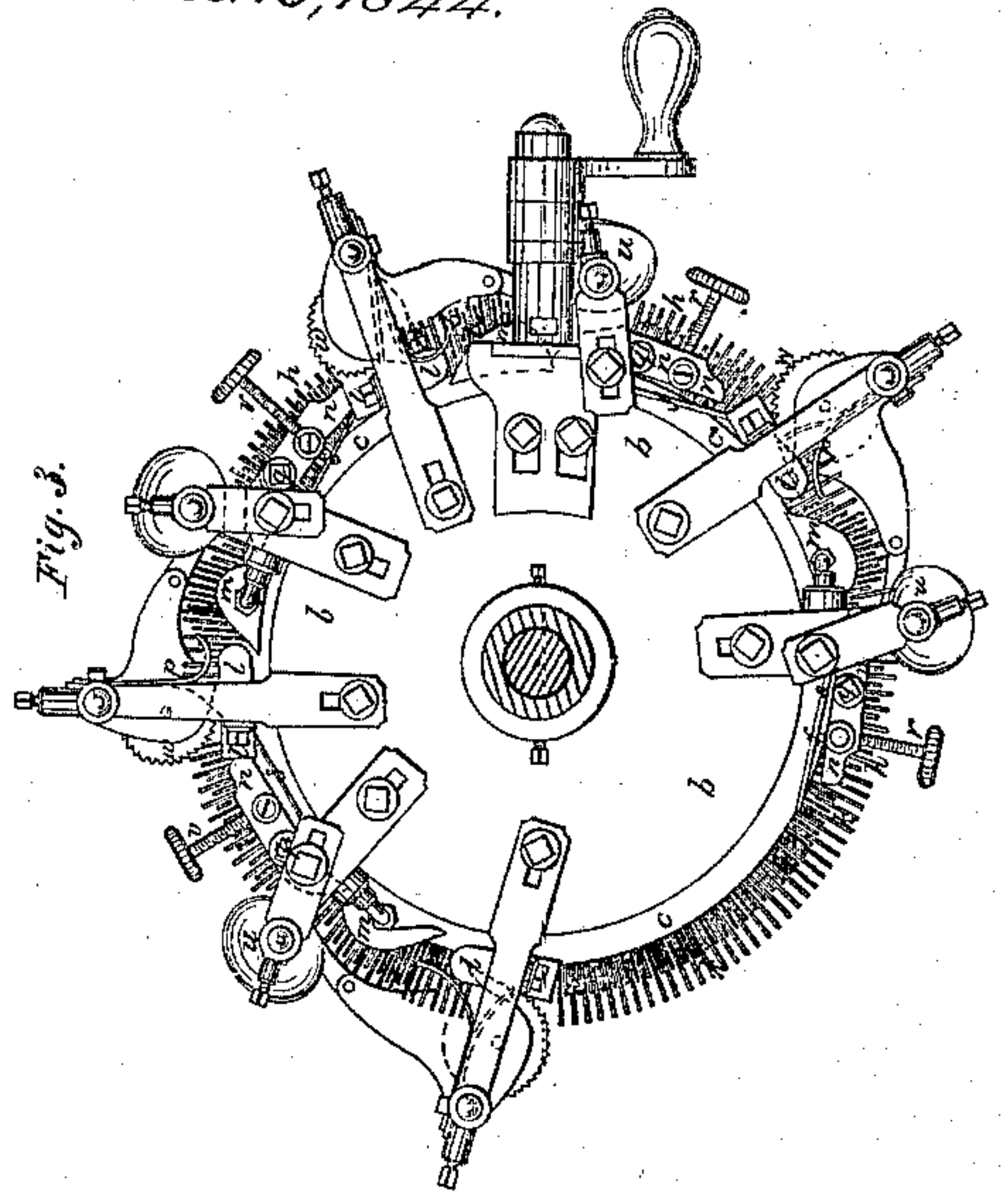


Fig. 3.

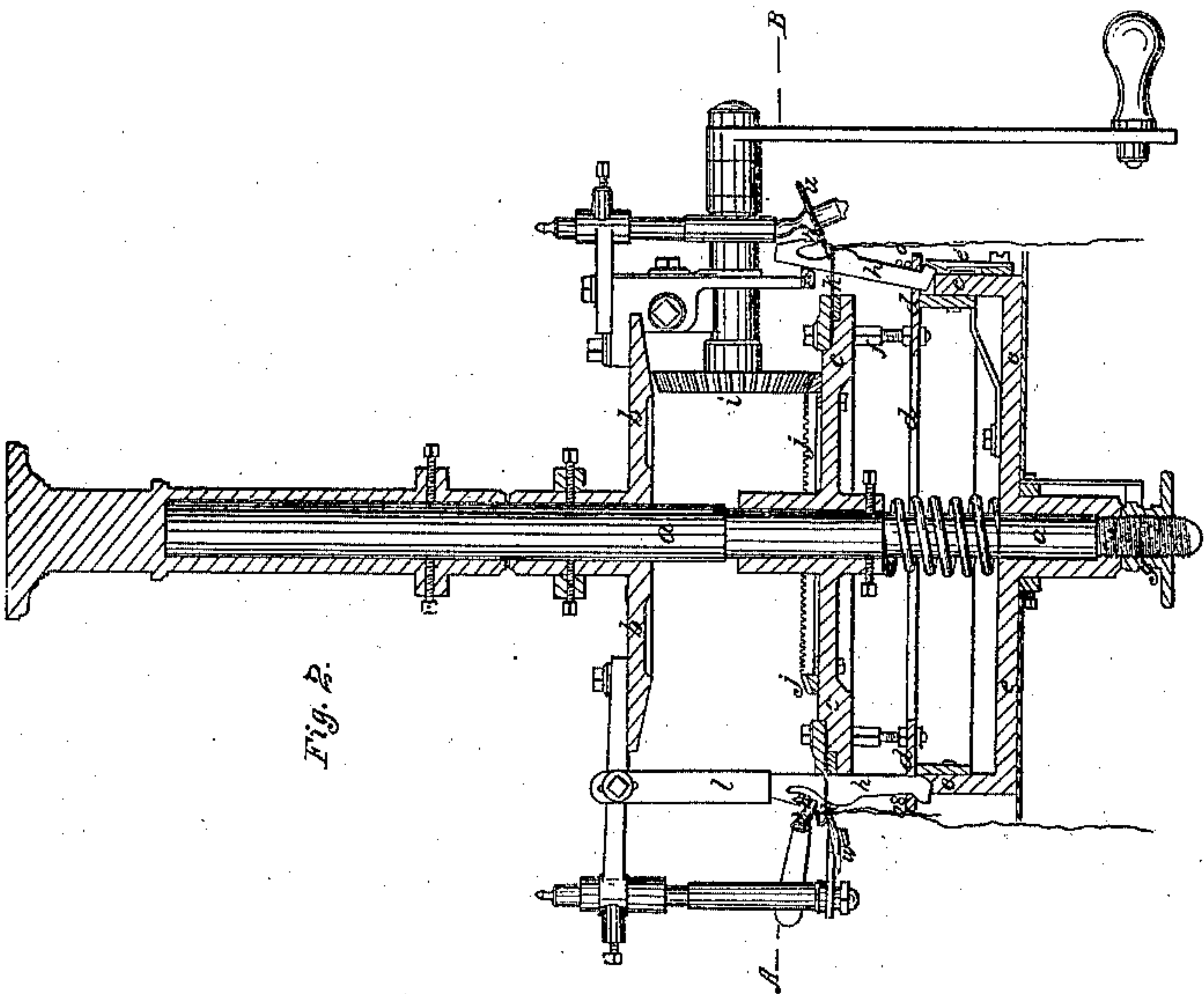


Fig. 2.

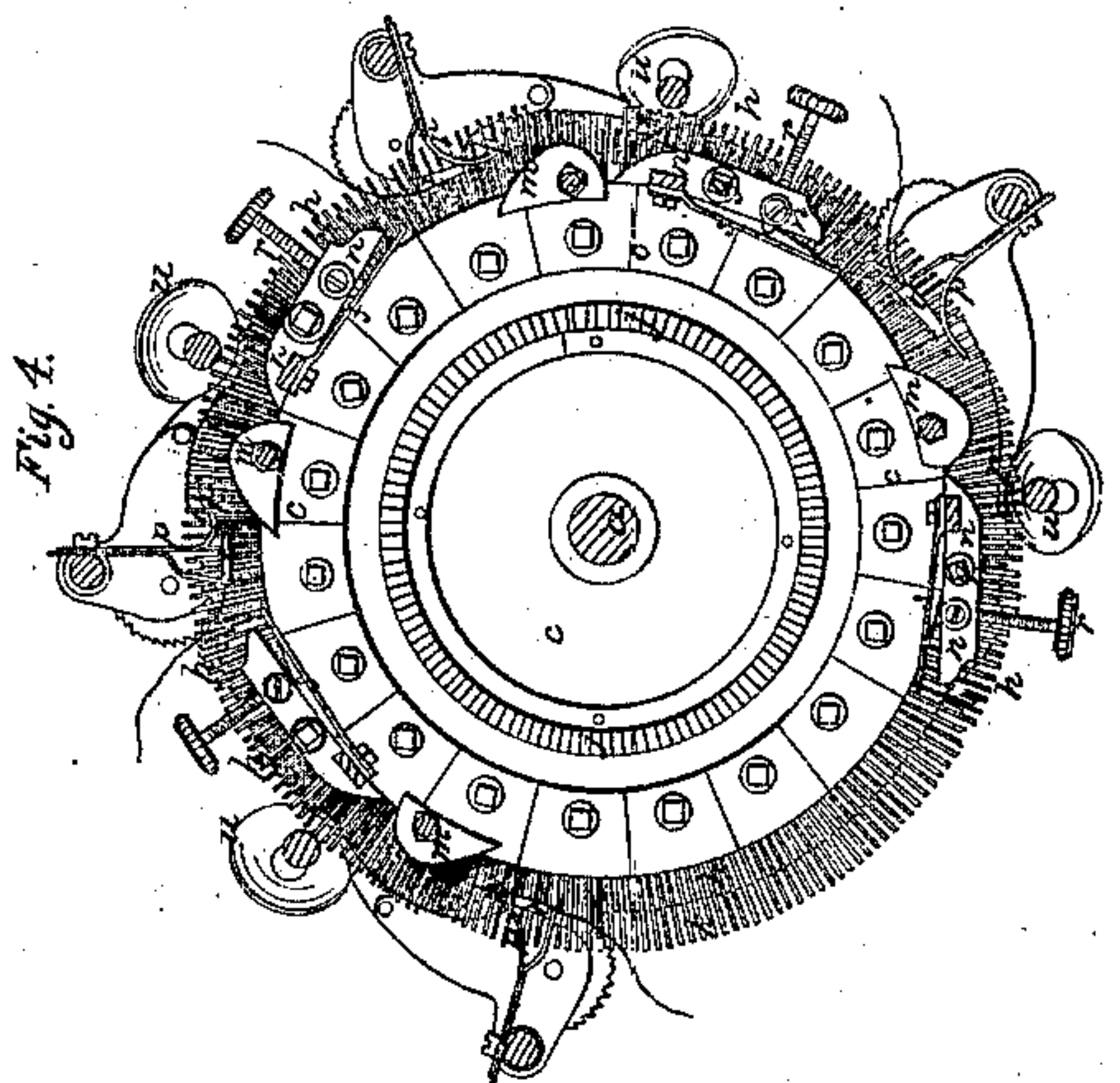


Fig. 4.

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No. 3,798.

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Fig. 11.

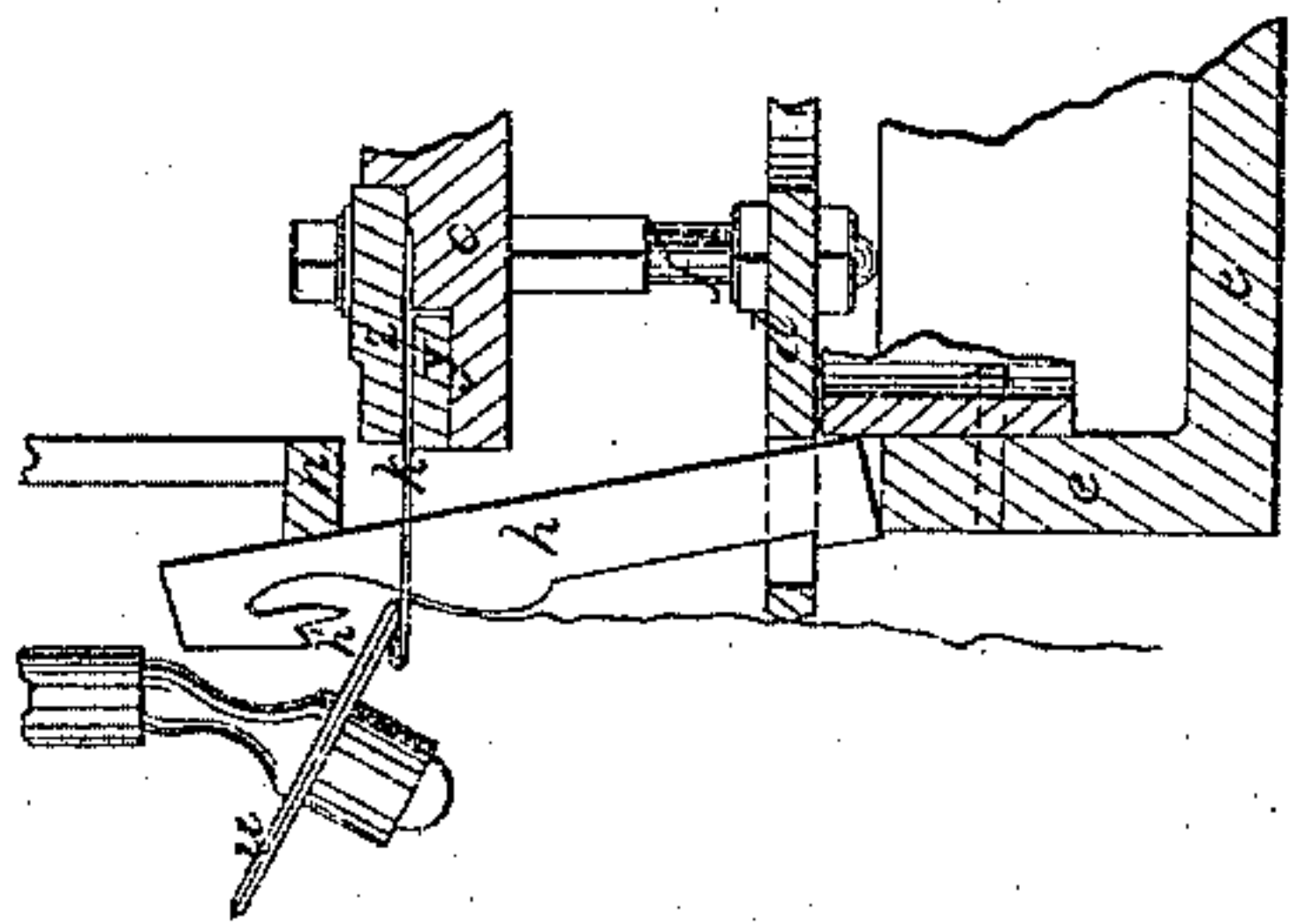


Fig. 12.

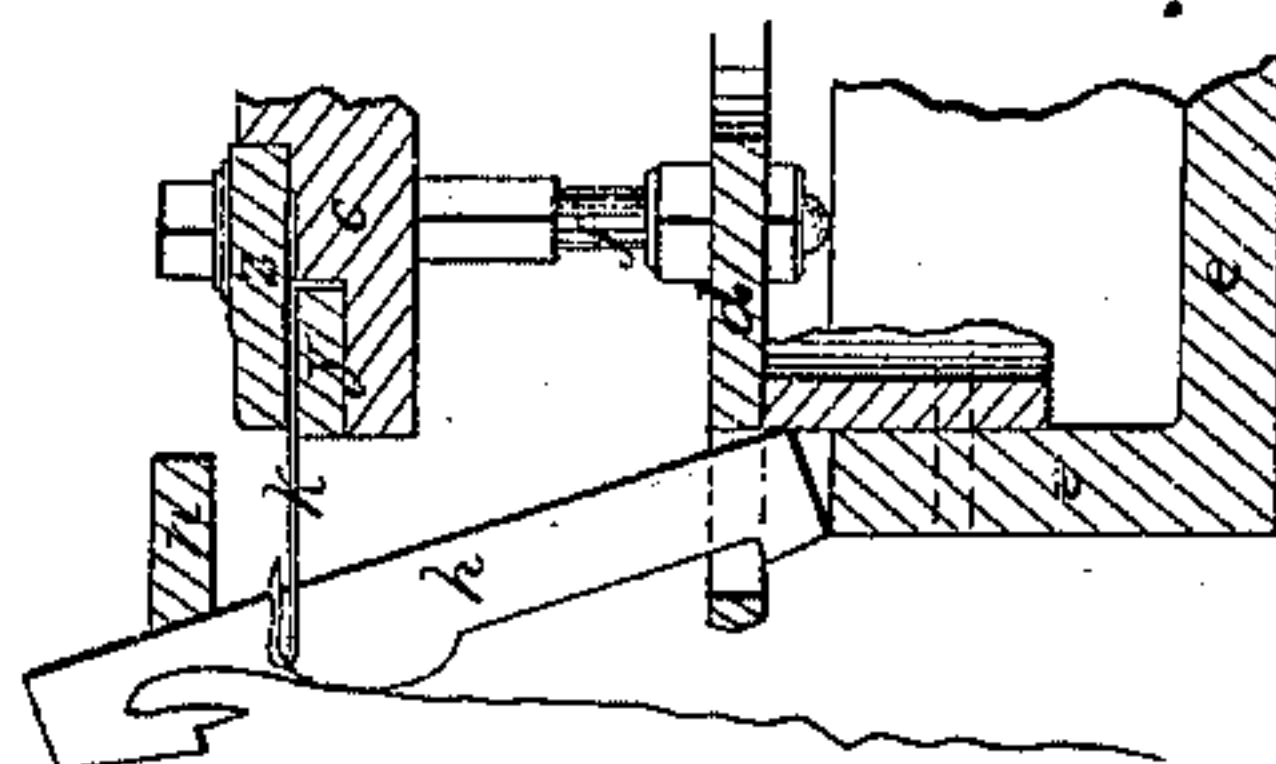


Fig. 7.

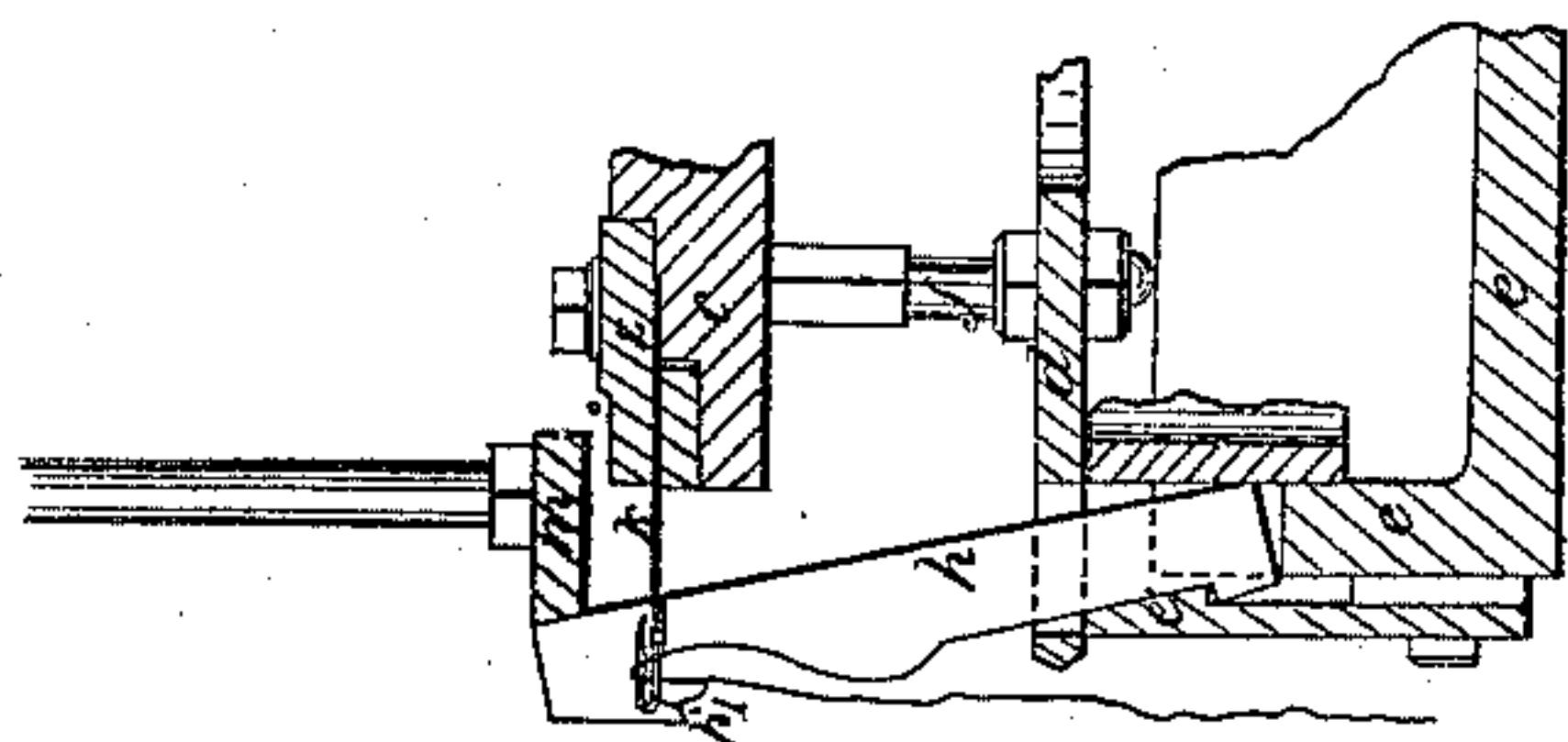


Fig. 8.

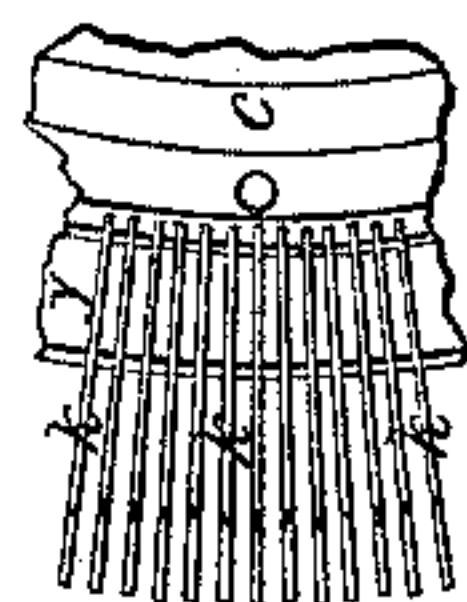


Fig. 9.

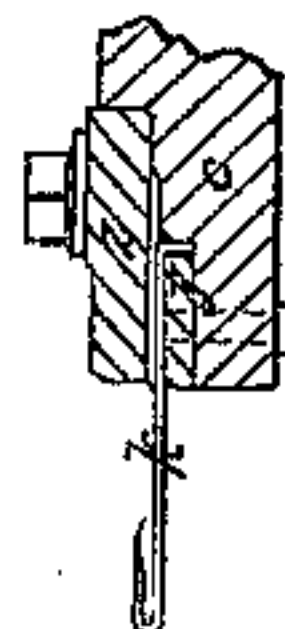


Fig. 10.



Fig. 6.

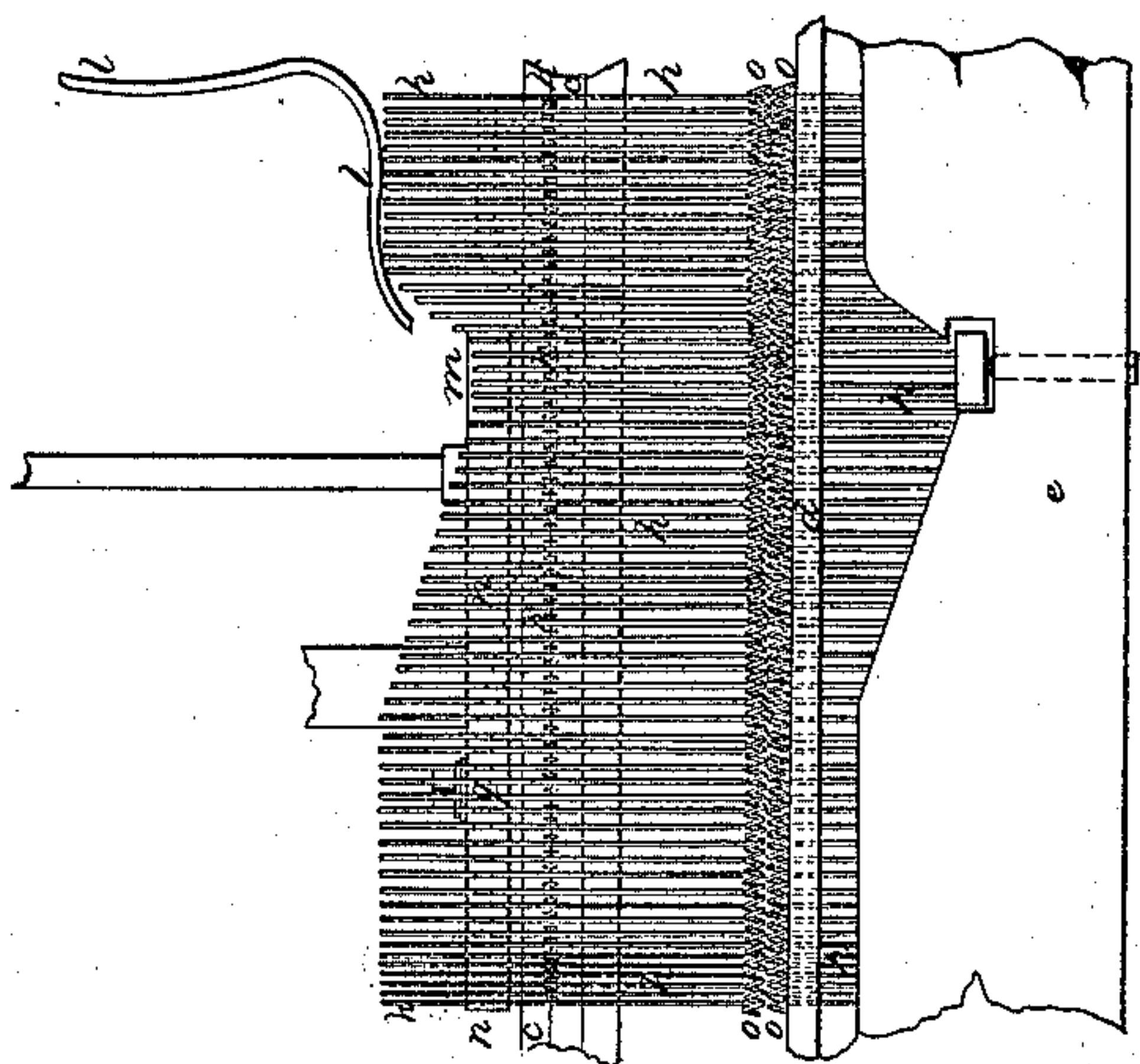
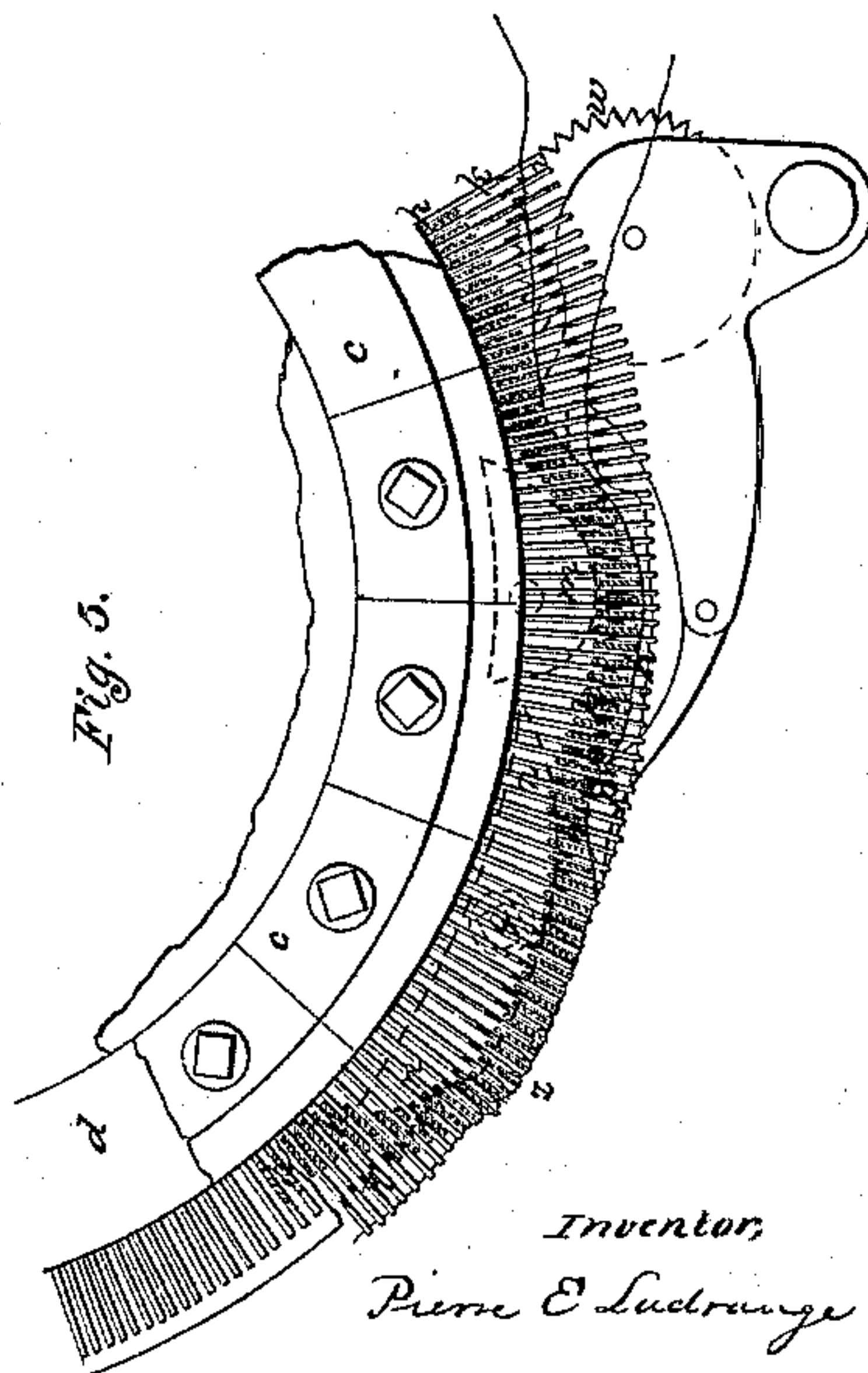


Fig. 5.



Inventor,
P. E. Ladrage

UNITED STATES PATENT OFFICE.

PIERRE E. LADRANGE, OF VIGNORY, FRANCE.

KNITTING-LOOM.

Specification of Letters Patent No. 3,798, dated October 16, 1844.

To all whom it may concern:

Be it known that I, PIERRE EMANUEL LADRANGE, of Vignory, France, have invented Improvements in Machinery or Apparatus for Knitting, of which the following is a specification.

This invention of certain improvements in machinery or apparatus for knitting consists in the construction and employment of certain apparatus and the arrangements thereof in conjunction with suitable mechanism as hereafter described for producing loops or meshes which being continued form the knitted work or fabric and in order that the invention may be perfectly understood, I have shown in the accompanying drawings various views of the machine and some of its parts detached in which its construction and operation is distinctly shown.

In Figure 1, is a side elevation of the whole machine complete, and Fig. 2 is a vertical section taken through the middle of the same. Fig. 3 represents a plan or horizontal view of Fig. 1 and Fig. 4 is a horizontal section or sectional plan taken through the line A B of Figs. 1 and 2.

The machine which is of a circular form is suspended from the roof or from a strong beam by means of the vertical shaft or circle *a a* and is composed principally of the four following parts to which the minor portions of the machine are connected. These four principal parts consist of four plates *b c d e* seen best in the sectional view Fig. 2. The first plate *b b* is firmly secured to the vertical shaft *a a* in any convenient manner and is intended to support various stationary parts of the apparatus that act upon the needles and jacks or sinkers as will be hereafter described, and is therefore denominated the support plate. The second plate *c c* is called the needle plate because the needles are ranged radially around its circumference as seen in the sectional plan view Fig. 4 and also in the detached figures. This plate is mounted loosely on the vertical shaft *a a* and revolves freely around it and is connected with the third plate *d d* by means of the bolts and nuts *f f* in Fig. 2. This plate *d d* which is made in the form of a broad ring is furnished at or near its periphery with long slits or openings (see detached view Fig. 5) which receive the jacks or sinkers and maintain them in a perpendicular position. From the circumstance of this plate being

thus perforated with long slits or openings it is called the "comb plate."

The fourth plate is shown at *e e* and is firmly fixed to the vertical shaft *a* by screws or otherwise but is capable of being raised up and down and its height thereby regulated (when required) by means of the screw box *g* below as seen in Figs. 1 and 2 and the helical spring seen in Fig. 2 the position of the railway plate requiring adjustment according to the fineness and coarseness of the thread and the elasticity which the knitted fabric is to possess.

The plate *e e* is called the railway plate because an undulating rib or rail which is formed on its upper surface supports the lower ends of the jacks or sinkers *h h* and by means of the undulations formed thereon which in the machine as represented are four in number, the action of the sinkers as seen in Fig. 1 and Fig. 6 is regulated.

From the foregoing it will be understood that the top and bottom plate *b* and *e* or as they may be called the "support plate" and "railway plate" are stationary being fixed to the vertical shaft *a a* as before stated, and that the "needle plate" *c* and "comb plate" *d* which are connected together by the bolts *f f* revolve freely around the shaft *a a*. Rotary motion is communicated to them by means of the bevel pinion *i i* on the cranks shafts, which pinion gears into a circular bevel wheel *j j* attached to the upper face of the needle plate *c c* as seen in Figs. 2 and 4.

As these plates revolve and carry around with them the needles *k k* and sinkers *h h* these latter are made to fall and rise in the perforations of the comb plate and between the needles of the needle plate according to the undulations formed on the upper surface of the railway plate, but as these sinkers might not always descend by their own weight at the proper time they are made to do so by coming into contact with and passing under the inclined end of the metal piece *l l* see Figs. 1, 2 and 6. When the sinkers have passed down (as shown in Fig. 6) the inclined plane of the railway plate they are kept down by the angle piece *e¹* Figs. 1 and 7 which catches on a ledge on the front part of the sinker as seen in Fig. 7. The requisite outward motion of the sinkers between the needles to form the loop is effected by the cam pieces *m m* and *n n* Fig. 4 which are supported from the plate

5 *b b* above as seen in other figures. When
 the sinkers have passed in front of these
 cams they are forced back into their origi-
 nal positions by the helical springs *o* as
 10 seen in Figs. 1, 2 and 6 which surrounds
 them and also by the pressing pieces *p* and
*p** as seen in Figs. 4, 5 and 6. The cam
 pieces *n n* are mounted on centers at 9 Figs.
 3 and 4 and the distance that the sinkers
 15 are forced out by them is regulated by
 means of the screw *r* which passes through
 a block on the same and abuts against a
 stationary piece *s* seen best in Figs. 3 and 4.

20 The motions of the sinkers it therefore
 appears are then regulated as follows: the
 upward and downward or vertical motion in
 the comb plate by the undulations on the
 railway plate, and the outward motions be-
 25 tween the needles of the needle plate by the
 cams *m* and *n* the backward motion by the
 spring *o* and pressing pieces *p* and *p**. The
 threads of which there are four in this ma-
 chine to form the work enter the trumpets
 30 *t t* Figs. 2 and 4 and are conducted by them
 under the front notches *h* h* h** of the sink-
 ers *h h h* Fig. 7 and laid along the needles
 as seen in Fig. 4. The front notch of the
 sinkers having taken hold of the thread dur-
 35 ing the descent of the sinker between the
 needles down the inclined plane in the rail-
 way plate a loop hanging down between the
 needles is formed and at the same time the
 sinker is pressed forward between the nee-
 40 dles by coming into contact with the cam *m*
 and thereby the loop is carried under the
 beak or beard of the needles as shown at Fig.
 7. It will be observed in Fig. 6 that after
 the sinkers have descended the inclined
 45 plane of the railway as already described
 and before they begin to ascend the opposite
 incline as hereafter described they pass
 along a horizontal portion which is repre-
 sented in the drawing Fig. 6 as capable of
 being adjusted by a screw this however is
 50 not essential to the machine the adjustment
 of the sinkers as to the height of the ma-
 chine is accurately constructed being made
 by the screw box *q*, as above described.

55 When the lower end of the sinker comes
 into contact with the opposite incline see
 Figs. 1 and 6 it is raised and is also pressed
 back by the pressing piece *p** which forces
 back the work and the sinker into the recess
 between the two cams *m* and *n* which is
 60 shown by dots in Fig. 5. The effect of this
 will be that as the sinker *h* passes up the
 inclined plane on the railway plate the notch
 of the sinker will be raised out of the loop
 and as the sinker is pressed back by the
 65 piece *p** the point 1 Fig. 7 catches hold of
 the work and draws it back from under and
 beyond the beak or beard of the needle
 which is then closed by coming under the
 revolving presser plate or roller *u* as seen in
 Fig. 11. Then the sinker in continuing its

progress is brought against the cam *n n*
 which gradually forces it outward and by
 the projecting shape of its breast pushes the
 work over the beard of the needle which
 70 has been closed for this purpose by the
 presser plate *u* and ultimately throws the
 loop of the work already made over the end
 of the needle and thereby over the loop
 which has just been made as seen in Fig. 12
 75 and *z* Fig. 5 and which loop remains at the
 end of the needle until another loop is made
 by the next two needles. When the work is
 thrown over it is pressed back by the notched
 wheel *w* and the sinkers are brought into
 80 their original position by the springs *o* al-
 ready mentioned.

The construction of the needles and the
 manner of fixing and securing them in the
 needle plate so that they can be changed
 or removed at pleasure is distinctly shown
 85 at Figs. 8, 9 and 10. The inner end of the
 needles is bent down and enters a circular
 groove made by screwing a brass ring *y* into
 the needle plate near its periphery. The
 shafts of the needles lie radially around the
 90 needle plate in grooves or notches made on
 the upper side of the brass ring *y* as seen in
 Fig. 8 and the needles are firmly secured in
 their proper places by means of the sector
 95 pieces *z* which are screwed lightly down to
 the needle plate. A ring of leather felt
 pasteboard or other suitable substance is
 placed between the sector pieces *z* and the
 needles and thereby holds the needles more
 100 firmly.

Having now described the invention and
 the manner of carrying the same into ef-
 105 fect it is scarcely necessary to point out to
 any one acquainted with the construction of
 machines that the form and construction of
 this machine admits of considerable varia-
 tion and many of the operations may be
 performed by other mechanical devices. I
 therefore do not confine myself to the pre-
 110 cise arrangements and construction of parts
 herein shown nor do I claim the exclusive
 use of the several parts except as hereinafter
 mentioned unless the said several parts be
 115 used in the construction and working of a
 machine as hereinbefore described for pro-
 ducing knitted work or fabrics. But

I do claim—

1. Arranging the hook billed needles, such
 as are used in the formation of stocking net
 and all other fabrics netted radially around
 120 a circular plate, or disk, or ring as herein
 described.

2. I claim the sinkers in combination with
 the comb plate provided with radial slots
 through which the sinkers pass, and by
 125 which they are guided, as herein described.

3. I claim the disk in combination with
 the needles; for closing the beaks of the nee-
 dles preparatory to casting off the old loops
 over the points of the needles as described. 130

4. I claim the arrangement of the cam
pieces *m m* and *n n* to throw out the sinkers,
and in combination with these I claim the
pressing pieces and helical springs for forc-
5 ing back the sinkers as herein described.

5. I claim the method of working the
sinkers up and down in the circle by means
of the undulating rib or rail in combination
with the sinkers.

6. I also claim the combination together 10
of all the elements enumerated in the fore-
going claims whereby I am enabled to knit
continuously around a circle as described.

P. E. LADRANGE. [L. s.]

In presence of—
S. VIERARD,
C. BAL.