

(No Model.)

6 Sheets—Sheet 1.

E. L. TAFT & H. M. RICH.

MACHINE FOR KNITTING RATTAN CHAIR BACKS.

No. 299,295.

Patented May 27, 1884.

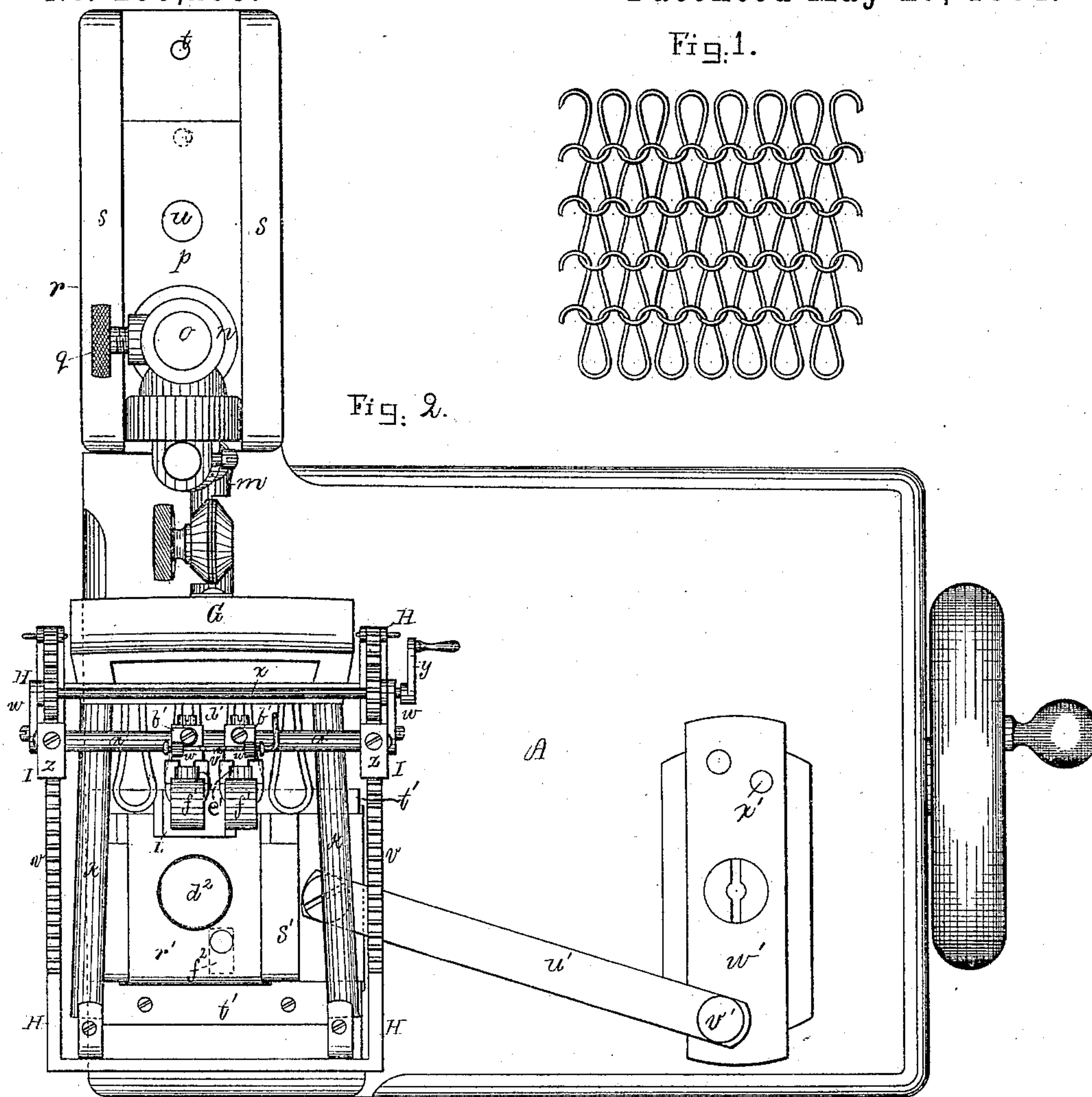


Fig. 1.

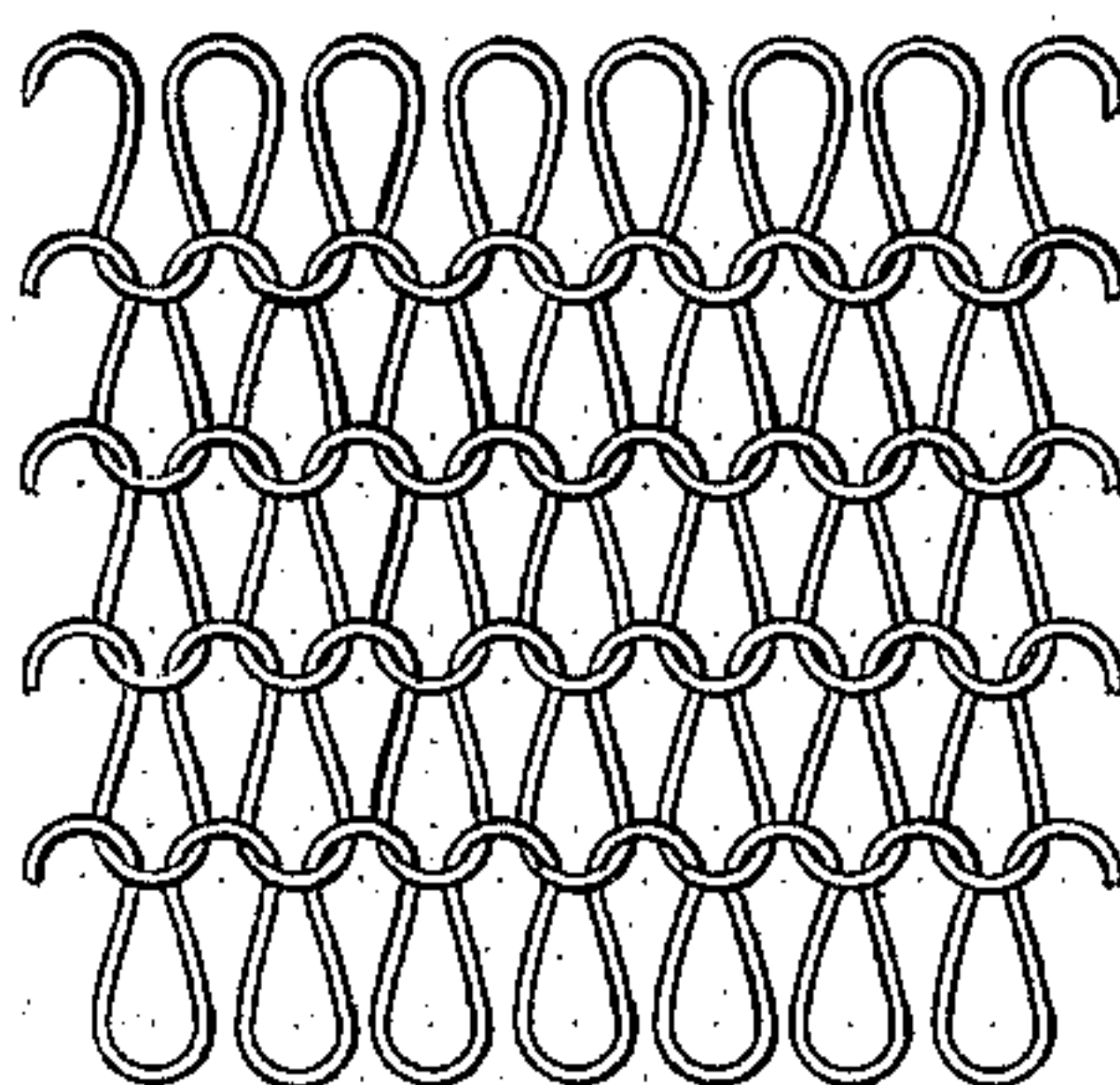


Fig. 2.

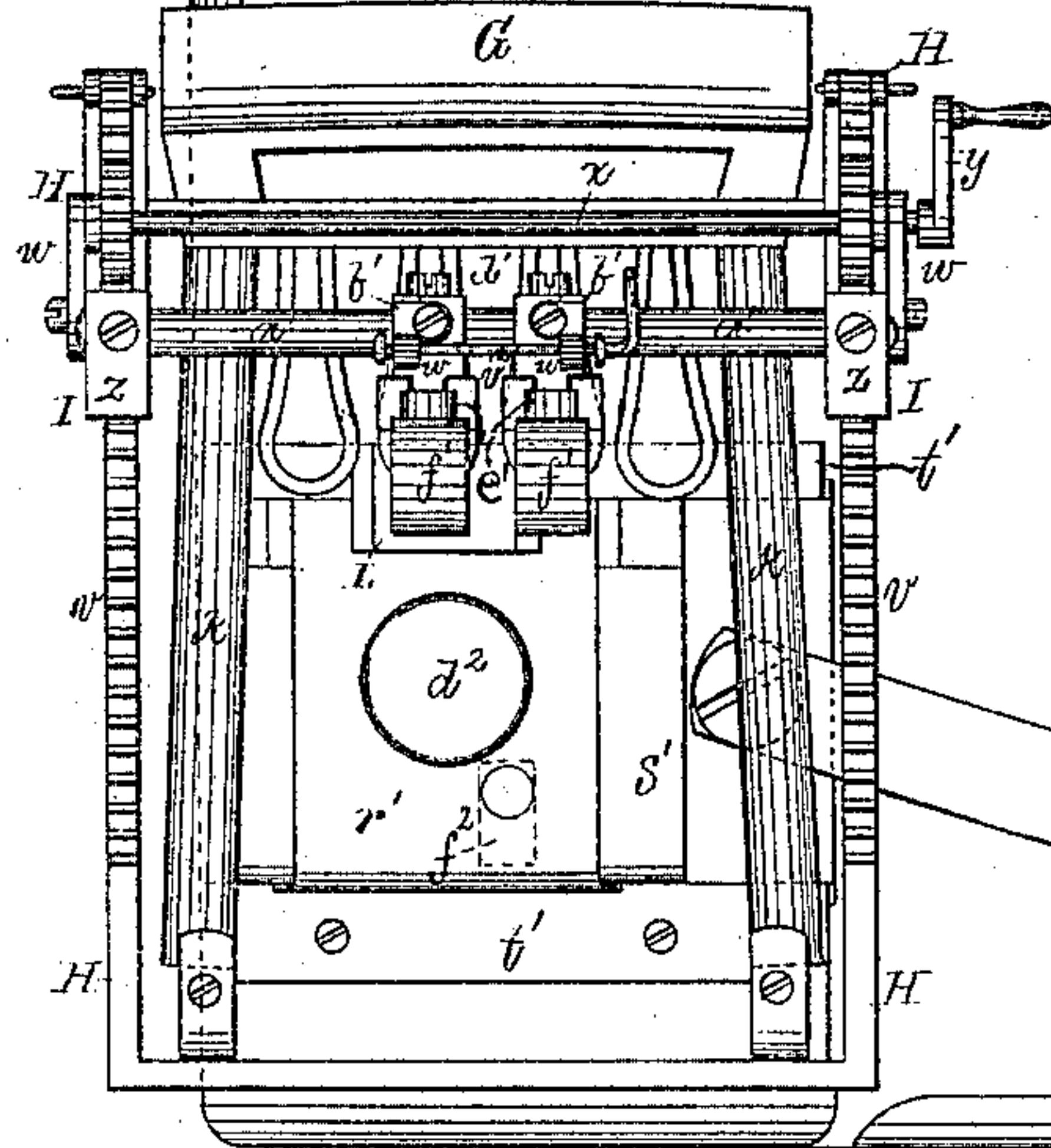


Fig. 7.

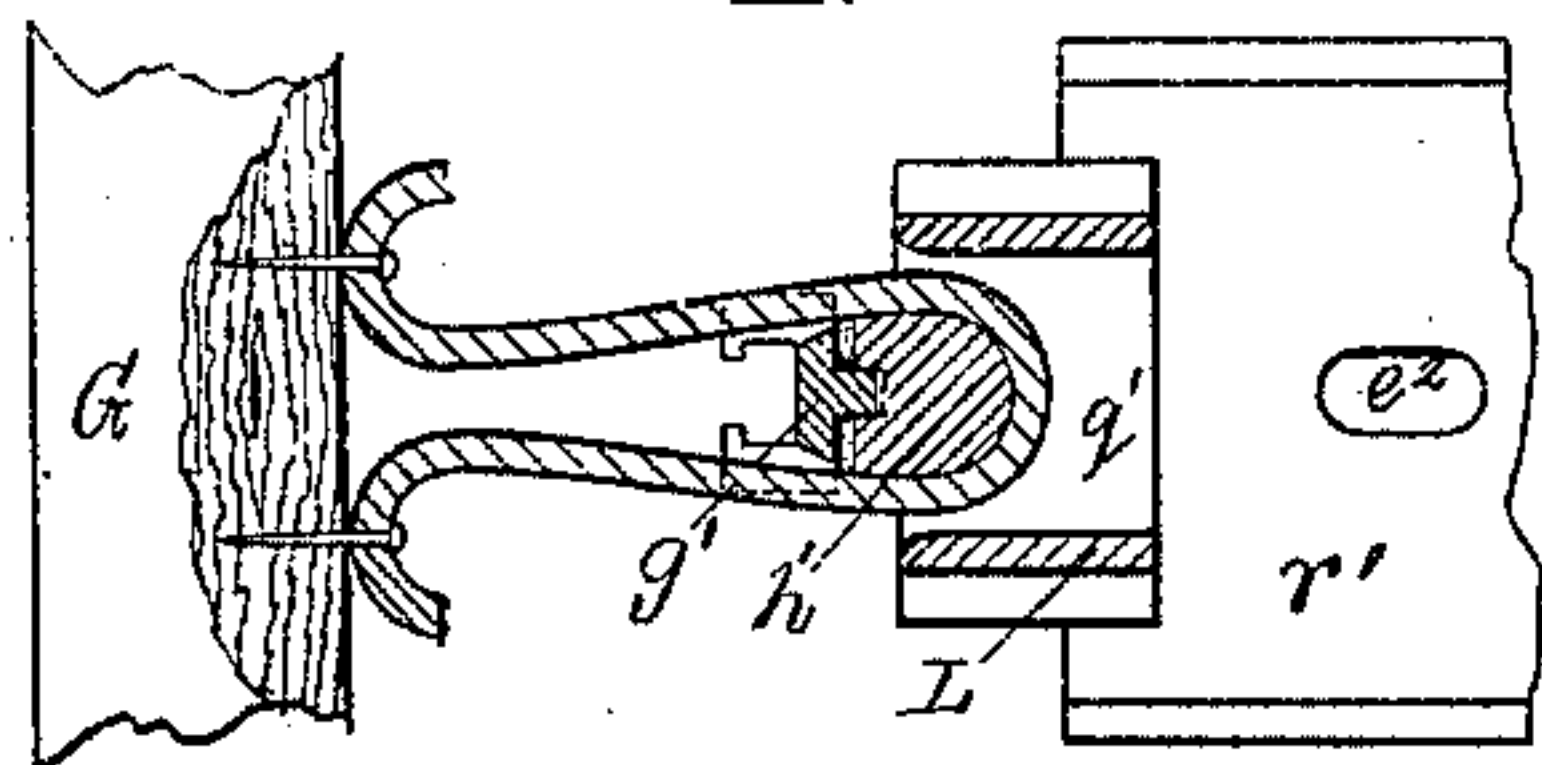
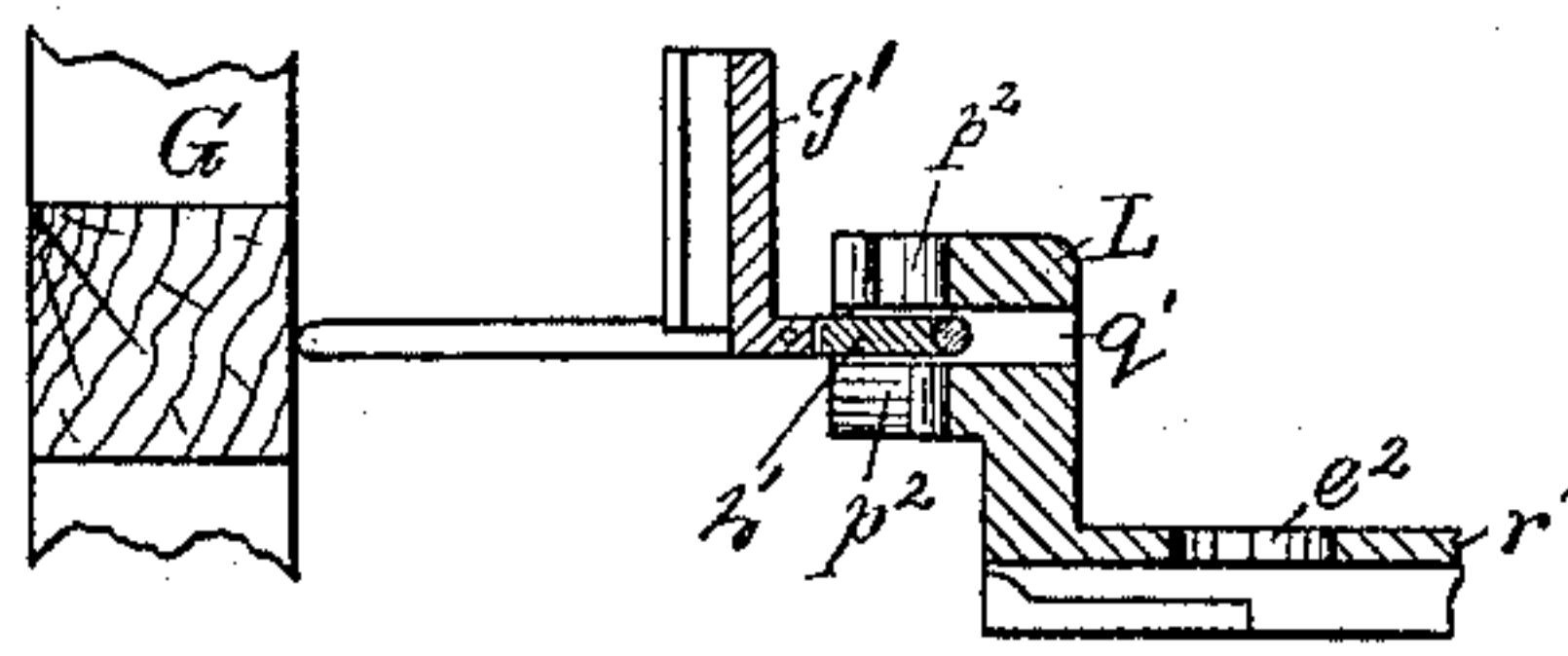


Fig. 8.



Witnesses.

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E. P. Pratt.

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Edward Lovell Taft.

Henry Murdock Rich.

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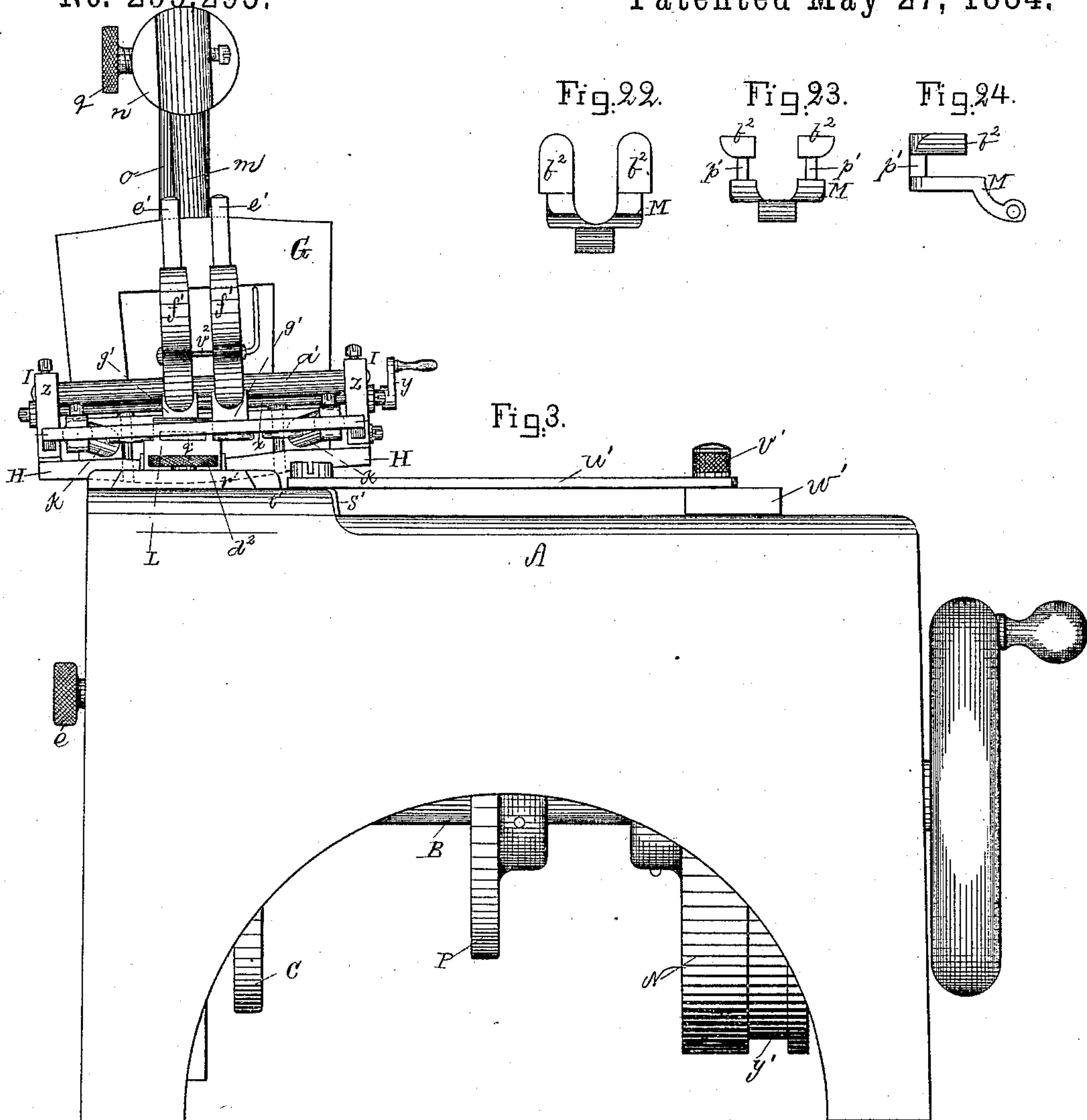


Fig. 22.

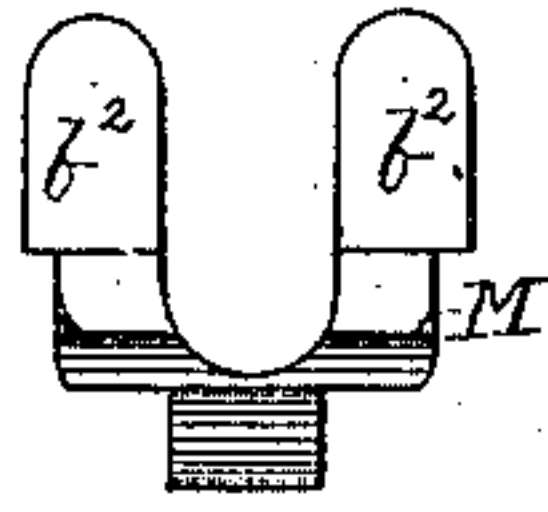


Fig. 23.

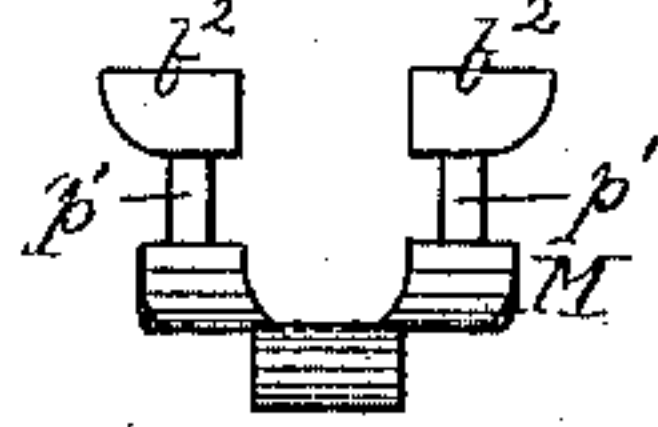


Fig. 24.

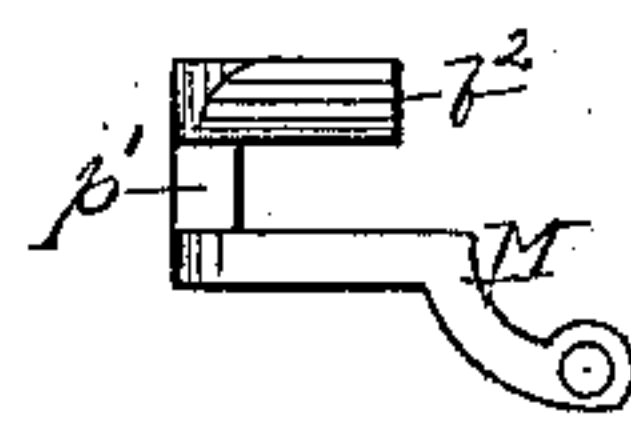


Fig. 3.

Fig. 16.

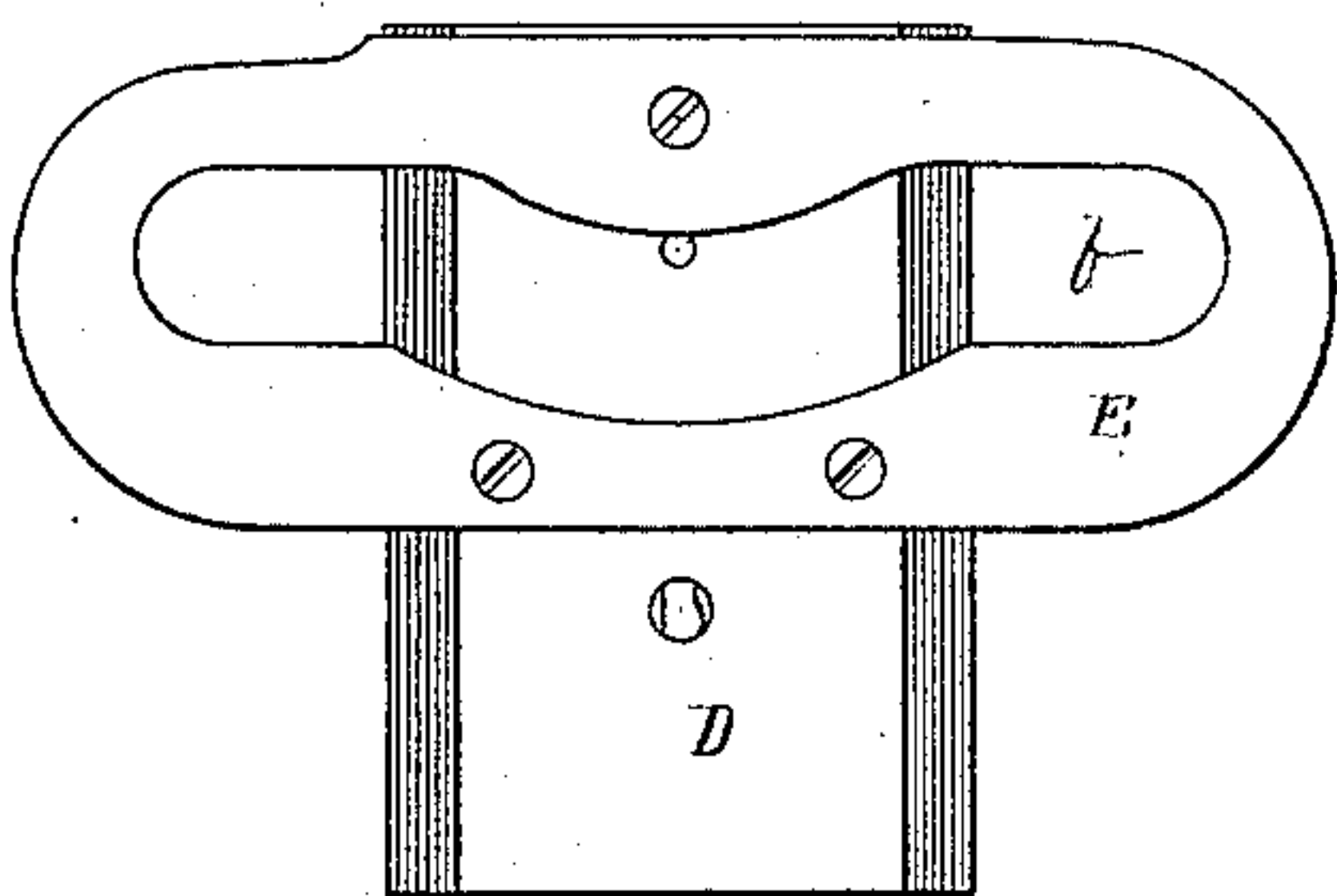


Fig. 20.

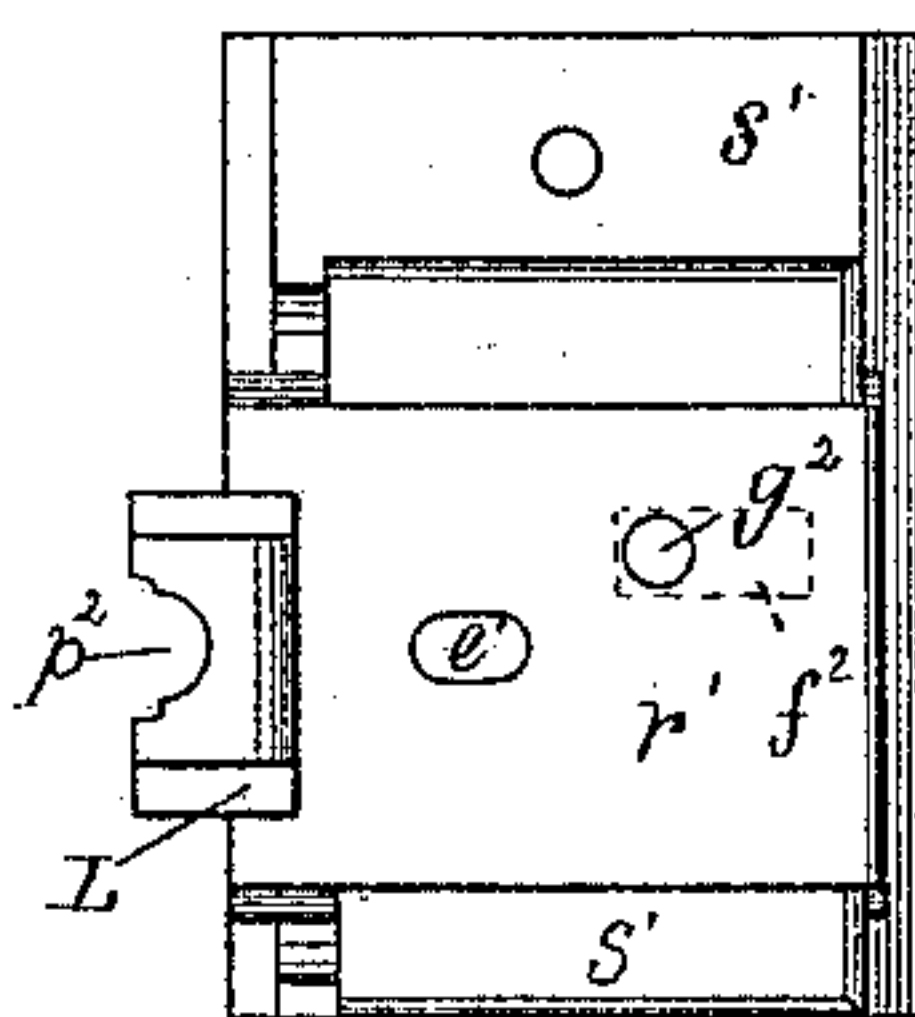
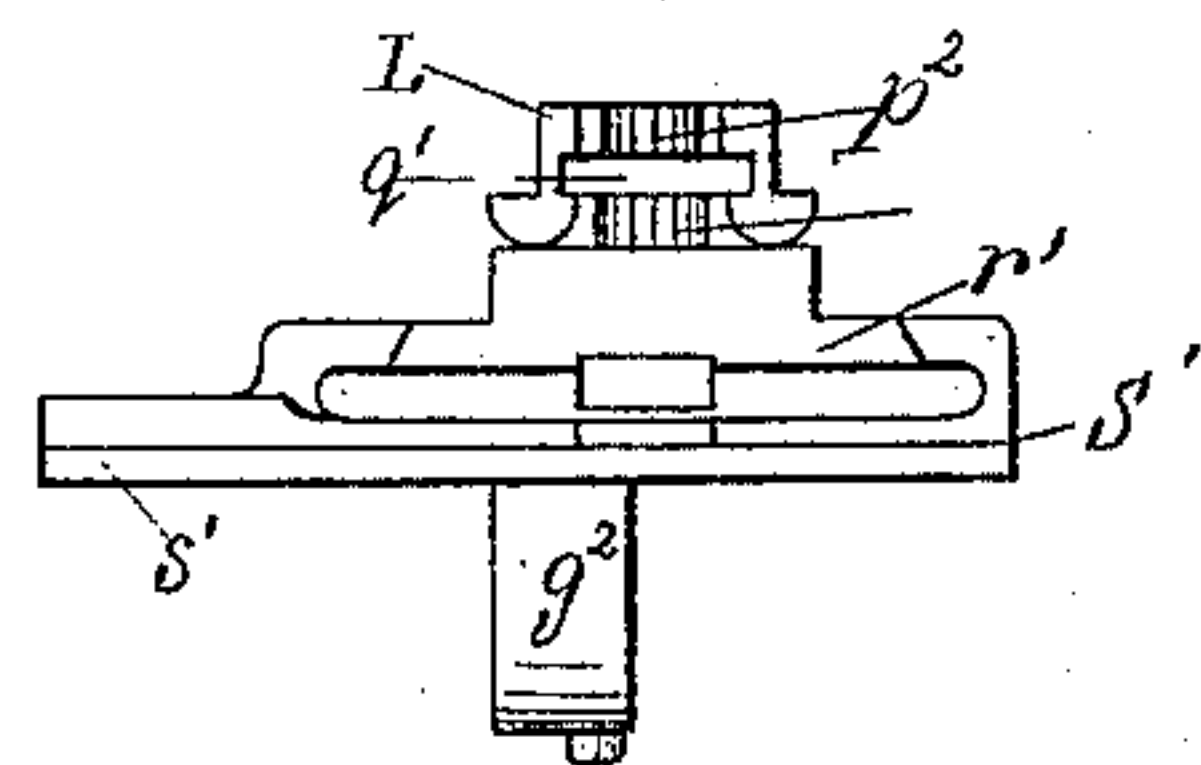


Fig. 21.



Witnesses.

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(No Model.)

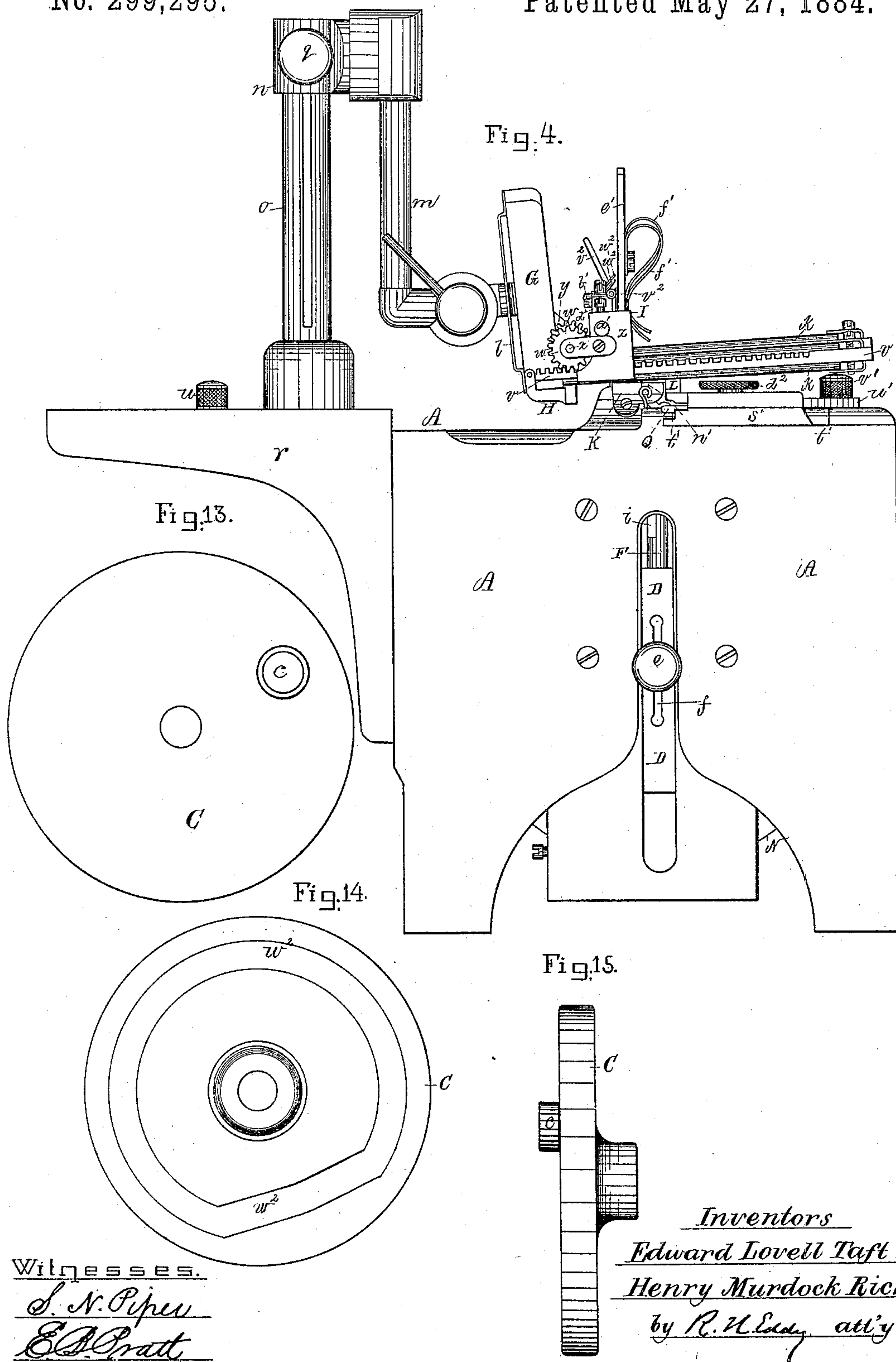
6 Sheets—Sheet 3.

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Witnesses.

S. V. Piper
E. A. Pratt

Inventors

Edward Lovell Taft.

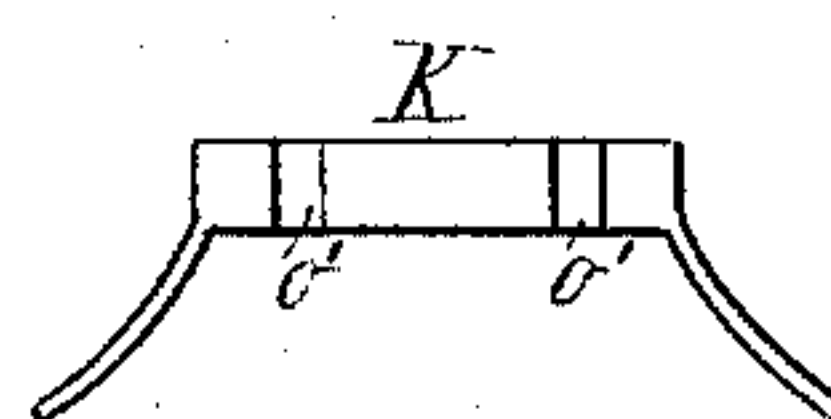
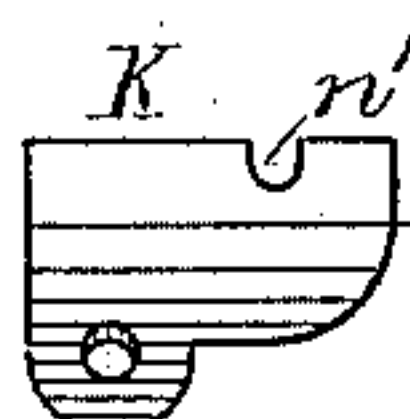
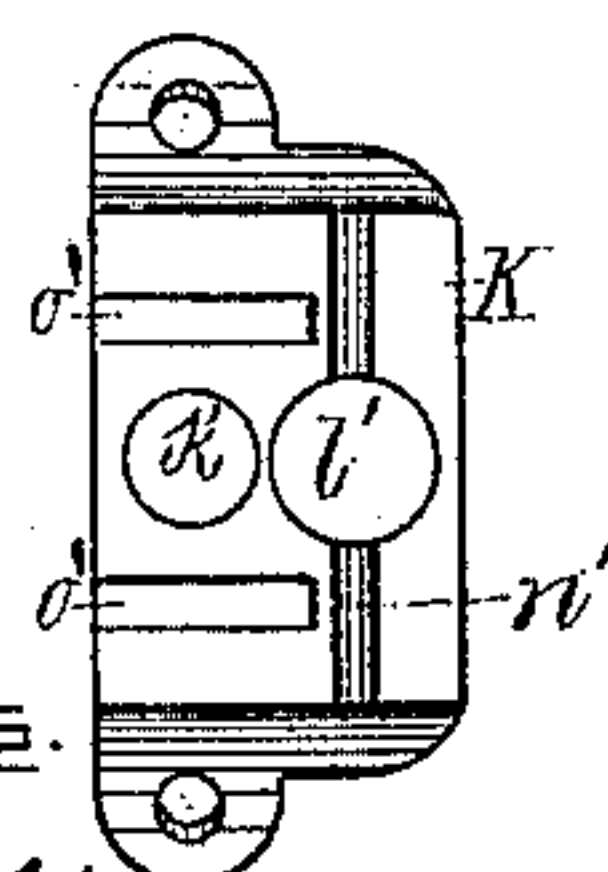
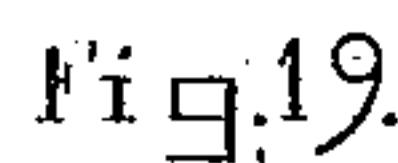
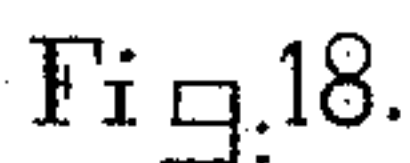
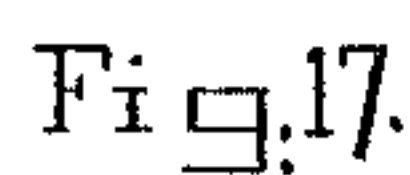
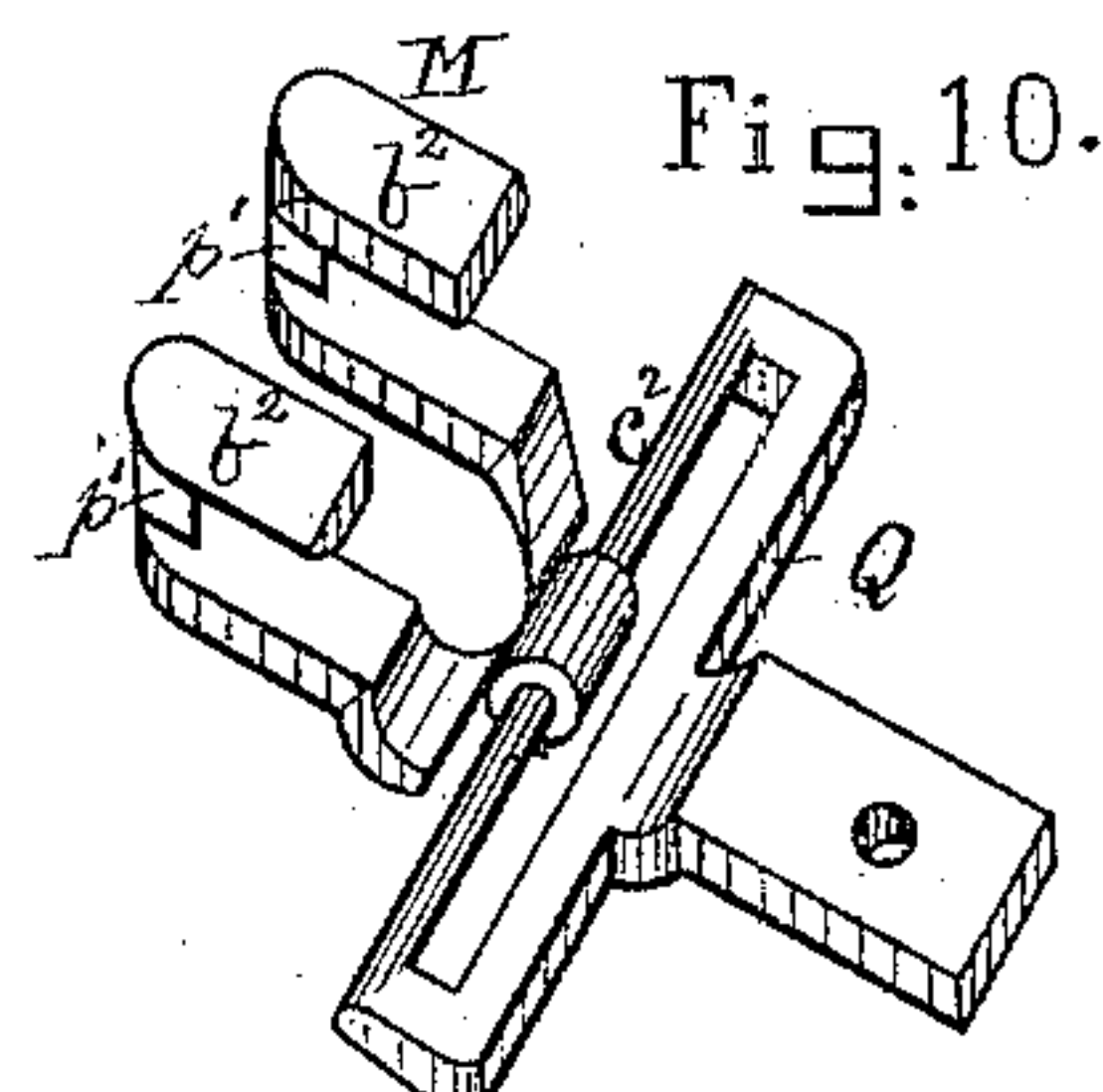
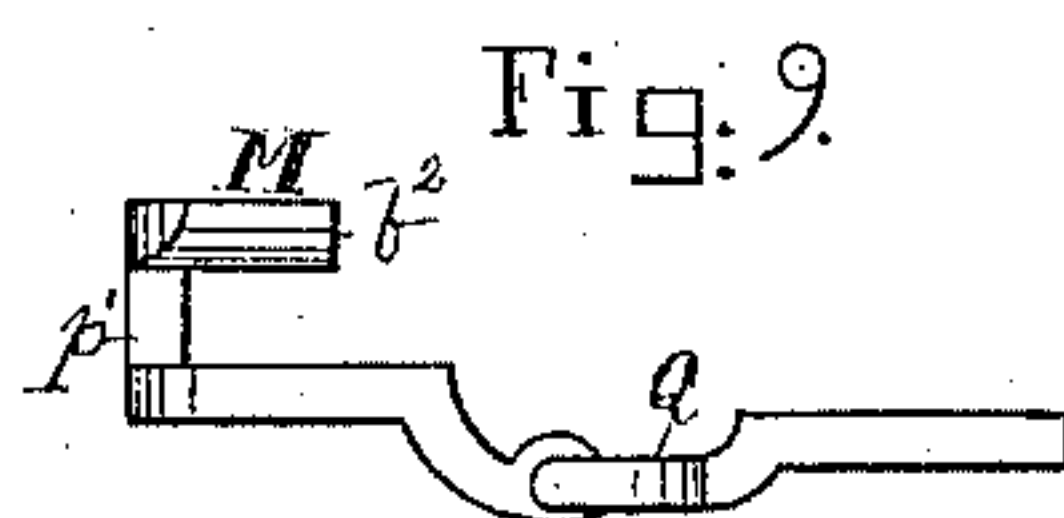
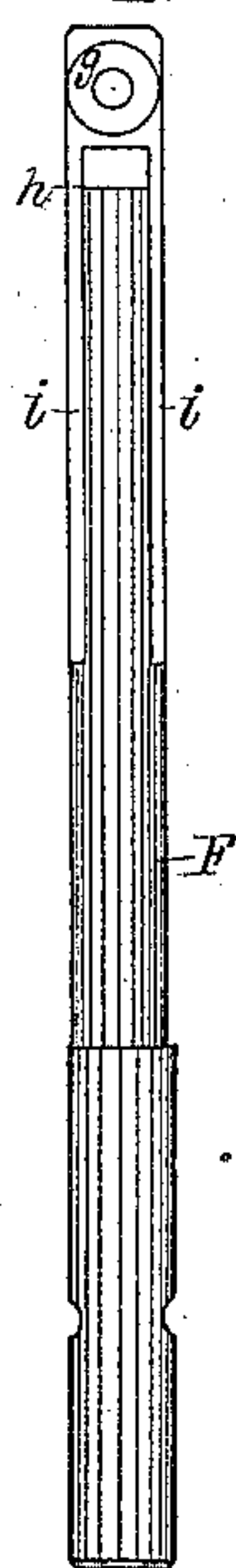
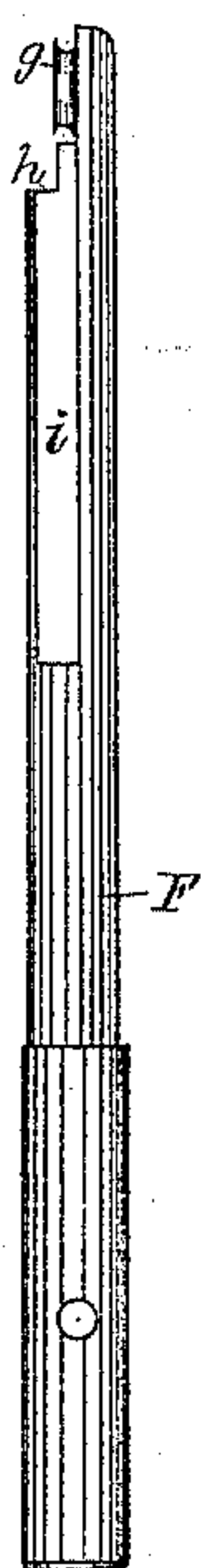
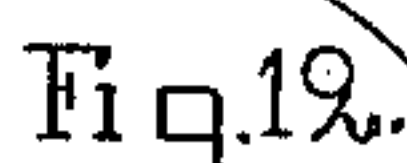
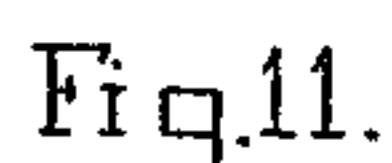
Henry Murdock Rich.

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E. A. Pratt

Inventors

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(No Model.)

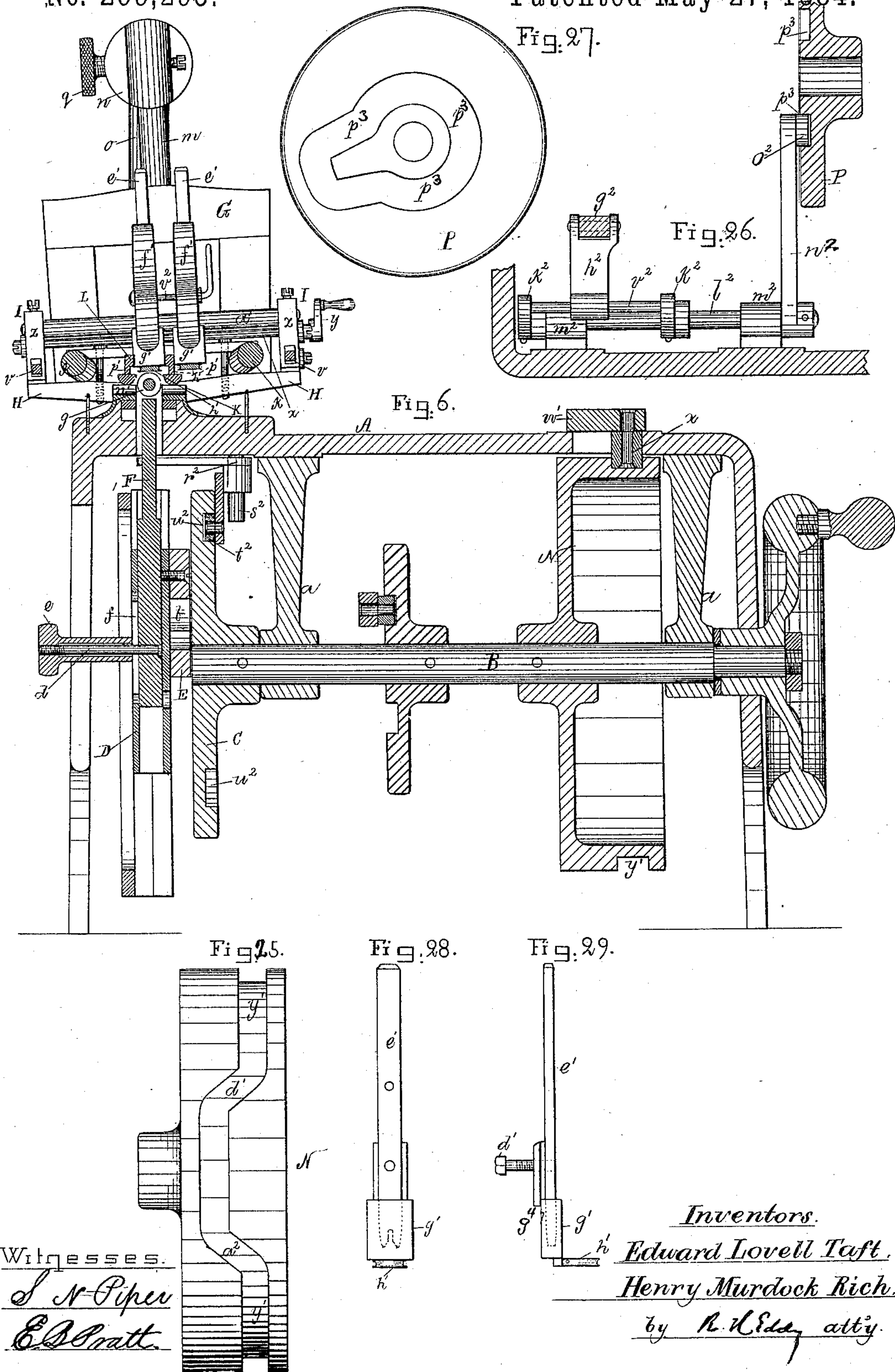
6 Sheets—Sheet 5.

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No. 299,295.

Patented May 27, 1884.



(No Model.)

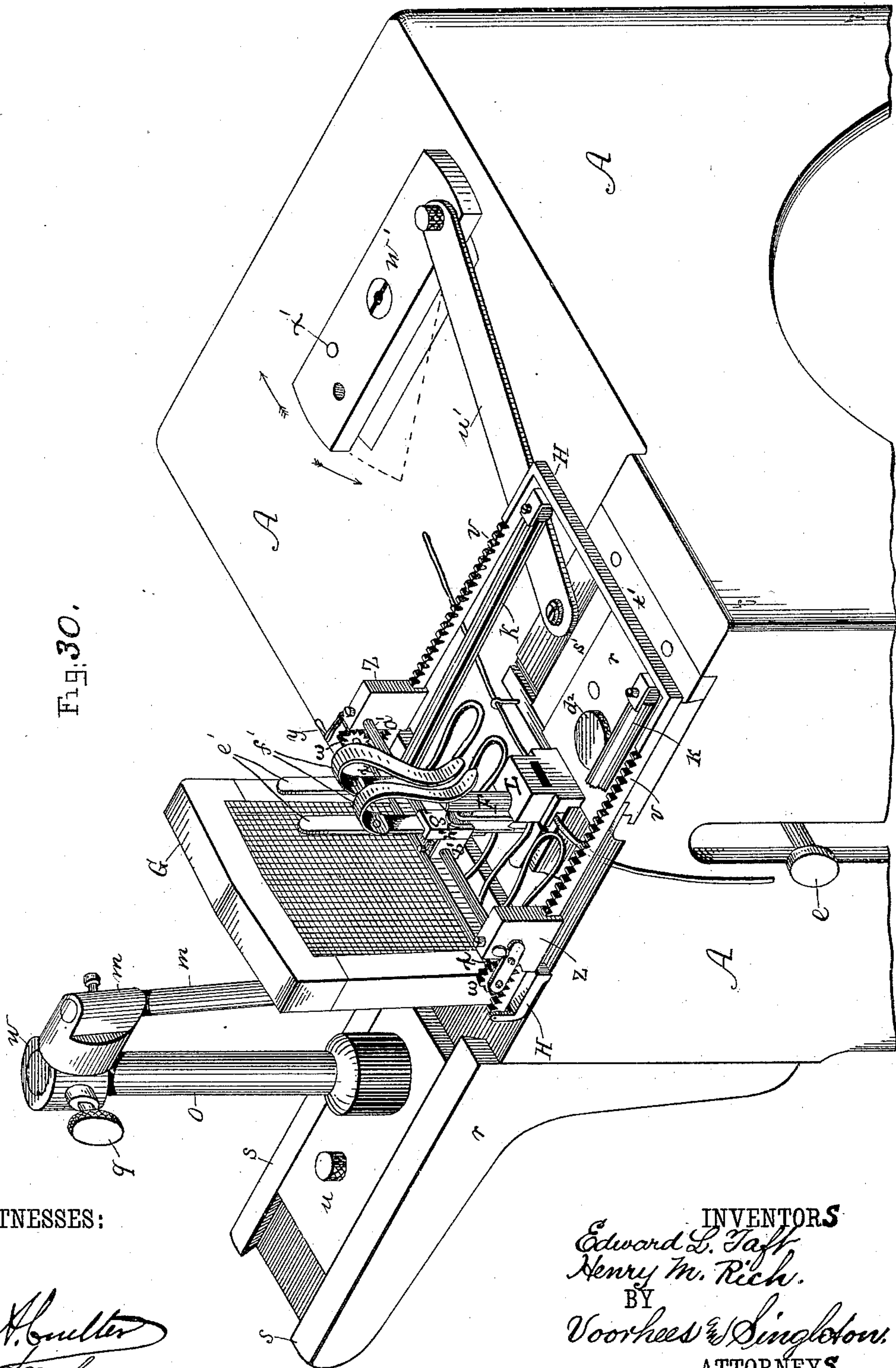
6 Sheets—Sheet 6.

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MACHINE FOR KNITTING RATTAN CHAIR BACKS.

No. 299,295.

Patented May 27, 1884.



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UNITED STATES PATENT OFFICE.

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ATHOL, MASSACHUSETTS.

MACHINE FOR KNITTING RATTAN CHAIR-BACKS.

SPECIFICATION forming part of Letters Patent No. 299,295, dated May 27, 1884.

Application filed October 9, 1883. (No model.)

To all whom it may concern:

Be it known that we, EDWARD LOVELL TAFT, of Gardner, and HENRY MURDOCK RICH, of Athol, in the county of Worcester, of the Commonwealth of Massachusetts, have invented a new and useful Improvement in Machines for Knitting Rattan Chair-Backs; and we do hereby declare the same to be described in the following specification and represented in the accompanying drawings, which illustrate a machine for the knitting of the portion of a chair-back that usually extends between the posts of such back.

The invention will be first described in connection with the drawings and then pointed out in the claims.

Of the said drawings, Figure 1 is a representation of a piece of the work produced by the machine, such work being like ordinary "plain knitting" from a single strand, wherein each loop, except those of the first and last of the ranges, passes through another loop, and has a second loop extending through it. Fig. 2 is a top view, Fig. 3 a front elevation, and Fig. 4 an end view, of the machine. Fig. 5 is a transverse section, and Fig. 6 a longitudinal section, of it, taken through the looper. Fig. 7 is a horizontal section, and Fig. 8 a vertical section, of the loop-supporting mechanism, to be described. Fig. 9 is a side view, and Fig. 10 a perspective view, of the pivoted strand holder or coverer and its carrier and the supporting-standard of the latter. Fig. 11 is a side elevation, and Fig. 12 a rear elevation, of the looper. Figs. 13 and 14 are opposite side views, and Fig. 15 an edge view, of the grooved cranked cam-wheel C, hereinafter described. Fig. 16 is an inner side view of the looper-carrier and its slotted plate. Fig. 17 is a top view, Fig. 18 an end elevation, and Fig. 19 a rear view, of the stationary grooved strand-guide, K, hereinafter described. Fig. 20 is a top view, Fig. 21 an inner side elevation, of the movable loop-holding abutment L and its sustaining dovetailed slide and its carrier. Fig. 22 is a top view, Fig. 23 a front elevation, and Fig. 24 a side view, of the strand-coverer M, hereinafter described. Fig. 25 is an edge view of the wheel N, to be explained. Fig. 26 is a top view of the mechanism for moving the loop-holding abutment

L and the strand-coverer M, Fig. 27 being a side view of the grooved cam P of such mechanism. Fig. 28 is a side elevation, and Fig. 29 an edge view, of the mechanism for insuring the position of the work for the looper to enter a loop thereof. Fig. 30 is a perspective view of the machine at work.

In the said drawings, A denotes the table for supporting the main operative parts of the machine, there being within such table, and suitably supported in bearings *a a*, the driving-shaft B. On the said shaft there is fixed a crank-wheel, C, for operating the looper-carrier D, or imparting to it its vertical movements. This looper-carrier has fixed to it, as shown in Fig. 16, a plate, E, having in it a slot, *b*, to receive the wrist *c* of the wheel C. The median curved part of the slot is a circular arc, or is formed so as to cause the said wrist, while moving in and through it and the looper-carrier is down to its lowest position, to impart to the looper-carrier no vertical motion, such looper-carrier then requiring to be stationary a sufficient time for other elements of the machine to operate in their order.

The looper is shown at F as a rod adapted to slide vertically in the carrier D, and provided with a screw, *d*, and a nut, *e*, for clamping it in position relatively to the carrier, which is slotted vertically, as shown at *f*, to allow of the vertical movements in it of the clamp-screw. At its upper part the looper carries a grooved wheel, *g*, pivoted to it and arranged with it, and with a shoulder, *h*, formed in it, in manner as represented. The looper has two grooves, *i*, in its opposite sides, extending down therein, as shown, such grooves being to receive the strand while the loop is being formed, and to properly keep apart the two side portions or flanks of the loop.

In the drawings, G represents a chair-seat having extended from it in the usual manner two back posts, *k k*, between which the knit fabric is formed by the machine, a series of starting-loops being first projected from the said seat at suitable distances apart. Immediately after each range of loops is completed, its extreme side or selvage loops are to be secured to the posts by nails or staples. The seat is fastened by screws to a spider, *l*, so pivoted to a pendulous arm, *m*, as to admit of

the chair-frame being turned upward or downward in or about in a vertical plane. This arm is pivoted to a slider, *n*, adapted to encompass and slide vertically on a post, *o*, projecting upward from a rectangular plate, *p*.
 5 A set-screw, *q*, screwed into the slider *n* and against the post, serves to fix the slider at any proper altitude on the post. The plate *p* is movable horizontally in a bracket, *r*, and between parallel guides *s s* thereof, such bracket
 10 being adjustable vertically, as shown. There is in the bracket along its middle a series of holes, *t*, they being arranged at distances apart equal or about equal to the length of a loop to be made. A pin, *u*, going through the plate
 15 *p* and into one of the said holes, determines the position of the plate for the formation of a range of loops. After each range of loops is made, the slide is to be moved backward a suitable distance for the next succeeding range
 20 to be produced, the pin and one of the holes being used to hold the slide in its required position. As the fabric is usually curved transversely or across the back of the chair, the arm *m* should be pivoted to the slider *n*, so
 25 that the chair-holding frame can be swung on a curve.

There is clamped to the chair-seat and posts a metallic frame, *H*, which, arranged with such
 30 seat and parts in manner as shown, has its two opposite side bars, *v v*, formed as toothed racks to receive two pinions, *w w*, carried by a shaft, *x*, provided at one end with a crank, *y*, as shown. The shaft is supported in a carriage,
 35 *I*, that rests on the two racks, and is adapted to slide on them lengthwise of them. This carriage consists of two uprights, *z z*, and a connecting-bar, *a'*, such bar being extended from one to the other of the two uprights and
 40 fastened to them. By revolving the crank *y*, the carriage *I* and the parts supported by it can be moved toward or away from the chair-seat, as occasion may require.

The bar *a'* extends through a series of slides,
 45 *b'*, each of which is not only provided with a set-screw, *c'*, for fixing it to the bar, but has applied to its front edge and held thereto by a set-screw, *d'*, a bar or standard, *e'*, the set-screw admitting of the said bar or standard
 50 being inclined more or less from a vertical line, as circumstances may require. There are to be as many of these slides as there are loops formed. There is fixed to each bar or standard *e'* a curved spring, *f'*, formed and arranged
 55 with the bar in manner as represented, the purpose and operation of said spring being hereinafter explained. Furthermore, there is to slide lengthwise on each standard *e'* a slider,
 60 *g'*, carrying a U-shaped tongue, *h'*, which is hinged to the slider so as to be capable of being turned from a horizontal into an upright position. This tongue has in its outer periphery a shallow groove, to receive a loop when against such periphery, the tongue being part of the
 65 mechanism for supporting the loop.

In order to hold the sliders *g'* from dropping off their standards *e'*, there is pivoted to the

slides *b'* a cranked shaft, *v²*, provided with spring catches or pawls *w²*, to take into notches *g²* in the sliders *g'*. There is such a pawl to
 70 each of the said sliders. By properly turning the shaft the pawls may be forced out of the notches, to allow of the sliders being moved downward.

To operate with the parts as above described 75 there are others—viz., the stationary grooved strand-guide *K*, the movable loop-holding abutment *L*, and the strand-coverer *M*.

The strand-guide *K* is a table or rectangular plate supported by legs or suitable means, it
 80 having in it two circular holes, *k'* and *l'*, the latter of which is for reception of the looper, which works upward and downward in it. Extending across the plate, and in range with the diameter of the hole *l'*, is a deep groove, 85
n', for the reception of the strand of rattan. There are also in the plate two parallel slots, *o' o'*, that extend from near the groove to and through one edge of the plate, in manner as
 shown, such slot being to receive the two up- 90 right posts *p'* of the strand-coverer *M*.

The movable loop-holding abutment *L*, notched vertically, as shown at *p²*, and slotted transversely, as shown at *q'*, projects in man-
 95 ner as represented from a sustaining dove-tailed slide or plate, *r'*, adapted to a carriage or carrier, *s'*, so as to slide therein transversely thereof, and upon and off the top of the strand-guide *K*. The carrier *s'* is so adapted to the table
 100 of the machine as to be capable of sliding thereon rectilinearly and horizontally in a direction at right angles to that of the movement of the plate *r'*, such carrier *s'* being arranged between and against parallel guides *t' t'*.

A long bar, *u'*, jointed to the carrier *s'*, can, 105 by means of a screw or pin, *v'*, be pivoted to either arm of a rocker-lever, *w'*, arranged as shown, and fulcrumed at its center to the table-top. A stud, *x'*, extends down from one arm of the said rocker-lever into a cam-groove, 110
y', formed on the periphery of a wheel, *N*, that is fixed on the driving-shaft, an edge view of such wheel and its cam-groove being shown in Fig. 25, which is continuous around the wheel. This groove has two oblique deflec- 115
 tions, *d' a²*, between and from which the groove is parallel to the side of the wheel. The deflecting parts of the groove cause, with the stud *x'*, the carrier *s'* to have imparted to it its reciprocating rectilinear movements, it being 120
 at rest while the stud may be in the other portions of the groove. While each range or row of loops is being made the bar *u'* is in pivotal connection with one arm of the rocker-lever *w'*; but immediately after the range may have 125
 been completed the bar is to be put in pivotal connection with the other arm of the said rocker-lever, in order to cause the feeding of the work to be reversed.

The strand-coverer *M* is a fork, having two 130 posts, *p'*, extending upward from its prongs, and provided with lips *b² b²*, to extend from them and upon the strand-guide *K* in manner as represented. The coverer *M* is hinged to

a slotted T-piece, Q, formed, as represented, upon the part c^2 of which the coverer slides lengthwise. This T-piece extends underneath the slide-plate r' , and is fastened thereto by a clamp-screw, d^2 , that goes down through a short slot, e^2 , in such plate and screws into the shank of the T-piece, the screw having a shoulder to rest on the top of the said plate r' .

The mechanism for advancing and retracting the loop-holding abutment L and the strand-carrier M may be thus described, it being shown in Figs. 26 and 27: Extending down from the plate r' , and through a slot, f^2 , in the carrier s' , is a projection, g^2 , which is pivoted to an arm, h^2 , that extends from and slides lengthwise on a round rod, i^2 , supported by two arms, k^2 k^2 , projecting from a horizontal shaft, l^2 , suitably supported on bearings m^2 m^2 , projecting from the table A. From one end of the said shaft l^2 an arm, n^2 , extends, and is provided with a friction-roller or stud, o^2 , which enters the groove p^2 of a cam, P. The projection g^2 goes down through a slot or opening in the table-top, such slot being of sufficient size to allow of the movements of the projection.

The next part of the machine to be described is the mechanism for insuring the position of the work for the looper to enter each loop thereof at the proper time, such mechanism being particularly exhibited in edge and side elevations in Figs. 28 and 29. Each of the standards e' is notched or forked at its lower end to receive a wedge-pointed stud, R, that extends up through the hole h' of the strand-guide K. The said stud R is supported by a carrier, r^2 , adapted to slide vertically on a stationary pin, s^2 , and having a stud or friction-roller, t^2 , to enter the groove u^2 of a cam-wheel, C, fixed on the driving-shaft. At the proper time the wedge-pointed stud R is forced upward between the prongs of the furcation of the standard e' , and by acting against them not only insures the standard being in a correct position, but holds it there the necessary time for it to be kept so.

The operation of the machine may be thus described: The strand of rattan being inserted in and extended through the groove n' of the strand-guide K, and the series of U-shaped tongues h' being down in horizontal positions within the several starting-loops, the wedge-pointed stud R is to be driven upward into the furcation of that standard e' which may be directly over the first loop of the range of starting-loops. Next, the movable loop-holding abutment L is moved up to the loop, so as to cause the loop to project a short distance into the slot q' of the said abutment, in which case the loop will extend into the shallow groove of the U-shaped tongue h' . Next, the looper F is to be moved upward. In rising, the grooved wheel g of such looper impinges against the strand, and as the looper continues to rise the strand will be raised by it in the form of a loop, the looper in the meantime forcing upward into a vertical position

the U-shaped tongue h' , that may be in the starting-loop. As the looper continues to rise, its shoulder h will be carried into contact with the lower edge of the said tongue h' , and will force such tongue and slider g' thereof upward. The looper will also be forced against the spring f' in front of such tongue, the said spring giving way to allow the looper to move upward. The looper having completed its rise, the slider g' will, by a catch or pawl, w^2 , of the cranked shaft v^2 , be held from descending during the depression of the looper, which next takes place. As the looper passes downward and leaves the loop, the spring f' retracts and bears the said loop over upon the periphery of the U-shaped tongue h' and holds it thereon. After this the looper continues its descent to its lowest position. On the looper having so gone down, the wedge-pointed stud R descends out of the furcation of the bar e' , releasing such standards, so that the chair and its attachments are free to swing. At this point the carrier s' and abutment L are moved together lengthwise of the table by the bar u' , as described, the T-piece Q sliding through the strand-coverer, the latter remaining stationary. The chair-carrying frame is swung at the same time, the loop in the abutment moving with the latter, and the next loop brought over the looper. Next, the wedge-pointed stud R rises as before, the abutment L recedes from the loop held within it, and the strand-coverer M is drawn back with it, so as to carry its lips b^2 over and upon the strand, beyond the newly-formed loop, the coverer holding the strand for the next loop to be made. The abutment L and carrier s' are then moved backward longitudinally of the table, and the abutment L is brought in toward the loops, the second loop being received into the slot q' and the cover M withdrawn from the strand and placed into position for the next stroke. The looper next rises and forms a loop through the second loop. In this way loop after loop is made throughout the range. The range having been completed, the abutment L is to be retracted far enough to allow of the last loop of the starting-loops being disengaged from such abutment. The said loop having been raised or moved up sufficiently, the work is to be next moved back far enough for a succeeding range of loops to be made. This is accomplished by removing the pin u from the plate p and sliding such plate on the bracket r the necessary distance, after which the pin is to be inserted in the plate and the bracket, so as to hold the plate in place. Next, the cranked shaft v^2 is to be turned so as to release the catches or pawls w^2 from the sliders g' . Next, the metallic frame H is to be moved, so as to cause the range of loops last formed to be drawn down into a horizontal position. In going down, each loop will draw its U-shaped tongue down with it, and both will leave the spring by which they were upheld. Next, the bar u' is to be disengaged from the arm of the rocker-lever w' , and kept so until

the first loop of the next range has been made, which, having been accomplished, the said bar *w'* is to be engaged with the other arm of the said lever *w'* in order that the feeding of the
5 work may be reversed.

We claim—

1. The combination of the stationary strand-guide K, and the looper F, the series of standards *e'*, sliders *g'*, U-shaped tongues *h'*, the
10 series of springs *f'*, the movable loop-holding abutment L, and the strand-coverer M, provided with mechanism for operating them, substantially as set forth.

2. The combination of the wedge-pointed
15 stud R, having mechanism for operating it, substantially as described, with the stationary strand-guide K, and the movable looper F, the series of U-shaped tongues, their carrying-slides, and the furcated sustaining-bars *e'*
20 thereof, the springs *f'*, the movable loop-holding abutment L, and the strand-coverer M, provided with mechanism for operating them, essentially as represented.

3. The combination of the metallic frame

H, having toothed racks, as set forth, and the
25 carriage I, having a cranked shaft, *x*, and pinions *ww*, to operate with the said racks, as described, with the stationary strand-guide K, and with the series of slides *b'*, standards *e'*,
30 curved springs *f*, sliders *g'*, U-shaped tongues *h'*, the movable looper F, loop-holding abutment L, and strand-coverer M, having mechanism for operating them, substantially as set forth.

4. The combination of the chair-seat and
35 post-supporting and operating mechanism, substantially as described, (consisting of the spider, the pendulous arm, the vertical slide, and adjustable post, arranged and adapted as
40 set forth,) with mechanism substantially as represented, for knitting work or a chair-back between the posts of a chair, as explained.

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Witnesses:

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