

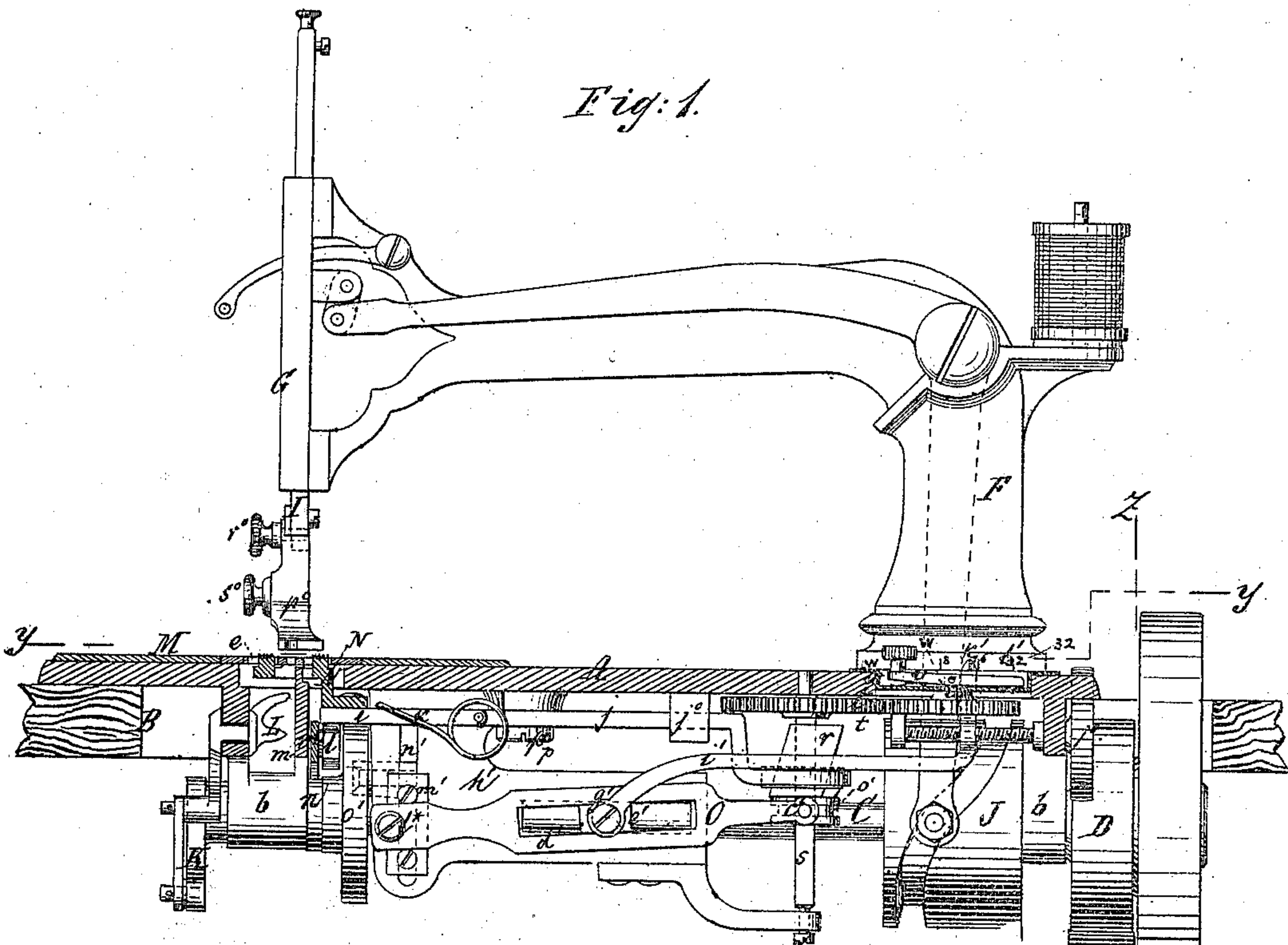
J. L. & D. H. COLES.

Sewing-Machines.

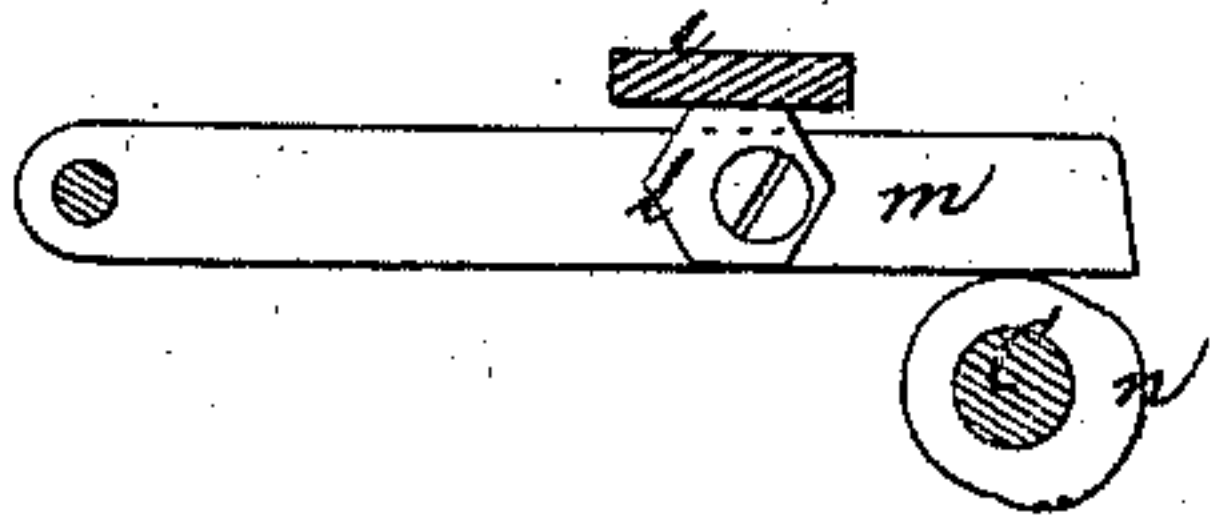
No. 134,463.

Patented Dec. 31, 1872.

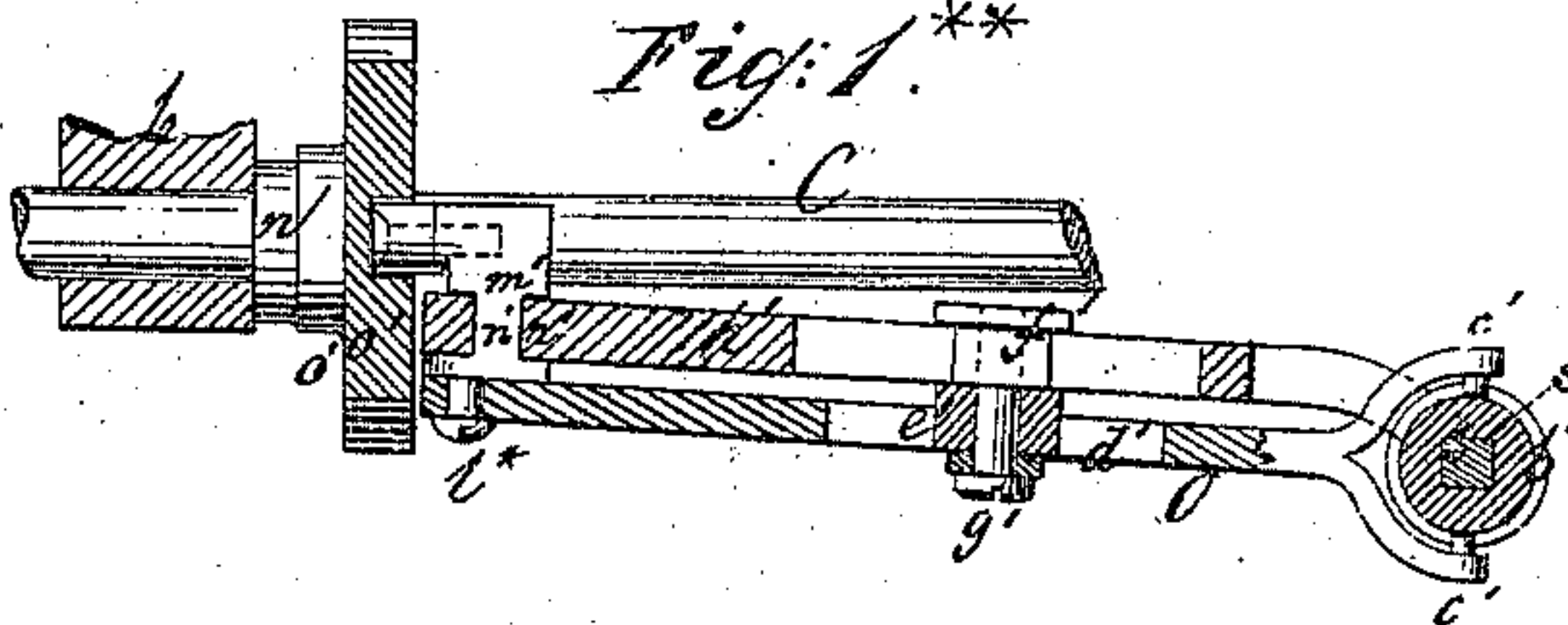
Fig. 1.



*Fig. 1.**



*Fig. 1.***



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Fig. 2.

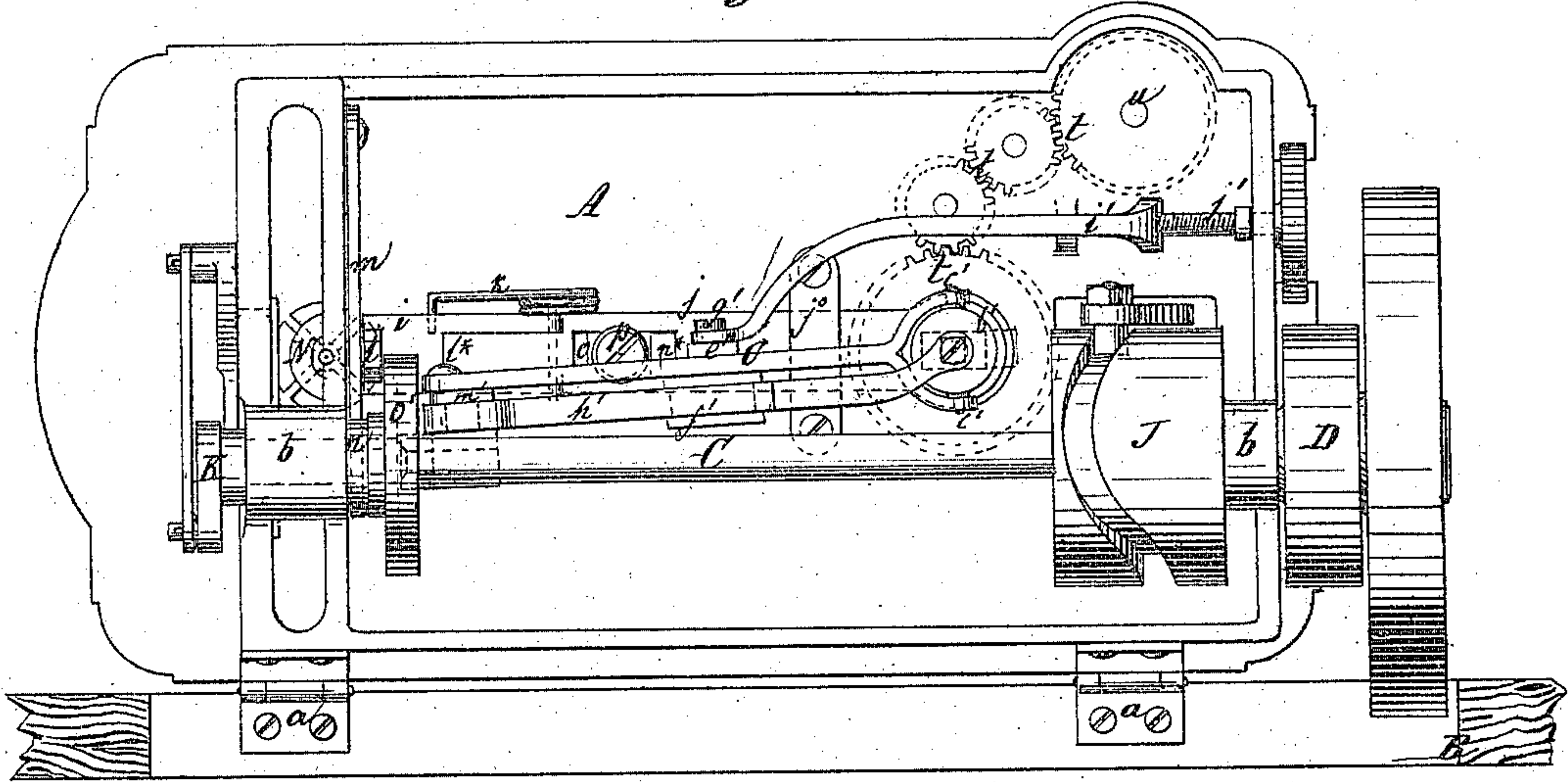


Fig. 3.

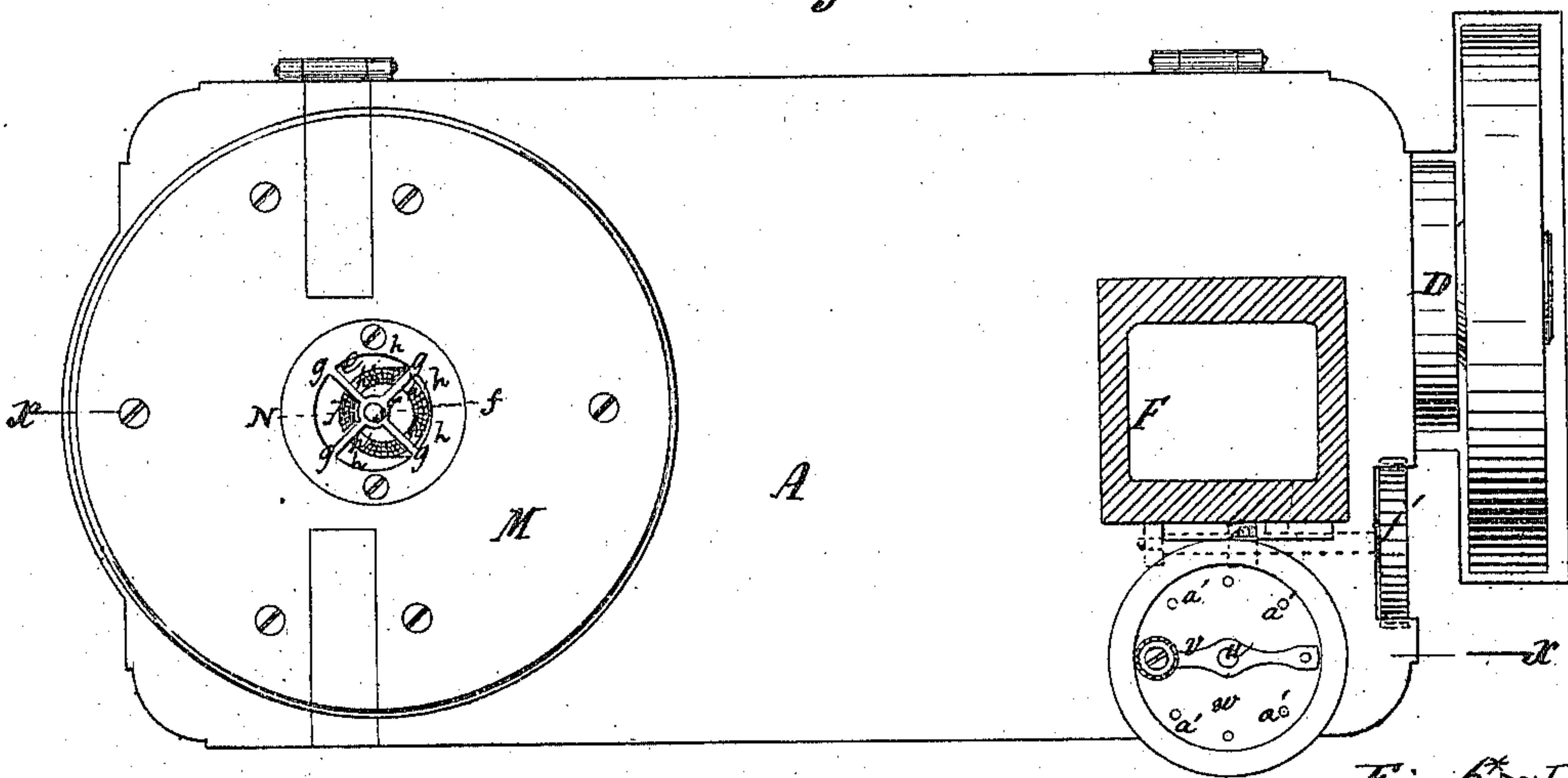


Fig. 5.

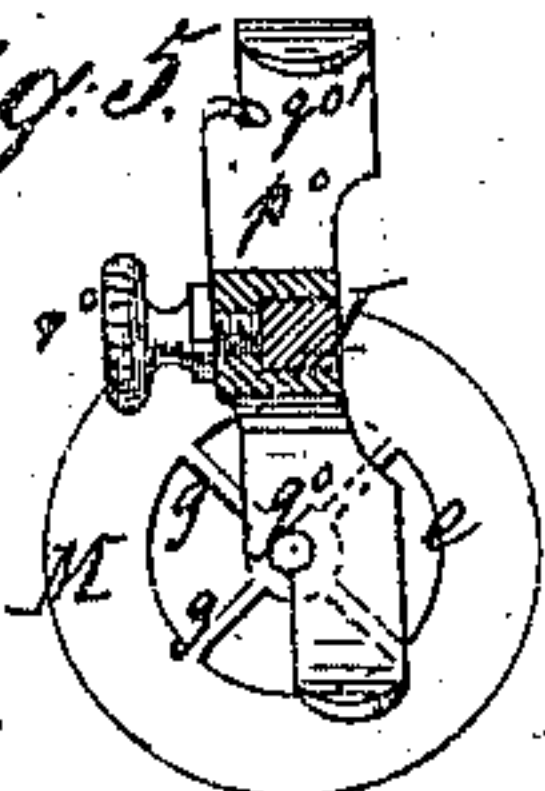


Fig. 5*.

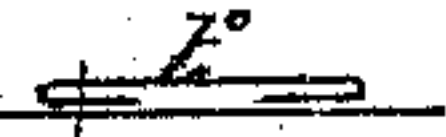


Fig. 4.

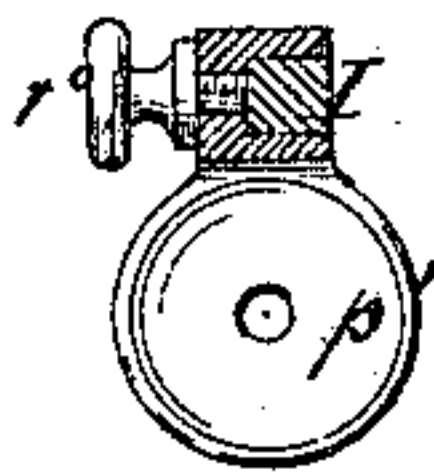


Fig. 6.

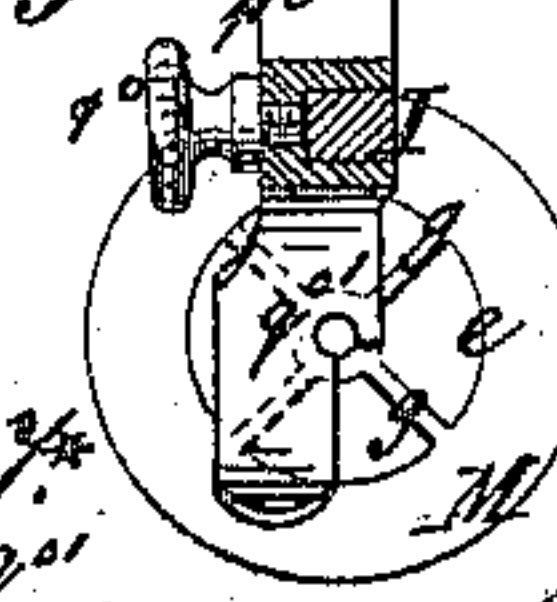
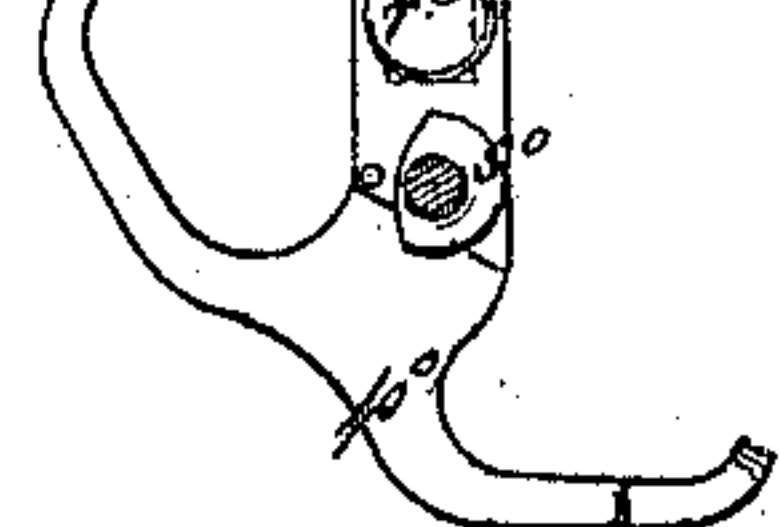


Fig. 6*.



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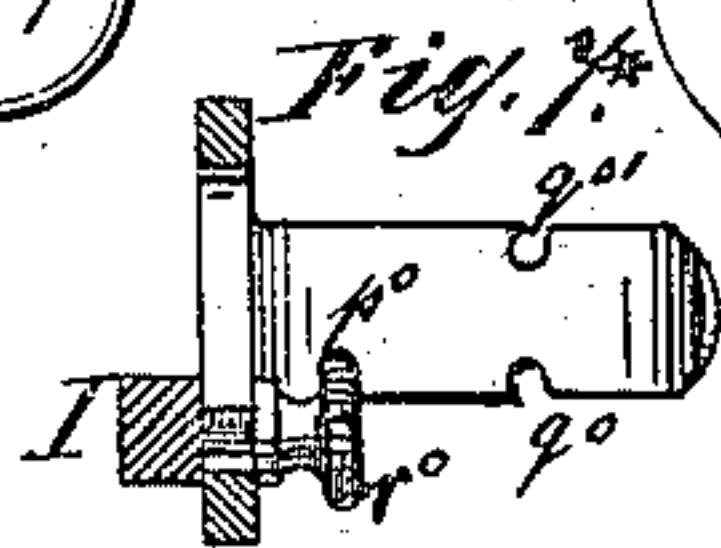


Fig. 7*.

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Fig: 10.

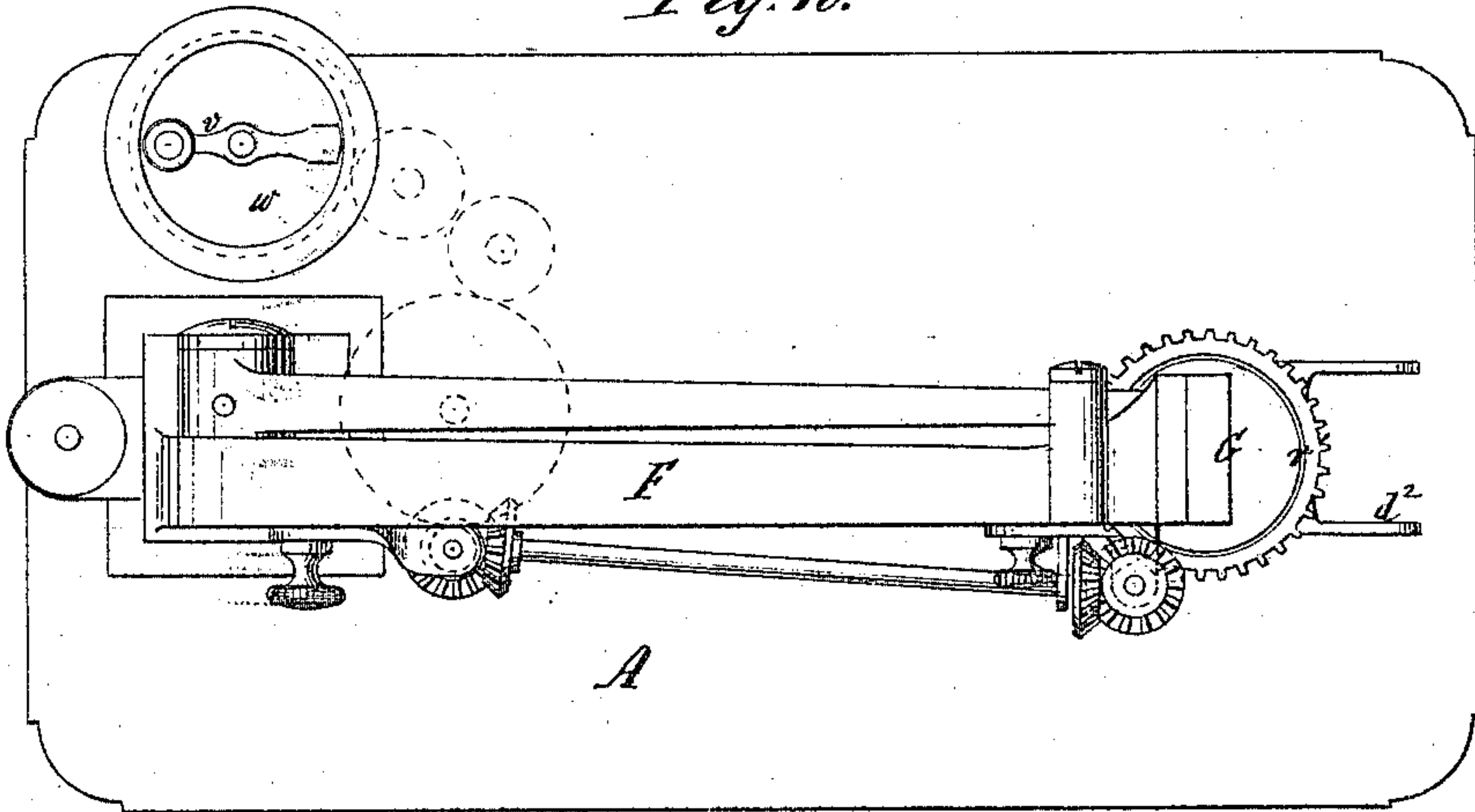


Fig: 11.

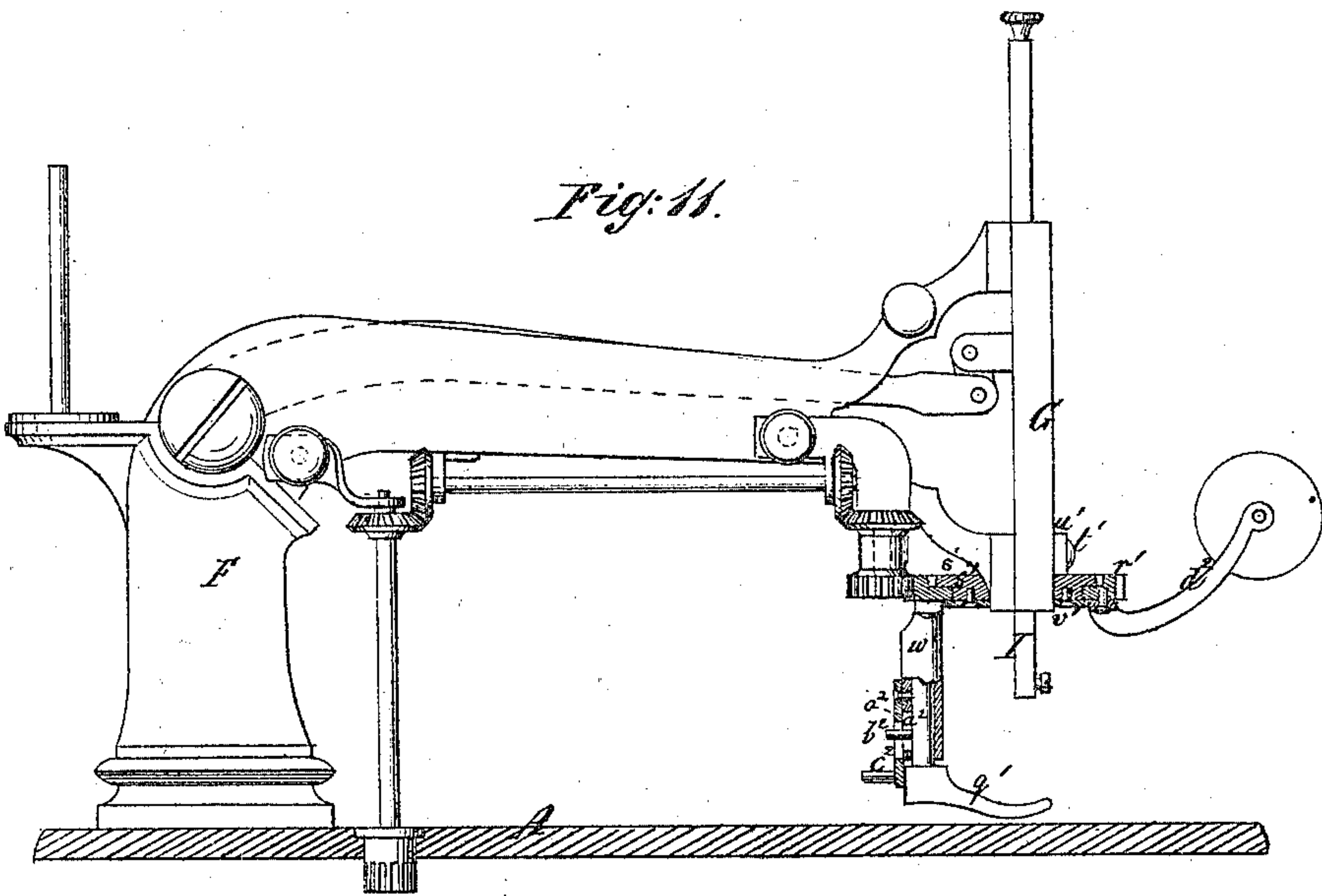
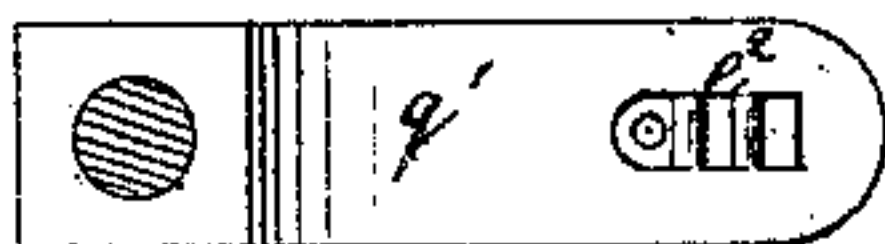


Fig: 12.



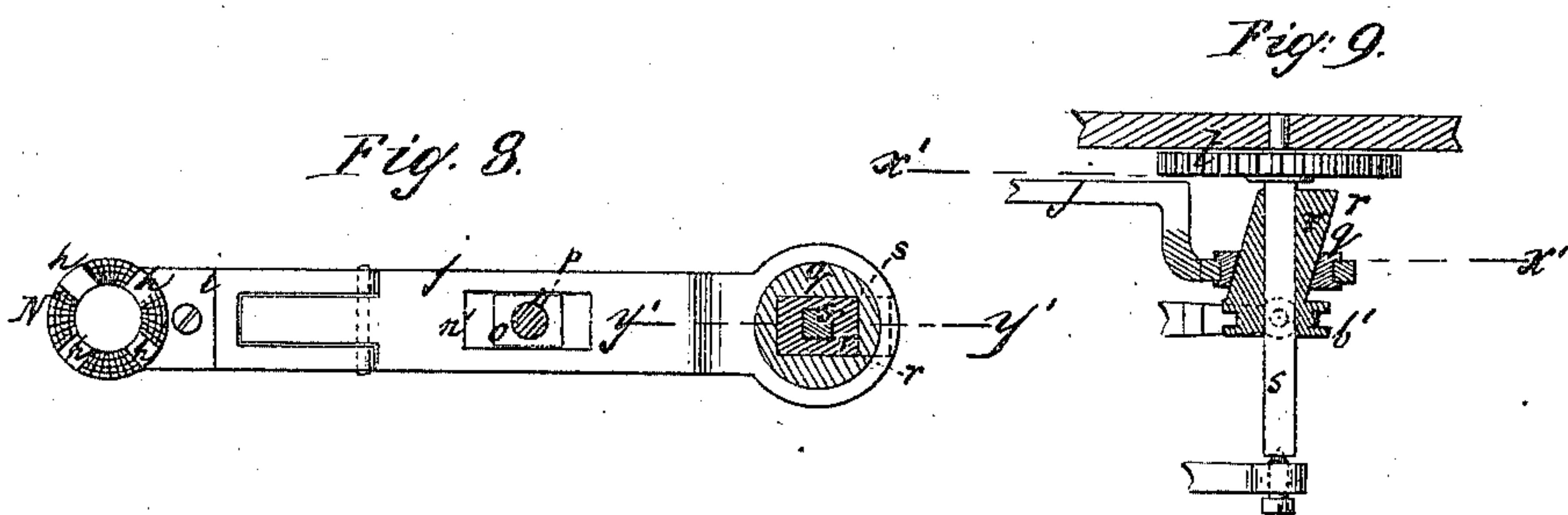
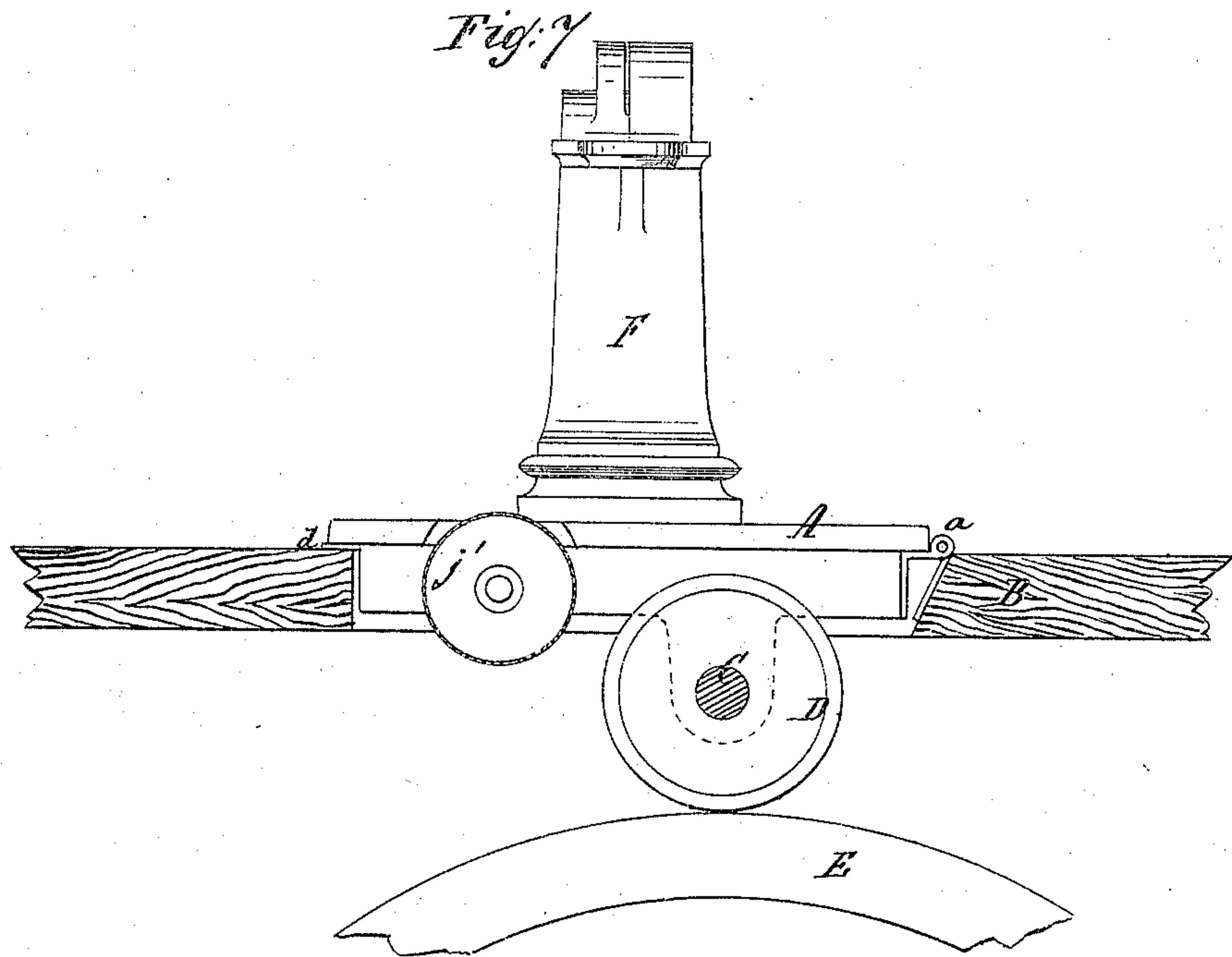
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UNITED STATES PATENT OFFICE.

JOHN L. COLES AND DAVID H. COLES, OF NEW YORK, N. Y.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 134,463, dated December 31, 1872.

To all whom it may concern:

Be it known that we, JOHN LOUIS COLES and DAVID HAMILTON COLES, of the city, county, and State of New York, have invented a new and useful Improvement in Sewing-Machines; and we do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 represents a longitudinal vertical section of our sewing-machine in the plane x , Fig. 3; Fig. 2 is an inverted plan of the same; Fig. 3 is a horizontal section of the same in the plane y , Fig. 1; Fig. 4 is a plan or top view of our universal presser-foot; Figs. 5 and 6 are plans or top views of our double-throated presser foot and universal feed, showing the presser-foot in two different positions; Fig. 7 is a transverse vertical section of our sewing-machine in the plane z , Fig. 1; Fig. 8 is a horizontal section of our feed mechanism in the plane x' , Fig. 9; Fig. 9 is a vertical section of the same in the plane y' , Fig. 8; Fig. 10 is a plan or top view of our sewing-machine when provided with a revolving presser-foot; Fig. 11 is a side view of the same; and Fig. 12 is a plan or top view of the revolving presser-foot as arranged for braiding purposes.

Similar letters indicate corresponding parts.

Our invention consists in a driving-wheel which is mounted on an eccentric pin fastened in the frame of a sewing-machine table, in combination with a friction-wheel secured on the main shaft of the sewing mechanism, and with a cloth-plate which supports said main shaft, and which is connected to the table on one side by hinges, while its other side rests upon elastic pads in such a manner that the friction-wheel is held in contact with the driving-wheel by the weight of the sewing-machine proper, and that by adjusting the eccentric pin of the driving-wheel said contact can be regulated, and a smooth and even motion of the sewing mechanism is obtained; also, in the arrangement of a ring-plate in the inner end of the arm which carries the feed-dog, said ring-plate being provided with a slot to receive an oblique slide feathered on an arbor

and connected to the feed-lever in such a manner that by the feed-lever a reciprocating motion is imparted to the oblique slide, and through it to the feed-dog, while by revolving the feather arbor, the oblique slide together with the ring-plate are caused to turn; and thereby the direction of the feed is changed; also, in combining with the oblique feed-slide a feed-lever, the fulcrum of which is movable, while the bifurcated inner end of said feed-lever engages with a groove in the circular hub of the oblique feed-slide in such a manner that by changing the fulcrum of the feed-lever the throw of the oblique feed-slide is varied, and thereby the feed is increased or decreased without disturbing the action of the oblique slide on the feed-dog; also, in combining with the feed-dog an eccentric button mounted on a lever, which is actuated by an eccentric, and serves to impart to the feed-dog the desired upward movement in such a manner that by turning the eccentric button the position of the feed-dog in relation to the throat-plate of the sewing-machine can be adjusted to suit the material to be sewed; also, in combining with the feed-lever and its adjustable fulcrum an index and scale to show the variation in the feed and the number of stitches to the inch; also, in combining with the oblique feed-slide, the feed-dog, and feed-lever, a handle which moves on a dial fastened to the cloth plate or table, and which is mounted on a shaft that is geared together with the feathered arbor of the oblique feed-slide in such a manner that by turning said handle the position of the oblique feed-slide can be governed and at the same time the direction of the feed can be observed; also, in the arrangement of a presser-foot having the throat or needle-hole in its center, in combination with a feed-dog, acting on the work on two or more opposite sides of the needle, and arranged to feed in different directions; also, in combining with a universal feed a presser-foot, which revolves round the needle-slide, the throat in said presser-foot being situated in line with the axis of its revolution in such a manner that the presser-foot preserves its relation to the feed-dog in whatever direction the feed takes place.

In the drawing, the letter A designates the cloth-plate of a sewing-machine, which is con-

nected to the table B by means of hinge-joints *a*, (best seen in Figs. 2 and 7,) so that the same can be turned down to the position shown in Figs. 1 and 7, or up to the position shown in Fig. 2. From the bottom surface of said cloth-plate project two lugs, *b b*, which form the bearings for the main shaft C. On the outer end of this shaft is mounted a pulley, D, the periphery of which is covered with India rubber, felt, or other strongly-frictional material; and when the cloth-plate is turned down to the position shown in Figs. 1 and 7 said pulley bears upon the circumference of the driving-wheel E, to which a revolving motion can be imparted by foot or any other power. This wheel is mounted on an eccentric stud or axis, *c*, Fig. 1, which is secured in the frame of the table, and which can be turned so as to raise or lower the driving-wheel. The loose edge of the cloth-plate A bears down upon the elastic pads *d* fastened on the table, (see Fig. 7,) and these pads partly support the weight of the cloth-plate and of the parts attached thereto, and thereby the pressure holding the friction-wheel D in contact with the driving-wheel is reduced; but the frictional contact between these two wheels is finally regulated by adjusting the eccentric axis of the driving-wheel, and by these means the motion of the sewing mechanism can be rendered smooth and even. If the frictional contact between the two wheels exceeds the proper limit, and a quick motion is imparted to the driving-wheel, the motion of the sewing mechanism is trembling and unsteady; and if the frictional contact between the two wheels is below the required limit the sewing mechanism is liable to stop. From the cloth-plate A rises an arm or standard, F, on the outer end of which is secured a plate, G, that forms the guide for the needle-bar and the presser-bar I. On the main shaft C are mounted a cam, J, (see Fig. 1,) which imparts motion to the needle-bar, and a crank, K, which imparts motion to the shuttle-driver L. In the cloth-plate A is secured the throat-plate M, and in this throat-plate is an aperture, *e*, through which works the feed-dog N. (See Figs. 3 and 8.) This feed-dog is so formed that it acts on the work on two or more opposite sides of the needle; and, in fact, it is, by preference, made circular, as shown, the aperture *e* in the throat-plate being round, while the throat *f*, which is situated in the center of said aperture, is supported by four radial arms, *g*, (see Fig. 3,) the aperture *e* being of larger diameter than the feed-dog so as to permit the latter to move in either direction a sufficient distance to impart to the work the required feed-motion; while the surface of the feed-dog is provided with recesses *h* to make room for the radial arms *g* of the aperture *e*. The feed-dog N is supported by a shank, *i*, which is hinged to an arm, *j*, (see Fig. 8,) and on which acts a spring, *k*, Figs. 1 and 2, that serves to depress said shank upon a button, *l*, which is secured to a lever, *m*. This lever bears down upon an eccentric or cam, *n*,

mounted on the main shaft, and as this shaft revolves a rising-and-falling motion is imparted to the feed-dog. The button *l* is eccentric, and by turning it on its pivot the feed-dog can be made to project more or less above the surface of the throat-plate, and its position can thus be regulated to suit the nature of the work. A detached view of the button *l* and lever *m* is shown in Fig. 1*. The button is by preference made hexagonal, but it can be made round, or in any other desirable form or shape suitable for the purpose, and it is fastened to its lever by a set-screw, so that it can be readily adjusted in the desired position. The arm *j* is made with an oblong slot, *n**, Figs. 2 and 8, into which is fitted a square block, *o*, that is held in position by a screw, *p*, being free, however, to turn on said screw. The inner end of said arm forms a circular socket, into which is fitted a ring-plate, *q*, (best seen in Fig. 8,) and through this ring-plate extends an oblique cam, *r*, which is feathered on an arbor, *s*, so that it can slide thereon, but is compelled to turn with said arbor. The cam *r* is flat and square, so that it slides through the ring-plate with ease and facility, and that if it is turned the ring-plate will be turned with it. A staple or strap, *j°*, supports the arm *j* near the oblique cam. The arbor *s* is connected by gear-wheels *t* (best seen in Fig. 2) with an arbor, *u*, on which is mounted a handle, *v*, (see Figs. 1 and 3,) which moves over a dial-plate, *w*, secured in the cloth-plate, so that by turning the handle the arbor *s* together with the arm *r* are revolved. In the dial are a series of holes, *a¹*, Fig. 3, and the handle is hinged to the arbor and subjected to the action of a spring, which depresses the tail end thereof. In this tail end is secured a pin, which can be made to engage with one of the holes *a¹* so as to prevent the arbor *s* from turning spontaneously. In order to disengage said pin the front end of the handle must be depressed. The oblique cam *r* is provided with a circular hub, *b¹*, (see Figs. 1, 2, and 9,) and this hub is furnished with an annular groove to engage with the tips of screws *c¹*, which are fastened in the bifurcated end of the feed-lever O. By this arrangement the oblique cam can be turned freely in either direction without getting disengaged from the feed-lever. This lever is provided with an oblong slot, *d¹*, into which is fitted a square block, *e¹*, that is secured to a slide, *f¹*, by means of a screw, *g¹*, so that the block can turn freely on the screw, and so that it can also be moved in the slot *d¹*. The slide *f¹* is fitted in a guide-slot (see Fig. 1**) provided for it in a bracket, *h¹*, which extends from the under surface of the cloth-plate, and the screw *g¹* connects, by means of a rod, *i¹*, with a screw, *j¹*, which is tapped in the end of said rod and journaled in the rim of the cloth-plate, (see Fig. 2,) so that by turning said screw the slide *f¹* is turned toward and from the oblique cam, and by thus changing the distance of the fulcrum of the feed-lever from the oblique cam the stroke of

said cam and consequently the length of the stitches are changed, as will be presently more fully explained. From the end of the rod i' extends an index, k' , through a slot in the cloth-plate, and as the screw j' is turned this index traverses over a scale, l' , marked on the base of the standard or arm F, (see Fig. 1,) said scale being so arranged that it indicates the number of stitches to the inch. The outer end of the feed-lever is connected, by a pivot, l^* , to a slide, m' , which moves in a guide-slot, n' , in the bracket h' , and from which extends a roller-stud that engages with a grooved cam, o' , mounted on the main shaft C, Figs. 1 and 1**.

When the main shaft is revolved, therefore, an oscillating motion is imparted to the feed-lever, and the oblique cam assumes a reciprocating motion on its arbor. By this reciprocating motion of the oblique cam a reciprocating or an oscillating motion is imparted to the arm j , and this motion is transmitted to the feed-dog, so that the cam feeds the work in a direction which depends upon the position of the oblique cam. At the same time when the feed-dog moves forward it is raised by the cam n so that it acts on the work, but when the feed-dog recedes it is depressed by its own weight, assisted by the spring k , so that it releases the work.

From this description it will be readily understood that the amount of the feed depends upon the stroke of the oblique cam, which is regulated by the position of the fulcrum of the feed-lever; and, furthermore, by turning the oblique cam the work can be fed in any desired direction. The direction in which the work is fed, therefore, is entirely under the control of the operator, and by turning the handle v the direction of the feed can be changed at any moment.

The presser-foot p' , which is used in ordinary sewing, is, by preference, made circular, (see Fig. 4,) to correspond to the circular shape of the feed-dog and of the aperture e in the throat-plate. This presser-foot has its throat or needle hole in the center, and it is made circular, so that it bears on the work on both sides of the needle, whatever the direction of the feed.

For certain classes of work, however, a presser-foot, p^o , is used, (see Figs. 5 and 6,) which is provided with two throats, q^o $q^{o'}$. This presser-foot is secured to the presser-bar I by means of a set-screw, r^o , and it is secured to its shank, (see Fig. 6*,) so that it can be reversed and brought in either of the positions shown in Figs. 5 and 6, the bottom surface of the shank of the presser-foot being inclined to throw the working end of the foot down and the tail end up. On the shank of the foot is a button, s^o , which serves to lock said foot in the required position. By referring to Figs. 5 and 6 it will be seen that the presser-foot bears on the work on opposite sides of its throat, and consequently on opposite sides of the needle, and thereby such an operation as,

for instance, that of sewing a millinery fold upon the skirt of a dress, is materially facilitated. This will be readily understood by referring to Fig. 5*. If the fold t^o is brought under the presser-foot, set as shown in Fig. 5, one edge thereof can be sewed on while the main body of the foot bears upon the fold, but if the skirt is moved out so as to bring the other edge of the fold under the needle the presser-foot bears upon the fold only close to its edge, and the operation of sewing is rendered difficult, and with an ordinary presser-foot the fold can be sewed on successfully only by reversing the skirt, which takes time and sometimes is difficult to perform. But by reversing the presser-foot to the position shown in Fig. 6 the second edge of the fold can be sewed on without reversing the skirt. Instead of making the presser-foot reversible, as shown in Figs. 5, 6, and 6*, it can be provided with two throats on its opposite edges, and in this case it is fitted to its shank so that it can be moved from one side to the other a sufficient distance to bring either one or the other throat under the needle. In this case the form of the double-throated presser-foot will be such as shown in Fig. 7*. In order to use this double-throated presser-foot with success it is necessary that the feed-dog shall act on the work on two or more opposite sides of the needle.

If it is desirable to expose the work close to the points, where it is pierced by the needle, a presser-foot, q' , may be used in combination with the universal feed, such as shown in Fig. 11. This presser-foot is secured to the rim of a gear-wheel, r' , which is fitted to the lower rounded portion of the front plate G so that it can turn freely on the same. For this purpose a disk, s' , is secured to the front plate by means of a screw, t' , which passes through a lug, u' , rising from said disk. The lower part of the disk is reduced in diameter so as to form a shoulder, against which is placed the rim of the gear-wheel r' ; and a plate, v' , which is secured to the lower surface of the disk s' by means of screws, prevents the gear-wheel from dropping off. The wheel r' is geared with the arbor s of the oblique cam by a series of wheels and shafts, as is clearly shown in Figs. 10 and 11, so that by revolving said arbor the presser-foot q' is turned round and caused to preserve its position in relation to the direction in which the feed-dog acts. The shank of the presser-foot q' is fitted into a tubular guide, w' , fastened to the rim of the gear-wheel, and which is provided with a slot, a^2 , through which extends a pin, b^2 , that is secured in the shank of the presser-foot and exposed to the action of a cam-lever, c^2 , while a spring acting on the upper end of the shank of the presser-foot has a tendency to depress the same. By turning the cam-lever the presser-foot is raised in the same manner as presser-feet of ordinary sewing-machines. To the gear-wheel r' is also secured a spool-carrier, d^2 , by preference in a position diametrically opposite to the presser-foot q' . In this

spool-carrier is placed a spool containing braid, and in this case the presser-foot is provided with a braid-guide, e^2 , (see Fig. 12,) so that the braid, after being passed through said braid-guide, comes under the point of the needle. By connecting the spool-carrier and the presser-foot to the wheel r' both said parts preserve their relation to the direction in which the feed-dog acts, and as the direction of the feed can be changed at will and at any moment a braid or other article of a similar nature can be sewed on a garment or other article in any desired direction, or to suit a drawing or pattern of any description.

What we claim as new, and desire to secure by Letters Patent, is—

1. The combination of a driving-wheel mounted on an eccentric pin with a friction-wheel mounted on the main shaft of an organized sewing mechanism, and with a cloth-plate which supports the main shaft, and is connected to the table of the machine on one side by hinges, while its other side bears down upon elastic pads, substantially in the manner and for the purpose herein shown and described.

2. The feeding-dog having a ring-plate at its inner end, when combined with the oblique feed-actuating cam feathered on a rotary arbor and operated by the feed-lever, substantially as described.

3. In combination, the feed-lever having an adjustable fulcrum, and connected with and operating the oblique feed-actuating cam-slide, substantially as described.

4. The combination, with the feed-dog, of an eccentric button mounted on a lever, which is actuated by an eccentric and imparts to the feed-dog the desired upward movement, said button serving to adjust the feed-dog in relation to the surface of the throat-plate, substantially as set forth.

5. The combination, with the feed-lever and its adjustable fulcrum, of an index and scale to show the variation in the feed, substantially as described.

6. In combination with the oblique feed-actuating slide, the feed-dog, and feed-lever, a handle which moves on a suitable dial, and is mounted on a shaft that is geared with the feathered arbor of the oblique feed-slide, substantially as and for the purpose herein set forth.

7. The combination of a presser-foot having a central throat or needle-hole with a feeding-surface arranged below the cloth-bed and acting on the work on two or more opposite sides of the needle, and arranged to feed in different directions, substantially as described.

8. In combination with a universal under-feed, as described, a presser-foot, which revolves round the needle-slide, the throat in the presser-foot being situated in line with the axis of its revolution, substantially as and for the purpose described.

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