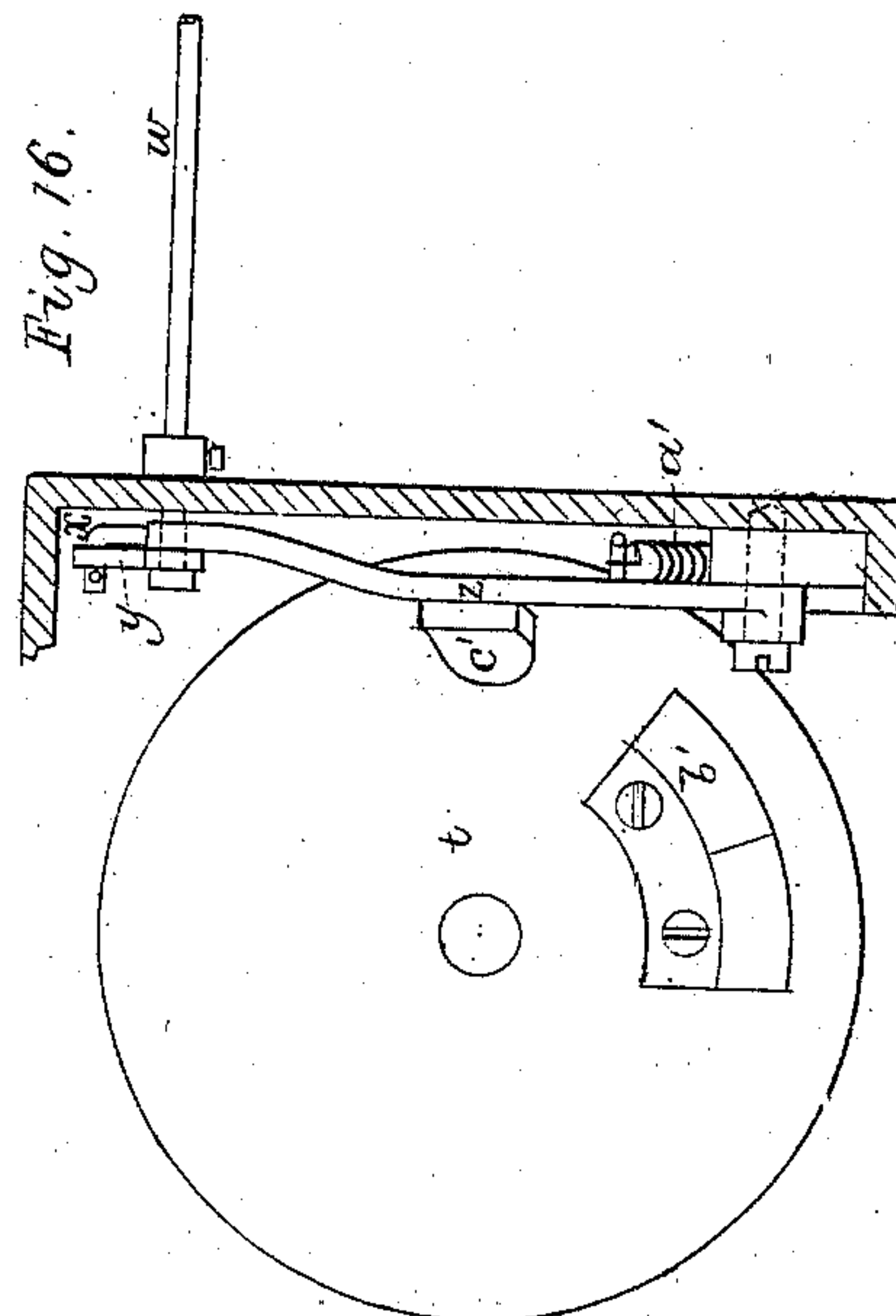
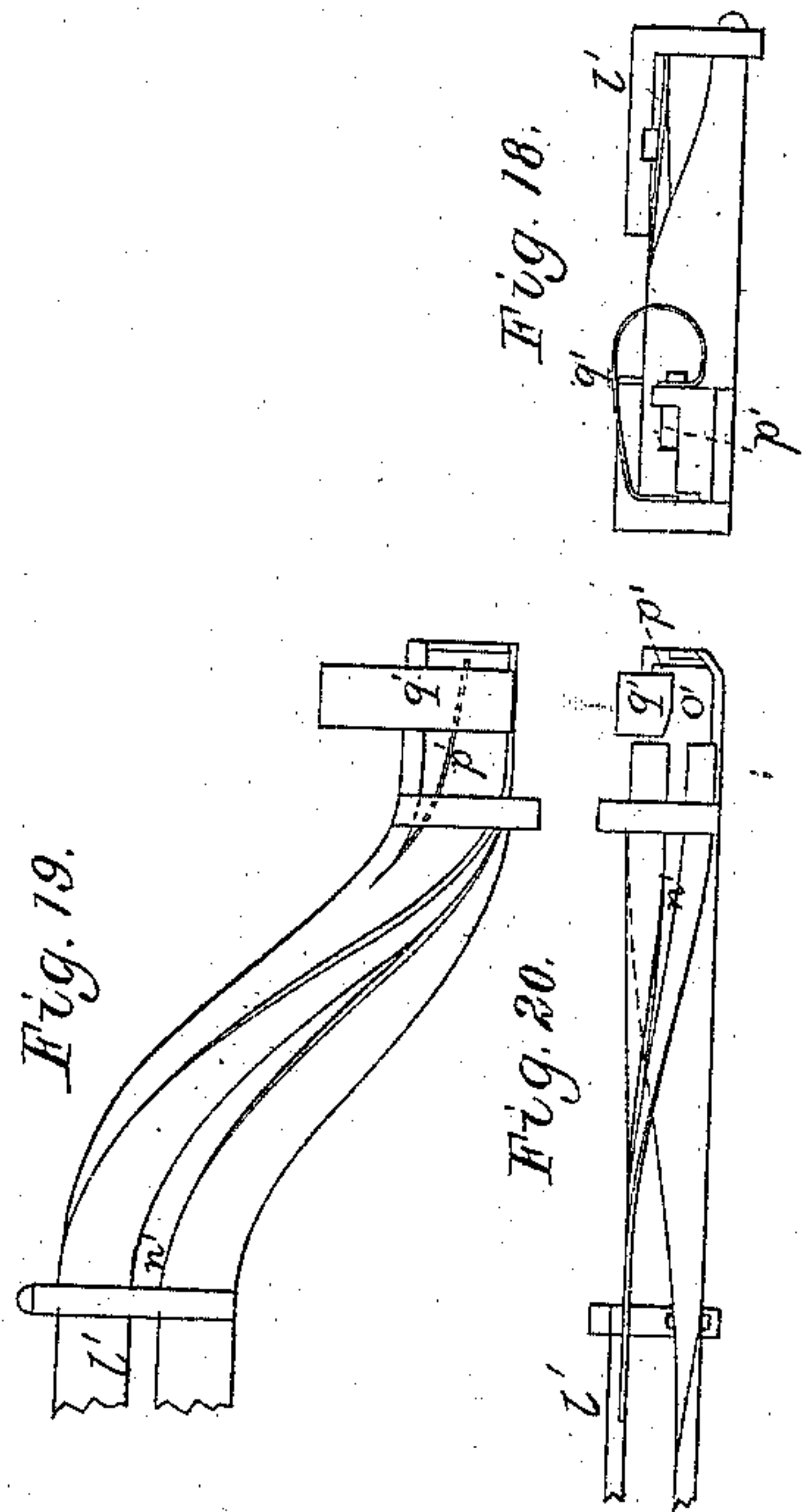
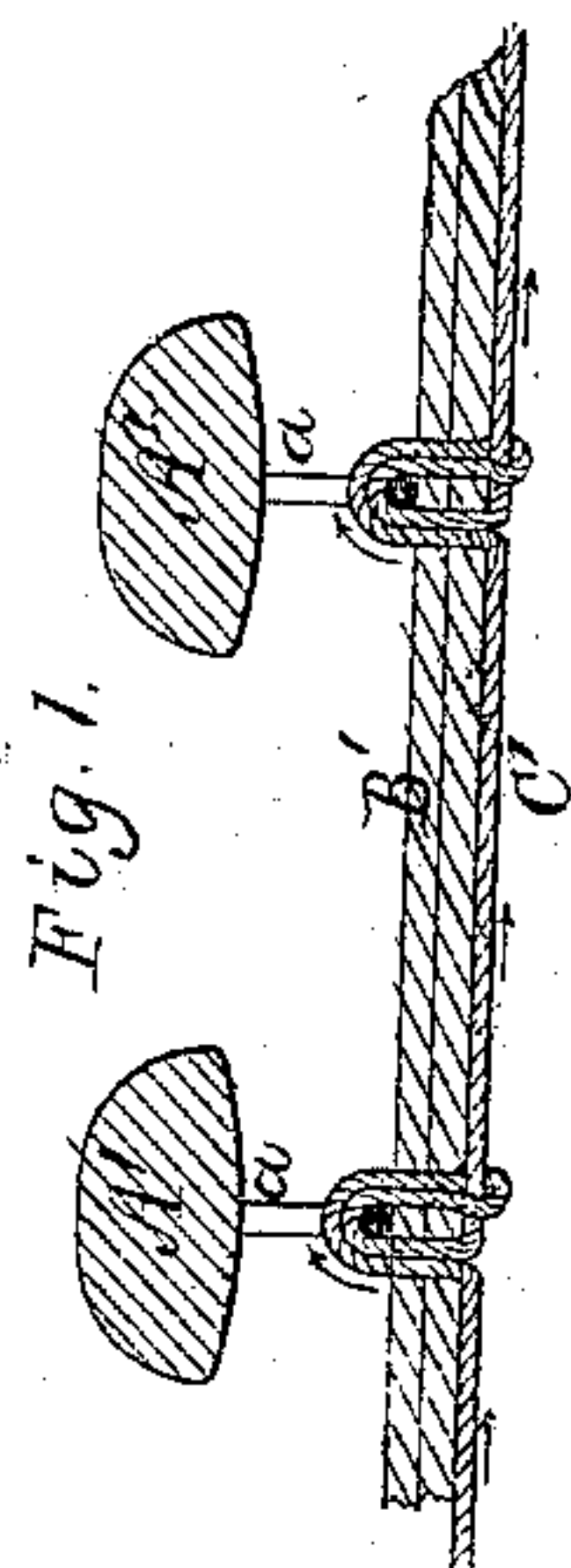


J. MATHISON.

MACHINE FOR AND METHOD OF SEWING BUTTONS TO CLOTH, &c.
No. 252,117.

Patented Jan. 10, 1882.



Witnesses

S. N. Piper
E. B. Pratt

Inventor.

Joseph Mathison.

by R. H. Eddy atty.

(No Model.)

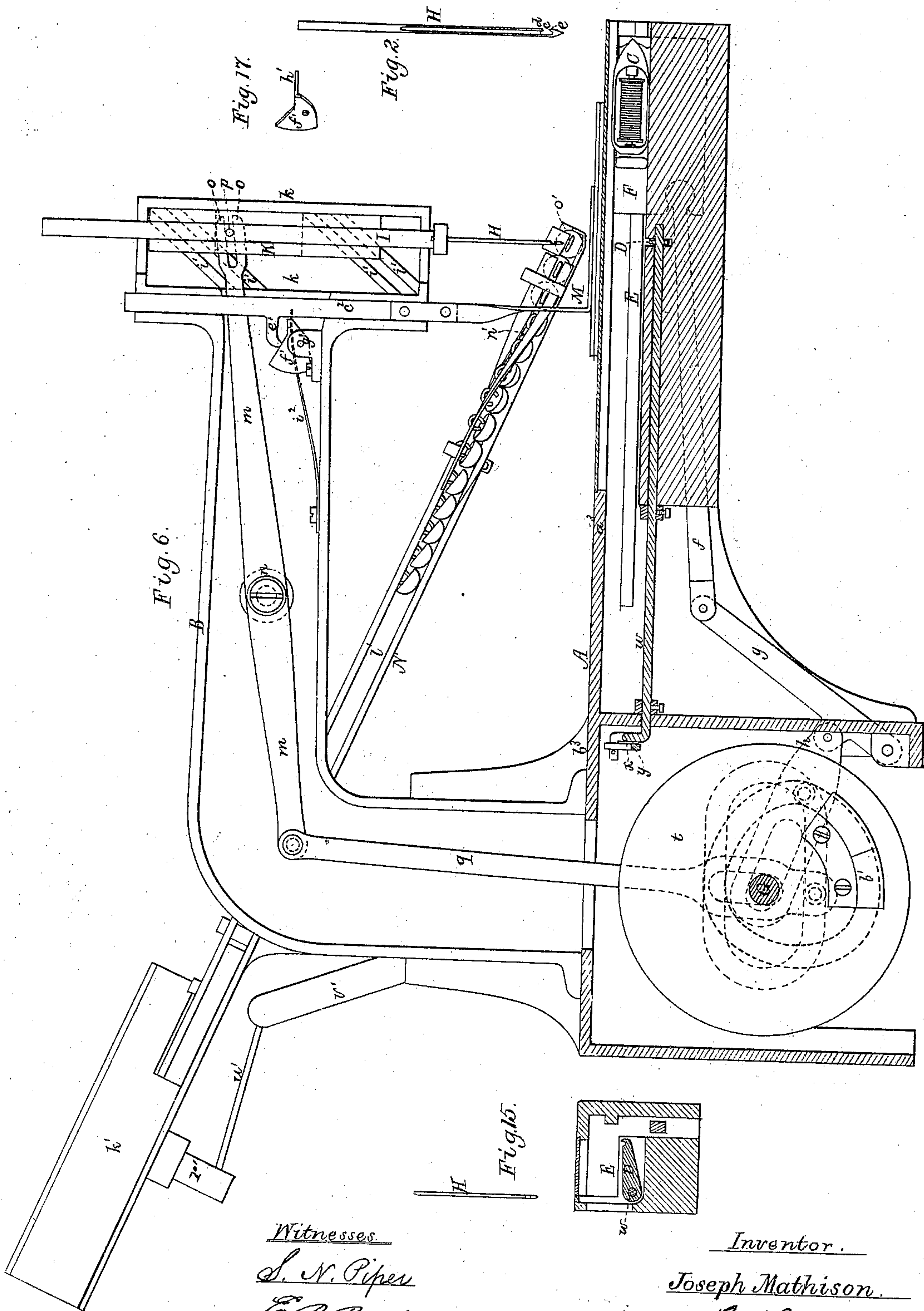
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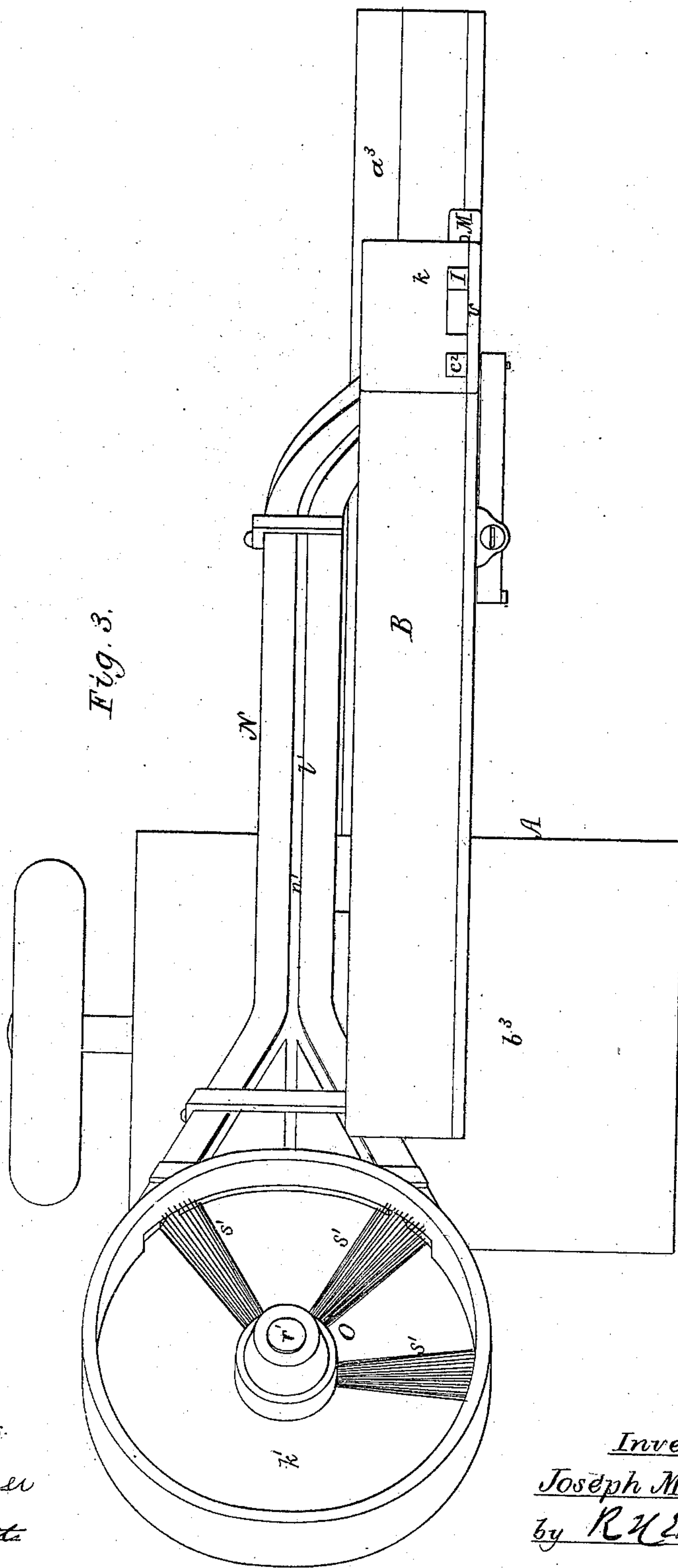
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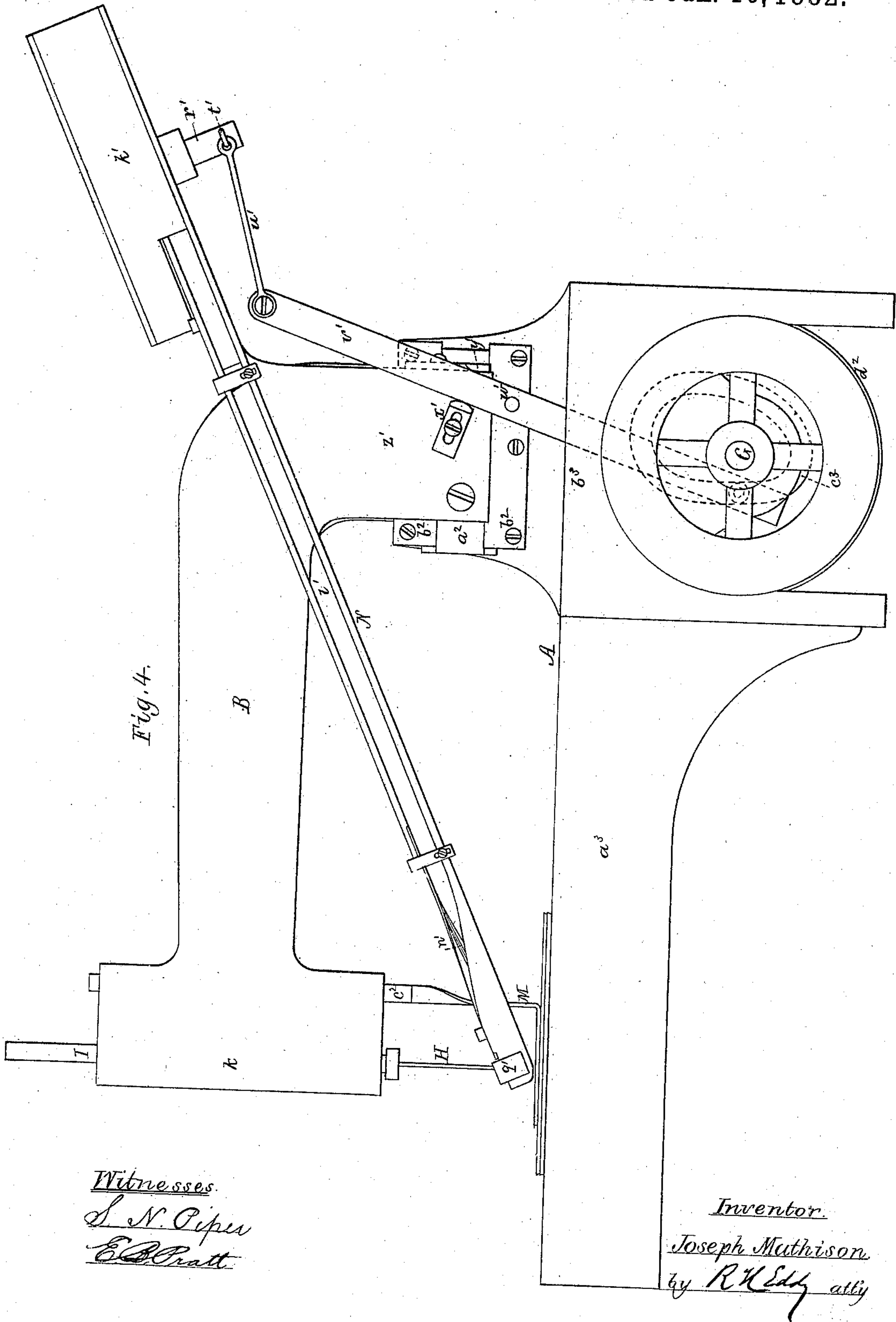
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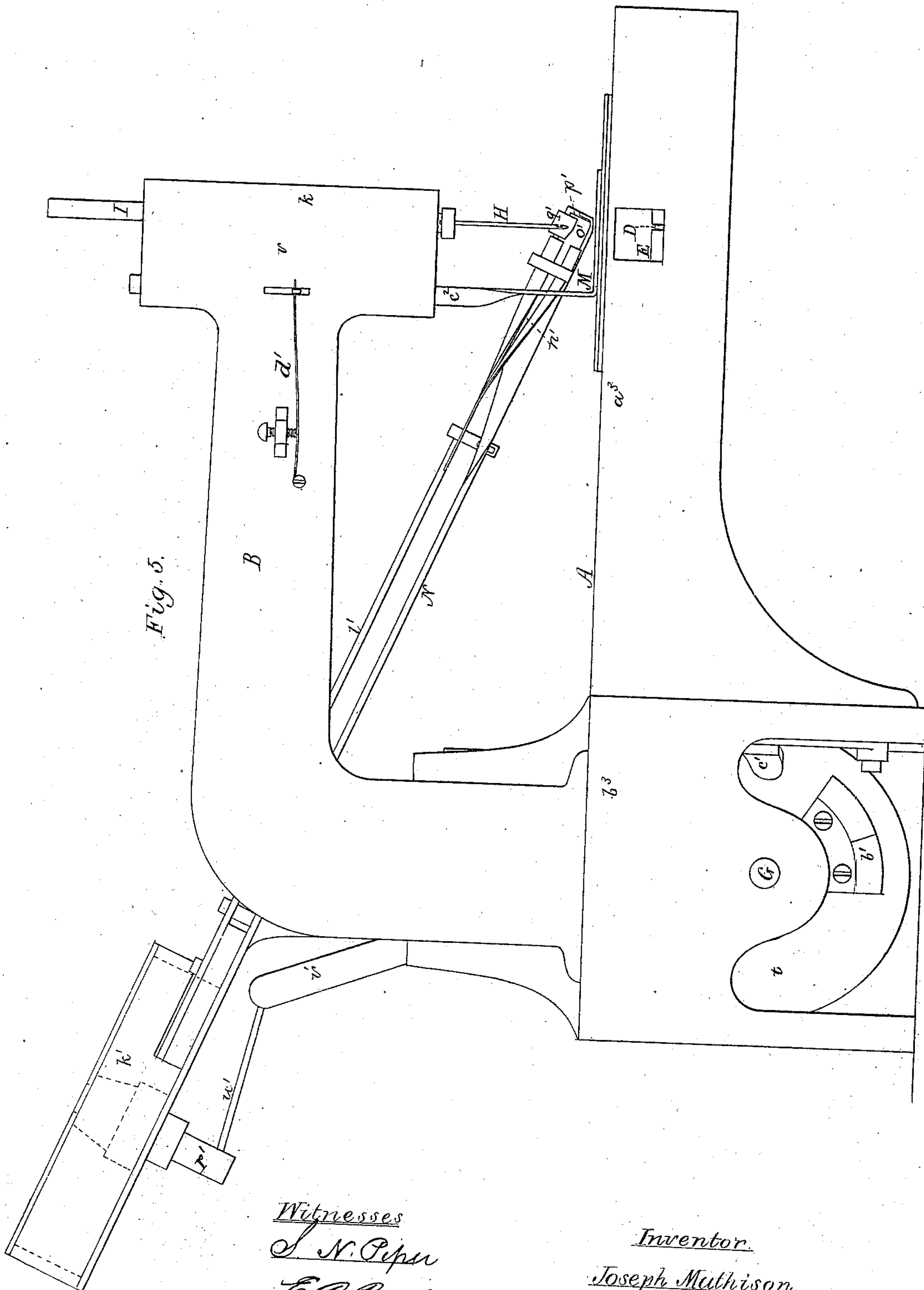
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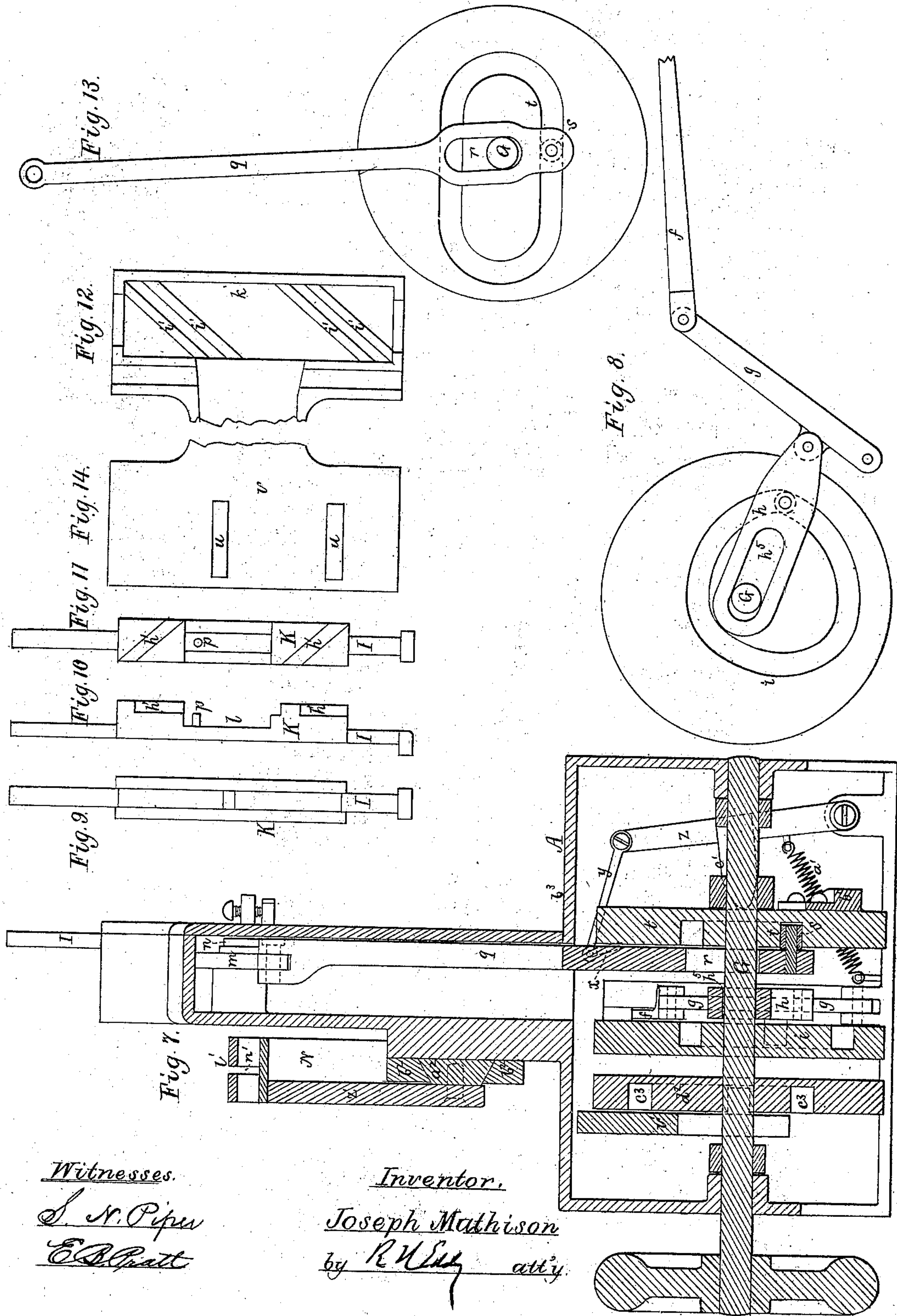
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UNITED STATES PATENT OFFICE.

JOSEPH MATHISON, OF LYNN, ASSIGNOR TO HIMSELF, CHARLES B. LANCASTER, OF BOSTON, AND WILLIAM D. ALLEN, OF LYNN, MASS.

MACHINE FOR AND METHOD OF SEWING BUTTONS TO CLOTH, &c.

SPECIFICATION forming part of Letters Patent No. 252,117, dated January 10, 1882.

Application filed November 12, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH MATHISON, of Lynn, of the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Mechanism for and Method of Sewing Buttons to Cloth or other Material; and I do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

Figure 1 denotes a section of a piece of sheet material and two buttons connected thereto by sewing, as performed by the mechanism hereinafter described. In such Fig. 1, A^1 A^2 denote two buttons, and B' a piece of leather or cloth, while C' is the thread used in connecting such buttons to the said piece. Each button has an eye, a . In making the button-connection stitch the thread is first drawn, in the form of a loop, by the rise of the needle, up through the piece B' . Next the loop is passed through the eye of the button A^1 and thence down through the piece B' . Next the thread is carried through the loop or part thereof below the piece and drawn tightly by the shuttle, so as to confine the button to the piece. By the same movement the thread is led forward to the position for the next button, A^2 , to receive it. The connection-stitch of this second as well as each succeeding button of the set is to be made in the same manner as that for the first button.

From the above it will be seen that by my process one thread only is used in fastening the buttons to the cloth and that each button is secured by a loop of such thread carried twice through the cloth and once through the button-eye; also, that the loop is secured in place by passing the same thread through it. The arrows in the drawings represent the course of the thread in forming the said connection-stitch, which is a locked stitch. It differs materially from a chain-stitch formed by a series of loops each of which goes through that next it. In this machine the sewing is performed by means of a needle and a shuttle, the latter carrying a bobbin on which the thread used in making the stitch is wound. The needle, a side view of which is given in Fig. 2, has an eye, c , open through the side and provided with two barbs or hooks, d e , arranged as represented.

Fig. 3 is a top view, and Figs. 4 and 5 oppo-

site side elevations, of the machine. Fig. 6 is a longitudinal section, showing mechanism within the goose-neck and shuttle-race. Fig. 7 is a transverse section, taken longitudinally through the driving-shaft of the machine. The remaining figures are hereinafter explained.

My invention consists in the peculiar method of securing buttons to cloth or other material and in the peculiar construction, as hereinafter described, of a machine for sewing buttons on cloth or leather, whereby the buttons are fed in an improved manner to the needle and their attachment effected by the loop of a single thread in a locked stitch; also, in the mechanisms for operating the shuttle-driver for feeding the work, for guiding and turning the buttons, and releasing them from the feeder when they are secured to the fabric or leather, all as hereinafter more specifically set forth.

In the drawings of the said machine, A denotes the base portion, and B the goose-neck, of the machine, the shuttle C and thread-guide D and their operative mechanisms being within such base, while the needle and the presser bars and their actuating devices are arranged mostly in the goose-neck.

The base is composed of a hollow arm, a^3 , and its supporting-table b^3 , the arm being extended from the table and directly underneath the goose-neck, in manner as represented. In this arm is the shuttle-race, shuttle driver, and the thread-guide. By means of the arm a shoe-upper to have buttons fixed to it can readily be supported, the arm being within the upper while the latter may be in the act of being sewed.

The shuttle-race is shown at E and the shuttle-driver at F . The latter is to move rectilinearly in the race. From the driver F an arm, f , jointed thereto, extends rearward and is jointed to the upper end of a lever, g , fulcrumed to the base and jointed to an arm, h . The said arm h has a slot, h^5 , through which the driving-shaft extends, and is provided with a stud to extend into the groove of a cam, i , fixed on the driving-shaft G , such shaft being arranged in the base in manner as represented. Fig. 8 is a view of the said described mechanism for operating the shuttle-driver or imparting to it its intermittent reciprocating motions as may be required to throw the shuttle through each loop in succession.

The needle is shown at H as projecting down from a carrier or bar, I. This bar slides vertically in a feeder, K. Fig. 9 is a front view, Fig. 10 a side view, and Fig. 11 a rear view, of the feeder and the needle-bar. From the feeder two inclined and parallel tongues, *h'*, extend in manner as shown, each of which goes between a pair of such tongues, *i'*, arranged in the head *k* of the goose-neck, in manner as shown in Fig. 12, which is a view of the interior of the said head. Between the two tongues *h'* *h'* the feeder is recessed, as shown at *l*, the bottom of the recess being flush with the back of the needle-bar. A forked lever, *m*, arranged in the goose-neck and to turn on a fulcrum at *n*, projects into the recess and receives between its prongs *o o* a stud, *p*, extending from the needle-bar. An arm, *q*, at its upper end, is jointed to the rear of the lever *m*. This arm has in its lower part a slot, *r*, through which the driving-shaft extends. A stud, *s*, from the arm, enters the groove of a cam, *t*, fixed on the driving-shaft, a rear view of the said arm and cam being shown in Fig. 13. The revolution of the cam *t* will impart, through the rod *q* and lever *m*, vertical movements to the needle-bar I. By reason of the recess *l* in the feeder K it will be seen that said needle-bar is adapted to have a limited vertical movement independent of said feeder. Thus, on the downward movement of the forward end of the lever *m* the needle-bar I will be carried directly down until the end of said lever strikes the end of the recess *l* in the feeder K. By this time the needle will have penetrated the material, and the continued downward movement of the end of the lever will impart a similar movement to the feeder K, in which the needle-bar slides, and as said feeder is confined by the tongues *h'* and *i'* it must of necessity move forward as it moves downward, and this forward movement will be imparted to the needle and thus to the material, feeding the same forward. As the lever *m* commences its return or upward movement the feeder K will remain stationary until the lever has reached the top of the recess *l*, when the needle will have cleared the material, and the continued upward movement of said lever will impart a return or backward movement to the feeder and the needle-bar. The feeder K is held in position, except as it is moved positively by the lever *m*, by the friction-pads *u u* upon the side plate, *v*, of the goose-neck, (see Fig. 14,) said pads being arranged to bear against the side of said feeder.

It will be observed that cam *t* is adapted to impart two strokes to the needle to each stroke of the shuttle, and that one of these strokes will be longer than the other. Thus, when the needle descends to catch the shuttle-thread it will only enter the shuttle-race far enough for this purpose; but when it descends the second time it will go down sufficiently far to permit the shuttle to catch and open the loop of the thread carried by the needle, so as to pass through the same.

It is obvious that as the length of feed de-

pends upon the throw of the needle a short and then a longer feeding movement will take place.

In practice the portion of the cam *t* which imparts the longer downward movement to the needle will be constructed to give the needle the usual "dip," for the purpose of better forming the loop for the shuttle.

Fig. 15 is a transverse section of the base, taken through the thread-guide D. This thread-guide is a hooked eye, as shown, it being projected from a horizontal shaft, *w*, arranged in the base. At its end next the driving-shaft the shaft *w* is provided with an arm, *x*, that is extended up from it, as shown in Fig. 16, which is a view of the mechanism for operating the shaft of the thread-guide.

A link or rod, *y*, jointed to the arm *x*, is also jointed to a lever, *z*, furnished with a spring, *a'*, to draw it toward the cam *t*, on whose side is fixed another cam, *b'*, to work against a projection, *c'*, of the lever *z*. While the cam *b'* is in movement against the said projection, the thread-guide will be raised up so as to force the thread into the eye of the needle and prevent it from escaping therefrom while the needle is rising in the work, after which the thread-guide will be turned down into a horizontal position below the shuttle-race, in order that the shuttle and its driver may pass freely over the thread-guide without obstruction therefrom. As the shuttle passes through the loop at its forward movement at the second descent of the needle the loop becomes spread by the shuttle and freed from the needle, which then rises clear of the thread.

The presser is shown at M as extending from a vertical slide-bar, *c'*, provided with a spring, *d'*, for forcing it downward. From the bar *c'* an ear, *e'*, extends over a cammed lever, *f'*, a perspective view of which is given in Fig. 17. The said cammed lever, arranged as shown, and supported on a fulcrum, *g'*, has its bent arm *h'* extended underneath the lever *m*. A spring, *i'*, fixed to the goose-neck presses the said arm *h'* upward. As the forward arm of the lever *m* may descend it will move the cammed lever *f'* so as to cause the presser to rise in order for the work to be fed along by the needle. The spring *i'* serves to move the cammed lever back to place, while the forward arm of the lever *m* may be rising upward.

The next part of the machine to be described is the button-feeder N. It consists of a cylindrical hopper, *k'*, provided with an inclined chute, *l'*.

Fig. 18 is an end view, Fig. 19 a top view, and Fig. 20 a front view, of the lower part of the chute.

Out of the hopper the buttons are discharged into the chute by one or more passages leading into the chute, each of such passages, as well as the chute, having in its upper side a guide-slot, *n'*, to receive the eyes of the buttons. The chute and its guide-slot at their lower parts are curved down, so as to cause each of the buttons in passing out of the lower

part of the chute to be turned down into a position for the needle in descending to pass through the eye of the button. In the front side of the chute is a port, o' , for the escape of the button. In descending to the bottom of the chute by the force of gravity the button will be moved against springs $p' q'$, arranged as represented, whereby it will be held by them, so as to have its eye extend out of the chute and into the path of the needle. When the work is fed forward the button, having been sewed to it, will be drawn out of the chute or away from the supporting-springs, the upper of which will yield, so as to allow of the escape of the button.

In effecting the attachment of the buttons to a piece of work or cloth the needle first passes down through the eye of a button and into and through the work, and is next moved forward a short distance, so as to feed or move the work along a like distance. At the same time the button-feeder is moved in a like direction a like distance. While the needle is down the thread-guide presses the thread into the open eye of the needle and keeps it there until, during the next rise of the needle, the thread may have been drawn up into the work. The needle, after taking the thread, rises and draws the thread in the form of a loop up through the cloth and the eye of the button. Next the needle is moved or fed back beyond the eye of the button, and is made to descend into the cloth and to force the loop down through the cloth. In thus descending into the cloth the needle is also again moved or fed forward, and feeds the cloth forward a distance for it to receive the next button. The button-feeder is simultaneously moved forward a like distance with the needle. The shuttle is next driven backward through the loop, the needle rising in the meantime and clearing itself from the loop and the cloth or work. The shuttle in going back draws the thread closely into the work and button, the latter, by the draft of the thread, being extracted from the chute. The needle, having risen out of the work, is fed or moved back to its original position, the button-feeder being simultaneously moved back to its original position, in which case another button will be presented to the work for being sewed to it. The button-feeder is never in the plane of the vertical path of the needle, and hence never obstructs its movement.

Within the hopper of the button-feeder is a reciprocating rotary agitator, O , which consists of a spindle, r' , and sundry masses s' of bristles, radiating from it, as represented.

A short arm, t' , projecting from the spindle is connected by a link, w' , with the upper part of a lever, v' , whose fulcrum is a stationary pin, w' . The upper arm of the said lever extends between two ears, $x' y'$, which are projected from a standard, z' , upon whose top the button-feeder is fixed. This standard has a dove-tailed tongue, a^2 , projecting from it between parallel guides $b^2 b^2$, extending from one side of the

goose neck. The lower arm of the lever v' has a stud projecting from it into the groove c^3 of a cam, d^2 , fixed on the driving-shaft. This cam, in revolving, imparts to the lever the movements necessary to effect, by its action against the ears $x' y'$, the afore-described movements of the button-feeder, and also a reciprocating rotary movement of the agitator. This movement of the agitator stirs the buttons in the hopper and facilitates their passage into the chute.

I do not claim any form of stitch as a means of uniting fabrics of any kind; nor do I claim the particular stitch used in my process independently of the mode in which it is formed and applied in my machine for the purpose of uniting buttons to leather or other goods, as hereinbefore set forth; but

What I claim as my invention is as follows:

1. The method of securing buttons to cloth or other material which consists essentially in automatically feeding the buttons from a receptacle to the material, then drawing a loop of thread up through the material and the eye of the button, next forcing the loop down through the material outside of the eye of the button, and then passing the thread through said loop and tightening the stitch by drawing upon the thread passed through said loop, and finally withdrawing the button from the feeding device simultaneously with the operation of tightening the stitch, all substantially as set forth.
2. The mechanism for operating the shuttle-driver, the same consisting of the combination, with the driver F , of the arm f , lever g , slotted arm h , provided with a stud, the cam i , and driving-shaft G , all constructed, arranged, and operating as set forth.
3. The work-feeding device consisting of the combination of the vibrating lever m , the needle H , needle-bar I , feeder K , having tongues h' , head k , having tongues i' , and the side plate, v , having friction-pads $u u$, all constructed, arranged, and operating substantially as described.
4. In combination with the stitch-forming mechanism of a sewing-machine, the chute N , provided with a slotted race turned at its lower end, as described and shown, into a position to present the eye of the button directly under and in the path of the needle, in the manner specified.
5. The combination of the button-feeder N , standard z' , tongue a^2 , guides $b' b^2$, lever v' , link w' , arm t' , spindle r' , and bristles s' , all constructed and operating as and for the purpose set forth.
6. The combination of the springs $p' q'$ with the button feeding chute, provided with the discharge-port o' and the button-eye-guide slot n' , all being arranged as explained.

JOSEPH MATHISON.

Witnesses:

R. H. EDDY,
E. B. PRATT.