

(No Model.)

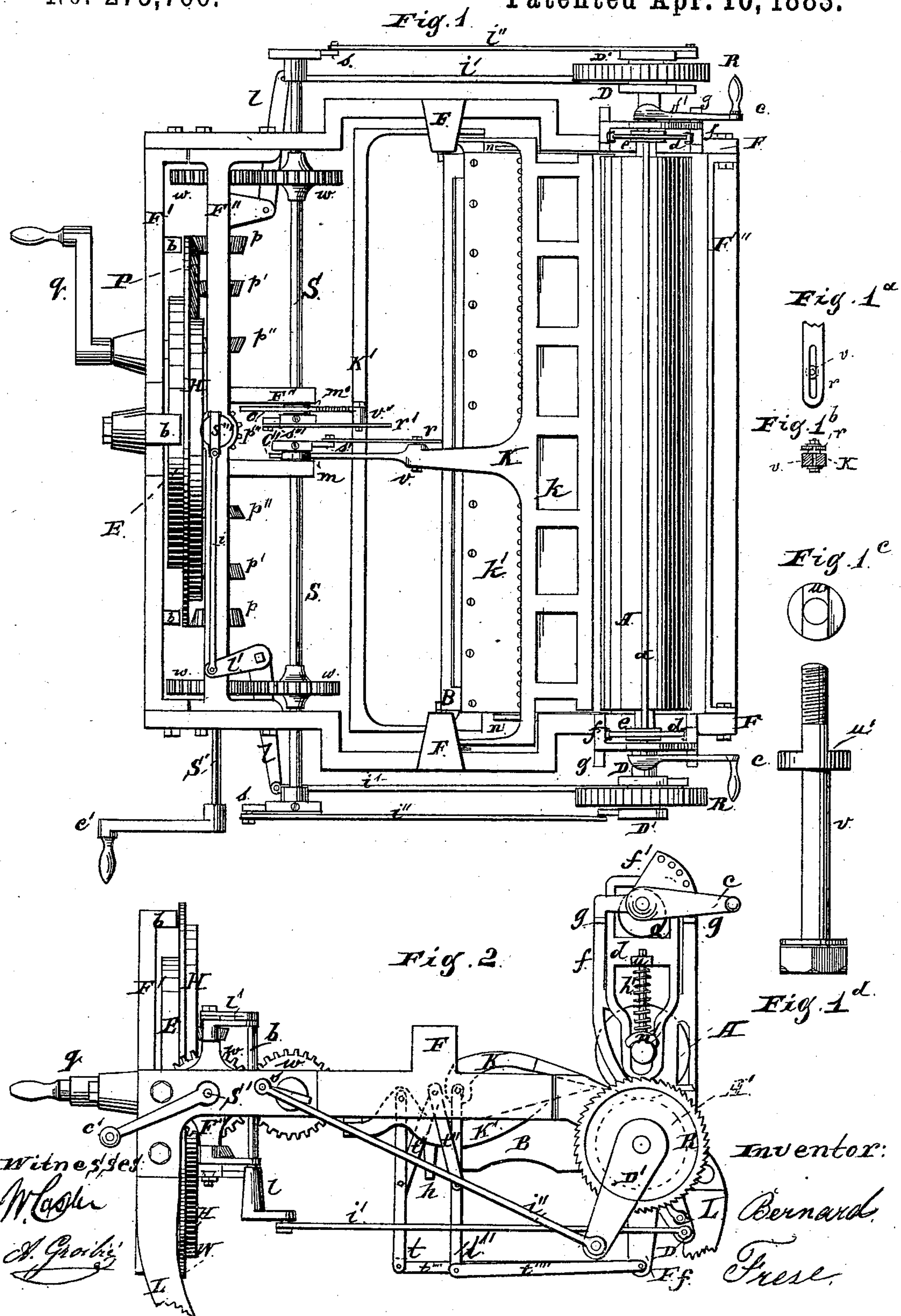
3 Sheets—Sheet 1.

B. FRESE.

PLAITING MACHINE.

No. 275,760.

Patented Apr. 10, 1883.



N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

3 Sheets—Sheet 2.

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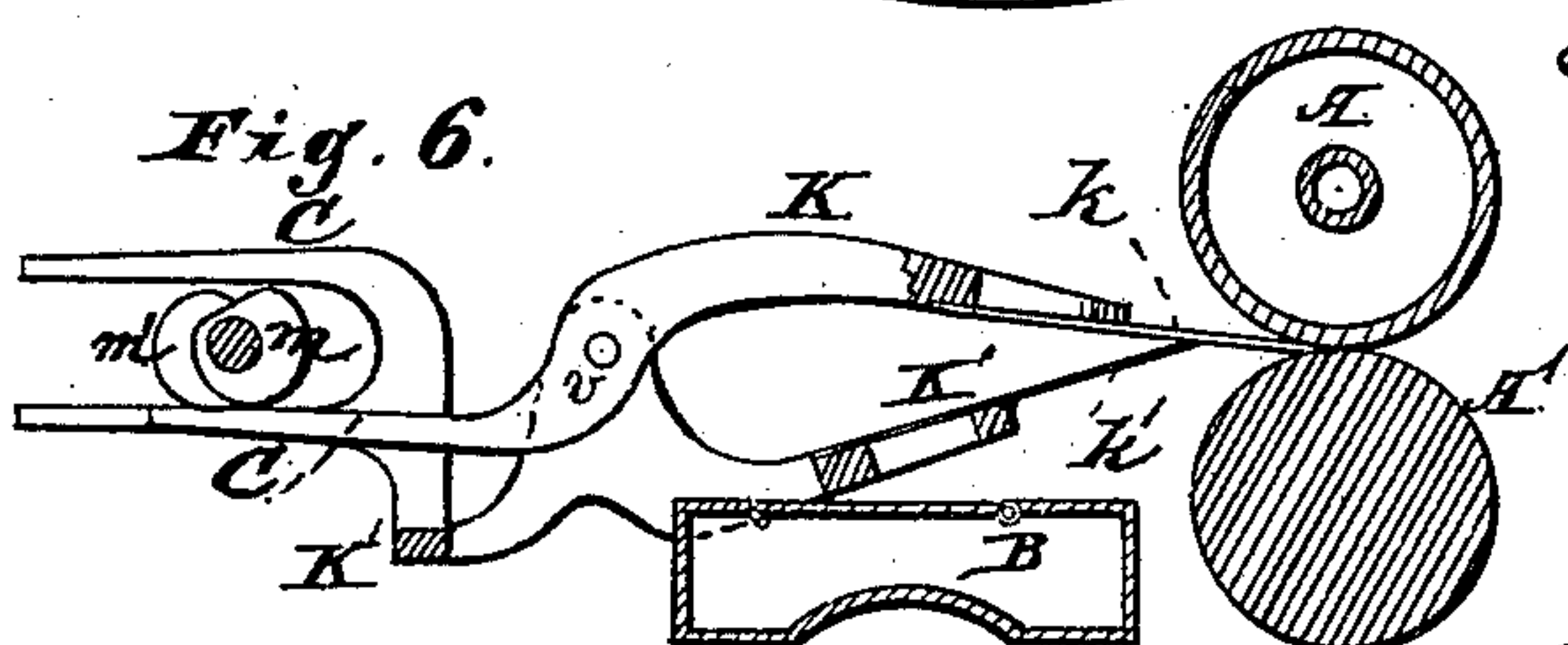
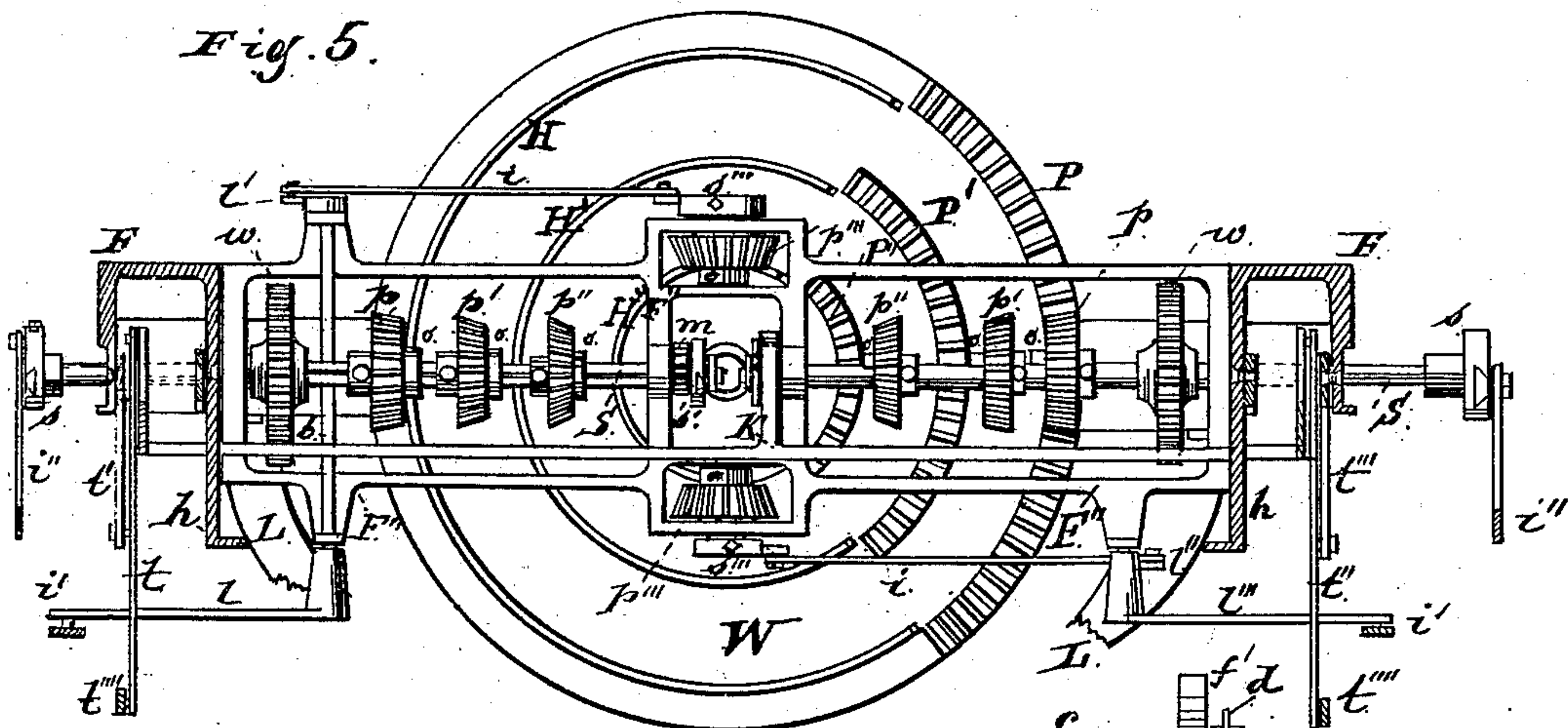
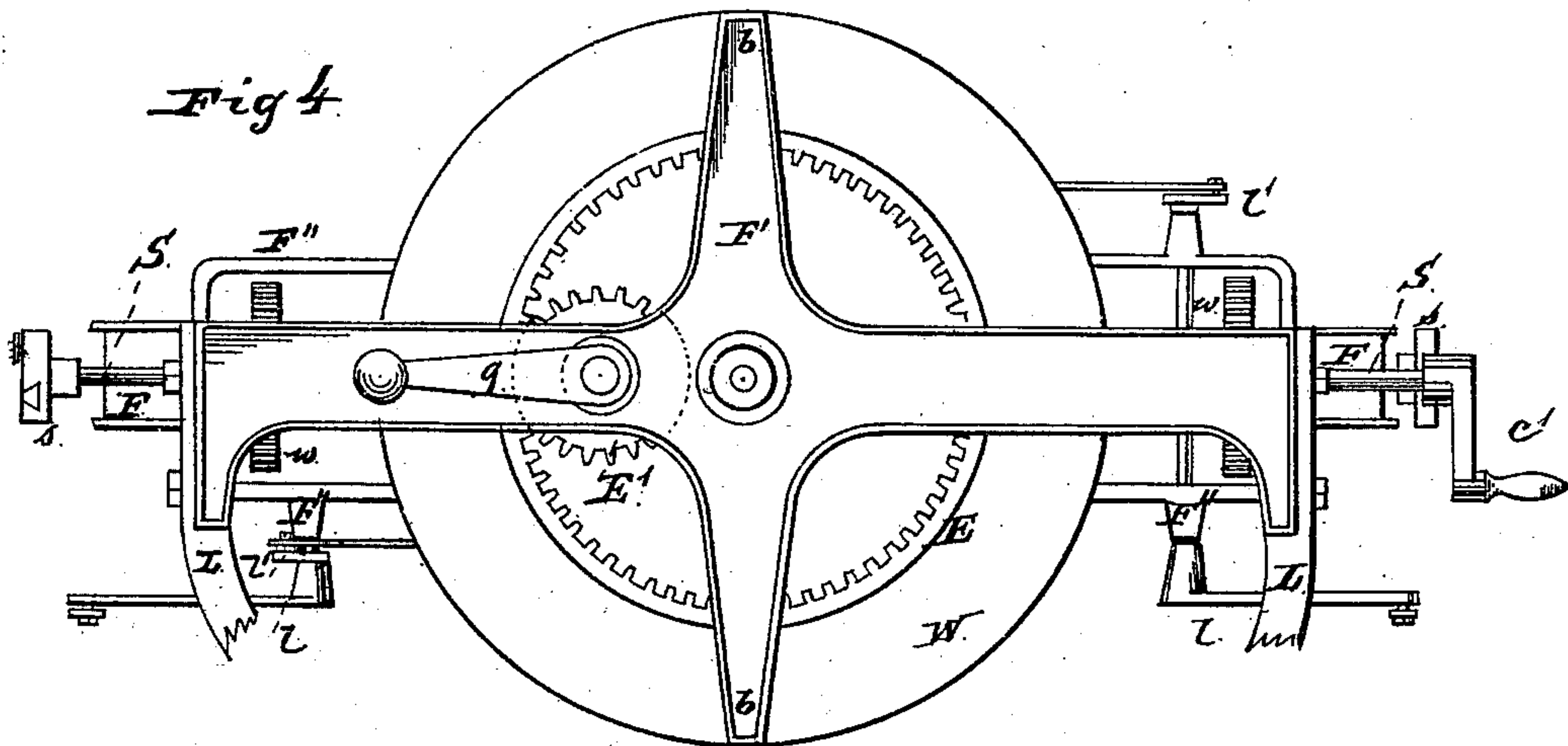
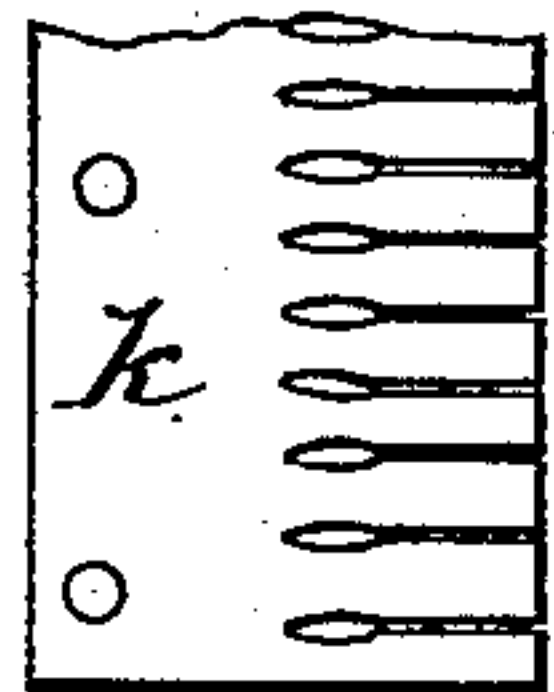


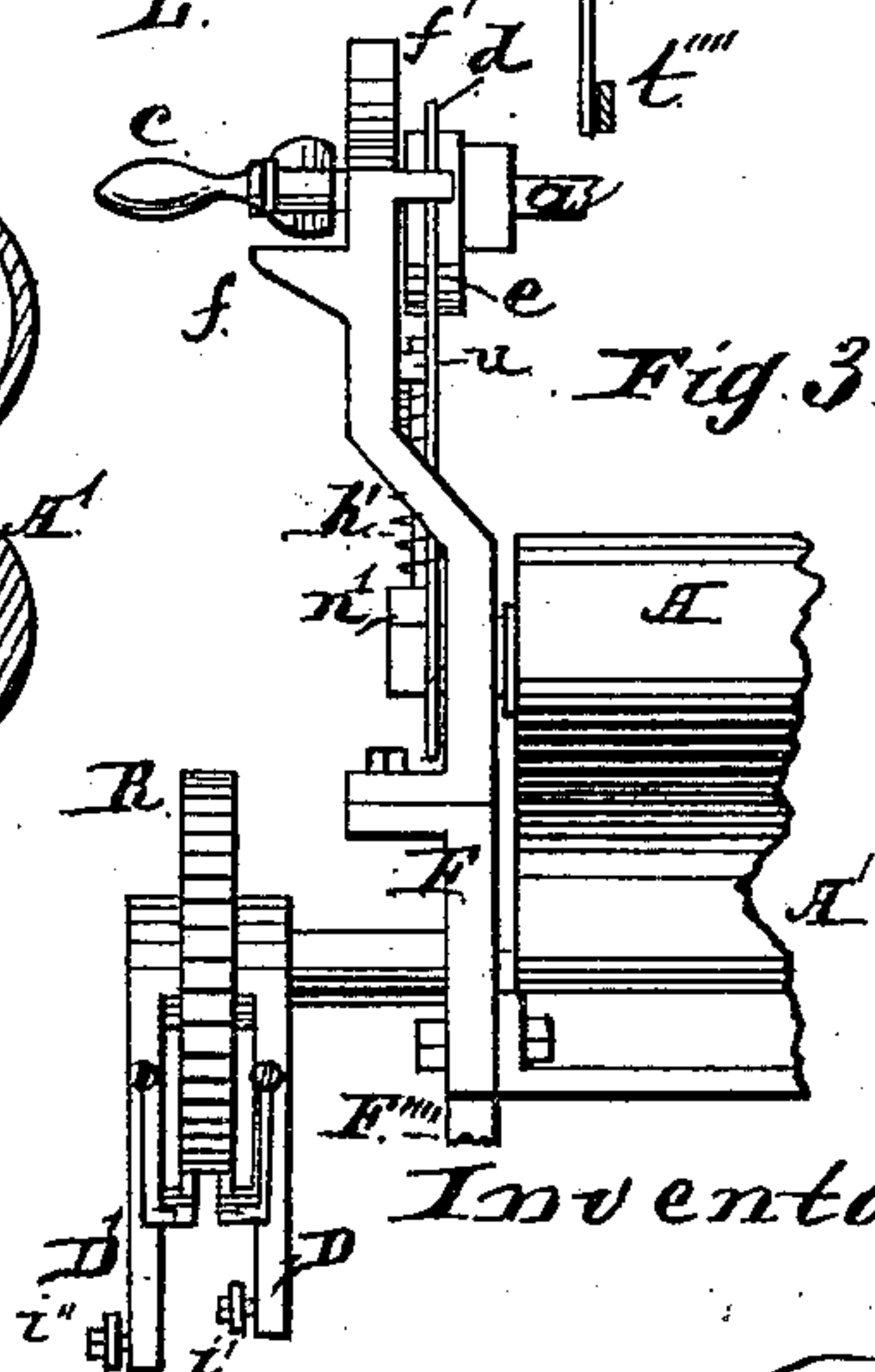
Fig. 7.



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Inventor:

Bernard Frese

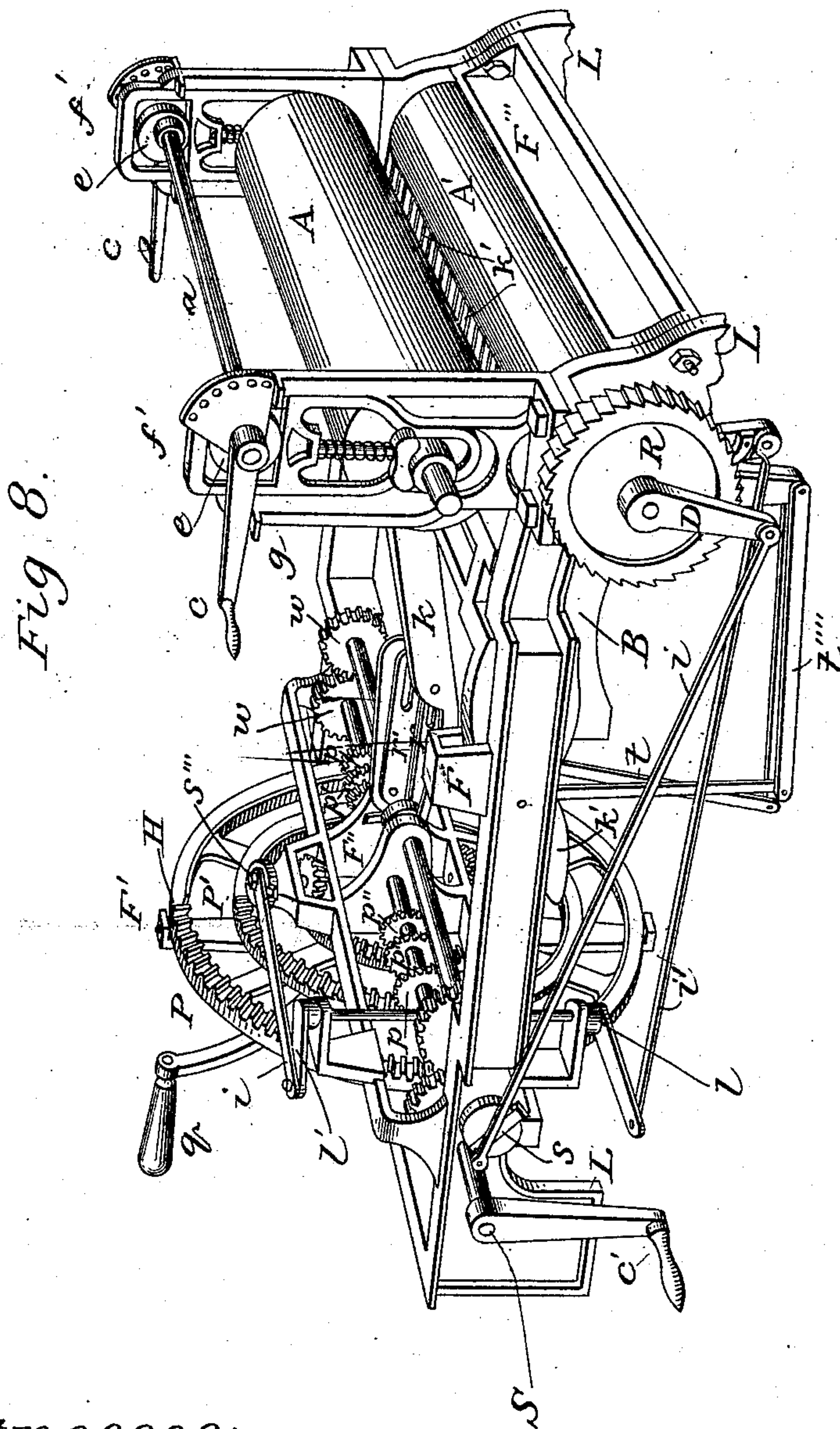
(No Model.)

3 Sheets—Sheet 3.

B. FRESE.
PLAITING MACHINE.

No. 275,760.

Patented Apr. 10, 1883.



Witnesses:
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Inventor:
Bernard Frese.

UNITED STATES PATENT OFFICE.

BERNARD FRESE, OF CHICAGO, ILLINOIS.

PLAITING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 275,760, dated April 10, 1883.

Application filed June 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, BERNARD FRESE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have
5 invented new and useful Improvements in Plaiting-Machines, of which the following is a specification.

My invention relates to improvements in plaiting-machines; and its objects are, first, to
10 provide a plaiting-machine that is quickly and readily adjustable to form one-side plaits as well as single, double, and triple box-plaits of different lap, different cap, different size, and for varying thickness of cloth; second, to pro-
15 vide a central support by which the knife-frames are carried in a straight line without varying their relative angular position; third, to provide convenient and efficient means for quickly raising and lowering the heated roller. I at-
20 tain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a top view of the machine. Fig. 2 is a side view. Fig. 3 is a back view of one side of the same. Fig. 4 is a front view. Fig.
25 5 is a back view of the front part of the same, having the upper knife and the horizontal shafts to which the cranks are attached left out, and showing the sectional parts of the center of the machine. Fig. 6 is a sectional
30 side view of the rollers, knives, knife-frames, cams, and the steam-box of the machine. Fig. 7 is a top view of a broken part of the knife-blades. Fig. 8 is a perspective view of the machine, showing the heating-roller raised and
35 the position of other parts changed to make them appear to view. Figs. 1^a, 1^b, 1^c, and 1^d are explanatory figures of the manner in which the adjustable connecting-rods are fastened to the loose bolts in the knife-frames.

40 Similar letters refer to similar parts throughout the several views.

The side pieces, F F and f f, and cross end pieces, F' and F'', the intermediate frame, F'', and the legs L constitute the frame of the ma-
45 chine, these several parts being fastened together with bolts or screws, as shown. The end piece F' is provided with lugs b, which support the disk or wheel W, that is pivoted on the center of the same. It has also a pinion, E', pivot-
50 ed on it, which has a crank and handle, q, at-
tached to its shaft on the outside of the frame.

On the side of the disk or wheel W facing the frame F' an internal gear, E, engaging with the pinion E', is attached, by means of which latter and the handle q it is revolved. 55
The opposite side of the disk is provided with segments of bevel-gearing P P' P'', extending about one-third of the circle of the wheel, at equal distances from its center. The remain-
60 ing two-thirds of the circle is provided with ribs H H' H'', each of which is placed preferably inside or on a smaller circle than the gear-segment to which it joins, and extends nearly up to the gear-segments, leaving but the space
65 of a tooth of the gear-segment on each end between it and the gear-segments. Each end is shaped like the teeth of the bevel-gear segments. The function of these ribs is to keep the pinions p p' p'' and the shafts S' and S in-
70 termittingly stationary during two-thirds of a revolution of the wheel W. The inner gear-segment, P'', revolves the pinion p'' once, the segment P' revolves the pinion p' twice, and the segment P revolves the pinion p three
75 times.

The frame F'' is fastened between and to the side frames F, but may also be made of one piece with the end piece F'. In this frame are two horizontal shafts, S' S', each having bear-
80 ings on one side in the sides of the frame, and on the other in cross-bars near the center of the same. On each of these shafts three bevel-pinions, p p' p'', are fastened by means of set-screws projecting with their conical points in a longitudinal groove on the shafts, and on
85 the sides which have bearings in the sides of the frame a wheel, w, is fastened on each, and on an extension of one of them a crank and handle, c', is removably attached. The cen-
90 tral part of the frame F'' also supports two vertical revolving shafts, on each of which a pinion, p''', and a guide-piece for the sliding cranks s''', the former being fastened between the bearings and the latter on the outside, are
95 attached. Each of the wheels w gears with a wheel of like diameter on the shafts S S. The latter have bearings on their outer ends in the side frames F, and on their inner ends in ex-
100 tensions of the frame F'', and both extend through and beyond their bearings on each end. On their outer ends the sliding cranks s s and their holders and on the inner ends

the cams m m' , also provided with sliding cranks s' s'' , are fastened. On the opposite end of the machine, next to the end piece F''' , the roller A' is supported in bearings in the side pieces F F , through which its shaft, having the ratchets R R attached, extends on both sides. Pivoted loosely on each side of each of the ratchets are the levers D D D' D' , each carrying a pawl that engages with the ratchets.

In the frames f f , which are fastened on the side pieces F , Fig. 3, the yokes d d , having a vertical slot at their lower end, which receives the shaft of the upper roller, A , and a horizontal opening at their upper ends to receive the eccentrics e e , slide vertically in guides on the frames. The shaft of the roller A also fits in a vertical slot in the frames f f . Caps n n , having a pin guided in a hole in the projections u on the yokes d attached, press on the shaft of the roller A by the action of coil-springs h' . A small shaft, a , extending through both frames f f , is pivoted in the center of the upper part thereof, on the outside of which cranks and handles c c are attached, and inside of the frames on the same the eccentrics e e are fastened. Two projections, g g , on the frames f prevent the cranks c c from being turned more than one half-revolution. The eccentrics e e are fastened on the shaft a at right angles to the cranks c c , so that when the cranks rest on one or the other of the projections g g the eccentrics present their dead-center to the sliding yokes d d . A segmental extension, f' , on the frames f f , perforated with holes near its periphery, is provided to give more or less tension to the springs h' h' by placing a pin in one or the other of them. By turning the cranks c in one direction the yokes d are moved downward by the eccentrics e e , causing the projections u u to press on the springs h' h' , which, by pressing on the caps n' n' , that bear on the roller A , cause the latter to be pressed on the roller A' . The vertical slot at the lower end of the yokes, embracing the shaft of the roller, permits the downward movement of the yokes. By turning the crank in the opposite direction the bottom of the vertical slot will come in contact with the shaft of the roller A , and will lift it out of contact with the roller A' .

The side pieces F F are formed so as to leave a recess for the accommodation of the sides and supporting-bars of the knife-frames K K' . At or about the center of this recess an angular extension, h , forms an arch, under which the sides of the knife-frames move, and to the inner sides of which the supporting-bars t' and t''' are pivoted, one on the outer part and one on the extension h .

To the frames K K' the blades k k' are fastened with screws. The upper frame, K , has an extension, C' , near its center, to which the slotted connecting-rod r is pivoted by the bolt v , and which passes under and bears on the under side of the cam m . Its supporting side extensions terminate at half the distance from the edge of the blades to the end of the extension C' .

The supporting sides of the lower knife-frame, K' , extend beyond their central support, and are connected by a cross-bar, which forms an opening in the same through which the cloth operated upon is passed. A fork, C , extending from near the center of the cross-bar, embraces the cam m' , and the slotted connecting-rod r' , bound to the bolt v' , connects the frame with the slide or extensible crank s'' .

The bolts v v' (shown enlarged in Figs. 1^a and 1^b, and in detail and section in Figs. 1^a and 1^b) have a flattened part, w' , which slides in the slot of the connecting-rods r r' , and prevents the bolts from revolving when the nut that binds the two together is tightened or loosened.

Pivoted in supports extending from one side of the frame F'' and fastened to a connecting-bar, b , the levers l and l' make connection with the upper pinion, p''' , and the adjustable crank s''' on the same with the lever D , by means of the connecting-rods i and i' , and pivoted on an extension on the opposite side of the frame F'' the connected levers l'' l''' make connection from the lower pinion, p''' , with the corresponding lever, D , on the opposite side by means of like rods, i i' . The levers D' are connected to the adjustable slides or cranks s s on the outside ends of the shafts S S , and each carries a pawl, that engages with the ratchets R R , corresponding with the one shown on lever D . The bar or double link t'' is pivoted at its upper end to the side extension of the knife-frame K , and at its lower end to one of the horizontal links t''' , which is pivoted at its opposite end to the extension F f of the side pieces, F . At the center of the link t'' the link t''' is pivoted, the upper end of which is pivoted to the inside of the frame F , thus supporting the frame K and causing the same, when vibrated, to move in a straight line by the well-known adjusting movements of the bars t'' and t''' . The double link t is pivoted to the side of the knife-frame K' at its upper end, and has the link t' pivoted to its center, and the latter has its upper end pivoted to the inside of the extension h . The lower end of the bar t is connected to the extension F f by another horizontal bar, t'''' . The opposite sides of the frames K and K' are supported in like manner.

B is a steam-box resting on points on the projections h and similar points on the inner sides of the frames F , which are not shown. Its cover (which is not shown) extends upward, but does not touch the lower knife-frame, K' .

The operations and the adjustments necessary to form the different kinds of plaits herebefore named are as follows:

To form a one-side plait, the crank q is turned to the right until a rib on the wheel is passed under the projections on one of the pinions on the shaft S' on the side having no crank attached; the projection or an equivalent flattened side of the hub o then rests loosely on the face of the rib and prevents the shaft S' from turning. The position of the crank on the inner end of the shaft S , to which the lower knife-frame is connected, will then

be forward, and the edge of the knife-blade is then being held close to the juncture of the rollers A' A. The blade *k'* thus forms a plate on which the cloth rests and is picked up from by the upper blade, *k*. The pinions *p p'* 5 *p''* on the shaft carrying the crank *c'* are moved back sufficient to not come in contact with the ribs H or gear-segments P, and are clamped to the shaft by the set-screws in their hubs. The crank *c'* can then be turned without interference from the pinions, which have no function to perform in one-side plaiting. The shafts S and S', being geared together by the wheels *w w*, will both be revolved by turning the crank *c'*. The movable crank *s* on the outside, being connected to the rocking lever D' by the connecting-rod *i''*, intermittently revolves the rollers A' and A—the former by means of the ratchet on its shaft and the pawl 10 on the lever, and the latter by its adhesion to the former—and causes the rollers to take up, press, and carry the folded cloth forward and between them. The movable cranks *s'* on the inner end of the shaft S, being connected to the knife-frame K, reciprocates the latter. The cam *m*, by depressing the extension C' at the end of each forward movement of the knife, causes the edge of the blade *k* to be lifted out of contact with the blade *k'* and the cloth resting on it, while the knife is moved backward and allows the same to bear on the cloth while the knife is moved forward, the front part of the centrally-pivoted frame being heaviest. The lower knife-frame, K', 15 is balanced by the cross-bar at its rear end, and is moved in and out of contact with the upper knife-blade by the cam *m'* and the forked extension C.

To adjust the machine to form plaits of a certain size, the cloth may be first inserted between the knives, the set-screw holding the adjustable crank *s'* and the nut binding the slotted connecting-rod *r'* are then loosened, and the edge of the knife *k* caused to pick up the cloth on the lower knife and moved forward as far as a gentle pressure will permit while the rollers are in contact. The sliding crank *s'*, (as well as *s s' s'' s''' s''''*), having scale-marks to indicate the throw of the cranks, is moved to the desired mark and bound by the set-screw. The crank *o'* is next turned to cause the crank *s'* to be placed in its most forward position, and while the frame K is being pressed forward slightly the nut on the bolt *v* is tightened. The lower knife is adjusted for the size of obverse plaits in the same manner. 20

To change the amount of lap of a plait, the movable cranks *ss* are given more or less throw, whereby the distance the cloth is carried forward by the roller after each formation of a plait is varied. The relative angular position of the two cranks on each of the shafts S governs the time at which the roller commences to feed or carry the formed plaits forward, which it must commence to do before the knife has ceased to move forward in order to avoid the cutting of the cloth while the knife-edge 25

presses the fold between the roller. When thus set the machine is ready to form plaits accurately in goods of the most delicate texture, and likewise the coarsest, and the manner in which the knives pick up the goods and carry them one on the other without changing the angle of the edge enables me to form plaits in silks and satins, as well as other fabrics, more accurately than has been done heretofore in an automatic machine. In forming box-plaits the crank *c'* is preferably removed, as it is not made use of. 30

To set and adjust the machine to form box-plaits, the wheel W is revolved, so that the ribs H will project either above or below both pinion-shafts, and the pair of pinions (one of each shaft) desired to be used is moved up, so that the projections *o* ride on the ribs. 35

To insure the fastening of the pinions in the proper places for correct gearing, holes are drilled in the proper place in the grooves on the shafts and countersunk sufficiently to cause the pinions to be moved to place by the set-screws being screwed in or projected in the countersinks. The pinions not made use of are fastened at a place where they cannot interfere with the wheel. The pinions *p''* are revolved once by the segment P'', the pinions *p'* twice by the segment P', and the pinions *p* three times by the segment P. The diametrical opposition of the shafts S' S' and the segments extending to but one-third the diameter of the wheel permits the pinions *p'''* to make more than one half-revolution before the segments P will actuate the pinions on the opposite shaft, thus affording sufficient interval for the cranks *s'''* to move the roller, while the knife-actuating pinions are stationary, one half-revolution of the pinions *p'''* being required to cause the retrograde movement of the levers D and *l l'* and connecting-rods *i i'*. By turning the crank *q* the wheel W is set in motion, and the pinions *p* are consecutively revolved by the latter. A pinion on one of the horizontal shafts first causes the formation of one or a set of obverse plaits to be formed. One of the pinions *p'''* is next revolved, causing the formed plaits to be carried forward between the rollers the desired distance for the cap of a box-plait. The pinion on the opposite horizontal shaft is next revolved, causing the formation of one or a set of reverse plaits, and the pinion *p'''* opposite the former pinion, *p'''*, causes the cloth to be carried between and through the rollers the desired distance for the space between each box-plait or each set of obverse and reverse plaits. By the movable cranks *s'''*, I am enabled to vary the width of the cap and the distance between a box-plait without altering the size and lap of the plaits, and am thus enabled to form a box-plait having a minimum lap, and having the plaits closely adjoining each other. To form a single, double, or triple box-plait, the respective pinions *p'' p''*, *p' p'*, or *p p* are moved in place. It will be seen that an irregular box-plait may be formed by fastening a pinion on 40 45 50 55 60 65

one shaft to gear with a different gear-segment than the pinion on the other.

To raise or lower the heated roller A, the crank *c* is turned to the right or left, and by this arrangement I furnish convenient and efficient means for doing so quickly and avoiding the risk of marking fabrics by allowing them to remain too long in contact with a heated roller when a disturbance of any kind necessitates temporary cessation of operation.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a plaiting-machine, a wheel or disk, W, having one or more bevel-gear segments, P, and ribs H, adjoining the same on a circle, either in or outside of the gear-circle, arranged to intermittently revolve pinions *p*, and pro-

vided with means for propelling the same, substantially as described and shown. 20

2. The combination of the rod *a*, crank *c*, eccentrics *e e*, vertical sliding yokes *d d*, and the rollers A A', substantially as and for the purpose set forth and described.

3. The combination of the rod *a*, crank or cranks *c*, eccentrics *e e*, yokes *d d*, caps *n'*, springs *h*, and the rollers A A', substantially as and for the purpose specified. 25

4. In combination with the knife-frames K, the linked supporting-bars *t t' t'''*, for the purpose herein described. 30

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Witnesses:

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