

5 Sheets—Sheet 1.

MACHINE FOR PLANING THE FOLDED EDGES OF HAT BRIMS.

Patented July 24, 1888.



Philip F. Larner.
Howell Bartlett.

Inventor:
Rudolf Hickemeyer,
By *Wm. Wood*
Attorney.

(No Model.)

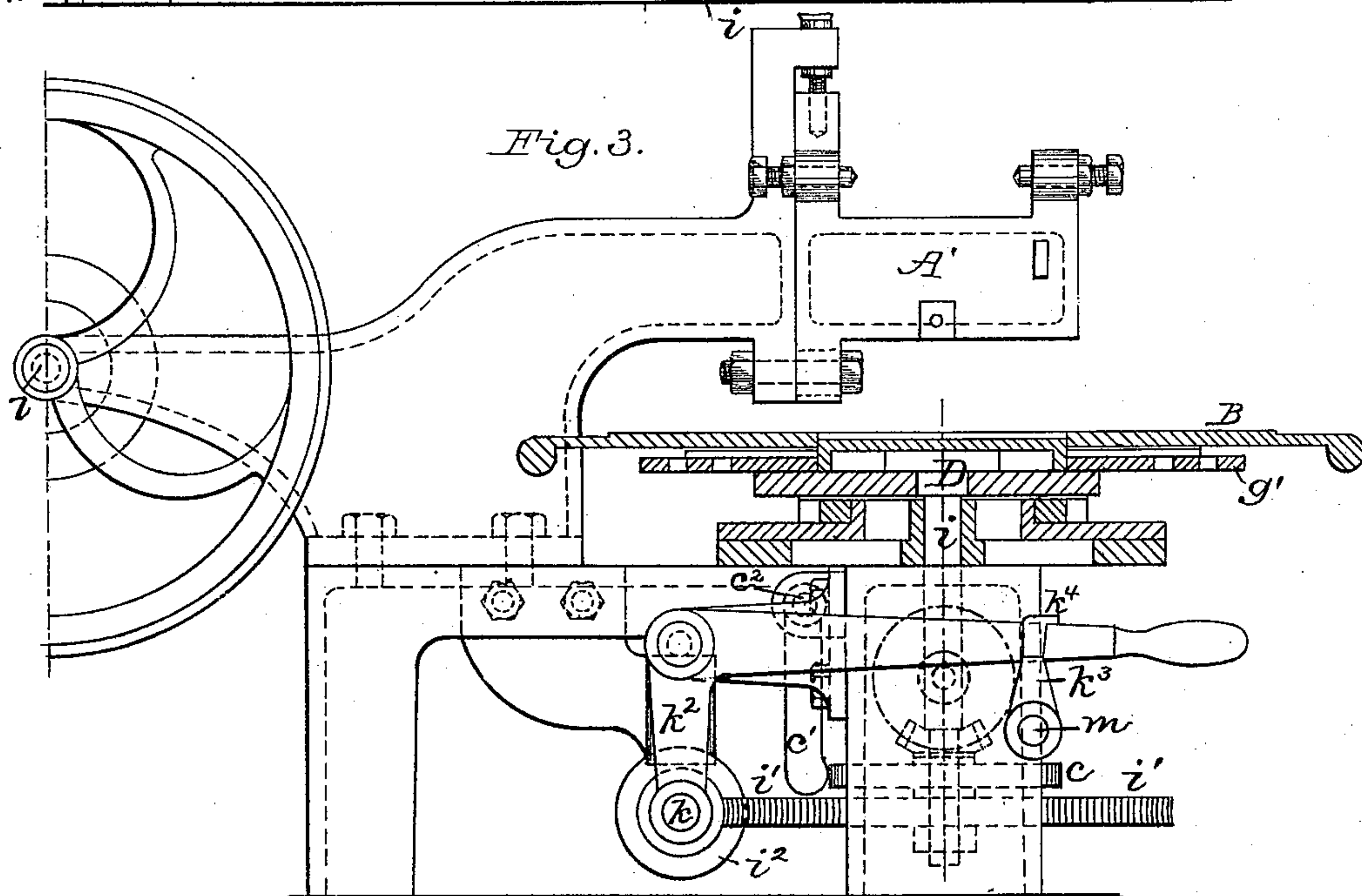
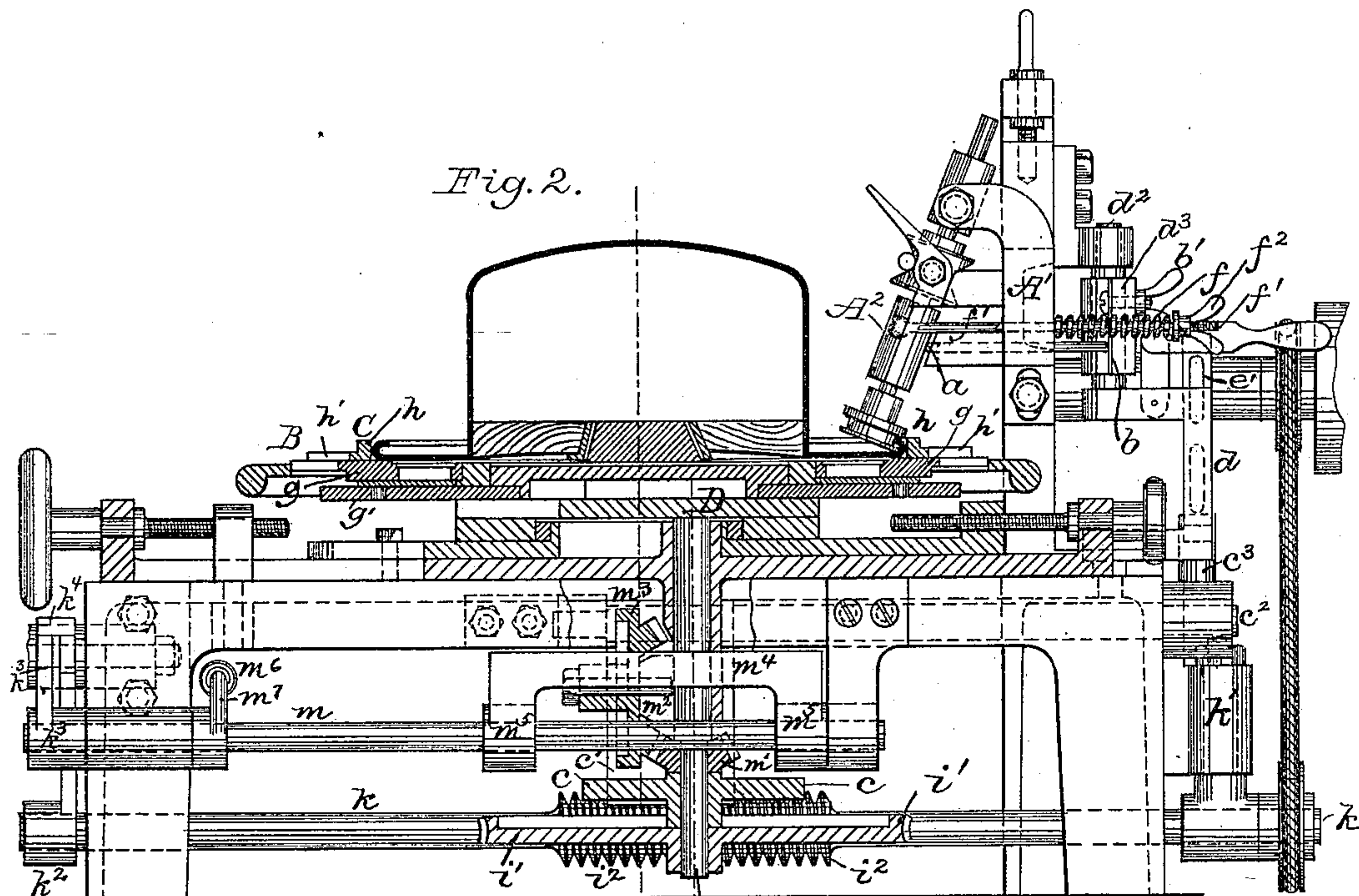
5 Sheets—Sheet 2.

R. EICKEMEYER.

MACHINE FOR PLANING THE FOLDED EDGES OF HAT BRIMS.

No. 386,457.

Patented July 24, 1888.



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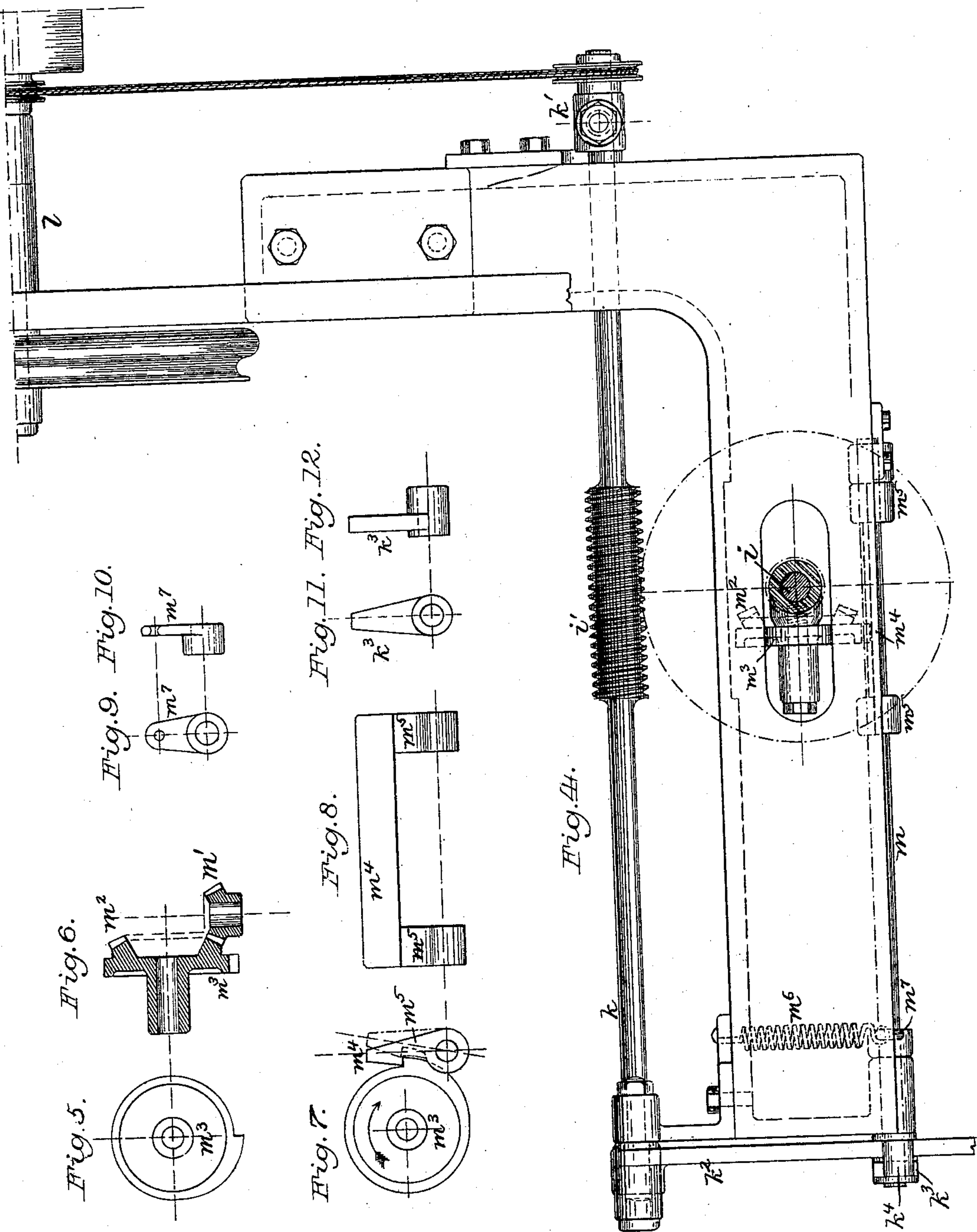
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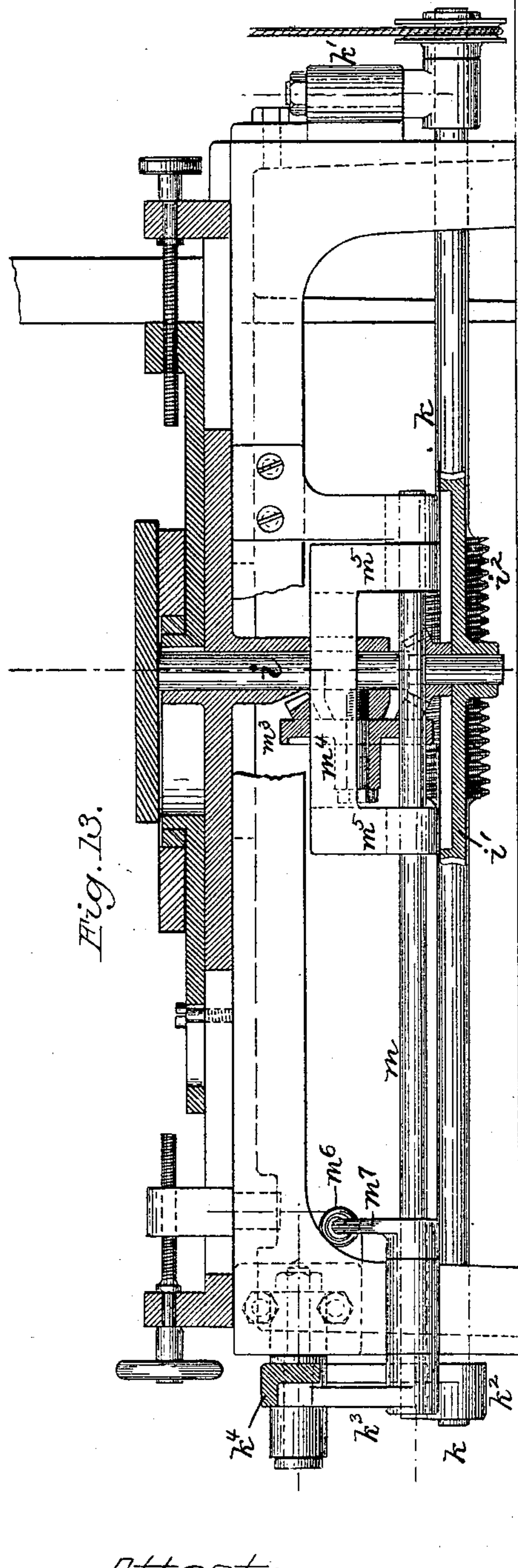
5 Sheets—Sheet 4.

R. EICKMEYER.

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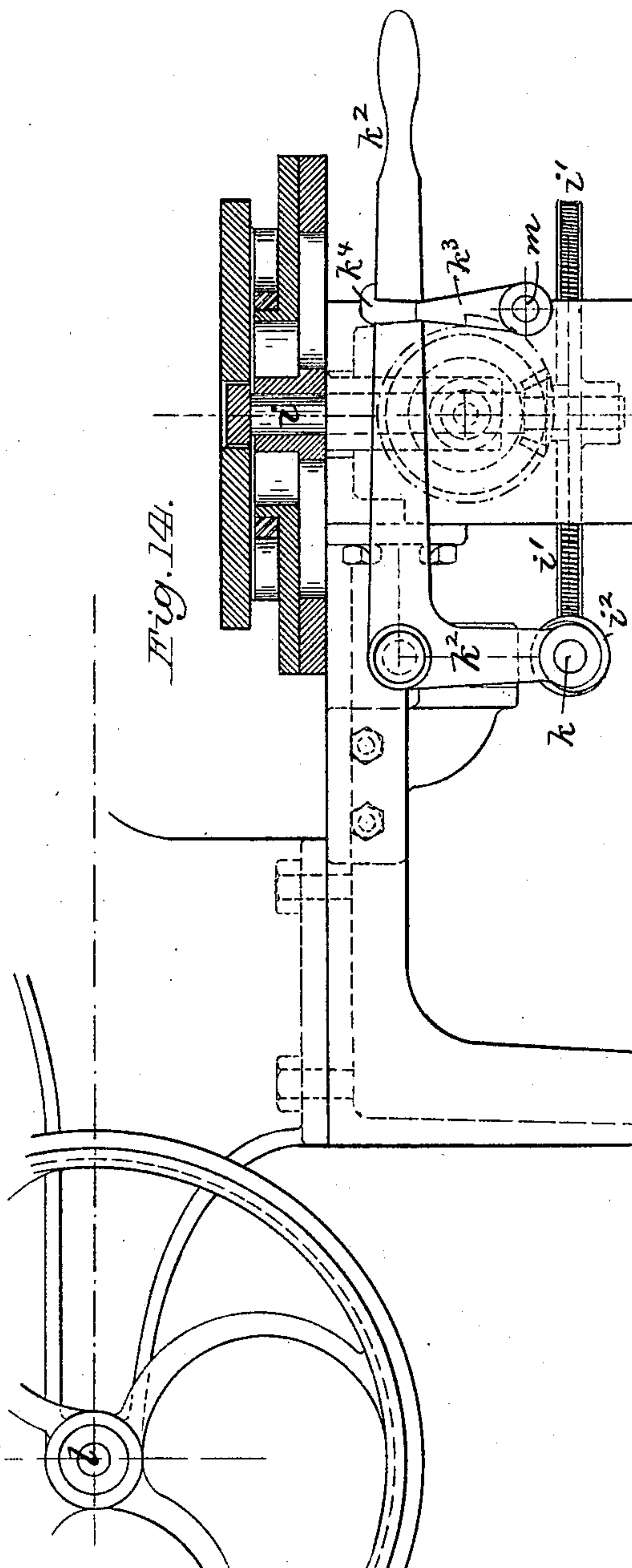
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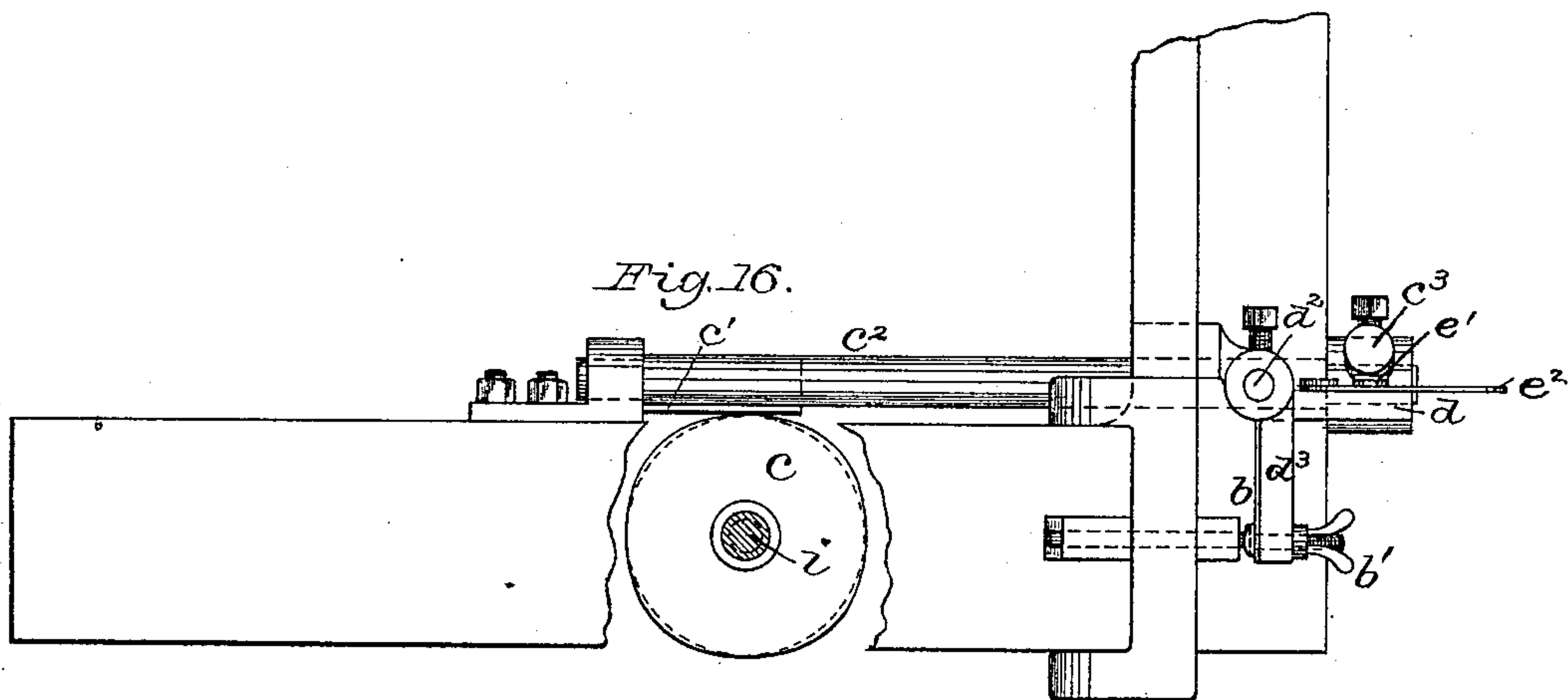
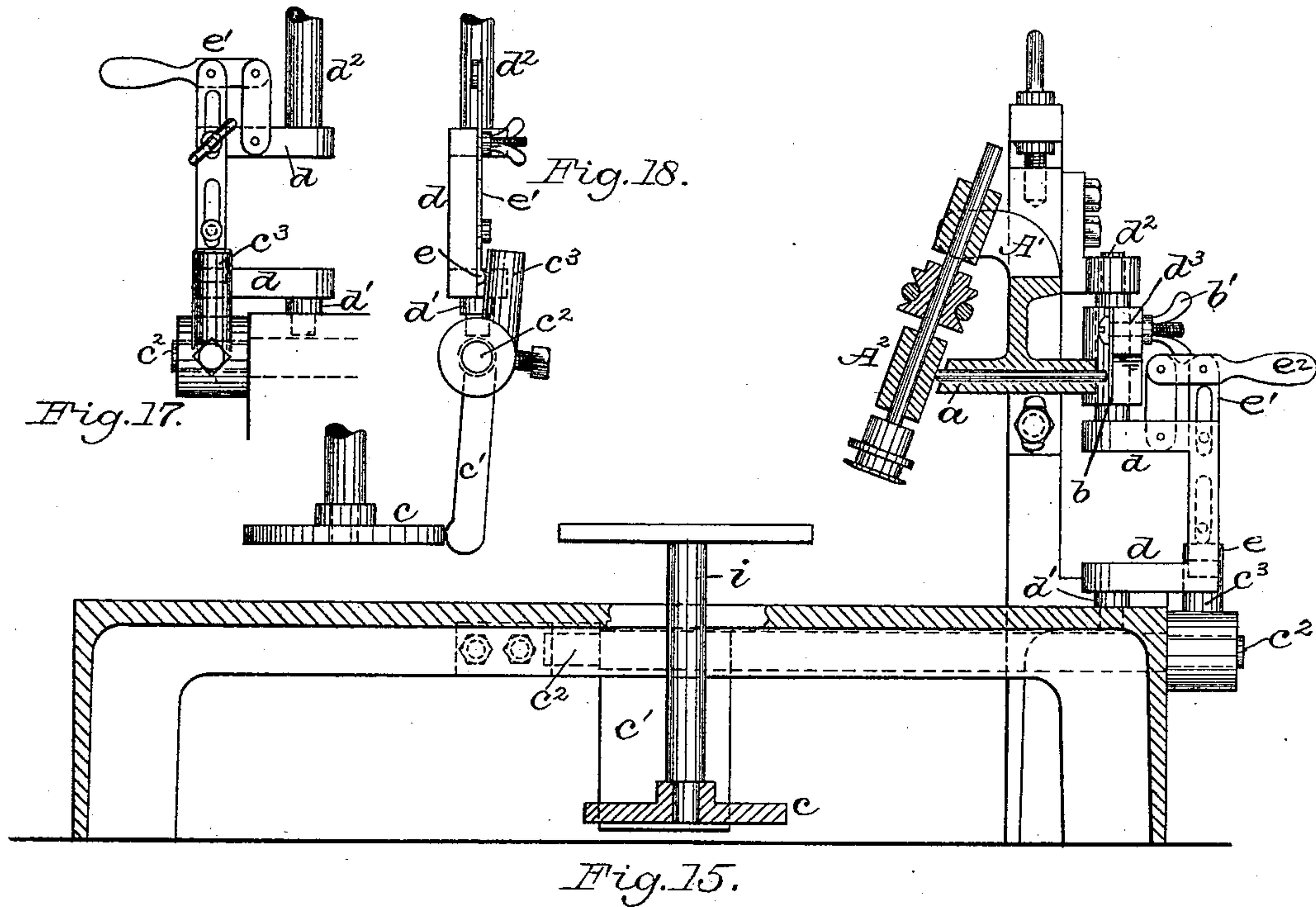
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UNITED STATES PATENT OFFICE.

RUDOLF EICKEMEYER, OF YONKERS, NEW YORK.

MACHINE FOR PLANING THE FOLDED EDGES OF HAT-BRIMS.

SPECIFICATION forming part of Letters Patent No. 386,457, dated July 24, 1888.

Application filed October 29, 1885. Serial No. 181,389. (No model.)

To all whom it may concern:

Be it known that I, RUDOLF EICKEMEYER, of Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Machines for Planing the Folded Edges of Hat-Brims; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of the several features of my invention.

In my Letters Patent dated May 5, 1885, No. 317,324, I disclosed a brim-planing machine which involved feeding the brim to the cutter by the hand of the operator applied to a hand-crank, it being then deemed necessary by me that the operation of the cutting mechanism be closely observed. In said machine a rotary planing-tool is employed, and its operation is found to be so reliable and uniform that, unlike any other forms of brim-planing tools known to me, it can be safely relied upon to perform its full duty without special supervision; and the prime object of my invention is to render such machines wholly automatic, and to thereby enable one person to operate several machines, or, if attending one, to devote a portion of his time to other duties incident to contemporaneous operations in the manufacture of hats, and especially to the curling and trimming of the brims thereof—as, for instance, the preliminary rounding of brims upon a somewhat similar machine devised by me, or operating a shaping-mold. Incidental to economy in time in this connection another object is to enable the adjustment of the brim-clamping ring to ovals of varied size and contour with a minimum of labor; and still another object is to render such machines of a more varied scope than heretofore in the matter of presenting a hat-brim to the planing-tool, whereby the overturned edge of a brim can be planed on lines more or less varied from the usual hat-oval—as, for instance, so as to plane said edge closely to the upper surface of the brim at each end and leave it specially full at the quarters at each side of the front and rear, as is sometimes deemed desirable by the trade. To these ends I have devised appropriate mechanisms, which, although in part illustrated in the accompanying drawings as when applied after the manner of attachments

to my prior machine, are also illustrated as when embodied in machines constructed with special reference to embodying said improvements therein.

After describing in detail the several illustrations, the features deemed novel will be specified in the several claims hereunto annexed.

Referring to the five sheets of drawings, Figure 1, Sheet 1, is a plan or top view of one of my improved machines. Fig. 2, Sheet 2, illustrates the same partially in side elevation and partially in longitudinal central section. Fig. 3 illustrates a portion of the same partially in end view and partially in central cross-section. Fig. 4, Sheet 3, is a partial plan and a longitudinal horizontal section of the same. Figs. 5 to 12 are detailed views of portions of the mechanism by which the automatic operation of the machine is obtained, having special reference to stopping it after it has been allowed to commence operations. Figs. 13 and 14, Sheet 4, are enlarged views of the lower portions of the machine, respectively in side elevation and end view, and each partially in vertical central section. Figs. 15 to 18, inclusive, Sheet 5, illustrate in detail the mechanism by which the planing-tool is automatically controlled for varying its presentation to a folded brim-edge.

Inasmuch as the machine here illustrated embodies many subjects of invention covered by my aforesaid Letters Patent, I shall deem it unnecessary to now minutely describe the same; but, if need be, reference can be had to said Letters Patent for a more complete understanding of such features as do not specially pertain to my present improvements.

Considered generally, the revolving planing-tool or rotary cutter A, the rotative hat-bed B, and the expansible brim-clamping ring C embody features of invention embraced by my said prior Letters Patent. In my prior machine said rotary planing-tool A was pivoted in a vertically-adjustable frame, A'; but a capacity for pivotal or swinging movement was provided to enable it to be swung into and from its working position, and in my present machine said planing-tool has not only this same capacity and for the same purpose, but also for another and widely different purpose, in that said cutter is thereby enabled to

occupy variable positions while operating upon the edge of a hat-brim, and thus to vary the line of cut from a true oval (as when operating with an oval chuck in the usual way) to irregular ovals. This portion of my invention is shown in Figs. 1 and 2, but is best illustrated as to details in Figs. 15 to 18, inclusive, Sheet 5.

Referring specially to Fig. 15, it will be seen that a horizontal sliding rod, a , is housed in guide-bearings in a portion of the frame A' , and abuts at its inner end against the portion A^2 of the frame in which the planing-tool shaft is journaled. The opposite end of said rod abuts against a flat plate, b , and this plate, if moved toward the planing-tool, will therefore cause said tool to be moved outwardly, its frame A^2 being mounted in the frame A' on horizontal pivots at its upper end. This vibrating movement of the planing-tool toward and from the center of the hat-bed is automatically effected by means of a rotary cam-wheel, c , which can be located on any suitably-revolved shaft in the machine, but is here shown as at the foot of a vertical shaft, by which the hat-bed B and its oval chuck are rotated. This cam may be variously patterned, according to requirements; but as here shown its working-surface is full at its quarters, as indicated by the difference between the circular dotted line and the full line in Fig. 16. This cam in rotating bears against a pendent arm, c' , on a rock-shaft, c^2 , which at its outer end is provided with a cylindrical vertical arm, c^3 , so that the latter is slightly vibrated in a vertical plane four times at each revolution of the cam.

At one end of the machine, to the right hand of the planing-tool frame, there is a vertical bell-crank lever, d , which is rectangular in form, has one short step or pivot, d' , and above this a longer pivot, d^2 , journaled in the frame A' , so that said lever can swing laterally in a horizontal plane. The long pivot d^2 has thereon an arm, d^3 , which projects laterally therefrom and at right angles to the rectangular portion d of said lever, and said arm d^3 carries the plate b , already described, as one which abuts against the outer end of the sliding rod a . On the vertical portion of the lever d there is at its lower end a sliding shoe, e , having a concave face, which is fitted to bear against the coincident surface of the cylindrical vertical arm c^3 on the rock-shaft c^2 .

As thus far described it will be obvious that when the cam c partially rotates the rock-shaft c^2 the lever d will be correspondingly vibrated as to time, and that the latter, operating through the arm d^3 and plate b , will force the rod a inward and cause the planing-tool frame to be swung on its pivot and its lower end thereby lifted, and thus vibrating the cutter in a vertical plane and varying the cutting line or path of the planing-tool, but always merging the said path with the oval path defined by the oval chuck, because said tool is also moved toward and from the center of the bed.

For securing the proper contact relations of the several parts thus described, as well as to secure the backward or return movements of the planing-tool, a spring is employed which may be variously applied; but, as illustrated in Fig. 1 at f , it is an expansive spiral spring encircling a rod, f' , which is pivoted at one end to the central portion of the planing-tool frame A^2 , passes through a hole in the frame A' , and is provided with an adjusting thumb-nut, f^2 , between which and the surface of the frame A' said spring is compressed. Inasmuch as this variation in the line or path of cut is not usually required, it is desirable that the machine be readily readjusted to operate on true ovals, as by the oval chuck, and this I have provided for by mounting the plate b on the lever-arm d^3 by means of a screw, b' , which serves as a pivotal clamp and enables said plate to be placed either coincident with the spindle a or to the one side thereof, so as to be thereby rendered inoperative. It will be seen that the working face of the cam c is unchangeable in its capacity to semi-rotate the rock-shaft c^2 ; but as it is desirable to vary the extent of the vibratory movement of the planing-tool, I have provided therefor by, in substance, elongating or shortening the length of the vertical cylindrical arm c^3 on said shaft, or, in other words, by varying the point of contact between said arm and the concave shoe e , before described as mounted on the vertical portion of the lever d . This shoe is attached to a vertical tail-piece, e' , which can slide vertically on said lever, and is raised or lowered by means of the small hand-lever e^2 , as clearly illustrated in Fig. 15. In this connection it should be observed that the features of invention involved in the mechanism thus far described are not limited to a cam, c , of any special form, and it will be obvious that if no other provision were made for variably presenting a hat-brim to the planing-tool in a true oval path this cam could be relied upon for accomplishing that purpose, if correspondingly shaped, it being understood, however, that I prefer to rely for cutting true ovals upon an oval chuck on which the bed is mounted, as in my prior machines, such a chuck being shown at D in the drawings illustrative of my present machines.

It is to be understood that in Figs. 15 and 16 the cam c , pendent arm c' , and rock-shaft c^2 are illustrated as when applied by me to a machine in which the hat-bed shaft is operated by hand, as shown in my prior Letters Patent, while in Figs. 1, 2, and 3 they are shown as when organized by me in an automatic machine.

I will next describe my improvement upon the expansible and contractible brim-clamping ring on top of the hat-bed B . In my prior machine said ring C was composed of a series of complex sections mounted on radially-sliding blocks g , controlled by means of a semi-rotative cam-plate, g' , provided with a handle,

g^2 , sufficiently well indicated in Figs. 1, 2, and 3 for the purposes of this specification. By swinging this handle to and fro all of the sliding blocks are caused to simultaneously move inward and outward, and to maintain their proper relative positions, so that the complex sections of the clamping-ring can be advanced inwardly for properly clamping the curled edge of a brim peripherally, and then retired for releasing it. When it is necessary to vary the outline of the clamping-ring, a pattern-plate is placed upon the bed and the several sections separately adjusted to its periphery and then tightened on the sliding blocks. In my former machines this adjustment involved the loosening and tightening of three screws at each section; but now I accomplish it by means of a single screw, because each ring-section h is in one piece and has a slotted tail-piece, h' , and a single clamp-screw, h^2 , by which it is mounted on its sliding box g , as shown in Fig. 1. This clamp-screw serves also as a pivot for its ring-section, enabling the latter when loose to be swung laterally to and fro, so as to readily conform to the outline of various pattern-plates, and the slotted tail-piece enables said section to be moved to and fro lengthwise of the radially-sliding blocks.

I have hereinbefore stated that in my prior machines the hat-bed was slowly rotated by hand for feeding the brim to the planing-tool, and I will next describe how this is done automatically and the bed automatically controlled by a stop-motion.

The vertical hat-bed shaft i is provided with a worm-wheel, i' , which meshes with a worm, i^2 , on a horizontal shaft, k , driven by means of a belt-cord from the main shaft l , from which, by means of a similar belt, the rotary planing-tool is also driven. The worm-shaft k at one end is mounted in a pendent swiveled hanger, k' , and at its opposite end in the pendent arm of a bell-crank lever, k^2 , having a handle at the end of its horizontal arm, so that if said handle be kept in an elevated position the worm and worm-gear will be in mesh, but also so that they will be separated if the handle be depressed—as, for instance, by its own weight when permitted to fall. This lever is maintained in an elevated position by means of a tappet or arm, k^3 , on a rock-shaft, m , the upper end of said tappet engaging with and passing beneath a lateral stud or projection, k^4 , on said lever.

I find that it is important for obtaining the best results that the planing-tool should make a preliminary or roughing cut around a brim and then a second or finishing cut, and therefore I have organized a stop-motion so arranged that the brim-bed will be revolved twice and then automatically stopped, thus indicating to the operator that a brim has been finished, and it is preferably always stopped and started at the front end of a hat-brim.

The requisite movements of the tappet-arm k^3 and rock-shaft m are derived from the hat-

bed shaft i by way of the small beveled gear m' thereon, which meshes with a beveled gear, m^2 , having twice the number of teeth on the small gear. The controlling-cam m^3 is on a short counter-shaft standing at right angles to the hat-bed spindle and mounted in a rigid hanger, and is connected to said gear m^2 . This cam has a peripheral working-face and bears against a horizontal bar, m^4 , mounted, by means of two arms, m^5 , on the rock-shaft m , and said cam is so shaped that at each revolution it will cause said shaft to turn backward slightly, and said bar is held to the face of said cam by means of a retractile spiral spring, m^6 , which is coupled to the rock-shaft by means of an arm, m^7 . The several parts thus described are shown in detail on Sheet 3 and are thereon clearly designated. They are also more or less shown in Figs. 1, 2, 3, 13, 85 and 14, and their operation is as follows: It will be assumed that the planing-tool is in operation, but the hat-bed at rest and the hand-lever k^2 depressed. A hat is placed on the bed and the brim-clamp adjusted thereto. The operator then raises the lever k^2 , whereupon the tappet-arm k^3 , because of the spring m^6 , moves under the stud k^4 on said handle and holds the worm and its gear in mesh. The hat-bed then slowly revolves twice, and when the greatest swell on the cam m^3 comes into contact with the bar m^4 it will release the tappet-arm k^3 from its position beneath the hand-lever, and by allowing it to drop cause the hat-bed to rest for the removal of a hat. At the time the hat-bed is thus stopped the widest portion of the cam is in contact with the bar m^4 ; but when the hand-lever is next raised by the operator the cam commences to revolve and the bar falls behind the shoulder on the cam, thus placing the tappet-arm k^3 beneath the hand-lever again.

It will be readily apparent that either of these improvements may be applied to a machine independently of the others and yet when organized in one machine, as shown, they cooperate in enabling the cost of planing curled hat-brims to be reduced to a minimum by economizing in the time of the operator, and enabling him to either properly attend to several such machines or only one, and thereby enable him to devote a portion of his time to other operations, whether these should precede or follow the planing of the brims.

Having thus described my invention, I desire to secure by Letters Patent—

1. In a hat-brim-planing machine, the combination, substantially as hereinbefore described, of a rotary hat-bed, a brim-clamping ring thereon, and a rotary planing-tool mounted in a swinging pivoted frame and automatically vibrated in a vertical plane, and also toward and from the center of said bed.

2. In a hat-brim-planing machine, the combination, substantially as hereinbefore described, of the rotary hat-bed, the rotary planing-tool mounted in a movable frame, the rock-

shaft, its cam and its spring, the sliding rod in contact with said planing-tool frame, and the series of levers and arms between said cam and sliding rod, whereby the latter is moved
5 longitudinally, varying the position of the planing-tool, toward and from the center of the hat-bed.

3. In a hat-brim-planing machine, the combination, with the planing-tool, its movable
10 frame, and sliding rod, of a vibrating lever provided with an adjustable plate abutting against said rod, and a clamp-screw, substantially as described, whereby said frame may or may not be moved by said lever during its vi-
15 brations, as set forth.

4. In a hat brim-planing machine, the combination of the planing-tool and its movable frame, a rock-shaft provided with an arm, and a complex lever and a sliding rod interposed
20 between said arm and planing-tool frame for enabling said rock-shaft to move said frame, and the adjustable shoe interposed between said arm and lever, substantially as described, whereby, notwithstanding the uniform move-
25 ments of the rock-shaft, the planing-tool and its frame may be variably moved to and fro.

5. In a hat-brim-planing machine, the combination of a hat-bed mounted upon an oval
30 chuck, a planing-tool mounted in a movable frame, and a cam detachably coupled to said

planing-tool frame for moving said tool toward and from the center of the hat-bed, substantially as described, whereby a hat-brim may be presented to the planing-tool in a true oval line or in various other lines merging with an
35 oval line.

6. In a hat-brim-planing machine, the combination, with a hat-bed and a series of radially-movable sliding blocks, of a brim-clamp-
40 ing ring composed of sections, each of which has a slotted tail-piece, and is attached to a sliding block by means of a single screw which serves as a pivot and a clamping device, substantially as described.

7. In a hat-brim-planing machine, the combination of the rotary planer, the rotating hat-
45 bed, and the stop-motion mechanism, substantially as described.

8. In a hat-brim-planing machine, the combination of the rapidly-driven rotary planing-
50 tool, the slowly-rotating hat-bed, and a hat-bed stop-motion containing a rotary controlling-cam which revolves but once during two revolutions of said bed, substantially as described.

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