

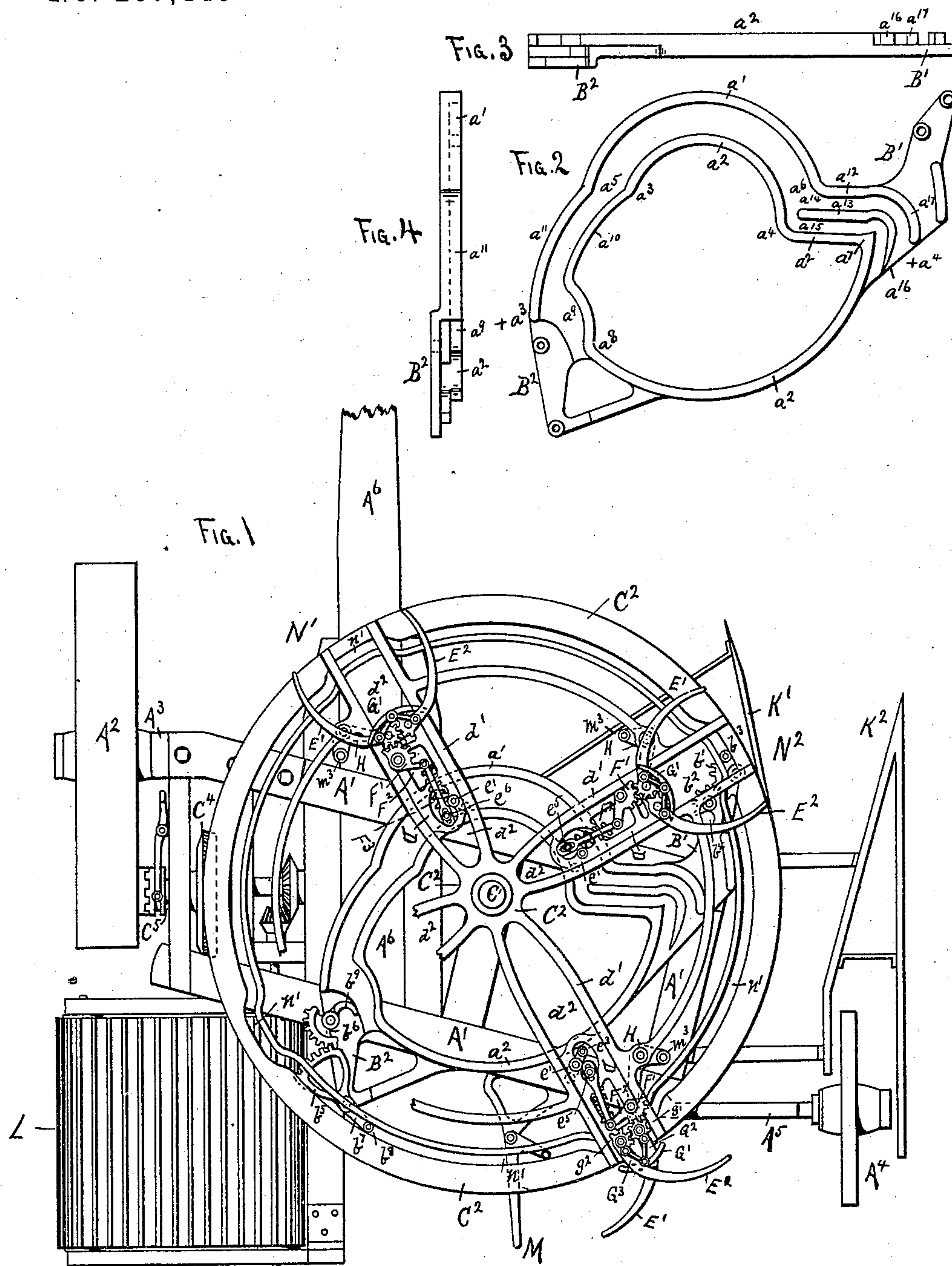
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5 Sheets—Sheet 1.

A. C. LAMAR.
FLAX PULLER.

No. 287,445.

Patented Oct. 30, 1883.



WITNESSES,
Louis Feeder Jr.
E. Howard Pitz

Alfred Ernestine Lamar,
INVENTOR, BY
Louis Fessier & Co Attys.

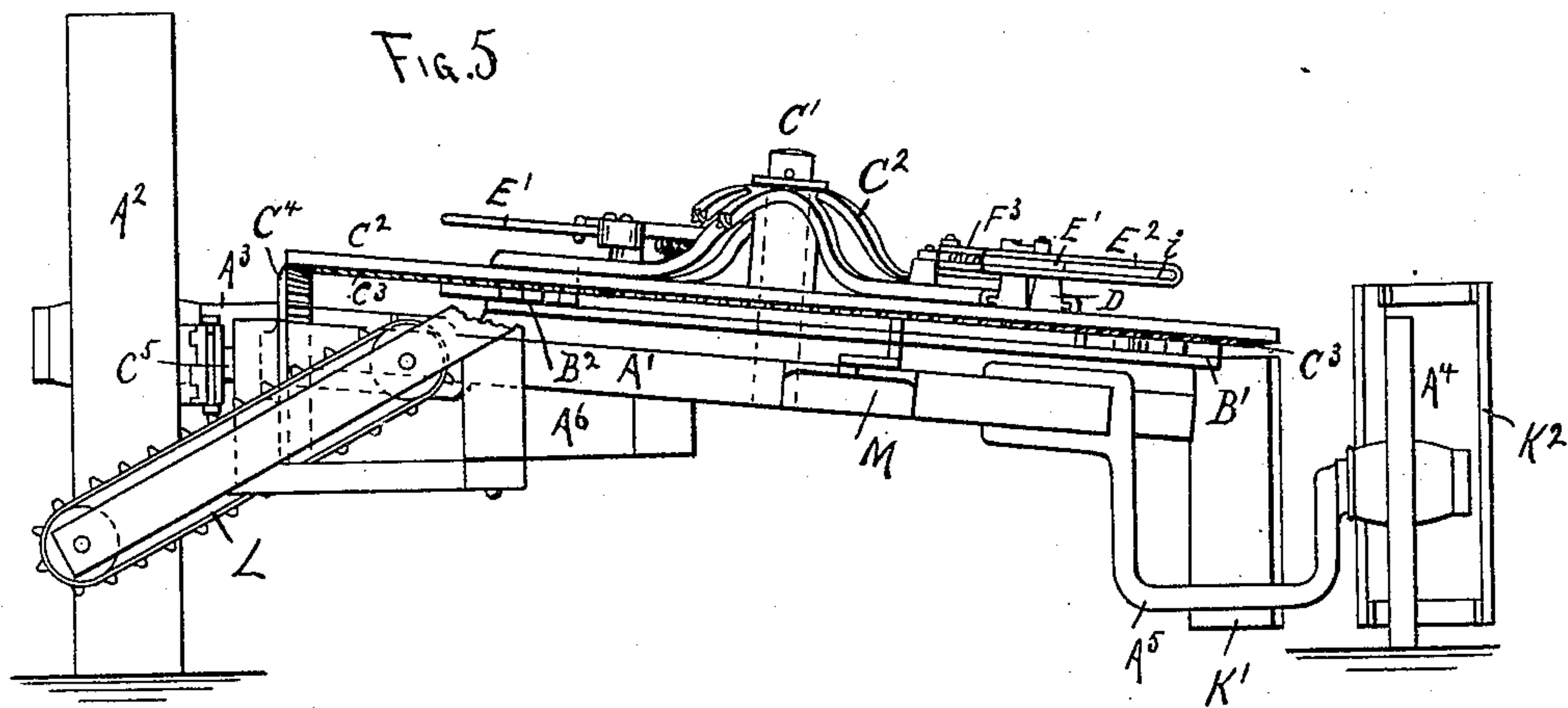
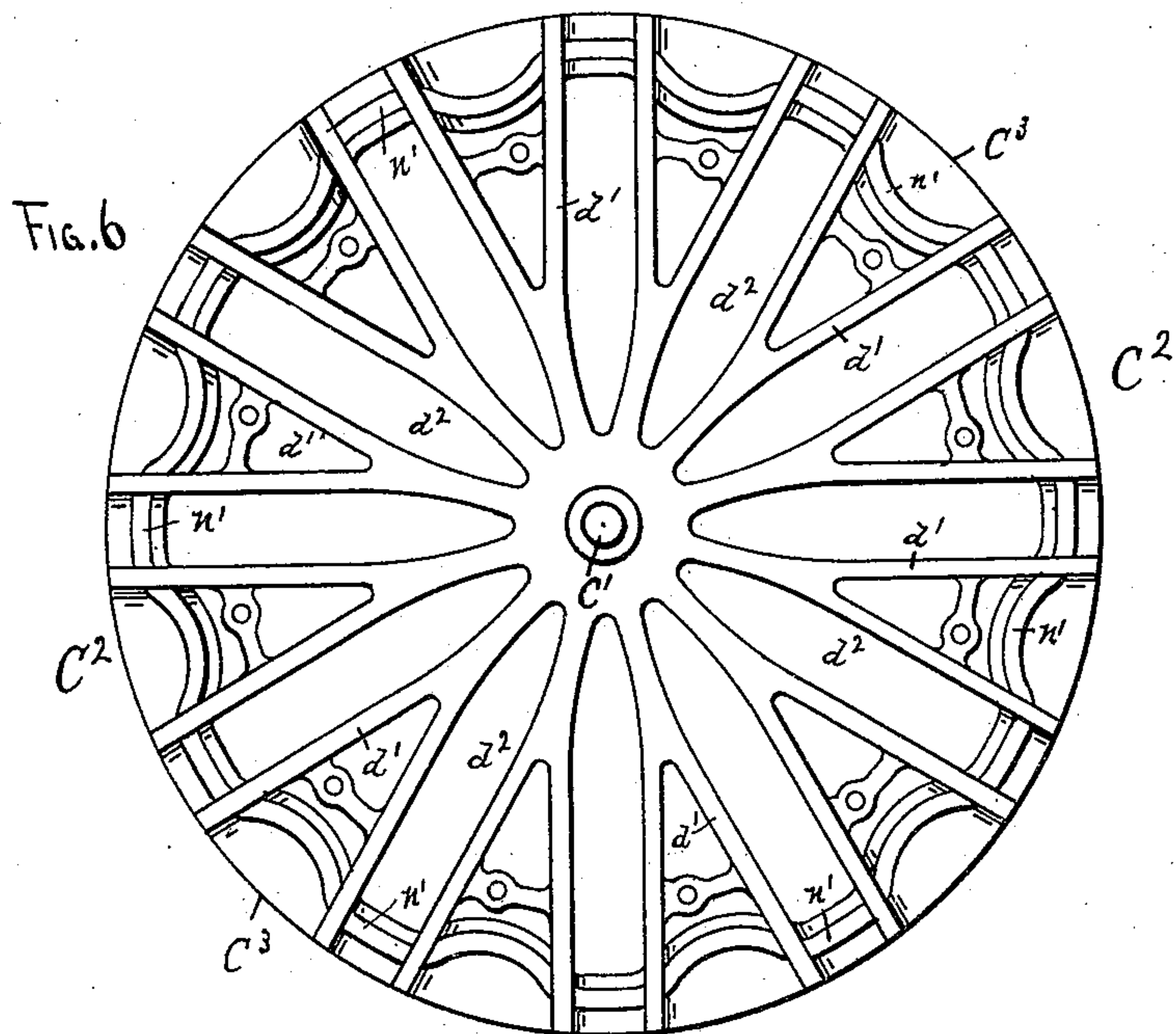
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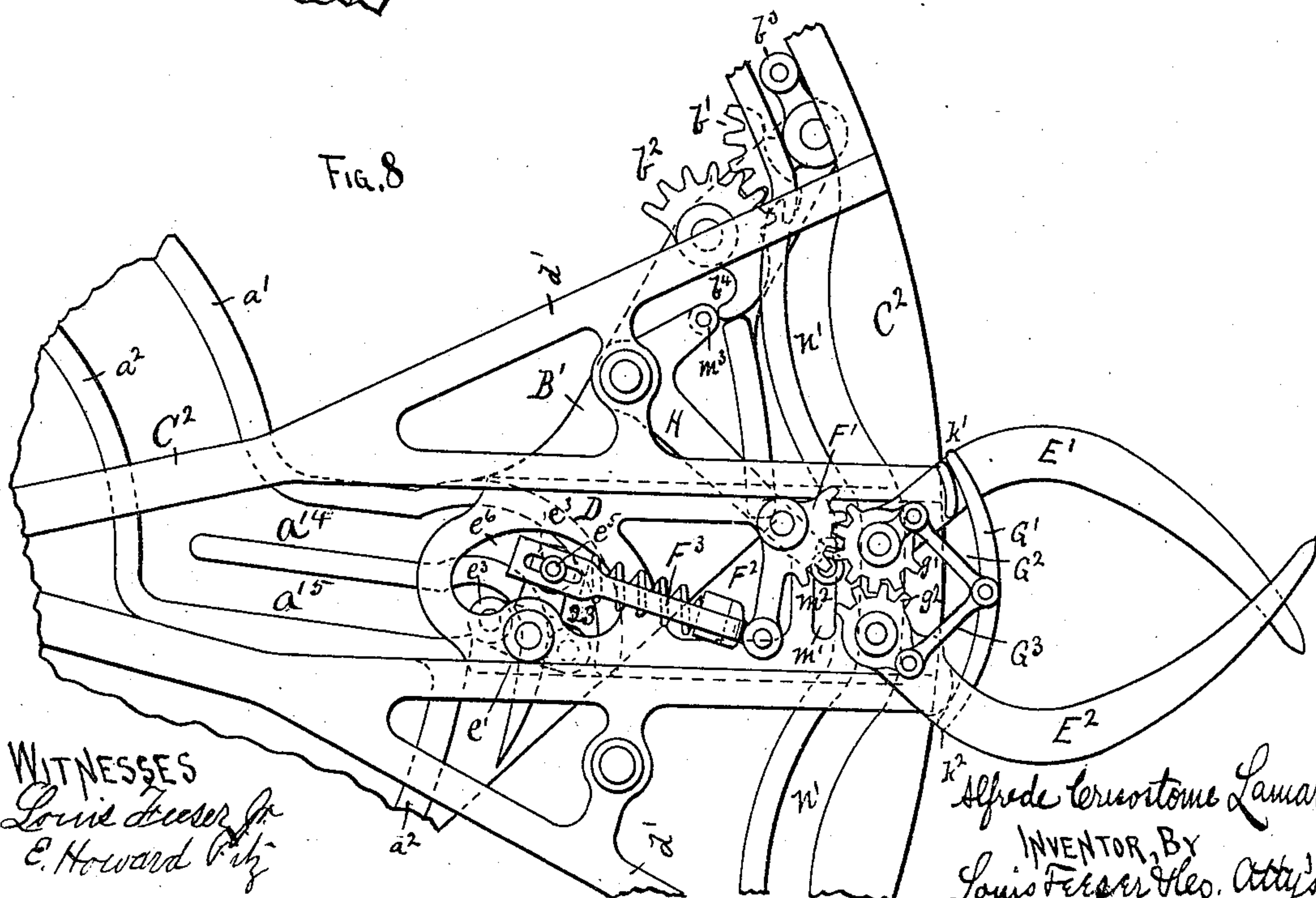
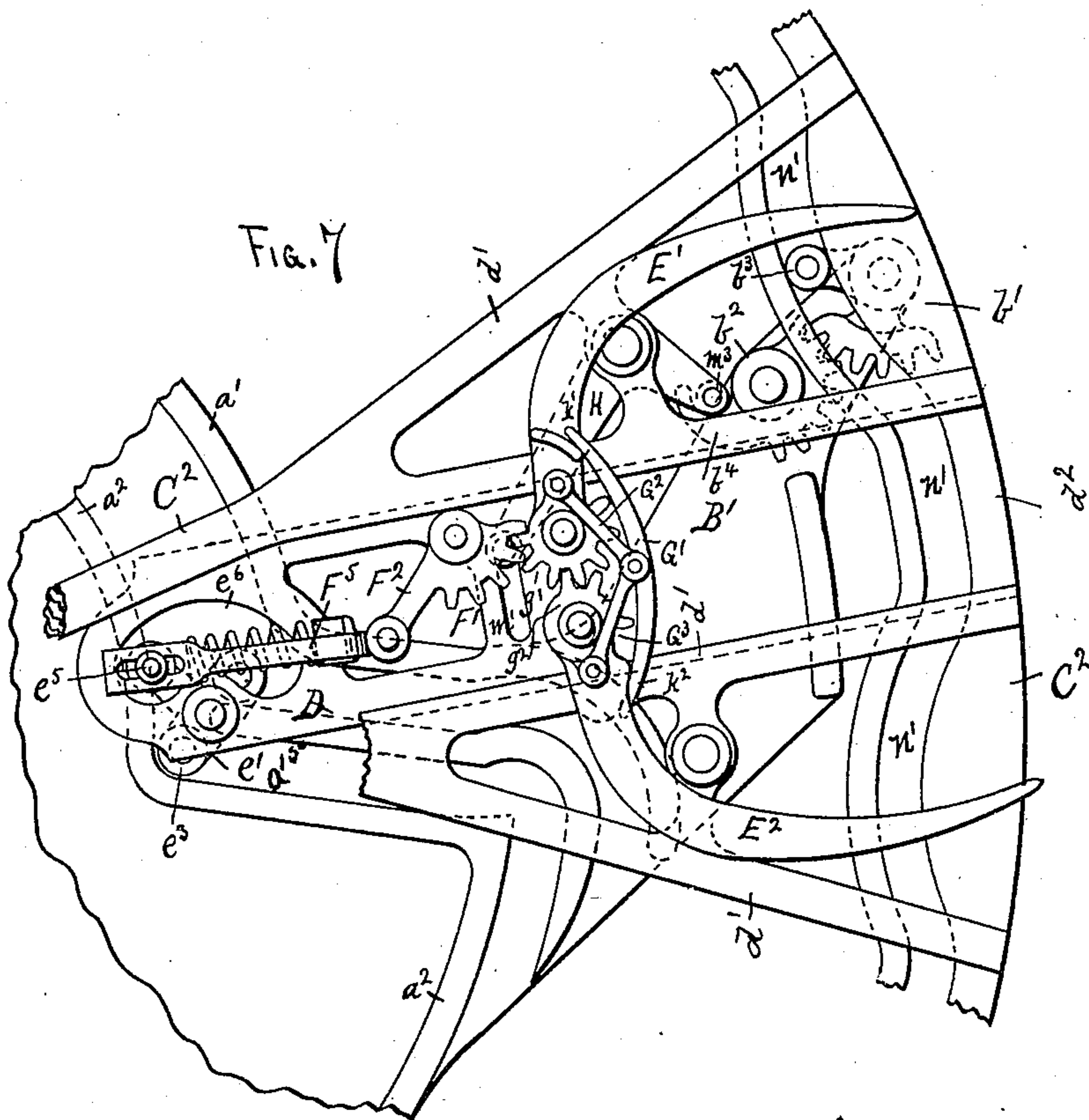
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5 Sheets—Sheet 3.

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Patented Oct. 30, 1883.



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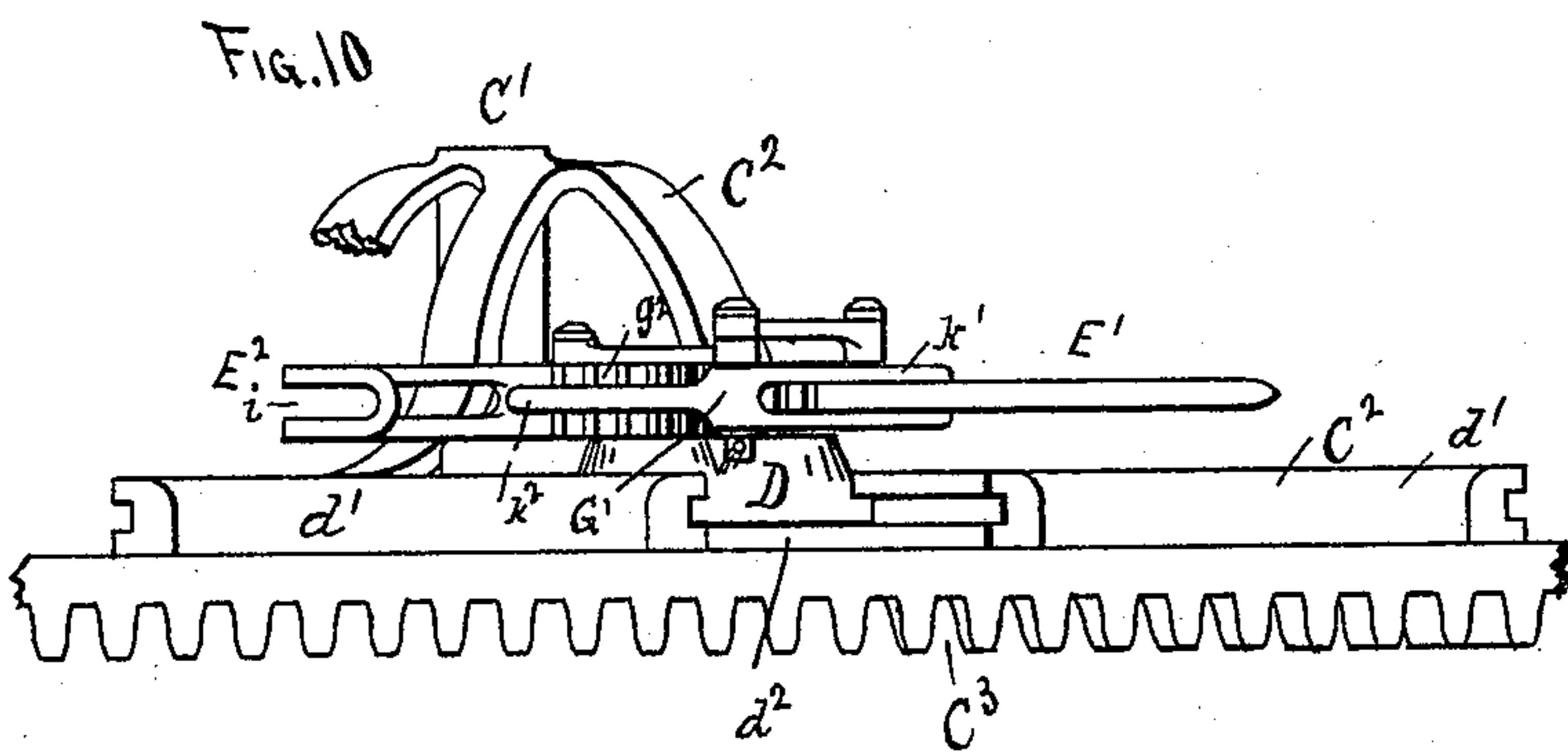
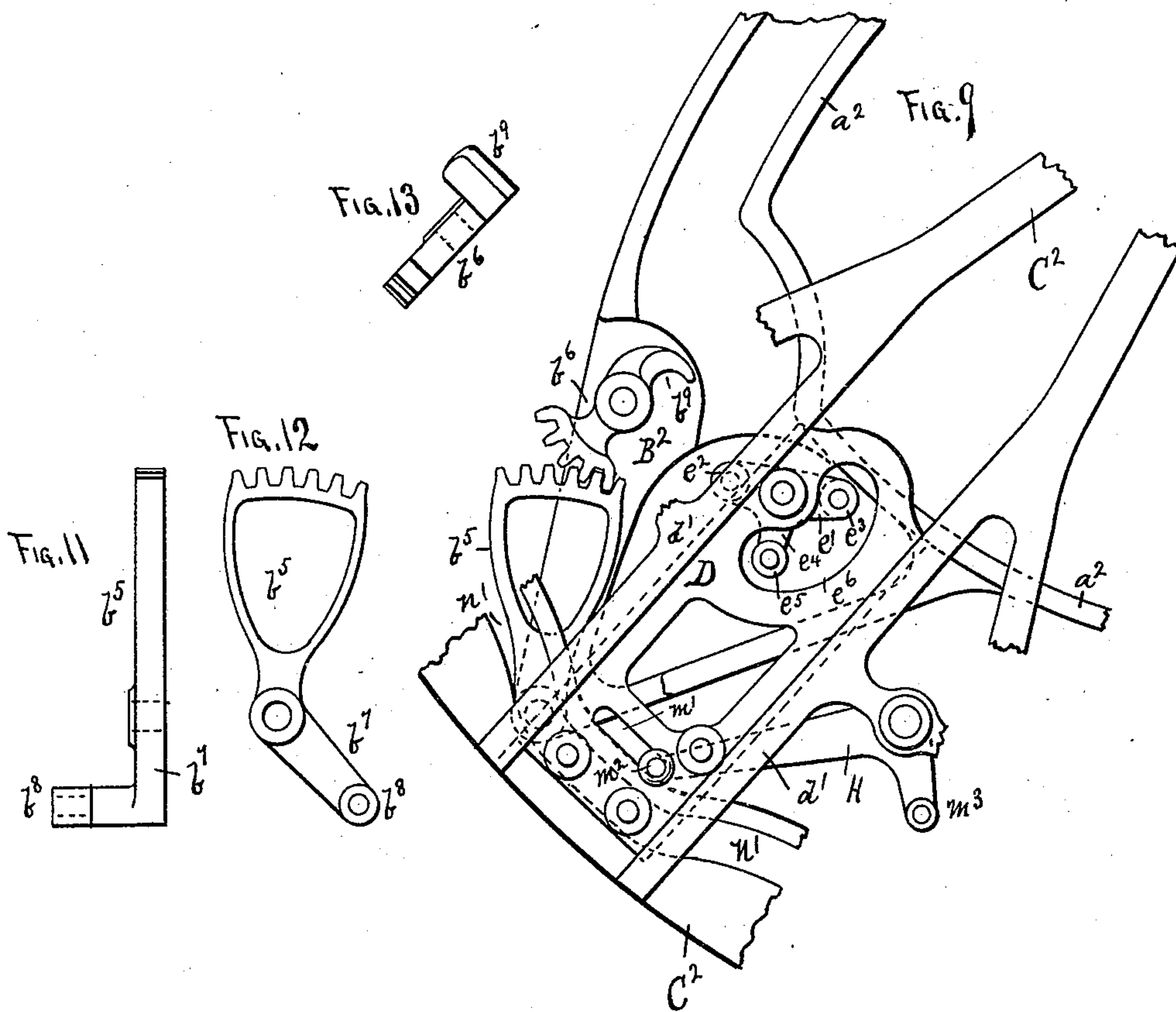
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5 Sheets—Sheet 4.

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FLAX PULLER.

No. 287,445.

Patented Oct. 30, 1883.



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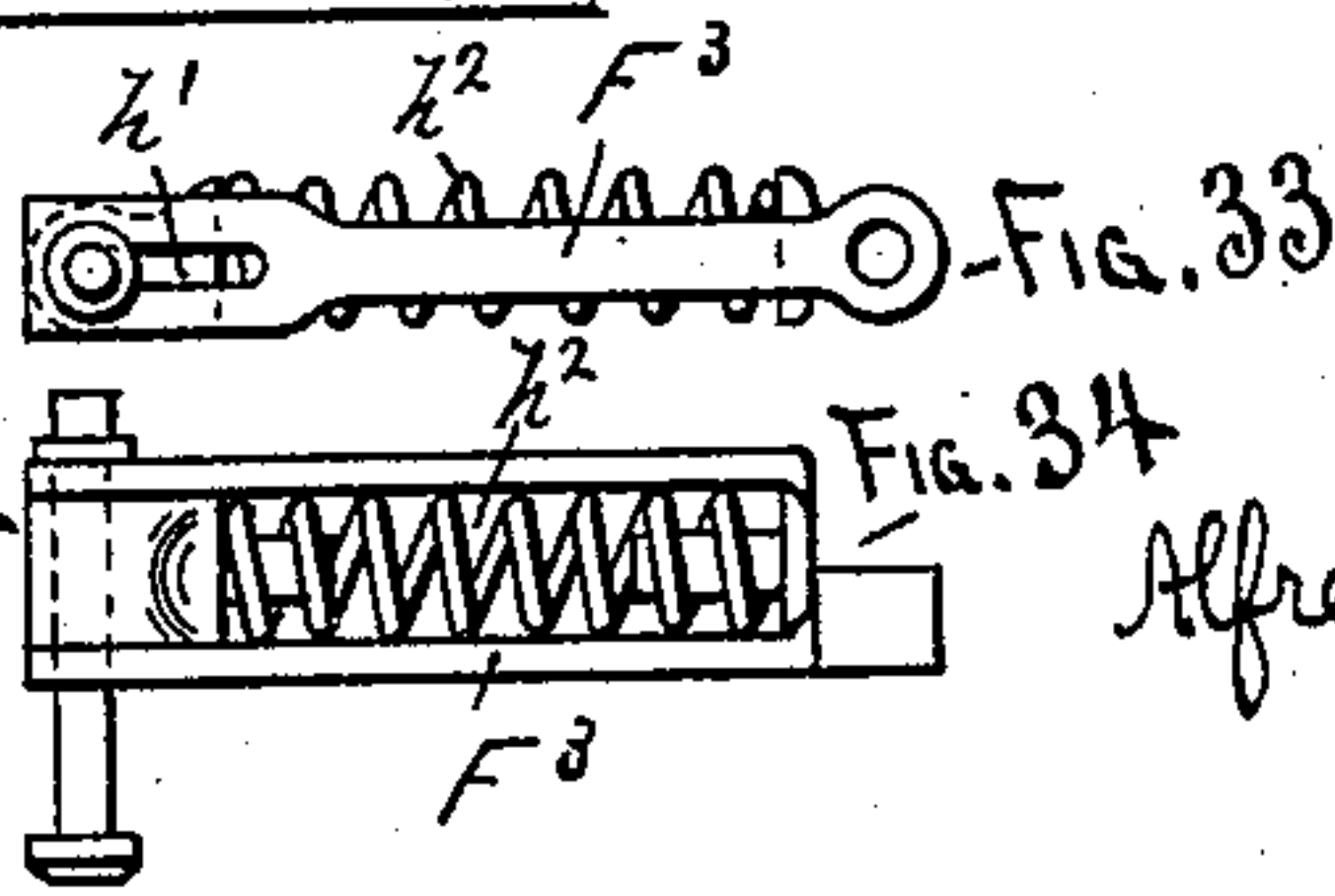
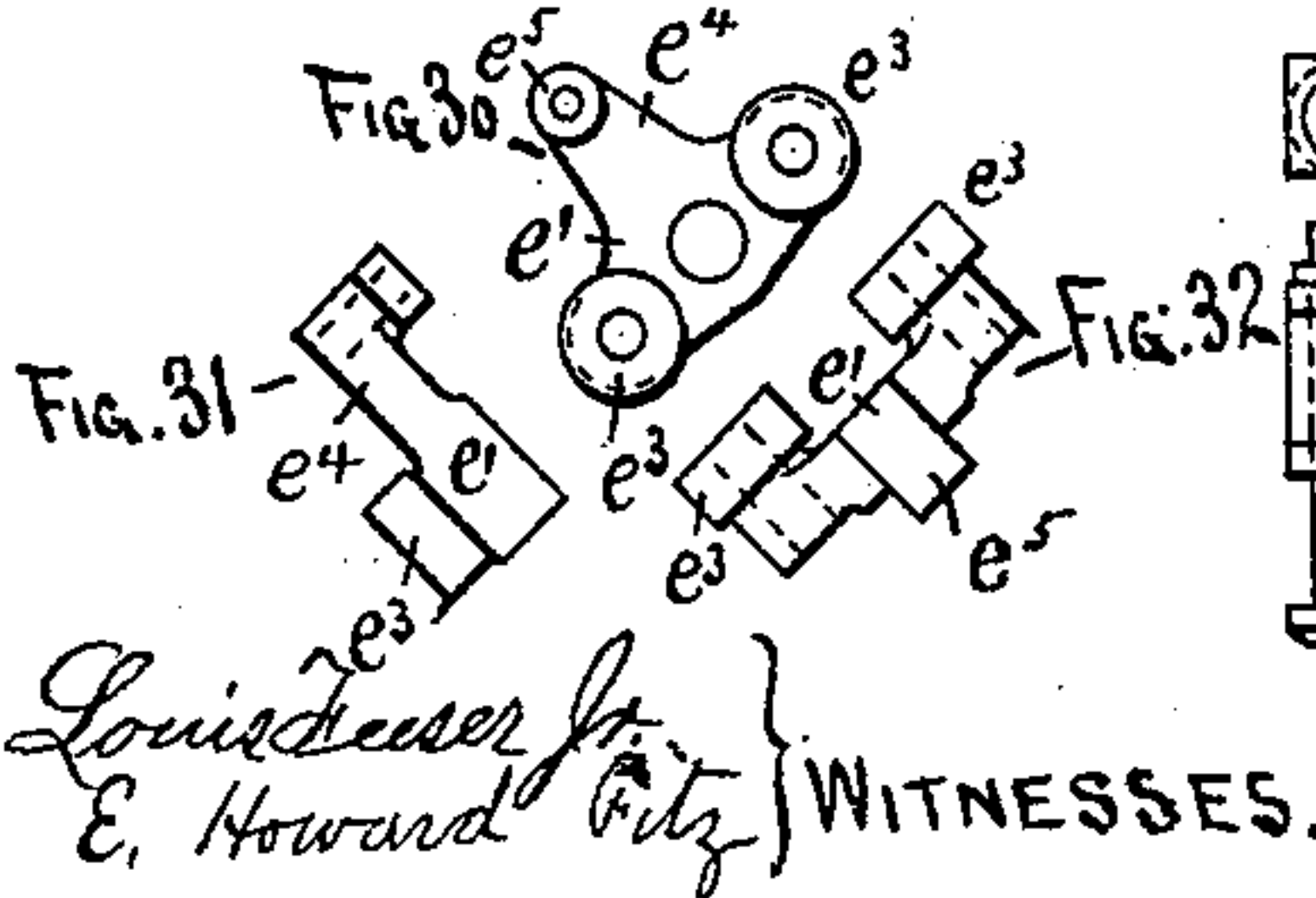
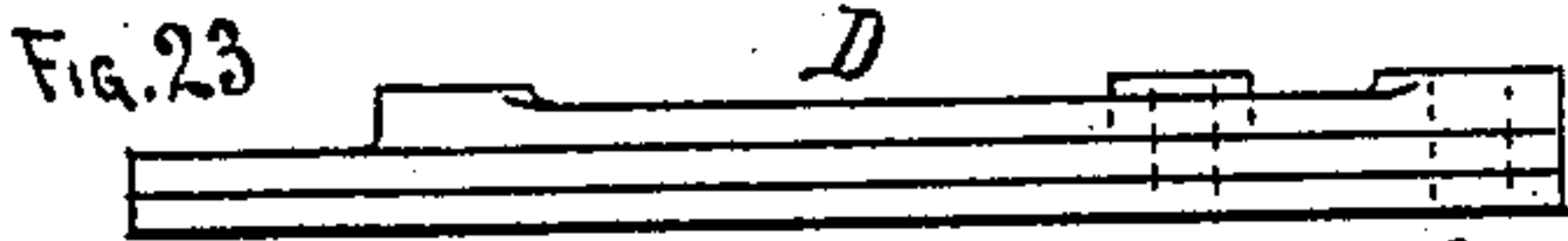
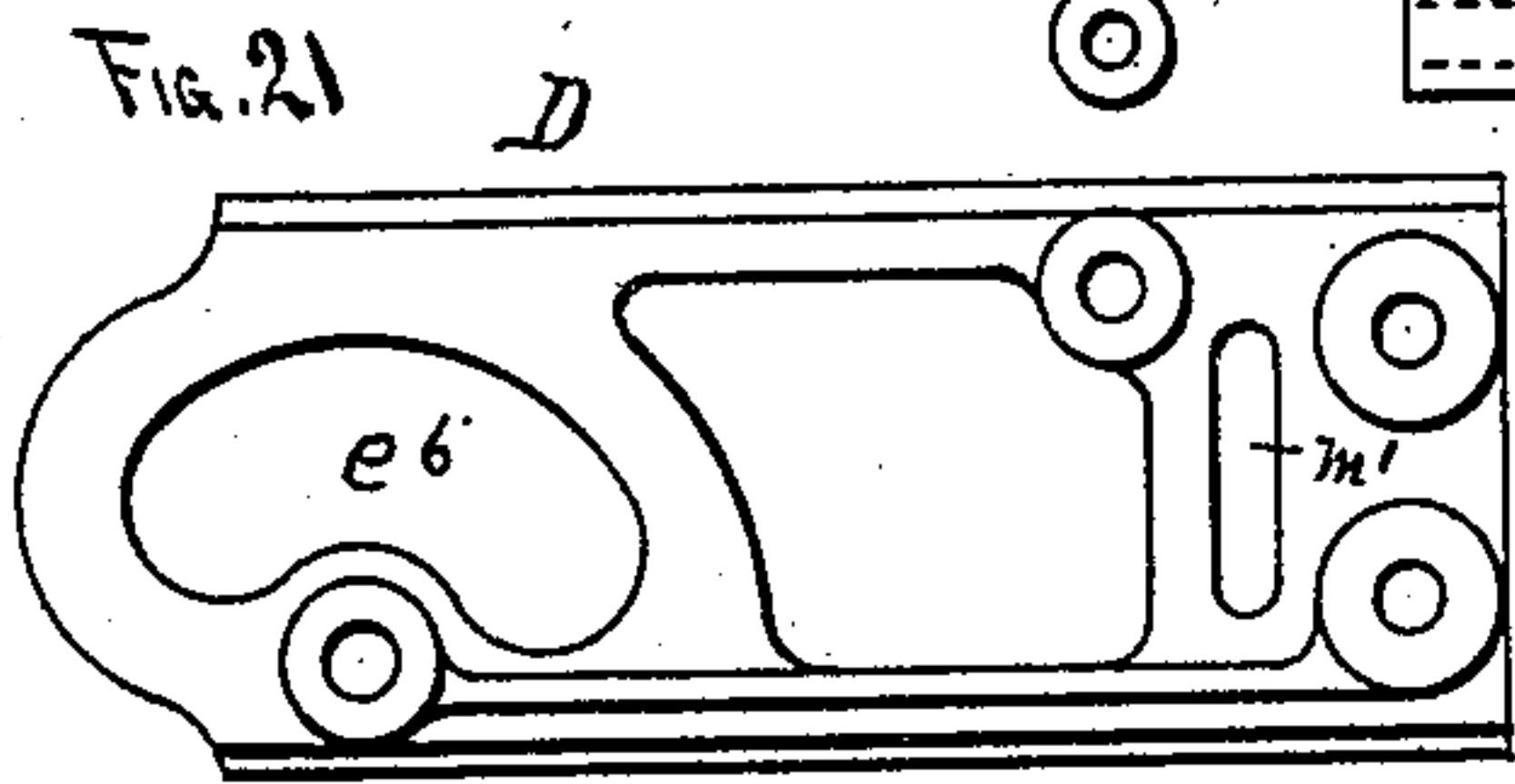
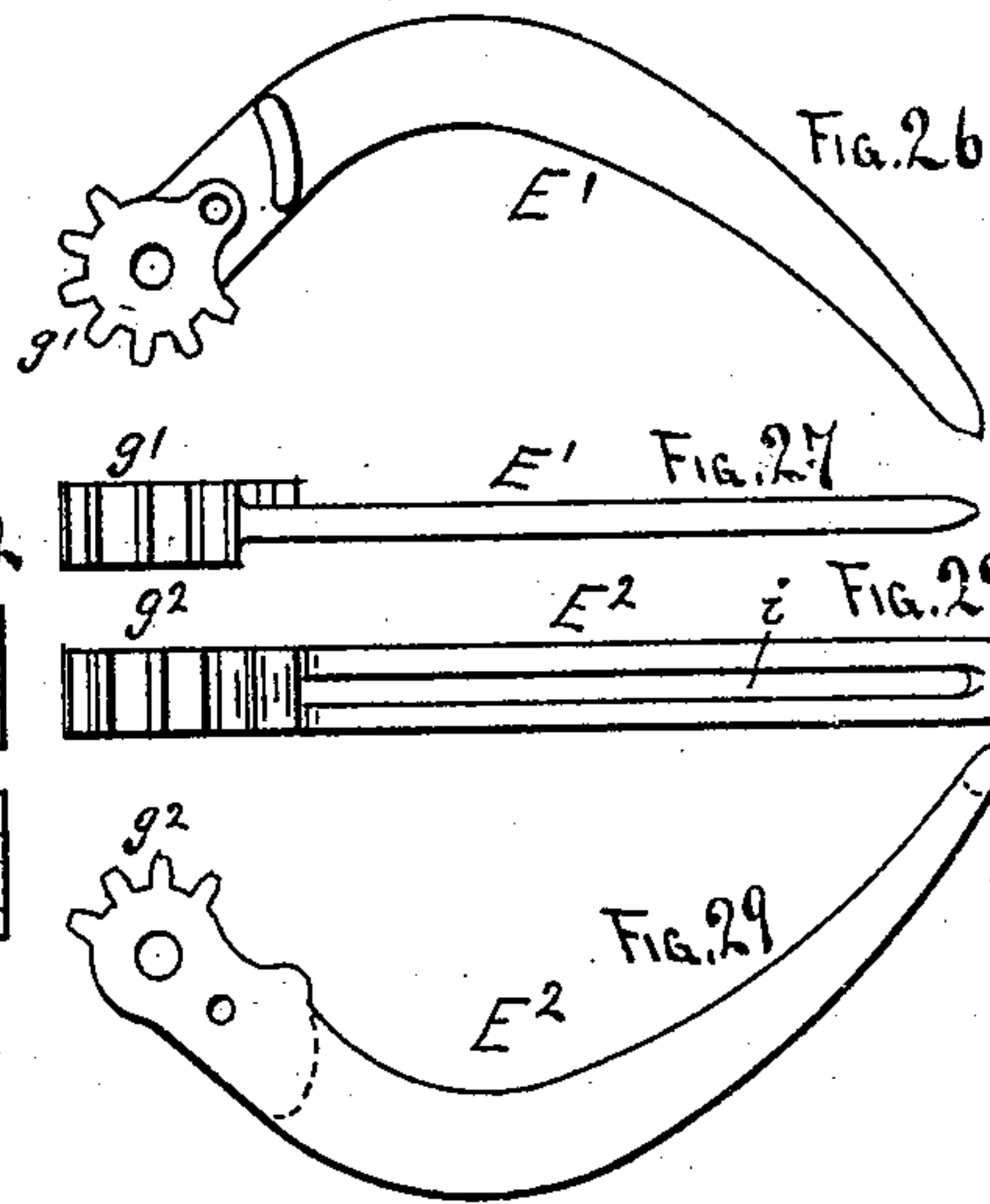
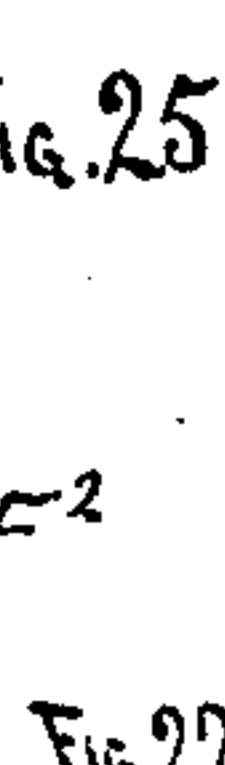
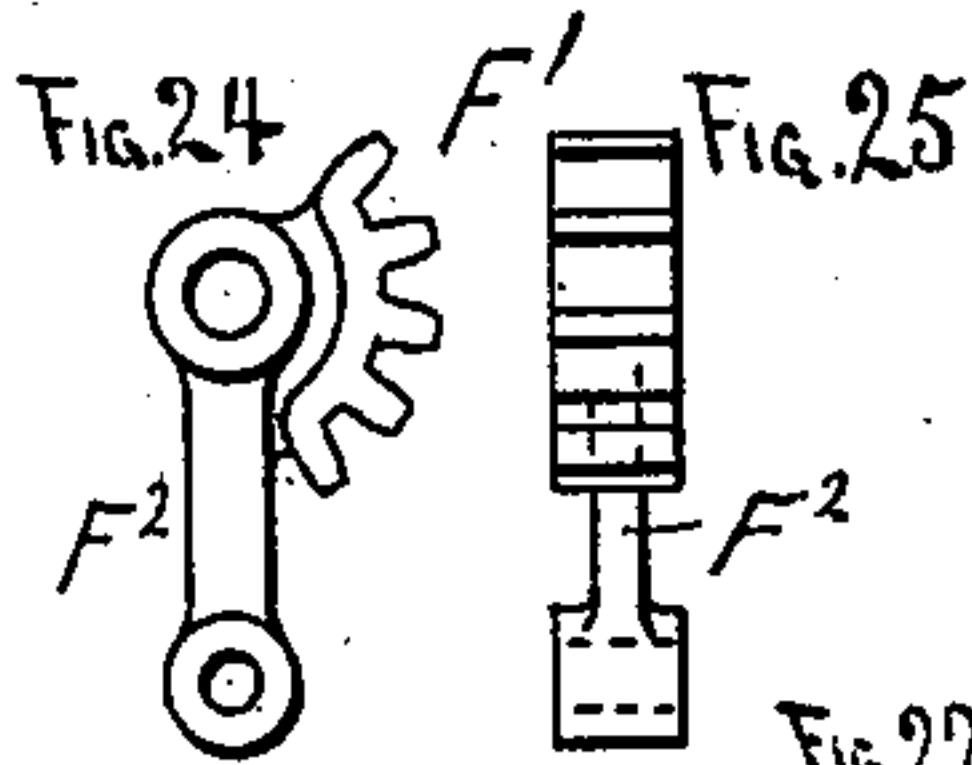
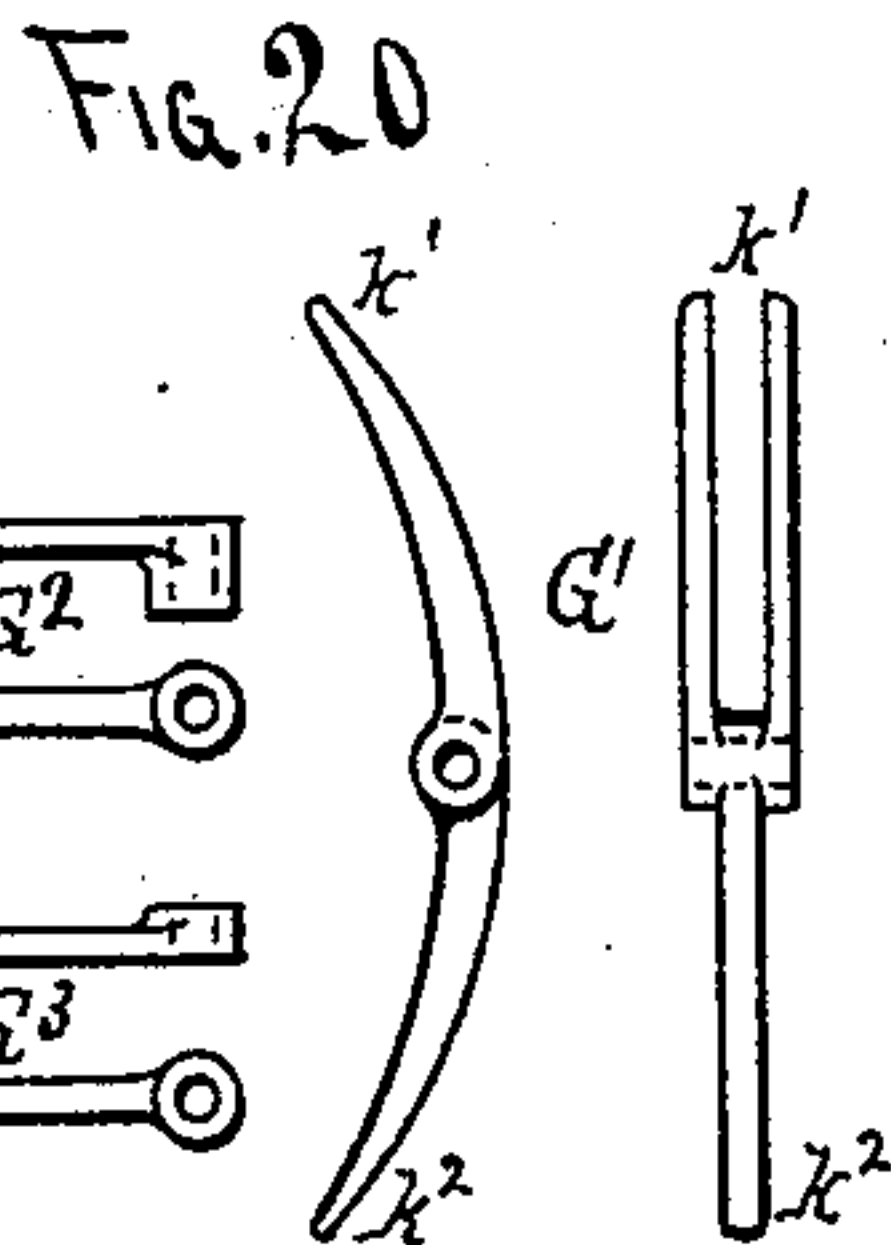
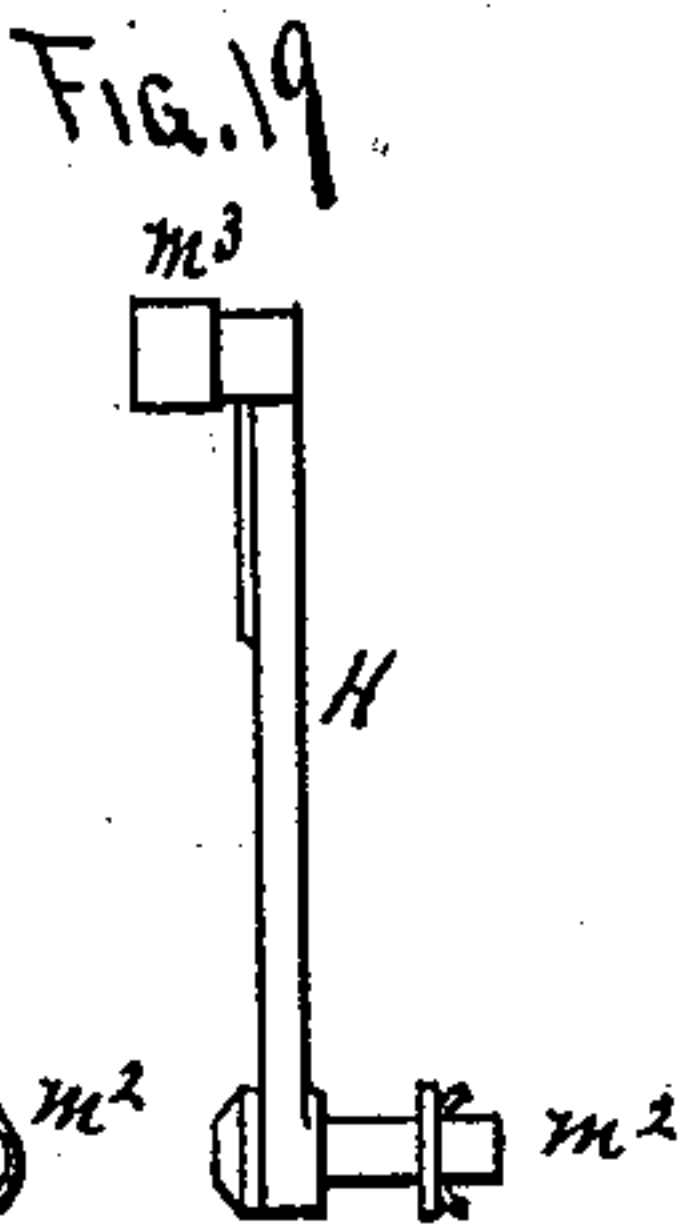
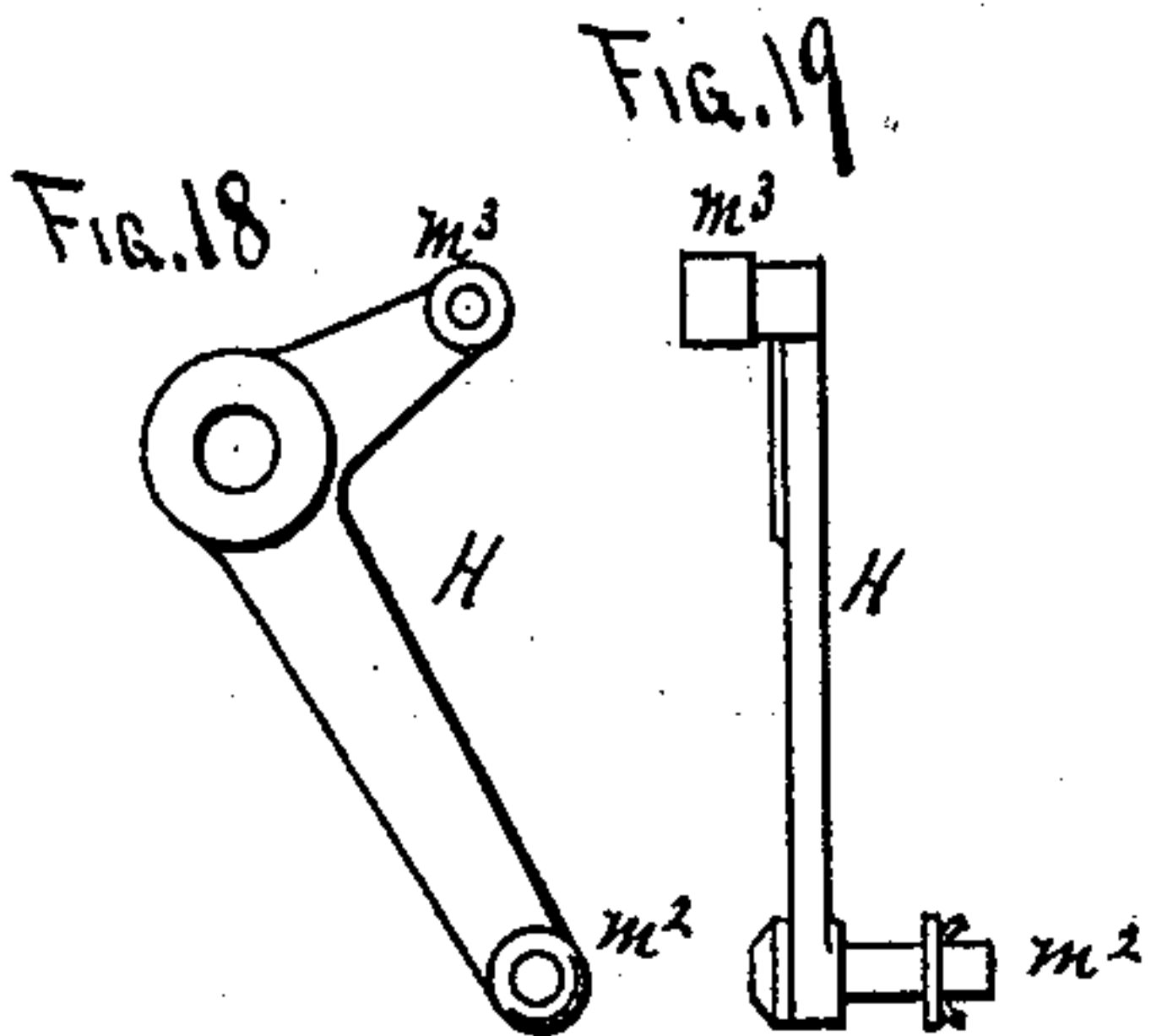
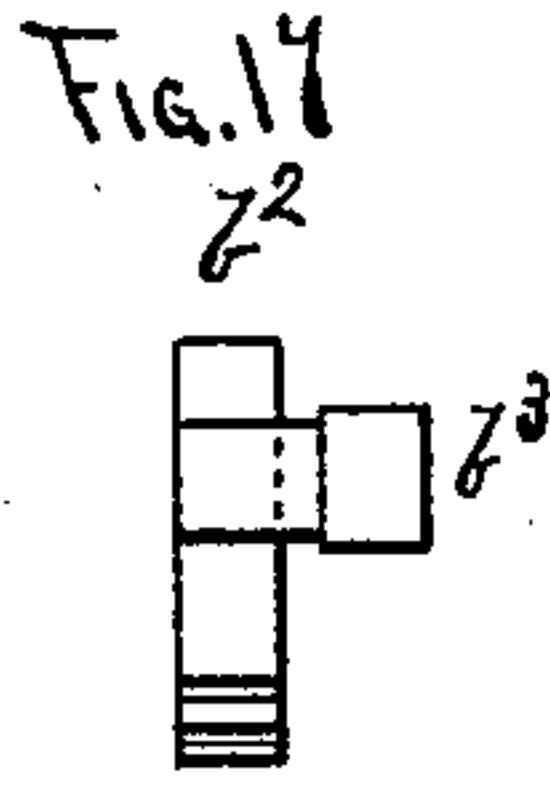
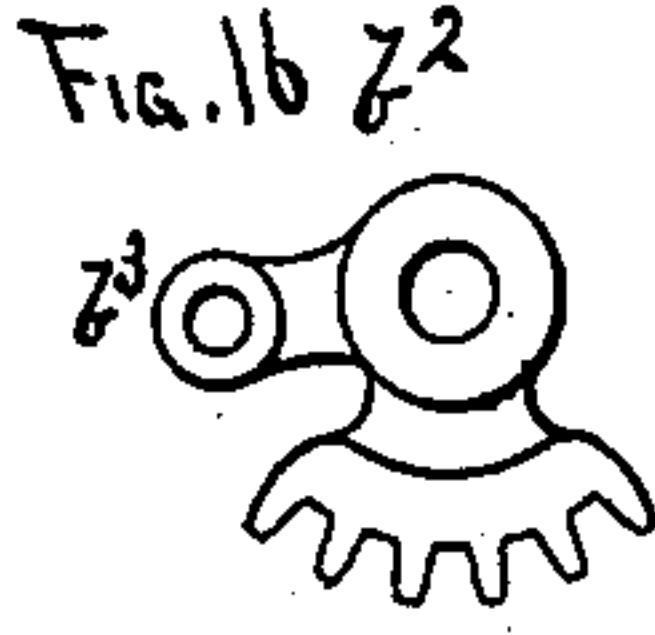
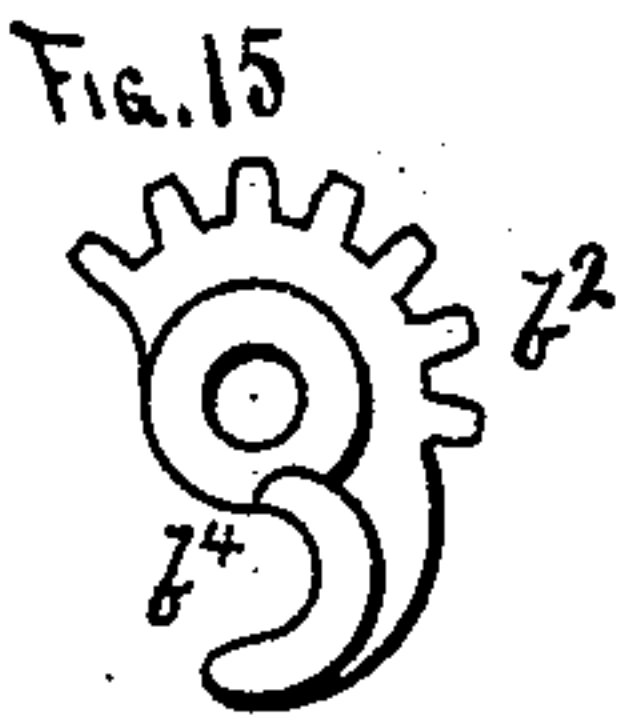
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5 Sheets—Sheet 5.

A. C. LAMAR.
FLAX PULLER.

No. 287,445.

Patented Oct. 30, 1883.



Alfreda Crivostoma Lamar,
INVENTOR, BY
Louis Fraser & Co. Attys.

UNITED STATES PATENT OFFICE.

ALFRÈDE C. LAMAR, OF ST. PAUL, MINNESOTA.

FLAX-PULLER.

SPECIFICATION forming part of Letters Patent No. 287,445, dated October 30, 1883.

Application filed June 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALFRÈDE CRISOSTON LAMAR, a subject of the Queen of Great Britain and Ireland, and a resident of St Paul, in the county of Ramsey, in the State of Minnesota, have invented certain new and useful Improvements in Flax-Pullers, of which the following specification is a full, clear, and exact description, reference being also had to the accompanying drawings, in which—

Figure 1 is a plan view of the machine, showing four sets of pulling devices, and with a portion of the revolving frame broken out to show some of the parts more fully. Fig. 2 is a plan view of the cam-frame. Fig. 3 is a rear view, and Fig. 4 is a side view, of the same. Fig. 5 is a rear view of the machine as shown in Fig. 1. Fig. 6 is a plan view of the revolving frame for supporting the pulling mechanism, showing the form when twelve sets of pulling-arms are used. Fig. 7 is an enlarged detail of a portion of the cam-frame, and revolving frame for supporting the pulling mechanism, and one of the sets of the pulling mechanism, showing their relative positions when the pulling-arms are withdrawn. Fig. 8 is a similar view, showing the pulling-arms extended. Fig. 9 is a similar view of the opposite side of the machine, showing the construction of the discharging mechanism. Fig. 10 is a side elevation of the part shown by Fig. 7. Figs. 11, 12, and 13 are detail views of the segments for operating the discharge mechanism. Figs. 14, 15, 16, and 17 are enlarged detached details of segments for closing the pulling-arms. Figs. 18 and 19 are enlarged detached detail views of the puller mechanism frame operating lever. Fig. 20 represents enlarged detached details of the puller-arm guides. Figs. 21, 22, and 23 are enlarged detached details of the sliding frame for supporting the pulling mechanism. Figs. 24 and 25 are enlarged details of the puller-arm-operating segmental lever. Figs. 26, 27, 28, and 29 are enlarged details of the puller-arms. Figs. 30, 31, and 32 are details of the puller-arms-operating cam-lever. Figs. 33 and 34 are detached details of the spring puller-arm connecting-rod.

A' is the base-frame, having a main driving-wheel, A², mounted upon an axle, A³, upon one side, and provided with a smaller wheel,

A⁴, upon a downwardly-curving axle, A⁵, upon the other side, and adapted to be drawn forward by horses attached to a tongue, A⁶. Fixed upon top of this frame A' is a cam-frame (see Fig. 3) having an outer rib, a', and an inner rib, a², as shown.

B' is an arm projecting from the cam-frame, and provided with two toothed segments, b' b², (see Figs. 14, 15, 16, and 17,) adapted to engage with each other, the segment b' having an upwardly-projecting spur carrying an anti-friction roller, b³, while the segment b² is provided with a curved finger or hook, b⁴, as shown. B² is another arm, projecting from the opposite side of the cam-frame from the arm B', and provided with toothed segments b⁵ b⁶, (see Figs. 9, 11, 12, and 13,) the segment b⁵ having an arm, b⁷, and anti-friction roller b⁸, and the segment b⁶ having a curved arm or finger b⁹, as shown.

C' is a center post or standard rising from the frame A', and adapted to support a circular frame, C², as shown. Around the outer edge of this frame C² is a bevel-gear, C³, into which the teeth on a bevel-pinion, C⁴, engage. This gear C⁴ is mounted upon a horizontal shaft, C⁵, (see Figs. 1 and 5,) running in suitable bearings in the frame A', and adapted to be driven by a gear and pinion from the main driving-wheel A², in the ordinary manner of driving harvesters, mowers, &c. By this means, when the machine is drawn forward, the frame C² will be revolved around the standard C'.

The frame C² is formed, as shown in Figs. 1 and 6, by parallel guides d', into open spaces d², radiating from the center of the frame. The frame may be formed with any number of these radial spaces. In Fig. 6 twelve are shown, which will be the ordinary number; but in Fig. 1 the frame is shown with four radial spaces and one partially broken out, so that the parts beneath are less obstructed. In each one of these open spaces d² a frame, D, is adapted to slide inward and outward.

Pivoted at their centers in each of the frames D, near their inner ends, are small levers e'. (See Figs. 30, 31, and 32.) The lower side of the outer ends of these levers e' are provided with downwardly-projecting studs carrying anti-friction rollers e² e³, and upon the outer

ends of arms e^4 , at right angles from each of the levers e' , are spurs e^5 , projecting upward through open spaces e^6 in the frames D.

Upon the outer ends of each of the frames D two curved arms, E' E^2 , are pivoted, and each provided with toothed segments g' g^2 , engaging with each other, so that by moving one of the curved arms the other will be made to move in the opposite direction. F' are other segments pivoted to the frames D, and adapted to engage with the segments g' on the arms E' . The segments F' are each provided with arms F^2 , connected by hollow arms F^3 with each of the studs e^5 . Each of the arms F^3 is formed with slots h' where they pass over the studs e^5 , (see Figs. 33 and 34,) and between the sides of the arms coiled or other springs h^2 are arranged, so that the arms F^3 will be flexible lengthwise, as hereinafter shown. Each of the curved arms E^2 is provided with a slot, i , into which the other arm, E' , runs when they are brought around toward each other, as shown in the lower part of Fig. 1 and in Fig. 8.

G' is a guide-arm connected by rods G^2 G^3 to the arms E' E^2 , and with one end at k' forked, to pass upon each side of the arm E' , while the other end, k^2 , passes into the slot i of the arm E^2 . By this means a guard is formed to protect the teeth on the ends of the arms E' E^2 from the flax when the arms are closed upon the gavel.

Each of the frames D is provided with a slot, m' , in which is pivoted one end, m^2 , of a series of crank-arms, H, while their other ends, m^3 , are provided with anti-friction rollers adapted to catch into the hooked finger or arms b^4 on the segment b' , as hereinafter shown.

Just back of the gear C^3 on the frame C^2 is a cam-groove, n' , in which the friction-rollers b^3 b^8 on the segments b' and b^5 run. This cam-groove n' is formed, as shown, with the parts which come between each pair of the guides d' a segment of a circle of which the standard C' is the center, while the portions which come between these segmental portions are curved inward toward the center, as shown, the object to be hereinafter set forth.

K' K^2 are two dividers adapted to gather the flax inward and compress it as the machine is drawn forward, to put it in proper shape to be caught by the pulling-arms. The bed-frame A' , and the cam-frame a' a^2 , and revolving frame C^2 are set at an inclination to the ground, the side next to the wheel A^4 being the lowest, and just in the rear of and partially beneath the projecting arm B^2 is an endless slatted belt, L, adapted to be revolved by gears, &c., from the shaft C^5 . In Fig. 1 one set of the pulling-arms is shown at N' open and drawn inward, and moving in that position around toward the dividers K' K^2 , and at N^2 one set is shown just ready to be thrown outward, while the third set is shown thrown outward, and closed, in the position they will assume when carrying the flax around to the discharge-point. When the machine is drawn forward, the frame C^2 is re-

volved, as before described, and carries the pulling devices around with it.

The anti-friction rollers e^3 e^3 on the levers e' are adapted to run in the space between the ribs a' a^2 from the point $+a^3$ to $+a^4$ and outside the rib a^2 from the point $+a^4$ to $+a^3$. The ribs a' a^2 , from the point a^5 to the point a^6 , are the segment of a circle of which the center of the standard C' is the center, and the rib a^2 , from the point a^7 to the point a^8 , is also the segment of a circle of which the standard C' is the center, but of a greater radius than the section from a^5 a^6 . At a^9 a slight inward or reverse curve is formed in the rib a^2 , and this rib connected to the rib a' by a web at a^{10} , while a similar curved section, a^{11} , is formed as a continuation of the rib a' between the points $+a^3$ a^5 and nearly parallel with the section a^{10} . From the point a^6 to the point a^7 the rib a^2 is in a straight line radiating outward from the standard C' , while the corresponding part, a^{12} , of the rib a' is in a line parallel with it and with a shorter rib, a^{13} , midway between them, leaving channels a^{14} a^{15} , which also radiate outward from the standard C' . The end a^{16} of the rib a^{13} and the end a^{17} of the rib a' are curved around, as shown, the object to be hereinafter explained.

While the frame C^2 , with the pulling mechanism attached, is revolving with the anti-friction rollers e^3 e^3 on one of the pulling devices in the space a^5 a^6 between the ribs a' a^2 , the arms E' E^2 will be held open and inward, as shown in Figs. 1 and 7. Then, when the arms E' E^2 have reached a point so that the rollers e^3 e^3 are about opposite the channels a^{14} a^{15} , as shown in Fig. 7, the cam-groove n' will have so acted upon the segments b' b^2 as to throw the hook or finger b^4 outward to catch the friction-roller m^3 on the bell-crank lever H and hold the latter stationary, so that as the frame C^2 continues to revolve the bell-crank lever will throw the frame D outward and cause the roller e^3 to run into the channel a^{15} , and the other roller e^3 to run into the channel a^{14} , as shown in Fig. 8.

As before stated, the channels a^{14} a^{15} radiate outward from the standard C' ; hence the frame D, when moved outward, will do so in a very short time. As the machine is drawn forward, the dividers K' K^2 will gather in a large amount of the flax and compress it, so that when the frame D is thrown outward the arms E' E^2 will enclasp a bunch of the compressed flax, and then, when the rollers e^3 e^3 strike the curved ends a^{16} a^{17} , they will be suddenly turned around and revolve the lever e' , and throw the segment F' around by means of the arm e^4 and connecting-rod F^3 , and cause the segment F' to act upon the segments g' g^2 on the arms E' E^2 , and close them and tightly compress the flax; and as the frame C^2 continues to revolve, the bunch of flax held by the arms will be pulled up by the roots and carried around to the projection B^2 , the rollers e^3 e^3 traveling upon the rib a^2 from a^7 to a^8 , and holding the

arms E' E² closed during that part of the movement. In the meantime another set of the pulling-arms have come into play, caught their "gavel" of flax and carried it around, and so on continuously. The sets of pullers will be so close together, and the speed of the frame C² will be so regulated, that all the flax will be caught by the arms as it is compressed between the dividers K' K². The curving of the axle A⁵ downward, as shown in Fig. 5, enables the roots of the flax to pass over it, while the inclining of the frame A' raises the discharge side of the machine, so that the flax will be carried upward as it is carried around and will not drag upon the ground. The inclination of the frame may be increased or decreased, as desired. As the arms E' E², with their gavels of flax, come around toward the reverse-curve part a⁸ a⁹ of the rib a², the flax will be thrown over upon top of the endless belt L, and then, when the roller e³ strikes the hooked finger b⁹ on the segment b⁵, (which will be thrown inward at the proper time and held inward by the cam-groove n'), the arms E' E² will be thrown open and the gavel of flax dropped upon the endless belt L and be carried off to one side and dropped upon the ground, out of the way of the machine when it comes around again. The reverse-curved portion a⁸ a⁹ forms an enlarged space for the rollers e³ e³ to revolve in when they are turned around by the hook b⁹. The rollers e³ e³ then pass on into the channel between the sections a¹⁰ a¹¹, the latter by their inclination gradually forcing the frame D inward until the point a⁵ is reached, from which point to the point a⁶ it will travel in the segment of a circle, as before described. By these arrangements each pair of the pulling-arms, as they are revolved, is suddenly thrown outward, grasps a gavel of the flax, pulls it up by the roots, carries it around, and discharges it on the opposite side of the machine. A crank-arm lever, M, adapted to be vibrated by the cam-groove n', or other means, will be pivoted beneath the frame A' at a suitable point to reach beyond the frame C² and strike the roots of gavels of flax as they are carried around and knock the earth loose therefrom.

Having described my invention and set forth its merits, what I claim is—

1. In a flax-pulling machine, a frame adapted to be moved forward, and provided with means for gathering the flax into a compact form, a revolving frame carrying a series of oppositely-curved gripping-jaws, means for projecting said jaws outward and closing them to seize a gavel of the flax, and means for opening said jaws to discharge said gavel therefrom and drawing the jaws inward again, substantially as described.

2. The combination of a frame, A', adapted to be moved forward, and provided with means for gathering the flax into a compact form, a

stationary cam-frame fixed to said frame A', a circular frame, C², adapted to be revolved above said cam-frame and carrying a series of oppositely-curved gripping-jaws, and rollers adapted to run in said cam-frame, means for projecting said gripping-jaws outward and closing them at one part of the movement of said revolving frame, and means for opening said gripping-jaws and withdrawing them inward at another part of the movement of said revolving frame, substantially as and for the purpose set forth.

3. The combination of a fixed cam-frame carrying segments b' b², a revolving frame, C², provided with parallel-sided openings or guides d² and cam-groove n', frames D, adapted to slide inward and outward in said cavities d², crank-arms H, pivoted to said frames C² and D, oppositely-curved gripping-jaws E' E², pivoted upon said frames D, and means for opening and closing said gripping-jaws and moving said frames D inward and outward, substantially as and for the purpose set forth.

4. The combination of a fixed cam-frame, constructed substantially as shown and described, and carrying pivoted segments b' b² b⁵ b⁶, a revolving frame, C², having guides d² and cam-groove n', sliding frames D, crank-levers H, pivoted to said frames C² and D, levers e', pivoted to said frames D, oppositely-curved and interlocking gripping-jaws E' E², having gear-teeth g' g², segment F' F², and flexible connecting-rod F³, substantially as described.

5. The combination of a fixed cam-frame, constructed substantially as shown and described, and carrying pivoted segments b' b² b⁵ b⁶, a revolving frame, C², having guides d² and cam-groove n', sliding frames D, crank-levers H, pivoted to said frames C² and D, levers e', pivoted to said frames D, oppositely-curved and interlocking gripping-jaws E' E², having gear-teeth g' g² and guard G', segment F' F², and flexible connecting-rod F³, substantially as and for the purpose specified.

6. The combination, with a flax-pulling machine, of the frame A', driving-wheel A², grain-wheel A⁴, and downwardly-bent axle A⁵, substantially as and for the purpose set forth.

7. The combination, with a flax-pulling machine, of a vibrating arm, M, adapted to strike the roots of the flax after it is pulled from the ground to knock the clinging earth therefrom, substantially as and for the purpose described.

8. The combination of the revolving frame C², set at an angle to the ground, and the flax-pulling mechanism, substantially as and for the purpose herein set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ALFREDE CRISOSTON LAMAR.

Witnesses:

C. N. WOODWARD,
LOUIS FEESER, Sr.