

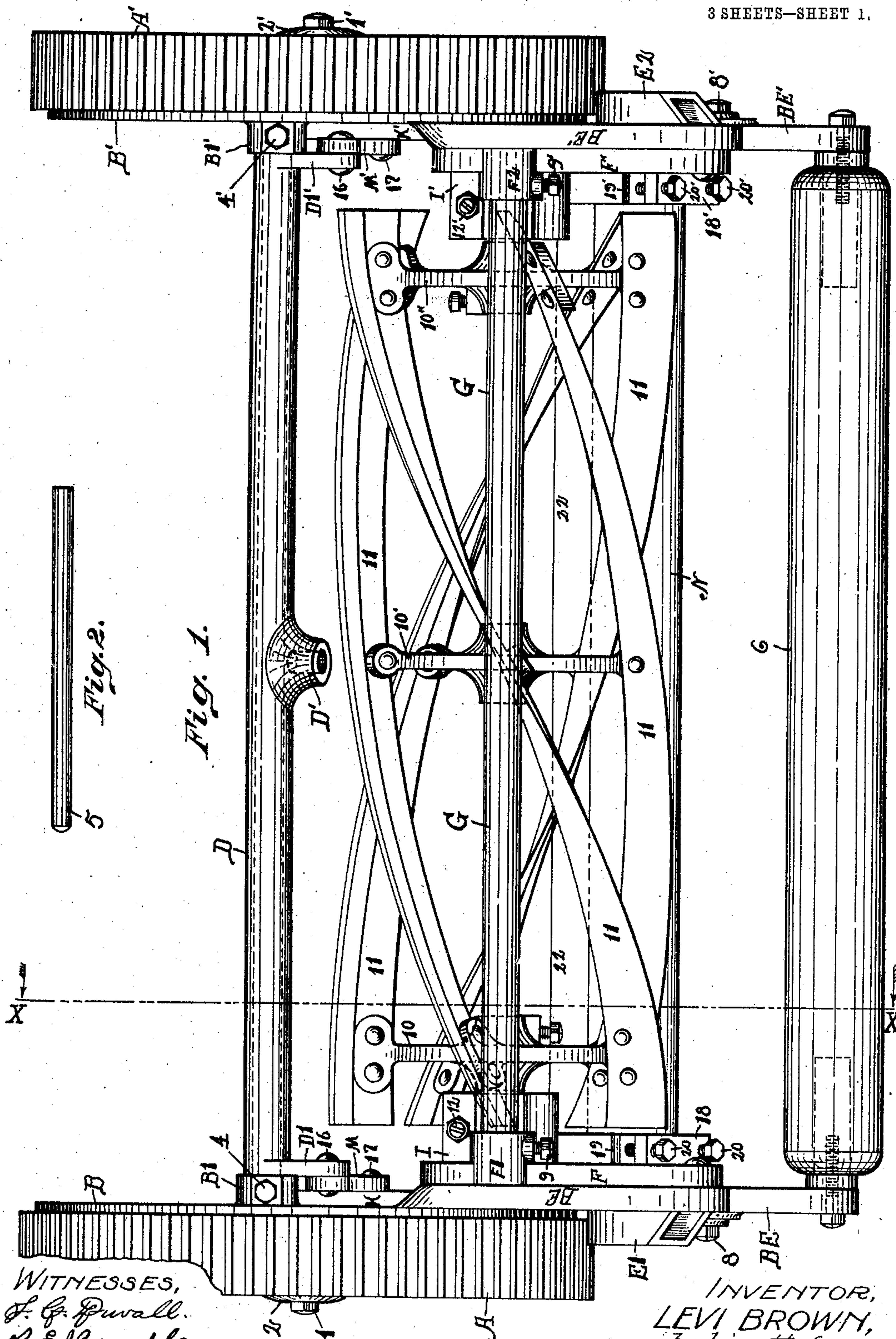
No. 781,397.

PATENTED JAN. 31, 1905.

L. BROWN.
LAWN MOWER.

APPLICATION FILED FEB. 29, 1904.

3 SHEETS—SHEET 1.



WITNESSES,
S. G. Puwall.
R. E. Handley.

INVENTOR,
LEVI BROWN,
By his attorney,
Robert W. Handley.

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3 SHEETS—SHEET 2.

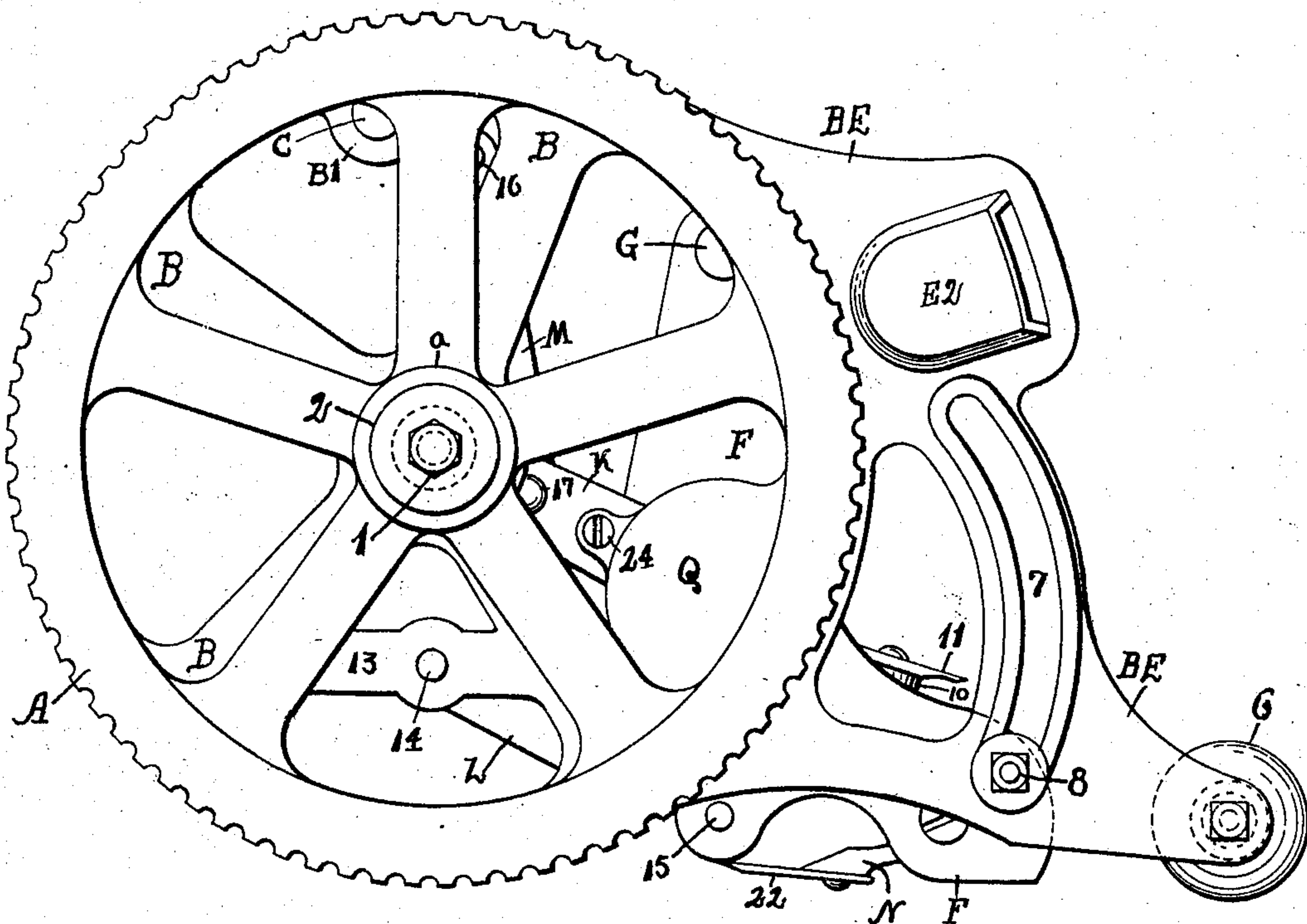


Fig. 3.

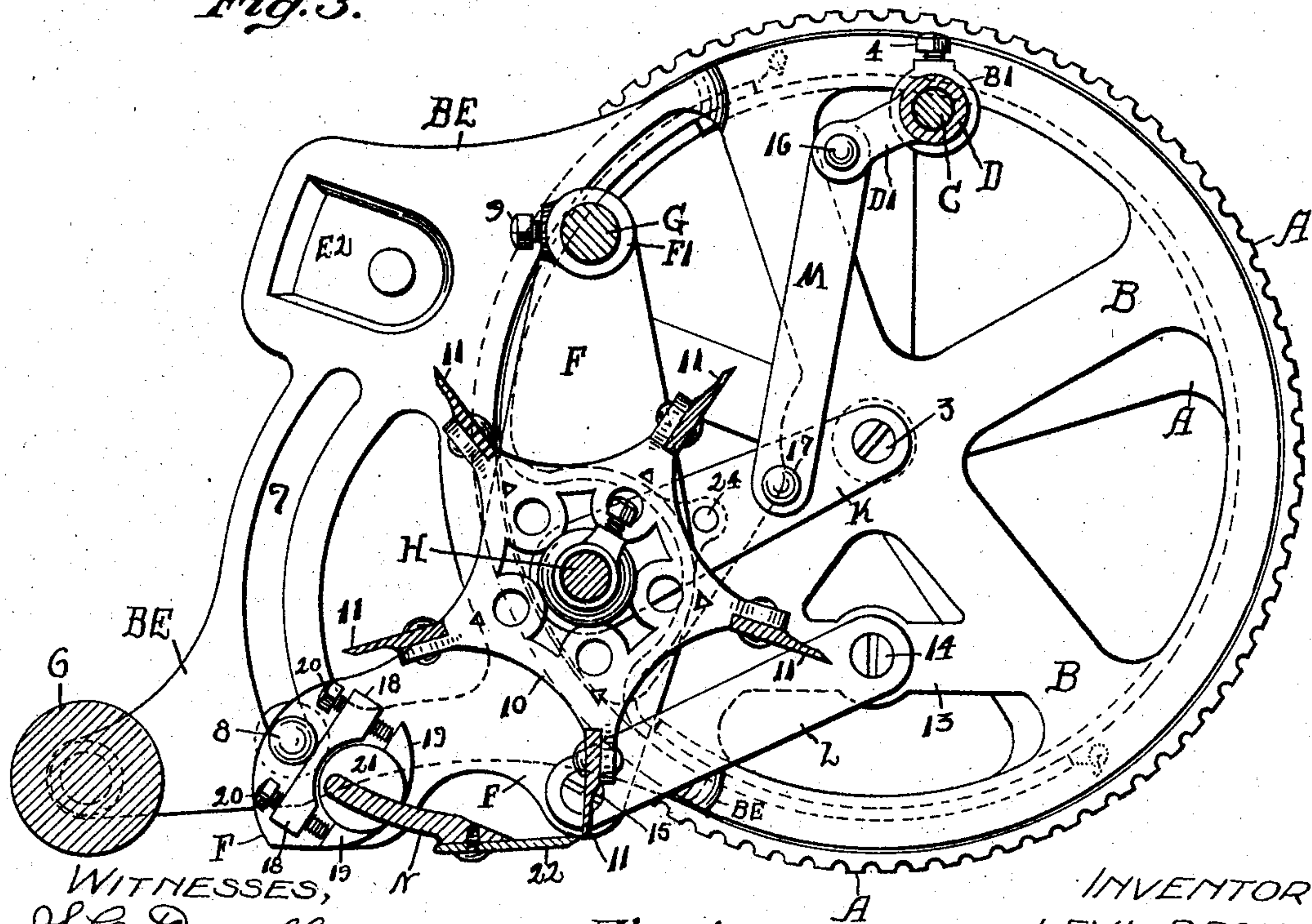


Fig. 4.

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3 SHEETS—SHEET 3.

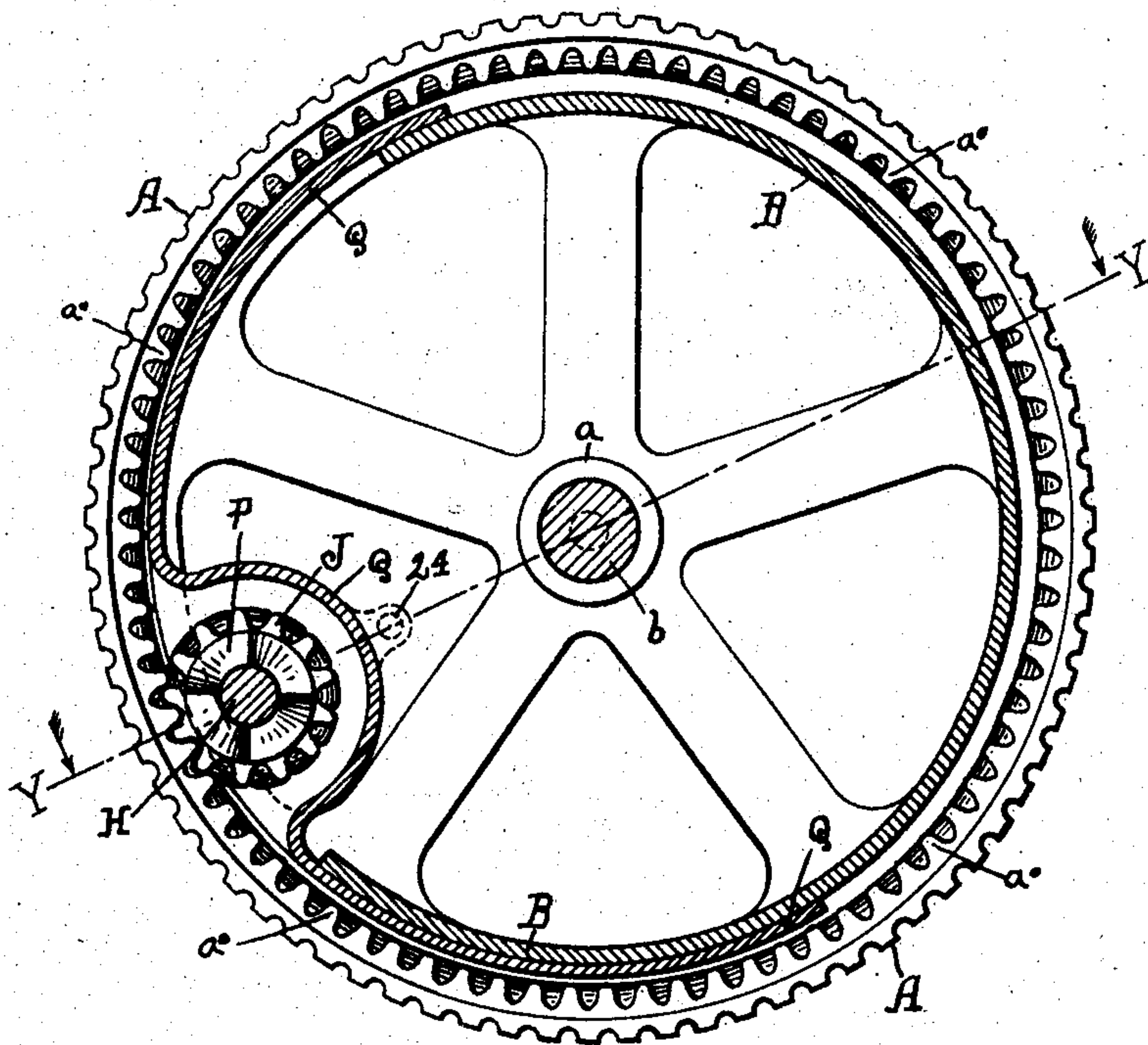


Fig. 5.

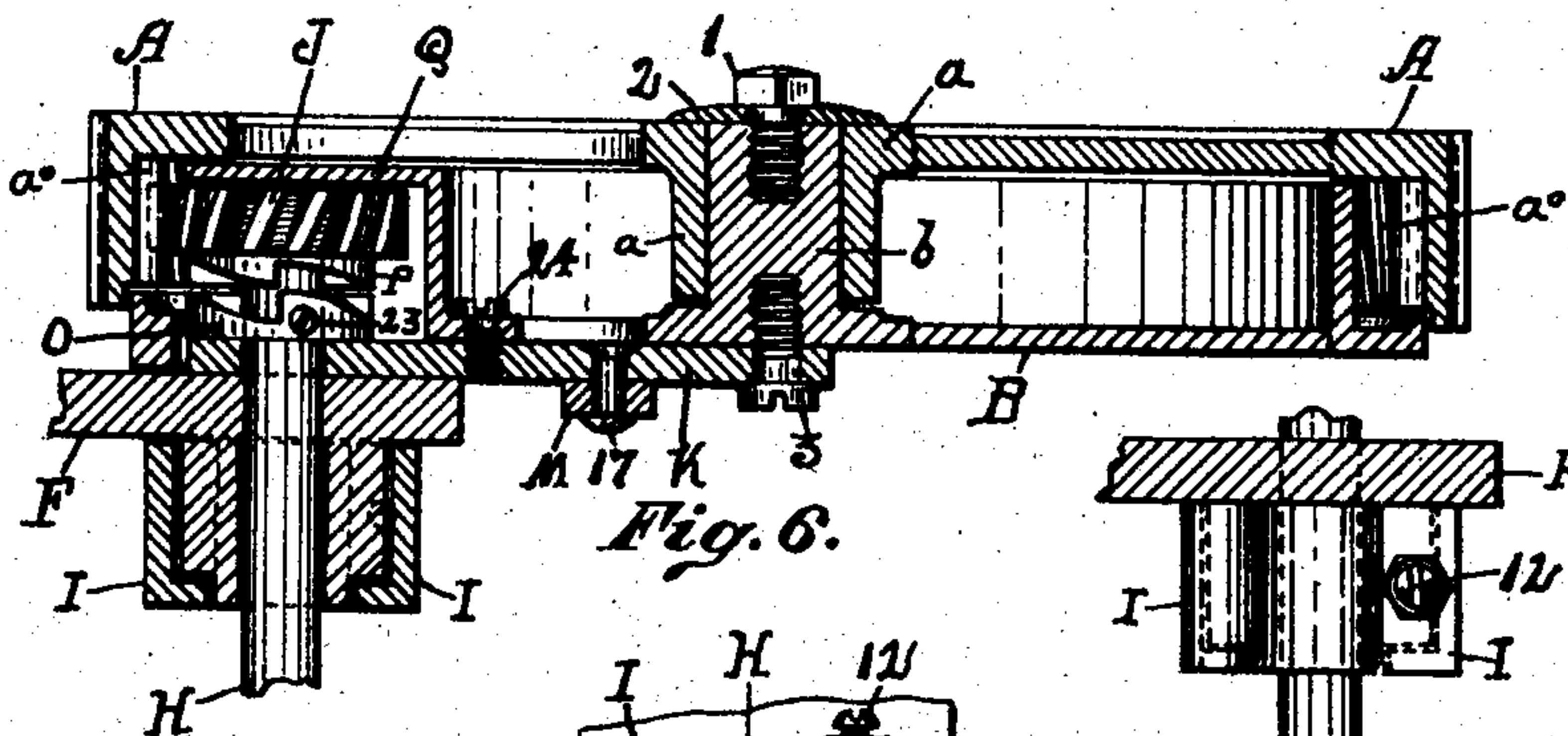


Fig. 6.

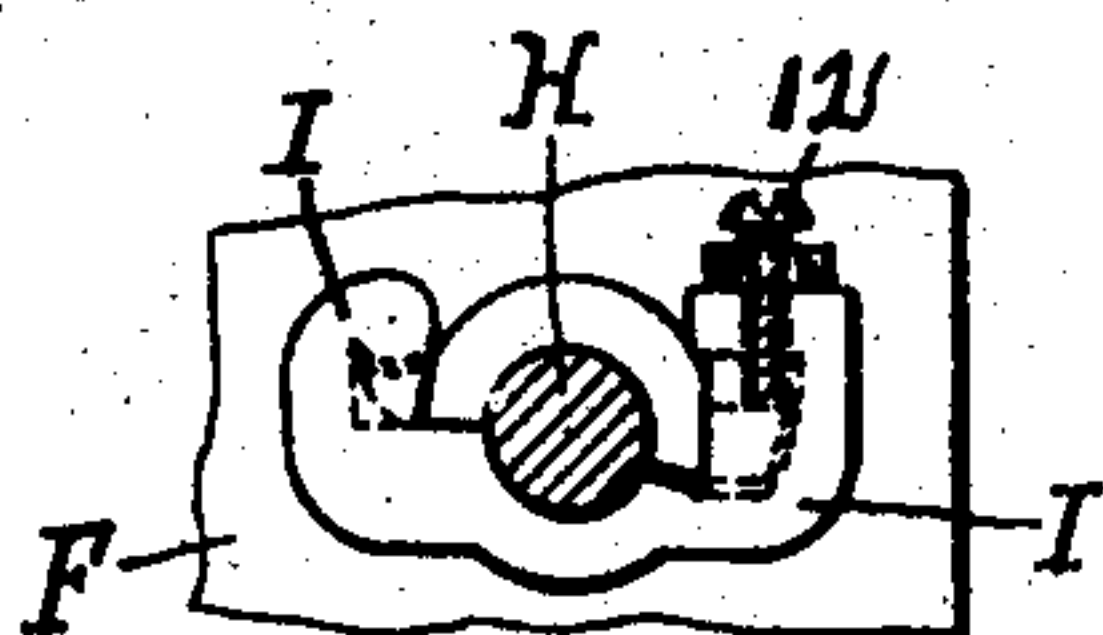


Fig. 7.

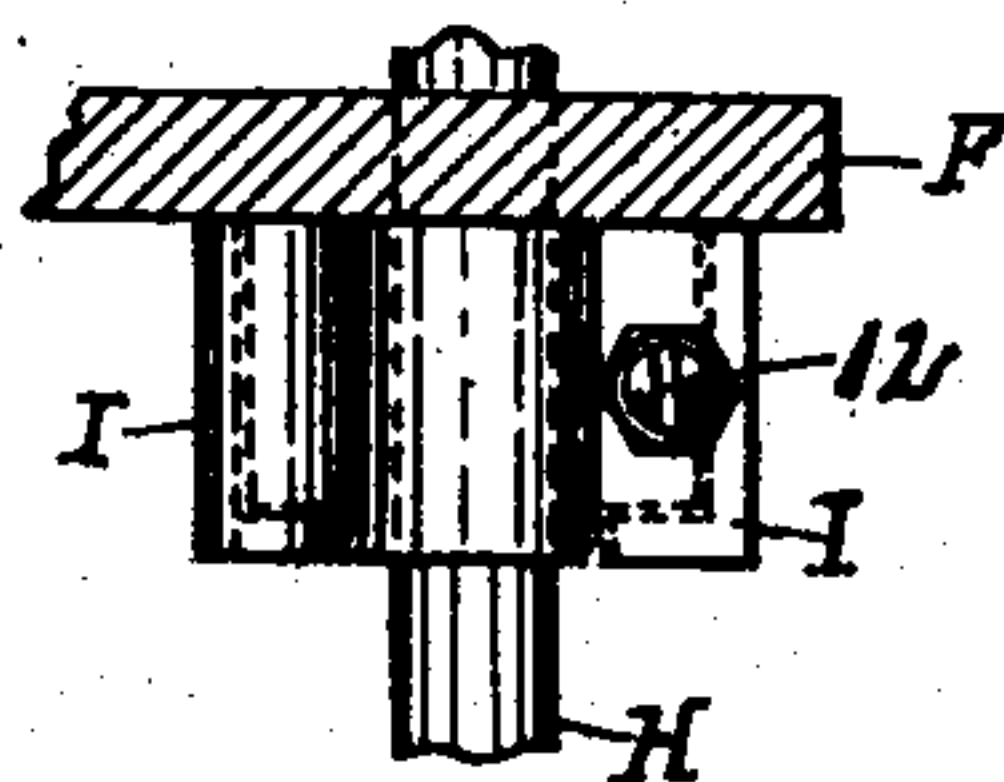


Fig. 8.

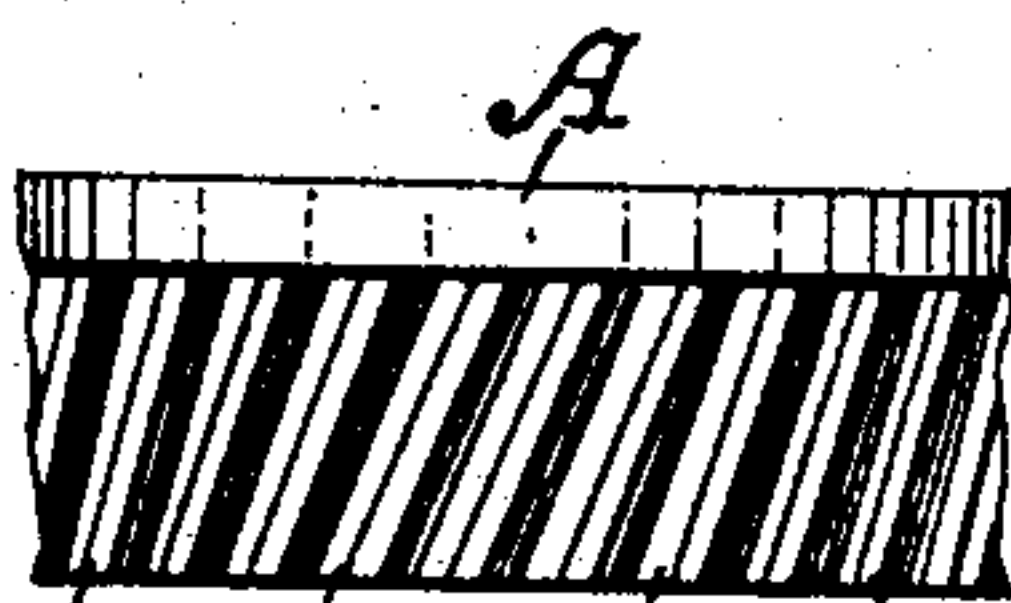


Fig. 9.

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UNITED STATES PATENT OFFICE.

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LAWN-MOWER.

SPECIFICATION forming part of Letters Patent No. 781,397, dated January 31, 1905.

Application filed February 29, 1904. Serial No. 195,916.

To all whom it may concern:

Be it known that I, LEVI BROWN, a citizen of the United States, residing in Richmond, in the county of Wayne and in the State of Indiana, have invented certain new and useful Improvements in Lawn-Mowers; and I hereby declare the following to be a full, clear, and exact specification of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of my present invention, broadly speaking, is the provision of an improved lawn-mower in which a maximum of mechanical efficiency will be developed with a minimum of power applied, while at the same time providing a machine composed of a minimum of mechanical parts consistent with the work it is adapted to perform.

Another generic object is to provide a lawn-mower which will be neat, artistic, and attractive in appearance, compact and symmetrical in its proportions, strong and durable in construction, positive in action, and capable of a wide scope of usefulness and efficiency.

A further object is the provision of a lawn-mower constructed in accord with well-known mechanical principles and along scientific lines wherein the size, weight, and strength of the various parts have been carefully and accurately determined, and the interactions and coöperation of the various essential elements are so nicely accounted for that each part fills its own specific sphere and all are combined into a harmonious whole to produce a mechanical ensemble and to attain other specific advantages which will presently be referred to.

A specific object of my invention is to provide a lawn-mower in which the various parts and mechanisms are so positioned and arranged that the weight of the machine will be principally in the rear of the cutting edge, thus overcoming the tendency, as heretofore, of the inclination of machines of this character to tip forward—that is to say, of the rear parts to rise upward and forward—which is more especially true when the machine is

working in heavy sward or when an obstacle is encountered.

A further and important object I propose to obtain is the provision of means whereby the cutting edge of my machine may be adjusted vertically, and that without throwing the machine out of alinement, and whereby the machine may be adjusted for cutting higher or lower, as desired, and means whereby said adjustment may be accomplished easily and quickly.

A still further object I have accomplished is the provision of an improved and novel boxing for main journals whereby said journals may be easily removed and whereby the portion of the boxing most likely to wear or damage may be easily replaced by a new member.

A further and perhaps the most important object is the provision of self-acting clutches or gears, one for each end of the main shaft, wherein their actions are purely automatic and noiseless, dispensing with the greater proportion of friction and resulting in a minimum of ease in operation; and, finally, another object is the provision of a novel dust guard or ægis adapted to travel with the vertical adjustment and completely inclose and protect the clutch mechanisms.

Other particular objects and specific advantages of my invention will be made apparent in the course of the ensuing specification.

The distinguishing feature of my present invention, briefly stated, consists in the two identical clutch mechanisms and the means for automatically throwing them into and out of gear; the means for adjusting the height of the cutting mechanism, while at the same time preserving the proper relationship of the parts with reference to each other and to the surface of the ground or sward; the novel and accessible boxing for the main journals; the automatically-operating guards for said clutches; the relative location of the various parts, and the several necessary and accessory elements which will presently be explained.

My invention consists in a lawn-mower containing the several distinctive features stated

and the relative disposition of the several parts, substantially as particularly described elsewhere in this specification, and in the legitimate combinations herein set forth with
5 reference to each other and to the entire machine.

In this construction I have attempted to co-ordinate, systematize, and harmonize a variety of mechanical movements and to bring
10 into line with the general scheme of operation a number of mechanical operations and devices which heretofore have had a more or less independent existence in order that in my present construction as a mechanical entity
15 there will be no discordant elements.

Referring now to the drawings forming a part of this specification for a visualization of my preferred construction, Figure 1 shows a top plan of a lawn-mower embodying in its
20 composition the means for obtaining the above-named objects. Fig. 2 is a detail view of a lever I employ for adjusting certain of the parts of my mechanism. Fig. 3 is an outside end elevation of the left-hand side of my lawn-
25 mower, which view, it will be understood, is identical with the opposite or right-hand side of the machine. Fig. 4 is a cross-sectional view of my mower, taken on the line X X of Fig. 1 and taken in the direction of the ar-
30 rows. Fig. 5 is a detail introspective view of one of the ground-wheels, and it also shows an end view of one of my clutch members. Fig. 6 is a central cross-section of one portion of the mechanism, taken through one of the
35 ground-wheels and clutch member thereof on the line Y Y of Fig. 5 and as taken in the direction of the arrows. Fig. 7 is a detail showing an inner face end view of one of the boxings for the reel-axle. Fig. 8 is a detail top
40 plan view of the parts shown in Fig. 7, and Fig. 9 is a detail plan of a portion of the gear of the ground-wheels.

Similar indices refer to and denote like parts throughout the several views of the drawings.

45 With all of the above-designated views and objects in mind I will now take up the description of my invention in detail, which I will refer to as briefly and compactly as I may.

Referring now to the drawings in detail, it
50 will be observed that my construction is dimorous—that is, that the parts located at each side of my machine are equipollent and identical in construction. Therefore for convenience of description I will refer to the parts
55 shown on the left-hand side by certain characters and will simply designate on the drawings the corresponding parts on the right-hand side of the machine by a related designation or subindice.

60 I will first refer to the ground-wheels, which wheels are designated by the indices A A', and each consists of an outer circumferential band, having its periphery cross-ribbed or serrated to form a traction-surface, with a flange ex-
65 tending centerward from the outer edge of

the band, with spokes integrally connecting the said flange with the hub portion *a*. The said band portion of the wheels has an internal spur-gear disposed across at an angle—that is to say, a series of cogs *a*⁰ disposed
70 across at an angle to the axial direction on the inner face of the band and equally spaced therearound. The said hubs *a* project somewhat into the interior space of the wheels, as is indicated in Fig. 6, and with journal-bear-
75 ings therein, as shown.

The letters B B' denote the relatively stationary bridge members, concentric with the wheels A A', which consist, essentially, of an outer segmental rim of less dimension than
80 the inner dimension of the band of said wheel, with spokes extending centerward, carrying the central outwardly-extending pintle *b*, as shown in Figs. 5 and 6. The said rim portion of the member B B' is open or segmented at one
85 portion of its circumference, as is indicated in Fig. 5, for the purpose hereinafter appearing. The member B B' is in Fig. 6 shown positioned in connection with the wheel A A', and the wheel A A' is revolvably mounted
90 thereto by means of the pintle *b* being inserted in the hub *a* of the wheel A A', secured by the tap-bolt 1 1', extending axially from the outside centrally into the pintle *b* and clamping the washer 2 2' against the outer
95 face of the wheel. Extending axially from the inside into the pintle *b* is a screw 3, shown in Figs. 4 and 5, oppositely disposed to the bolt 1, and is for the purpose presently stated. Extending inward from and integral of the
100 member B B' is the protuberances B¹ B'', having an internal cavity to receive the ends of the cross-arm C, with its ends entering the said cavities and secured therein by the set-screw 4 and 4', as shown. The said cross-arm C is
105 of a length to space the members B and B' to the requisite distance apart for the swath to be cut, and it is surrounded by the thimble D, which thimble is rotatable on the cross-arm C and extends to and between the protuber-
110 ances B¹ and B'', as shown in Fig. 1 of the drawings. Extending rearward and inclined slightly upward from the center of the thimble D is a protuberance D', having an open cavity extending thereinto at a right angle to
115 the thimble D, in which cavity one end of the lever 5 is adapted to be inserted for the purpose presently made apparent. Extending rearward and slightly downward from each end of the thimble D are the fingers D¹ D''.
120 The purposes of this will be explained hereinafter.

The characters BE BE' denote the rearwardly-extending members of the framework of my machine, which are integral with and
125 extend to the rear from the members B B'. On the outer face of the members BE BE' are formed the ears E¹ and E² to provide means for the attachment of the forks of the propelling-haft (not shown) and which may be
130

of any desired construction, and between the rear points of the members BE and BE' is rev-
 olubly mounted the sward-roller 6. Through
 the members BE and BE', below the said ears,
 5 are formed segmental and substantially ver-
 tical slots 7, approximately as shown in Figs.
 3 and 4.

The indices FF' denote the adjustable plates
 movably mounted over and separated from
 the member BB', with their tail portions over-
 lapping and contacting with the inner face of
 the respective member BE BE'. In said tail-
 pieces of said members BE BE' is a bolt 8 8',
 disposed through the slots 7, adapted to oper-
 15 ate therein and adapted to be secured at any
 point in said slots by the outside nuts, which
 are threaded on said bolts, as shown in Fig.
 3. On the upper ends of the extremities of
 the plates FF' are hangers F¹ F², in which are
 20 secured the respective ends of the cross-stay
 G, secured therein by the set-screws 9 and 9'.

The letter H denotes the main shaft. (Shown
 in cross-section in Figs. 4, 5, and 7, portions
 thereof in Figs. 6 and 8, while in Fig. 1 it is
 25 located immediately below the stay G, and
 therefore is not apparent.) The shaft H is
 supported by the respective boxings I and I',
 (which will presently be referred to in detail,)
 passes through apertures therefor in the plates
 30 F and F', and on the ends thereof are loosely
 and revolubly mounted the bevel-gear pinions
 J, (only one of which appears in the drawings.)
 The bevel-gear of the said pinions are so
 formed and positioned as to mesh with the
 35 gears a^0 of the respective wheels A and A', as
 is indicated in Figs. 5 and 6. On the shaft H
 is secured the spiders 10 10' 10'', to which are
 securely mounted the spiral knives 11, plural
 in number and as shown in Figs. 1 and 4.
 40 The said boxings I I' are shown most clearly
 in Figs. 6, 7, and 8 and are of novel construc-
 tion, their body portions being secured to the
 plate FF', with their secondary members
 locking in the chimes thereof, the two parts
 45 surrounding the shaft H, to which they may
 be adjusted by the set-screws 12 12', as shown.

The letters K K' denote an arm pivoted at
 one end by the screw 3 and then extending rear-
 ward and downward, passing between the
 50 plate FF' and the member BB' and with an
 aperture therethrough in which operates the
 shaft H. It will now be seen that the shaft H
 and the plate FF' may be raised and lowered,
 (within the limits of the two rear spokes of
 55 the member BB',) with the screw 3 as its piv-
 otal point. In order to allow of said move-
 ments and to retain the plate FF' in the po-
 sition shown, I have devised a parallel move-
 ment—that is, I extend a web 13 across be-
 60 tween the two lower spokes of the members B
 B', and in the center of this web is pivoted by
 the screw 14 one end of the arm L, the other
 end of said arm being pivoted by the screw 15
 to the plate F below the shaft H, whereby
 65 said arms K and L are at all times parallel with

each other, as indicated in Fig. 4. Pivoted to
 the outer ends of the fingers D¹ D² by the
 rivets 16 are the upper ends of the links M M',
 the lower ends of said links being pivoted to
 the arms K K' by the rivets 17. It will now be
 70 seen that by inserting the lever 5 in the pro-
 tuberance D' the lever 5 can be moved back and
 forth, which of necessity will raise and lower
 the shaft H and all the parts thereunto con-
 nected, and also that when the shaft H is at
 75 the point desired it may be secured at that
 point by tightening the nuts of the bolts 8 8'.

The cutter-bar N is secured between the
 members F and F' adjustably, as indicated.
 The lugs 18 18' are integral of the members
 80 F F', while the lugs 19 19' are integral of the
 bar N, and on each end of the bar N is an in-
 tegral axially-extending pintle 21, (only one
 appearing in the drawings,) which extend into
 and operate in a correspondling aperture
 85 formed through the members F F', and then,
 by means of the two pairs of set-screws 20 20
 20' 20', the bar N may be secured in the de-
 sired position to adjust its blade 22 in the
 proper cutting relationship with the edge of
 90 the knives 11.

The operation of the clutch-and-pinion me-
 chanisms will now be referred to and are most
 clearly shown in Figs. 5 and 6. Secured to
 the shaft H by the screw 23, as in Fig. 6, is
 95 the minor member O of the clutch, while the
 major member P of the clutch is integral with
 the gear-pinion J, above referred to. It will
 now be obvious that should the machine be
 pushed forward over the sward—that is, in a
 100 direction to the left when referring to Fig.
 3—the wheels A A', traveling revolubly on
 the sward, will support and carry all of said
 parts of the machine, also that as the said
 wheels revolve the inclination of the gears a^0 ,
 105 meshing with similar gears of the pinion J,
 will by the forward thrust cause the pinion J
 to traverse inward, thus causing the face P of
 the clutch to engage and lay with the face of
 the member O of the clutch, thus causing the
 110 shaft H to revolve forward with a multiplied
 motion, also if the forward movement of the
 machine be discontinued the gear J will be
 discontinued, while the revolution of the shaft
 H, carrying the knives, may continue, event-
 115 uating in at once throwing the member P out
 of engagement with the member O, and the
 members of the clutch will continue out of en-
 gagement with each other until the ground-
 wheels are again rotated forward, thus dis-
 120 pensing with any cause for clicking as the
 shaft and knives continue to revolve.

The letter Q denotes the guards of identical
 construction, (only one of them appearing in
 the drawings,) which guards are primarily for
 125 protection of the respective clutch-and-pinion
 mechanisms. Said guards consist of a cap,
 disposed over the pinion, as shown, and se-
 cured by the screw 24 to the arm K K' and
 with arms extending in the segment of a circle
 130

between the flanges of the members A B and A' B', as indicated in Fig. 5, where they are free to move cycle-like when the shaft H is raised and lowered.

5 From the above description, taken in connection with the accompanying drawings, it will be apparent that I have produced an improved lawn-mowing machine embodying the objects elsewhere referred to, and while I
10 have illustrated and described the best means now known to me for carrying out the principles of my invention I desire that it be fully understood that I do not restrict myself to the exact details of construction shown, but hold
15 that any slight changes or variations therein as would suggest themselves to the ordinary mechanic would clearly fall within the limits and scope of my invention.

Having now fully shown and described my
20 invention and the preferred manner for its construction, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A lawn-mower of the character described having the ground-wheels provided with angular internal gears formed around their
25 bands, a stationary base member for each of said wheels with means for revolubly mounting the respective wheels thereon, a cross-stay connecting said base members, a main
30 member integral with the respective base members having a segmental vertical slot in the rear portions in rear of the ground-wheels, a ground-roller mounted between the rear points of said main members, an adjustable
35 plate overlying the inner faces of the respective main members with their rear ends adapted to be adjusted thereto within the limits of said slots, a reel-shaft extending through between and beyond said adjustable plates, an
40 arm pivoted to the axis of each base member and pivoted around said reel-shaft, a second parallel arm pivoted to said base member and to the adjusting-plates, and means for lowering and raising said reel-shaft from a single
45 point, all substantially as shown and described.

2. A lawn-mower having in combination, a two-part frame, a pair of ground-wheels mounted to said frame, the angularly-disposed teeth formed in the bands of the ground-wheels,
50 a cross-arm connecting the members of the frame, a ground-roller mounted in the rear between the members of the frame, an adjustable plate disposed over each of the members of the frame, a cross-stay connecting the adjustable members at their tops, means for securing the adjustable members at their rear to the members of the frame, a pair of pivoted parallel arms for guiding the adjustable plates vertically at each end of the machine, a shaft
60 carried by said adjustable plates, a series of spiral knives mounted on said shaft, a pinion revolubly mounted on each end of said shaft each pinion having its teeth disposed at an angle to mesh with the angularly-disposed
65 gear-teeth formed in the band of the adjacent

ground-wheel, a clutch member integral with the said pinions, and an oppositely-disposed clutch member secured to the shaft whereby the forward movements of the ground-wheel will cause the members of the clutch to engage with each other to revolve the shaft, all substantially as shown and described. 70

3. A lawn-mower having in combination, a two-part relatively stationary frame, a pair of ground-wheels revolubly mounted to the
75 sides of the frame, a ground-roller mounted between the members of the frame, a pair of plates adjustably mounted to the respective members of the frame, a cross-stay connecting the said plates, a pair of pivoted parallel
80 arms for guiding the adjustable plates vertically, a shaft carried by the adjustable plates, a series of knives mounted on said shaft, a pinion revolubly mounted on each end of said shaft, a clutch member integral with each
85 of said pinions, and oppositely-disposed clutch members secured to the shaft and adapted to engage with the respective clutch members as the machine is moved forward the shaft will be revolved and as the machine is moved
90 backward the clutches will be disengaged, all substantially as shown and described and for the purposes set forth.

4. In a lawn-mower, the combination with a relatively stationary frame mounted on
95 ground-wheels and means for its propulsion, a pair of plates adjustably mounted to the respective members of the frame, a cross-stay connecting said plates, a pair of pivoted parallel arms at each end of the machine for guiding
100 the plates vertically, a main shaft carried by the adjustable plates, a series of knives mounted on said shaft, a pinion mounted revolubly on each end of said shaft, a clutch member integral with each of said pinions,
105 and a clutch member secured to the shaft, substantially as described.

5. In a lawn-mower, the combination of a main frame, a pair of ground-wheels mounted on the frame, angularly-disposed teeth formed
110 in the band of the ground-wheels, an adjustable frame mounted within the main frame and pivotally connected with the main frame concentric with the ground-wheels, means for securing the adjustable frame to the main frame
115 at desired elevations, the main shaft and a cutter-bar carried by and adjustable with the inner frame, the spiral blades carried by said shaft, means for adjusting the cutter-bar in relation with the knives, the lever for vertically
120 adjusting said inner frame, a clutch mounted to each end of the main shaft whereby the said shaft will be revolved by and with a multiplied speed from the forward revolutions of either or both of the ground-wheels, and
125 an adjustable guard for each of said clutch mechanisms, all substantially as shown and described.

6. In a lawn-mower, the combination with a rigid frame united by a cross-arm having a
130

thimble therearound, a pair of ground-wheels mounted to the frame, an inner frame mounted for vertical adjustment with reference to the rigid frame, a shaft extending through and
 5 between the end members of the inner frame, a two-part interlocking boxing secured to each of the end members of the inner frame for the support of said shaft, an arm pivoted at one end to and near each end of the shaft and piv-
 10 oted at the other end to the main frame concentric with the ground-wheels, a bar parallel with the said arm one end being pivoted to the main frame and the other end pivoted to the inner frame, a link pivoted to and extend-
 15 ing up from the said arm and pivoted to the respective fingers extending out from said thimble, means in the center of said thimble for turning it on said cross-arm, and means for adjustably securing the inner frame to the
 20 main frame after being adjusted, all substantially as shown and described.

7. In a lawn-mower, the combination with the relatively stationary frame mounted on ground-wheels, a cross-bar uniting the mem-
 25 bers of the frame, a thimble surrounding said cross-bar with means for causing its rotation, a finger extended from each end of said thimble, an adjustable frame mounted between the members of the main frame, a pair of paral-
 30 lel arms pivotally connecting the adjustable frame to the stationary frame at each end of the machine, a link pivoted to each of said fingers of the thimble and extending to and pivoted with the upper parallel arms, means
 35 for securing the rear ends of the adjustable frame in connection with the stationary frame, the shaft carrying a series of spiral blades and the adjustable cutting-bar carried by said inner frame, and the automatic clutches and
 40 pinions connecting said shaft with the ground-wheels, all substantially as described and shown and for the purposes set forth.

8. In a lawn-mower, the combination of a rigid frame mounted on ground-wheels, the
 45 cross-arm uniting the extreme members of the frame, a thimble revoluble on said cross-arm, a finger extending out from near each end of said thimble, the ground-wheels revolubly
 50 mounted at each end to said frame, an inner frame mounted for vertical adjustment with reference to the rigid frame, a rotatable shaft extending through and between the end mem-
 55 bers of the inner frame, a two-part interlocking boxing carried by each of the end members of the inner frame in which boxing said shaft is adapted to revolve, arms pivoted near
 60 each end of the shaft with their opposite ends pivoted to the main frame concentric with the ground-wheels, bars parallel with each of said arms one of the ends being pivoted to the main
 frame and the other end pivoted to the inner frame, a link pivoted to and extending up
 from each of said arms and pivoted to the re-
 65 spective fingers extending out from said thimble, means central of said thimble for rotating

in on said cross-arm, and means for securing the inner frame to the main frame after being adjusted, all substantially as shown and de-
 scribed.

9. In a lawn-mower, the combination of a rel- 70
 atively stationary frame mounted on ground-wheels, means for the propulsion of the mower manually, a pair of plates adjustably mounted to the respective members of the frame, a cross-
 stay connecting said plates, a pair of pivoted 75
 parallel arms located at each end of the mower for guiding said plates vertically, a main shaft carried by the adjustable plates, a plurality
 of knives permanently mounted on said shaft, a pinion mounted revolubly on each end of 80
 said shaft, a clutch member integral with each of said pinions, and a clutch member secured to each of the end portions of the shaft to en-
 85 gage with the respective clutch members of said pinions, all substantially as described.

10. In a lawn-mower, the combination, of a rigid frame mounted on ground-wheels, the cross-arm uniting the extreme members of the frame, a thimble revoluble on said cross-arm, a pair of identical fingers integral with and 90
 extending out from the end portions of said thimble, the ground-wheels mounted revolubly to said frame, an inner frame mounted for vertical adjustment with reference to the
 rigid frame, a rotatable shaft extending 95
 through and between the end members of the inner frame, a two-part interlocking boxing permanent to each of the end members of the inner frame by which boxings said shaft is
 100 carried, arms pivoted at one end near each end of the shaft with their opposite ends pivoted to the main frame concentric with the ground-wheels, bars parallel with each of said arms one of the ends being pivoted to the main
 105 frame and the other end pivoted to the inner frame, a link pivoted to and extending up from each of said arms and pivoted to the re-
 spective fingers of said thimble, means for ro-
 tating said thimble on said cross-arm, and means for securing the inner frame to the main 110
 frame after the frame has been adjusted, all substantially as described.

11. In a lawn-mower, the combination, of a relatively stationary frame carried by a pair of ground-wheels each having a rim, angularly- 115
 disposed gear-teeth formed interiorly of said wheels, a movable frame mounted to and be-
 tween the members of the stationary frame, a pair of interlocking two-part adjustable 120
 boxings carried by the two outer opposite members of the inner frame, a shaft carried by said boxings with its ends extending into the interior space of said wheels, a bar mount-
 125 ed between the lower parts of the secondary frame, a plurality of cutting-blades mounted on said shaft, a clutch mechanism carried on the ends of said shaft with one portion of each clutch secured to said shaft and the other por-
 130 tion revoluble loosely thereon, a gear-pinion integral with each of the free members of the

clutch with the teeth of said pinions disposed
at an angle and meshing with the gear-teeth
of their respective ground-wheels, means for
raising and lowering said shaft and bar inde-
5 pendent of the ground-wheels and main frame,
and means for securing said shaft and bar in
their adjusted positions, all substantially as
described.

In testimony whereof I have hereunto sub-
scribed my name in the presence of two sub- 10
scribing witnesses.

LEVI BROWN.

Witnesses:

J. M. LONTZ,
R. W. RANDLE.