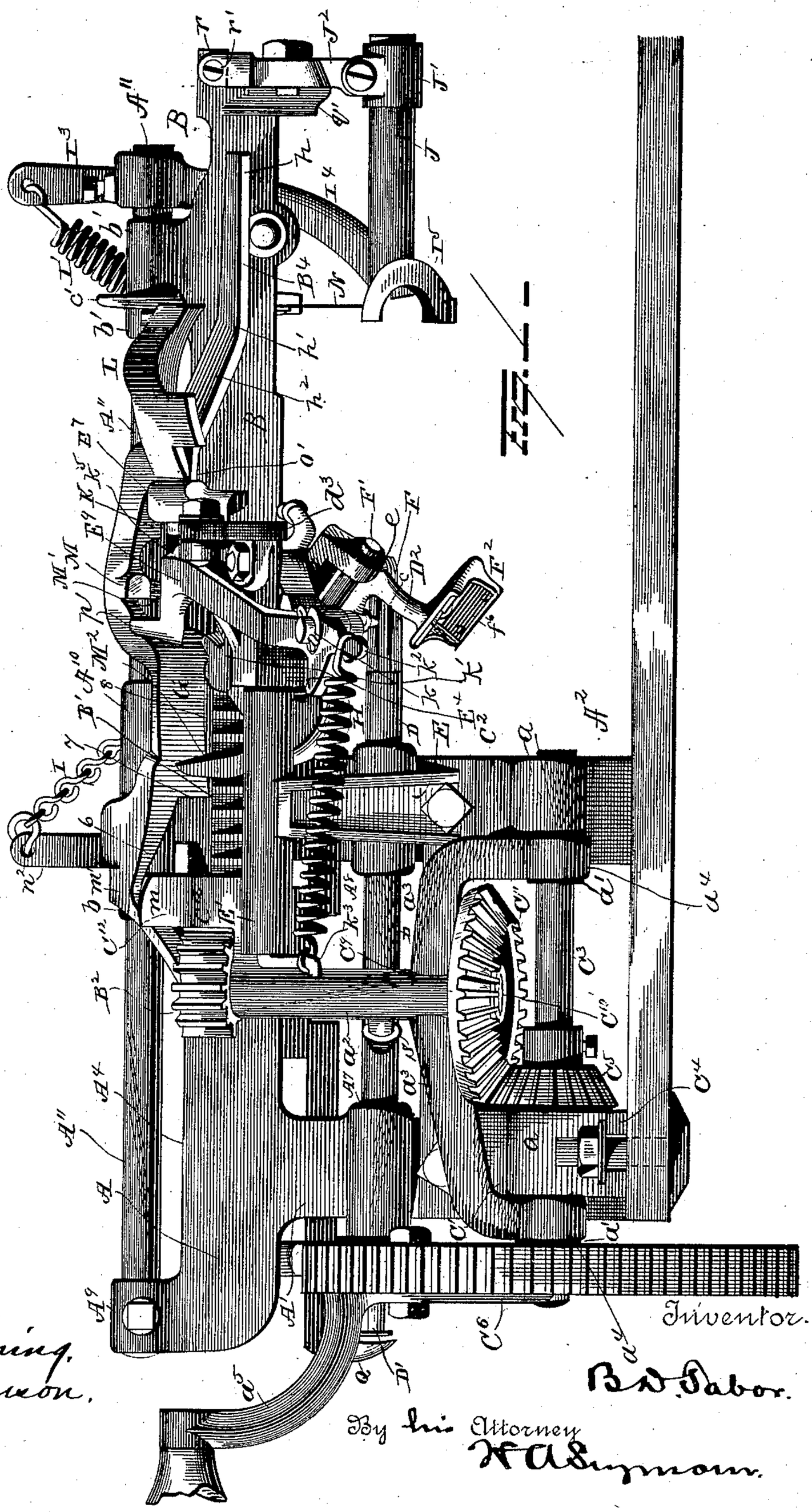
(Model.) 12 Sheets—Sheet 1.

B. D. TABOR.

APPLE PARING, CORING, AND SLICING MACHINE.

No. 383,922. Patented June 5, 1888.



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(Model.) 12 Sheets—Sheet 2.

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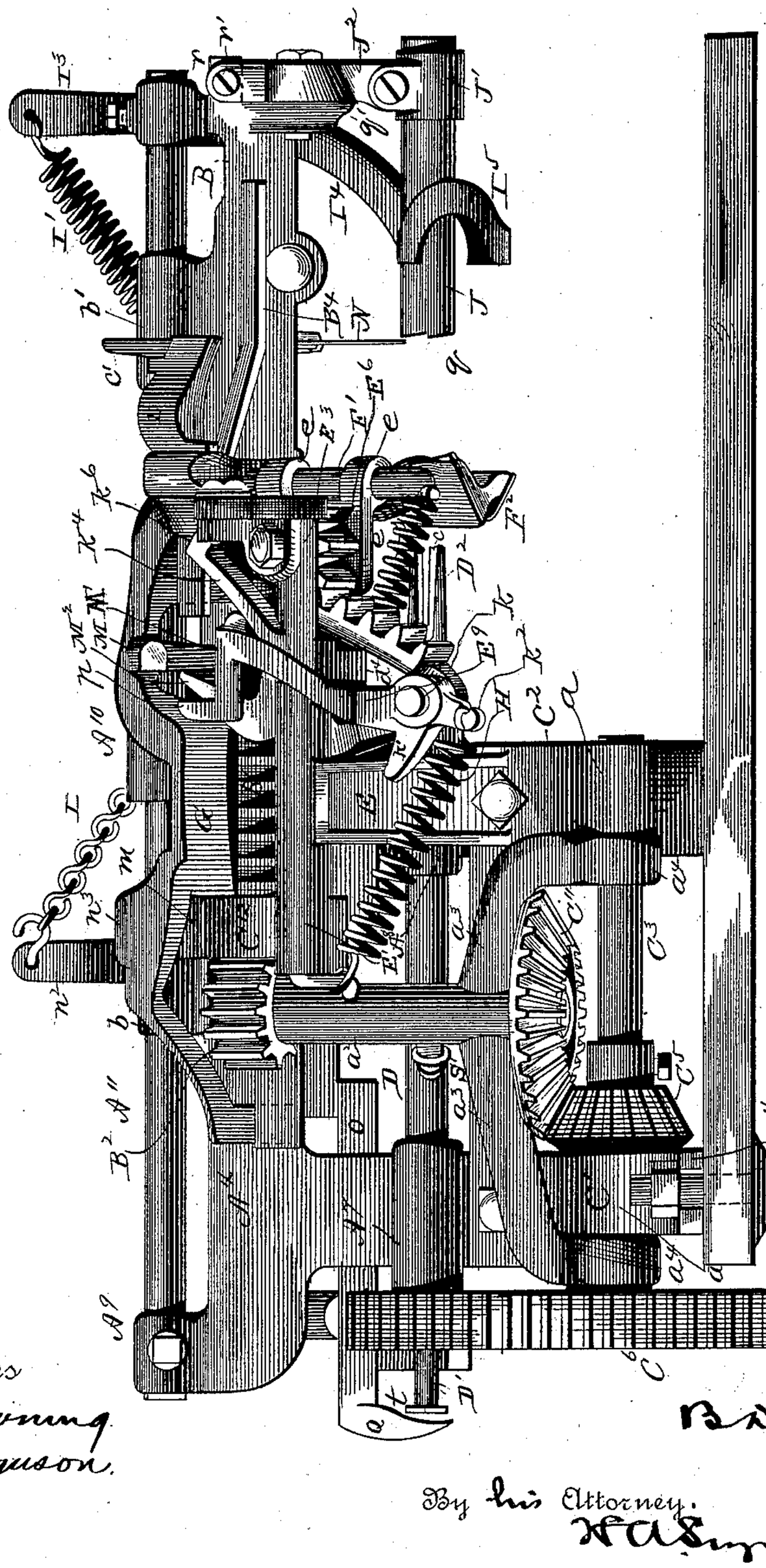
FIG. 2.



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(Model.) 12 Sheets—Sheet 3

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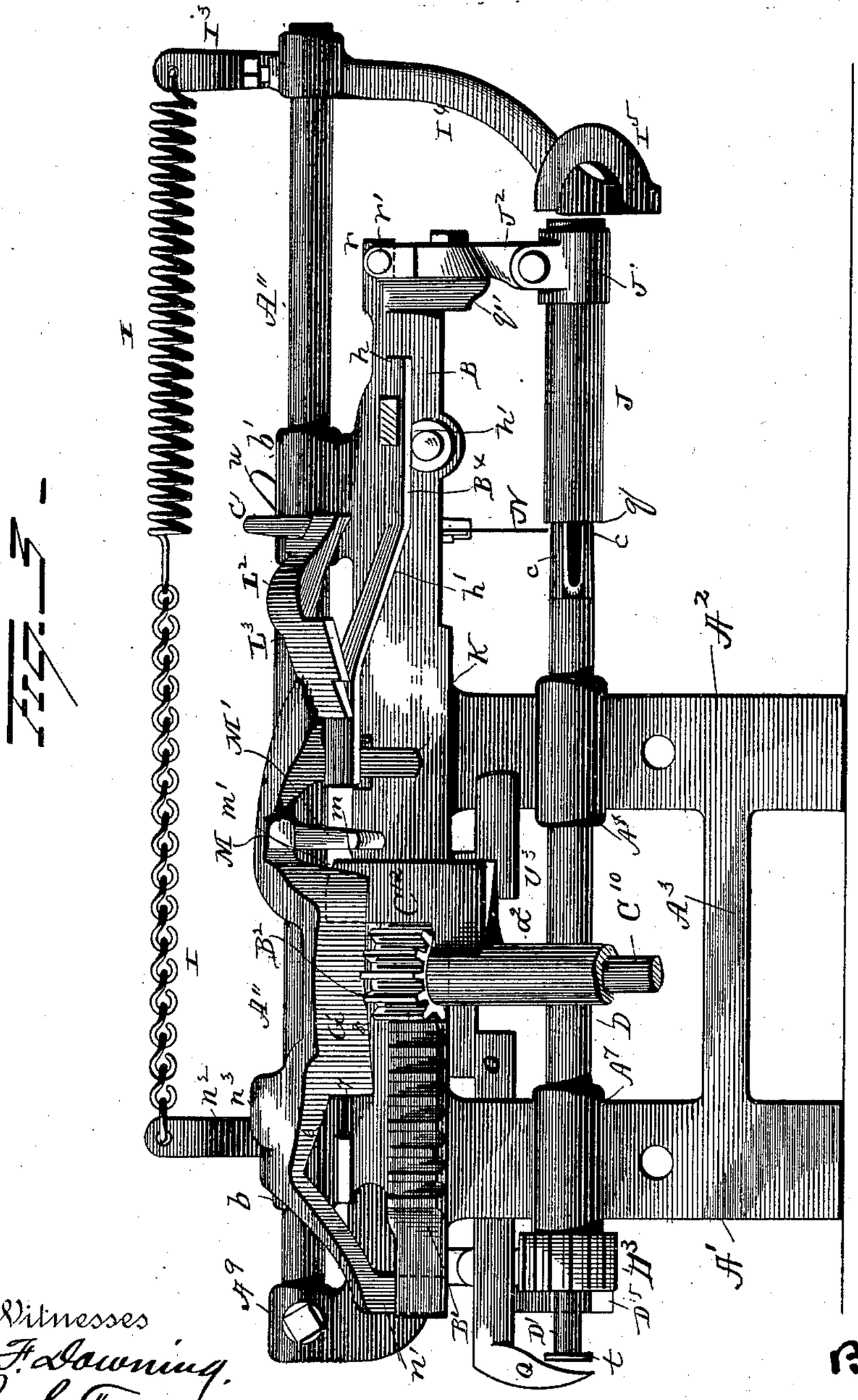

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(Model.) 12 Sheets—Sheet 4.

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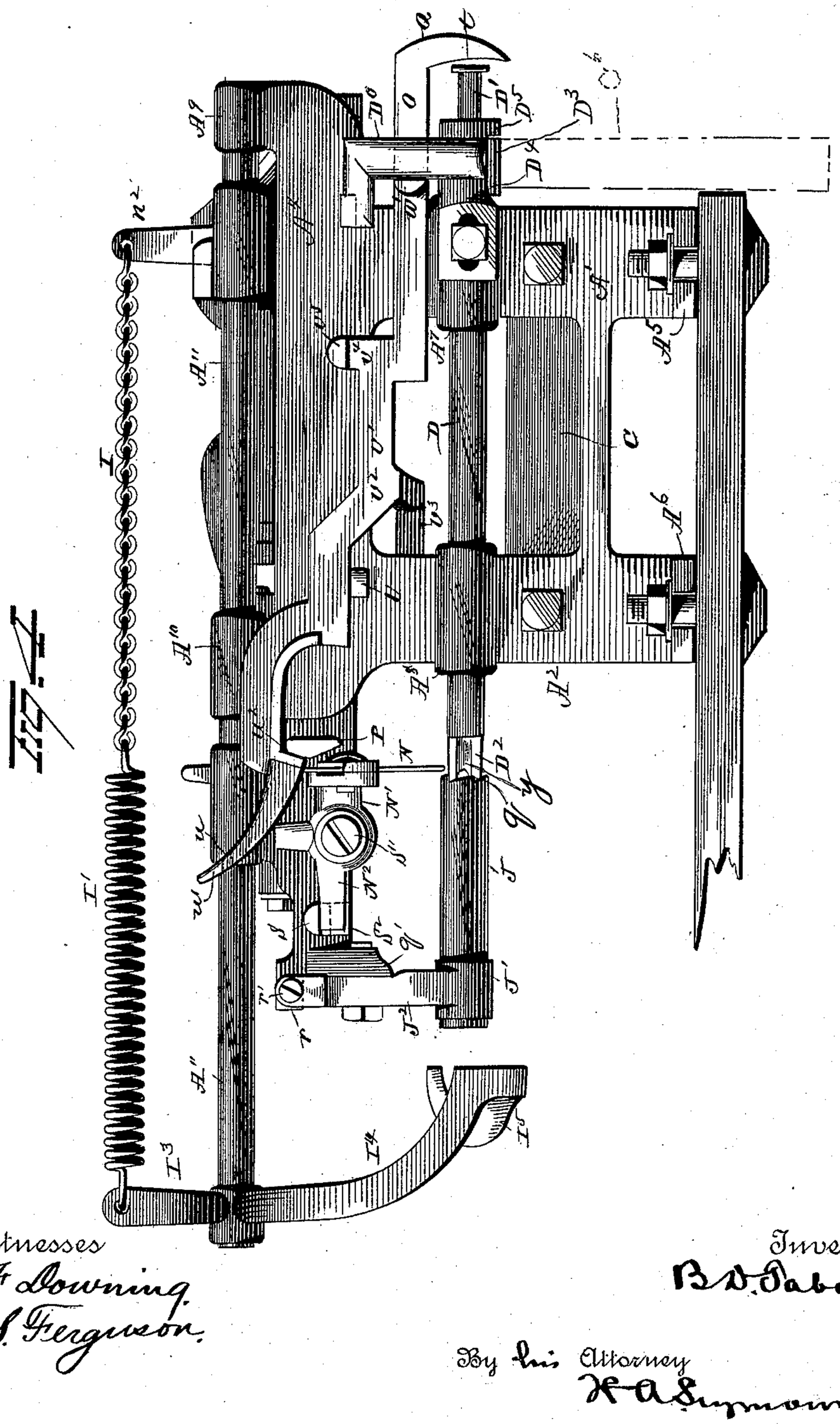

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(Model.) 12 Sheets—Sheet 5.

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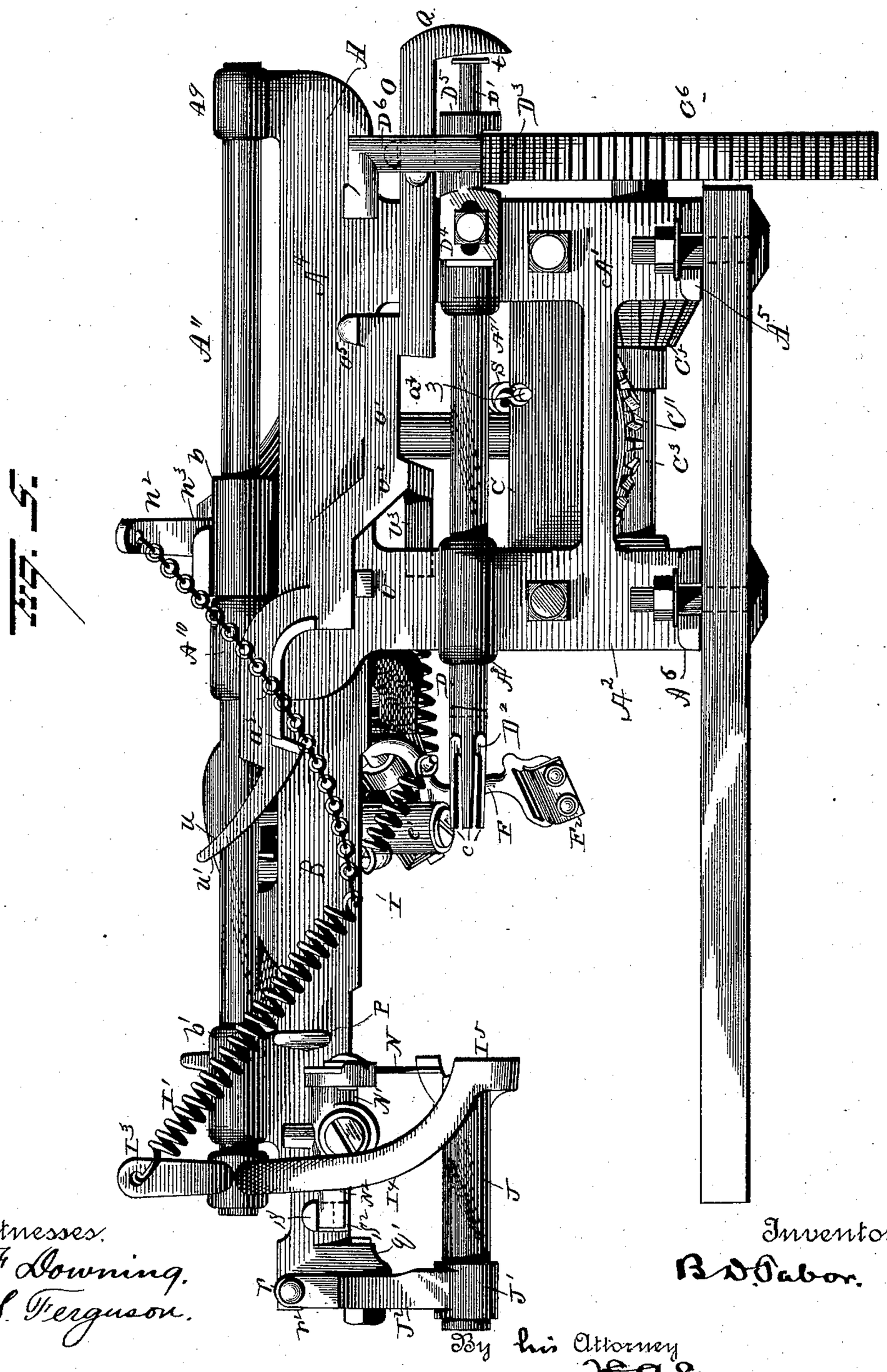

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(Model.) 12 Sheets—Sheet 6.

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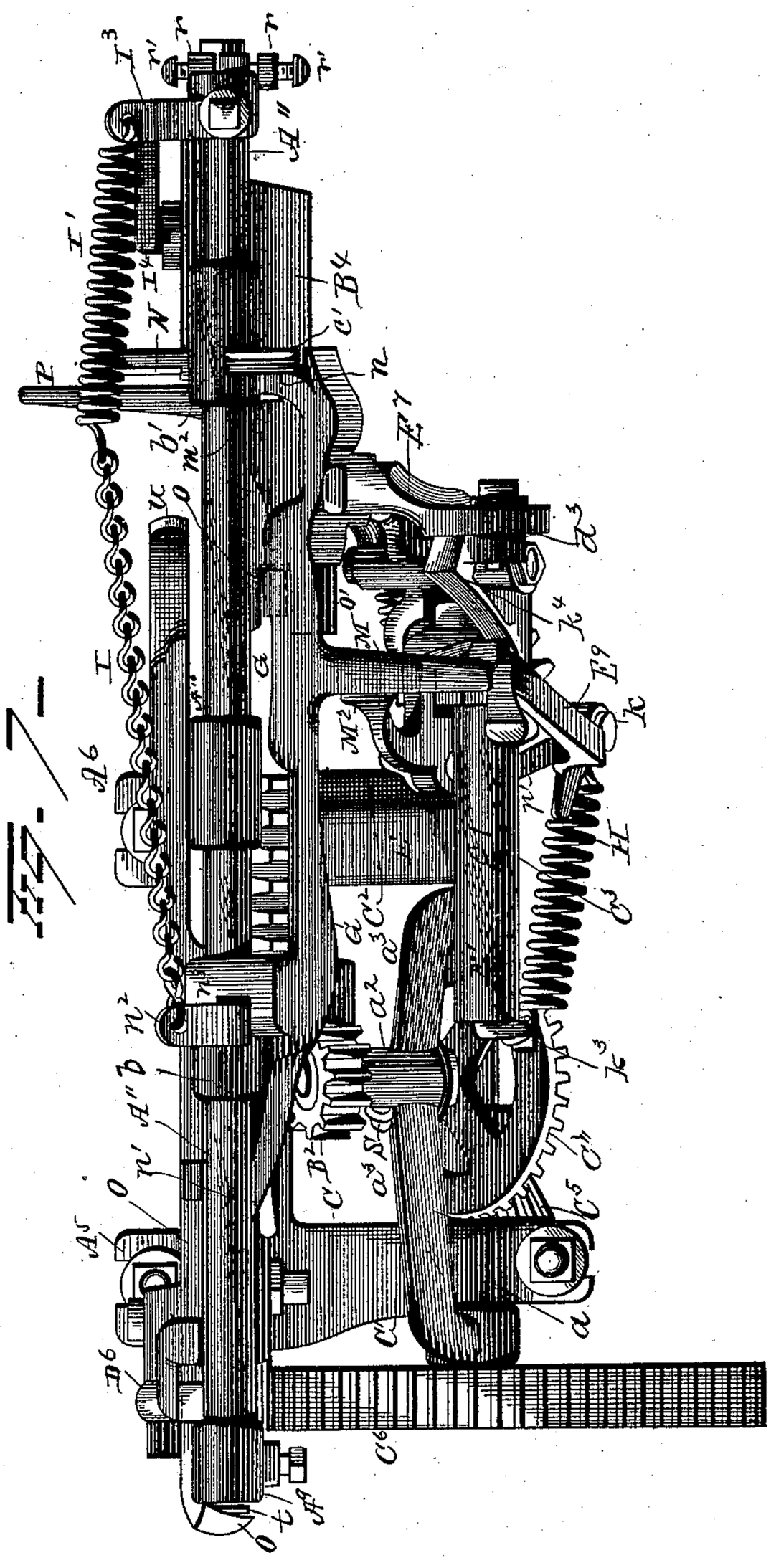

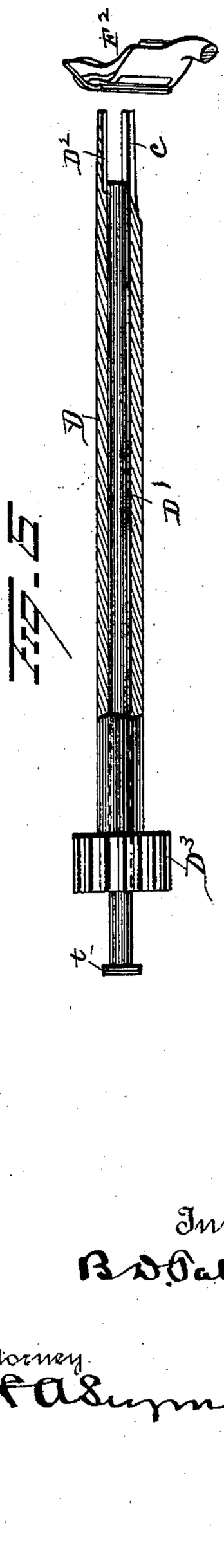

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Fig. 8.

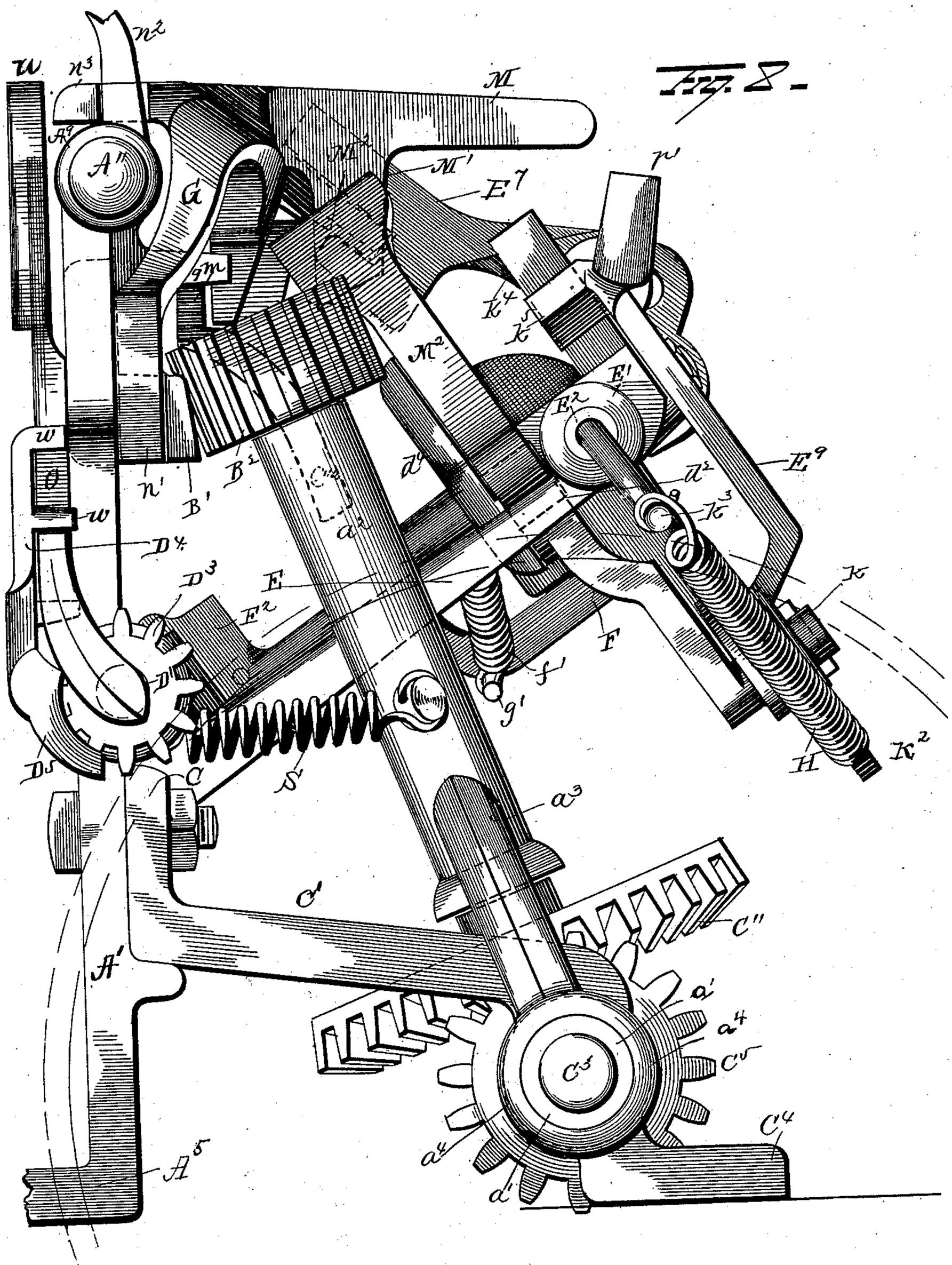

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Fig. 9.

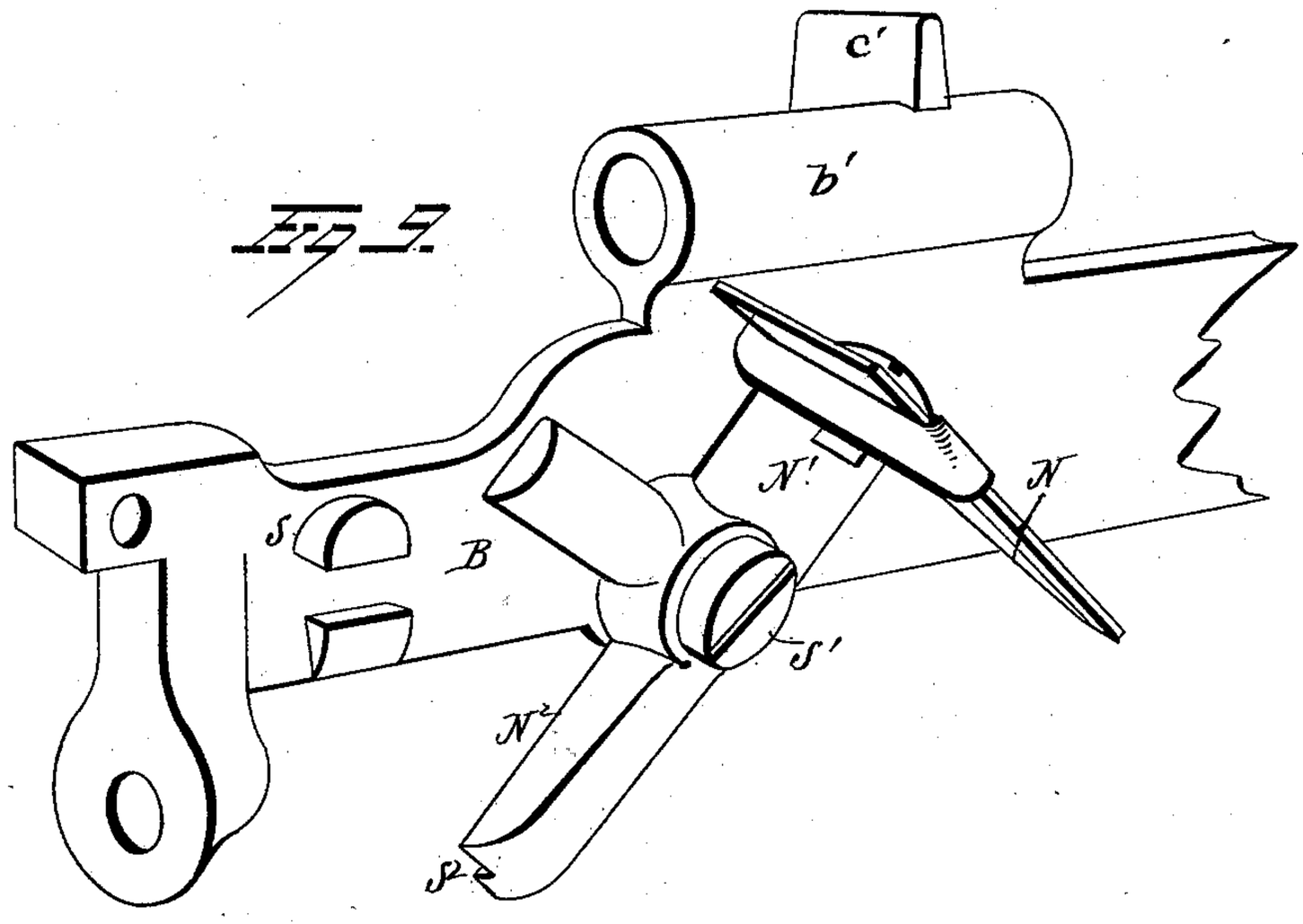

Fig. 11.

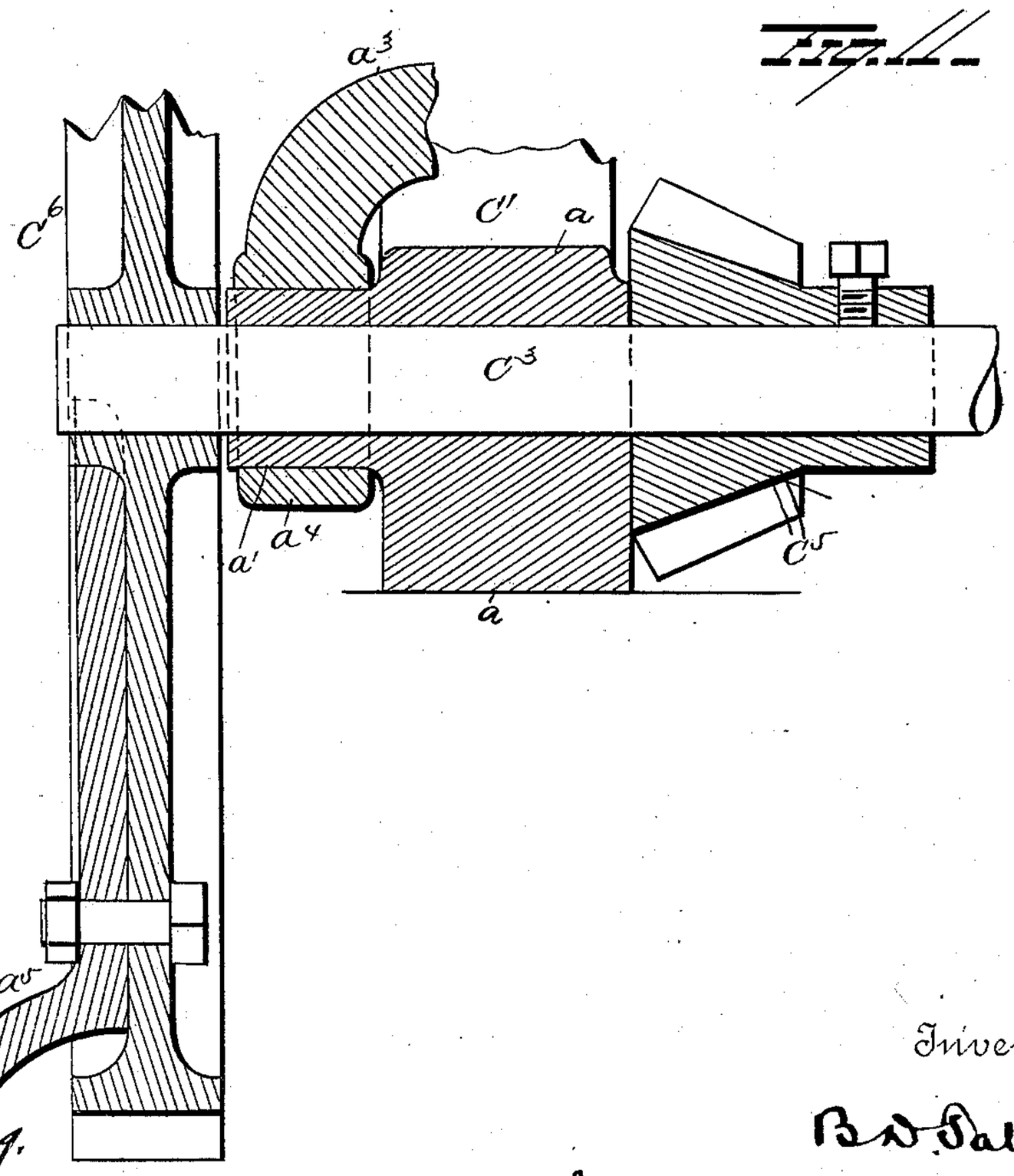

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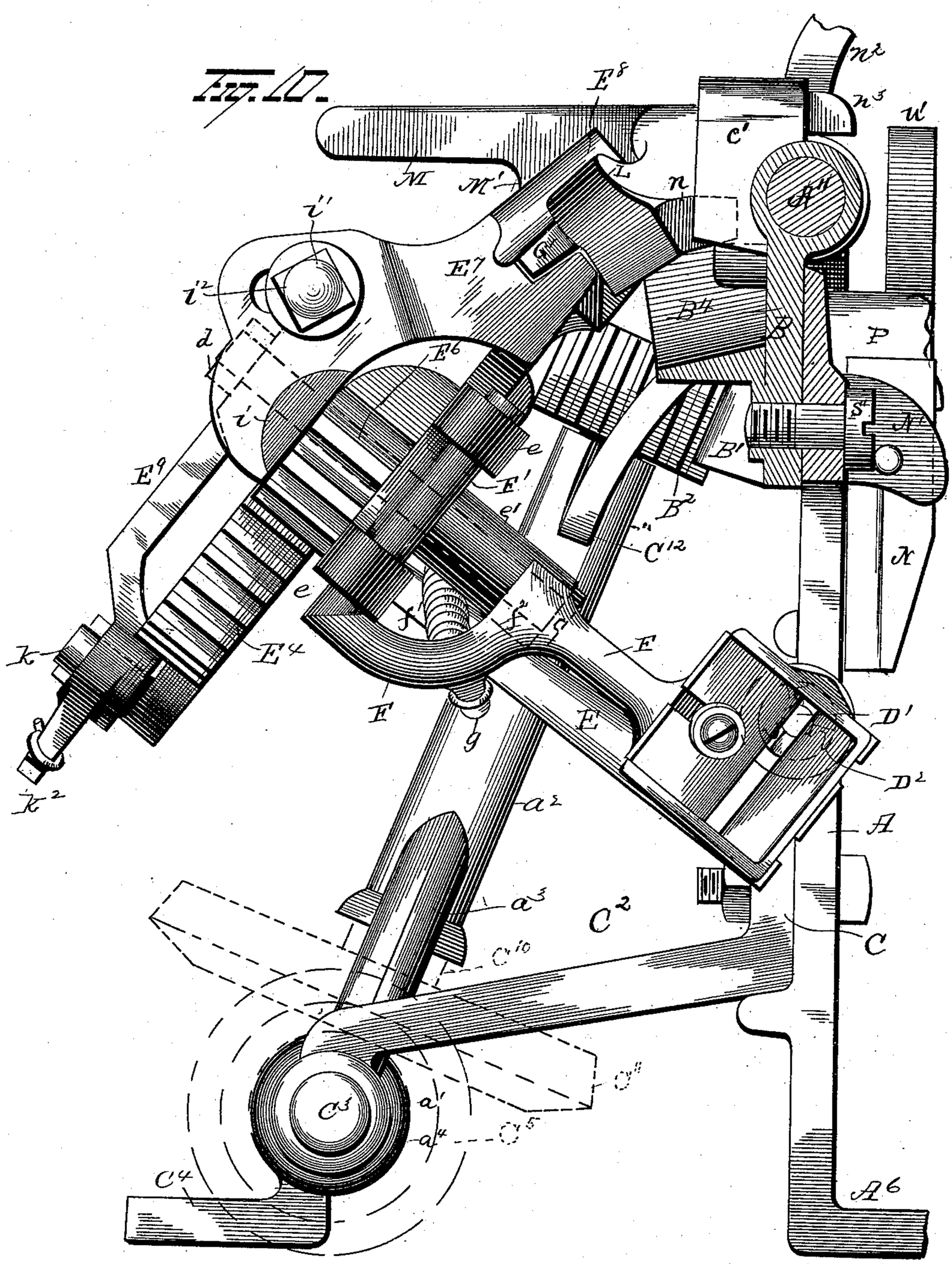
Fig. 10.



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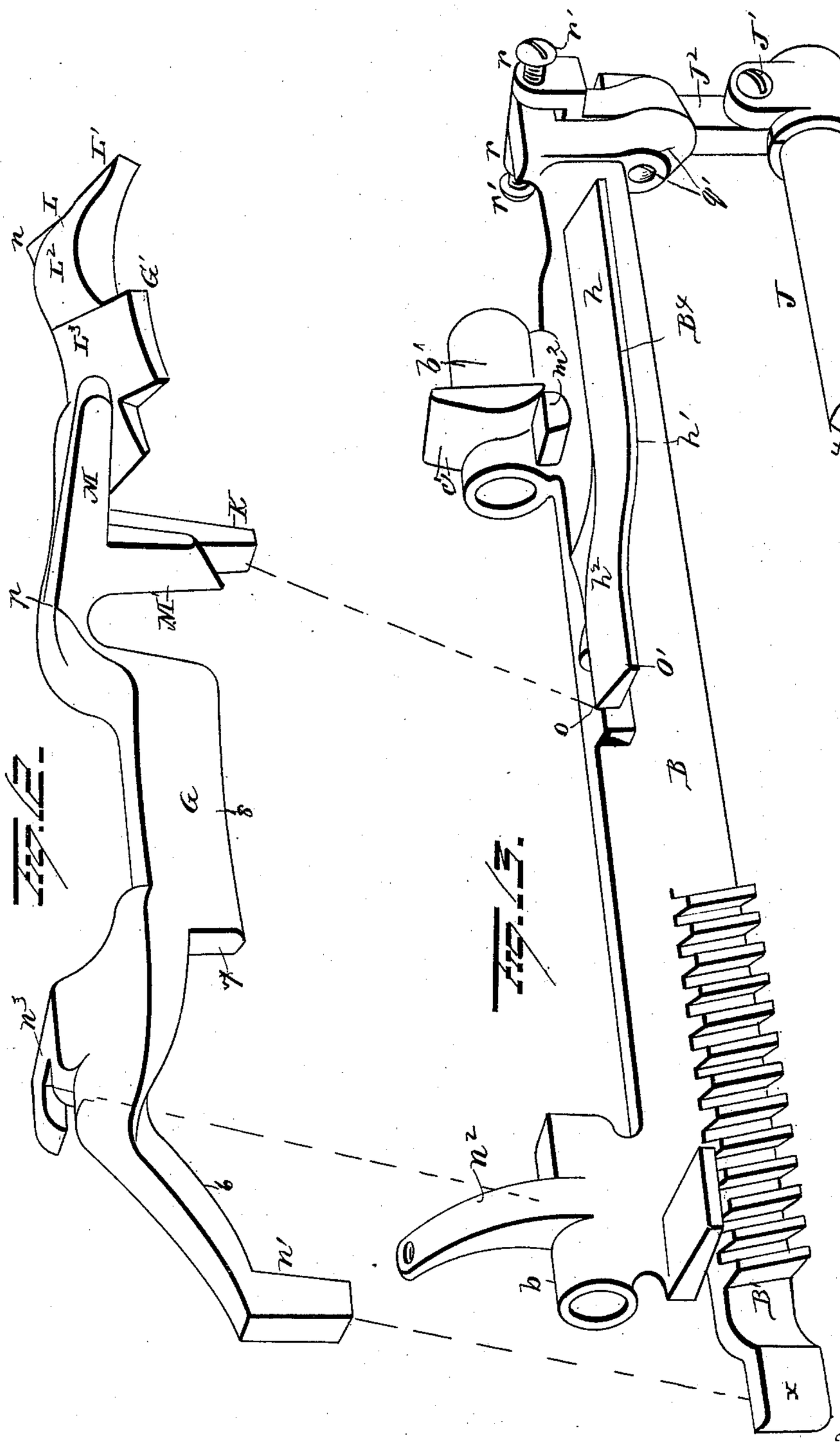

Fig. 2.

Fig. 3.

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Fig. 15.

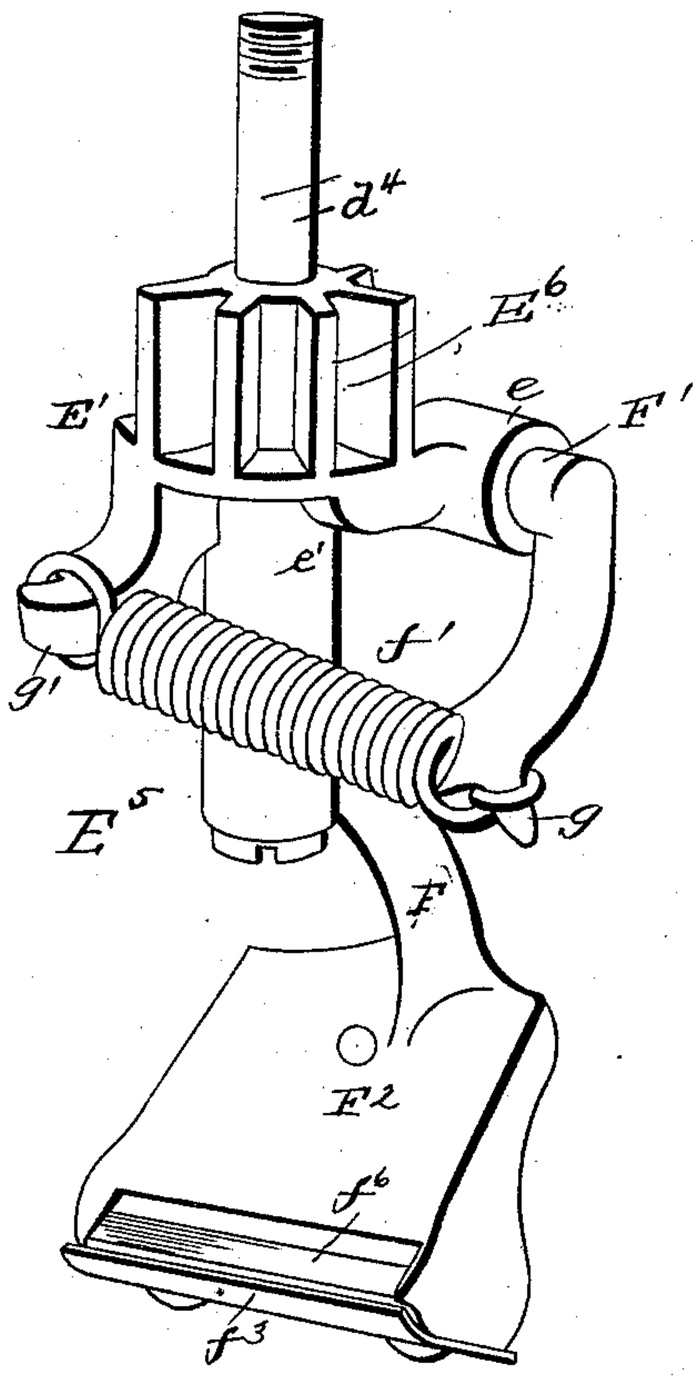


Fig. 16.

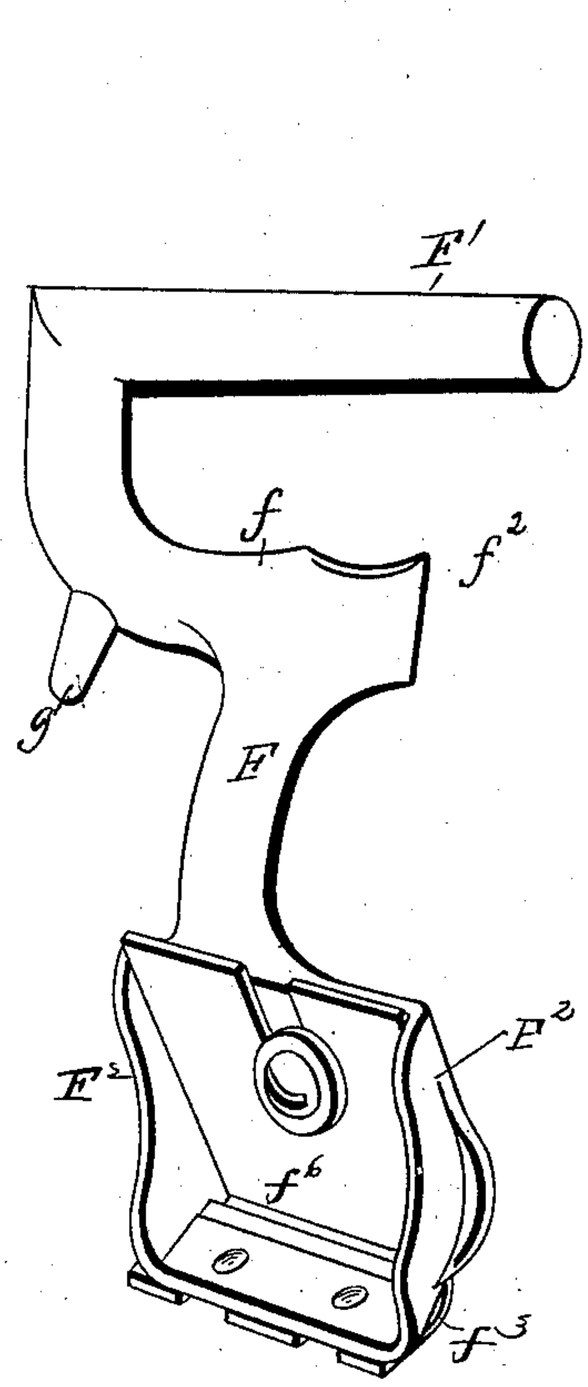
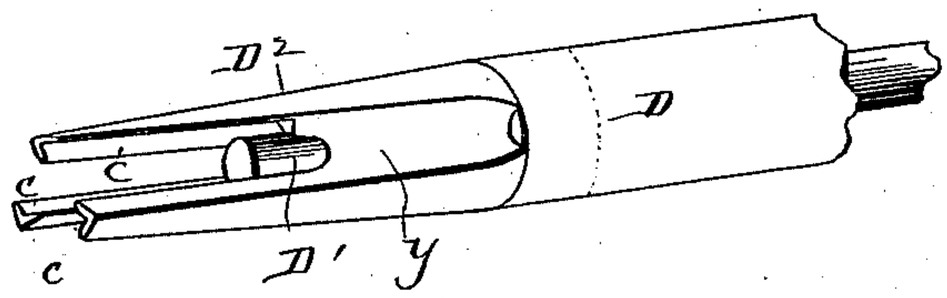


Fig. 14.



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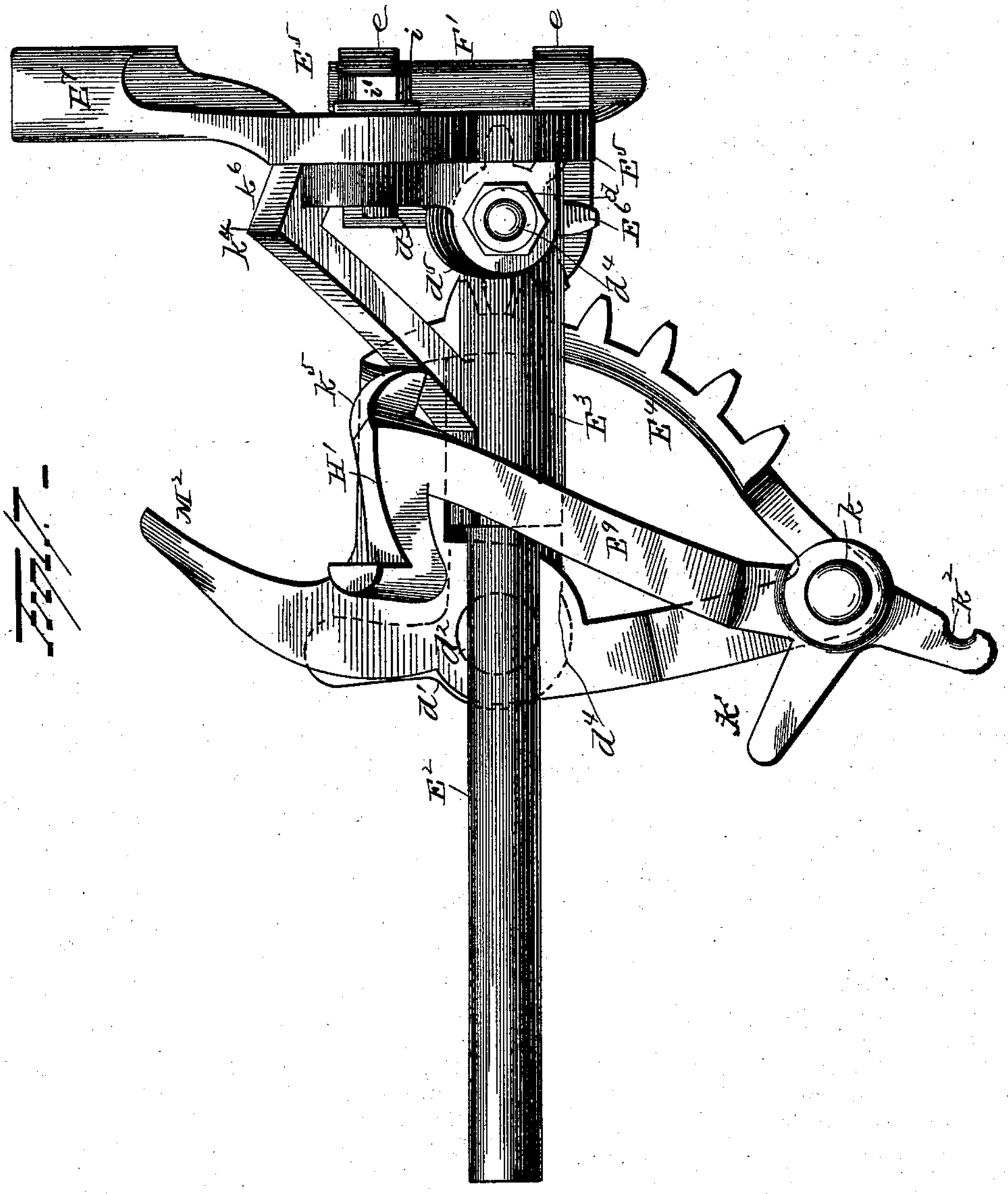

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UNITED STATES PATENT OFFICE.

BYRON D. TABOR, OF WILSON, NEW YORK.

APPLE PARING, CORING, AND SLICING MACHINE.

SPECIFICATION forming part of Letters Patent No. 383,922, dated June 5, 1888.

Application filed August 27, 1887. Serial No. 248,050. (Model.)

To all whom it may concern:

Be it known that I, BYRON D. TABOR, of Wilson, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Combined Parer, Corer, and Slicing Machine; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in apple paring, coring, and slicing machines, and more particularly to a machine of this type that is available for use in the rapid preparation of fruit for drying the same in large quantities.

It is essential that a machine designed for continuous daily use in fruit-drying factories shall have strong working parts, that are reliable in action, susceptible of adjustment to take up "lost motion" incidental to wear, and that may be quickly removed from position to permit necessary repairs.

Heretofore the machines used have been more or less defective in all these important attributes.

With a view to correct such defects as have been enumerated and produce a paring, coring, and slicing machine that is efficient, rapid, and easy in its operation, as well as simple, strong, and durable in form and manner of construction, I have devised my present invention, which consists in an improved form and means of operating the turn-table of the parer by the use of which the paring operation is perfectly executed from the beginning to the end of the same on apples of varied sizes.

Improved features of construction of the combined machines are shown in my present improved apple paring, coring, and slicing apparatus; also, important specialities of detail not enumerated that are useful in the adjustment and manipulation of the combined implements are shown.

As it is intended to utilize malleable or gray cast-iron in the manufacture of this machine—that is, the frame and other working parts except the knives and springs—these cast portions are designed to properly distribute the material to afford requisite strength, economize weight, and permit their rapid production with but little fitting up or other expensive machine work being necessary to complete them ready for assembling into operative form.

A detailed description of the mechanism and its manner of operation will now be given, in which novelty will be indicated, and afterward pointed out in the claims.

Referring to the drawings, making a part of this specification, Figure 1 is a right side elevation of the complete parer, corer, and slicer, the combined implements being in position to receive an apple. Fig. 2 is a right side elevation of the combined apparatus, showing the relative position of parts when the paring-knife is commencing to pare an apple. Fig. 3 is a right side elevation of the main portion of the device with the working parts in the position assumed when the paring operation is completed. Fig. 4 is a left side elevation of the main portion of the machine exhibiting the relative position of the coring and slicing mechanism with regard to an apple being cored and sliced after the paring operation is completed. Fig. 5 is a left side elevation of the combined implements, showing the adjustment of the working parts of the core-ejecting device when the slicing operation is completed and the parts have receded to receive another apple on the fork. Fig. 6 is a side elevation in partial longitudinal section of the apple-holding fork, showing the core-ejector in position therein and a detached view of the paring-knife stock in front of the fork. Fig. 7 is a plan view of the combined parer, corer, and slicer, with the parts in position to commence the paring of an apple. Fig. 8 is a rear end elevation of the apparatus, showing position of parts when the parer is in use. Fig. 9 is an enlarged perspective view of the slicing-knife, showing its hinged and locking connection with the main frame, the knife being elevated from operative position. Fig. 10 is a front elevation of the machine, partly in section. Fig. 11 is a side elevation of the driving-shaft and a longitudinal section through its supporting-bracket and attached gearing. Fig. 12 is an enlarged perspective view of the detached switch-bar that controls the operation of the paring mechanism. Fig. 13 is a perspective view of the sliding table and coring attach-

ment carried thereby removed from the machine. Fig. 14 is an enlarged side and end view of the fruit-holding fork. Figs. 15, 16, and 17 are views of detached parts of the paring mechanism.

A represents the main frame of the machine that gives support to the paring, slicing, and coring devices, and it consists of two standards, A′ A^2, that are integrally connected by the lower cross-bar, A^3, and an upper horizontal bar, A^4, that is parallel to the lower bar, A^3, this top bar being the backbone of the machine. I designate it as the "main-frame" bar. The lower ends of the standards A′ A^2 are provided with laterally-extended flanges A^5 A^6, that constitute the feet of the main frame A, and by which the device is mainly supported in position on a platform or table by lag-screws or similar means.

The standards A′ A^2 have cylindrical enlargements or boxes A^7 A^8 made integral with their bodies at points about midway between the top edge of the main-frame bar A^4 and the lower surface of the flanges A^5 A^6, and are perforated axially to receive a fork-spindle, that will be described in proper connection.

Upon the top edge of the main-frame bar A^4, at its rear end, and also at its forward end, integral bosses A^9 A^{10} are made to project above the edge of the bar A^4. These cylindrical bosses A^9 A^{10} are perforated longitudinally, and these axial perforations being of equal diameter are made to support a cylindrical guide-rod, A^{11}, which is extended beyond the front standard, A^2, such a distance as will afford a proper support for the sliding table B and the clearing-loop that detaches an apple from the tubular corer, as will be hereinafter alluded to.

Upon the rightside of the main frame A, immediately below the bosses A^7 A^8, the gear-frame C is attached by bolts or set-screws. It is provided with two bracket-arms, C′ C^2, that extend away from the main frame A a proper distance to afford a proper support to the main gear-shaft C^3, the free ends of these arms C′ C^2 being enlarged to form cylindrical boxes *a a*, (see Figs. 1 and 11,) that receive the gear-shaft and permit it to revolve. The arm C′ has a projecting flanged foot, C^4, that assists to support the paring-machine on its platform.

Upon the main gear-shaft C^3 a bevel-pinion, C^5, is adjustably secured by a set-screw inserted in its projecting hub, and on the outer projecting end of this shaft C^3 the main driving-wheel C^6 is secured, preferably by a screw-threaded connection with its hub.

Upon the sides of the arms C′ C^2 of the gear-frame C annular projections *a′ a′* are made that are concentric with the boxes *a a*, (see Fig. 11,) the surfaces of these projections being made true, and upon them as bearings the swinging bracket-frame C^9 is mounted.

The bracket-frame C^9 is intended to give swinging support to the upright shaft C^{10}, and for this purpose is made with a perforated elongated box, a^2, that is bored out to fit the body of the shaft, and is of such proportionate length to this shaft as to afford at each of its ends a shoulder-bearing for the gear-wheels affixed to the ends of this shaft C^{10}.

At the lower end of the elongated box a^2 of the bracket-frame C^9 two arms, a^3, are made to extend laterally at opposite points from its wall and are curved downwardly, the extremities of these arms a^3 being enlarged and perforated to produce boxes a^4, that neatly fit the projecting bearings *a′ a′*, formed on the boxes *a a* of the arms C′ C^2 of gear-frame C, for their reception, and this connection of the boxes a^4 and bearings *a′* is such as to prevent objectionable end-play, while the free rocking of the bracket-frame C^9 is permitted upon the bearings *a′* as pivotal points. A spiral spring, S, is secured on the side of the elongated box a^2 to a hook made to receive its looped end, and this spring is secured by its other end to the gear-frame C of the machine at 3, this spring being designed to hold the bracket-frame in yielding contact with the rack of the sliding table of the machine, as will be made plain in the description of the operation of the apparatus that will be hereinafter given.

Upon the lower end of the shaft C^{10} a bevel-wheel, C^{11}, is secured. This wheel is of a proper size to revolve between the arms a^3 of the bracket-frame C^9, and, meshing with the bevel-pinion C^5, affords a direct connection for the transmission of motion and power communicated to the main gear-wheel C^6 through its handle a^5; or, if desired, the machine may be made to operate by other means than hand-power.

The sliding table B (see Fig. 13) is an oblong plate of metal slidingly secured upon the guide-rod A^{11} by the boxes *b b′*, that are made integral with its upper edge, these boxes being laterally projected to throw the body of the sliding table upon the right side of the main frame A, and thus permit it to reciprocate freely without frictional contact with the main frame A, against which it lies.

Upon the right side of the sliding table B, extending from a point near its rear end forwardly, the rack B′ is preferably formed integral with the table B, its teeth being given an inclination to project the lower edge beyond the top edge of the rack to cause it to mesh squarely with the spur-pinion B^2, which latter is secured to the upper end of the upright shaft C^{10}. (See Fig. 8.)

In the boxes A^7 A^8, formed in the standards of the main frame A, the cylindrical fork-spindle D is inserted. This spindle is perforated axially to receive a core-ejector rod, D′, that is of proper length to extend through the spindle and slightly project in advance of the fork D^2 when forced forward to its greatest extent. The fork D^2 is made in a manner that will now be explained. The material used is preferably steel, of good quality to insure strength, and the body is first rendered cylindrical to correspond in diameter with the end of the spindle D, with which it is formed integral or remova-

bly secured by threaded attachment. The body of this cylinder is slotted longitudinally to a point near the end where it connects to the spindle, three tines being formed in this manner, they being equidistant from each other. The hub or rear cylindrical end of the fork is milled out to form three grooves or depressions, *y*, that are in effect shallow extensions of the slots that produce the fork-tines *c*. These grooves are intended to receive the stem of the apple, and thus prevent it from interfering with the free action of the paring-knife when it is finishing the paring operation. An inspection of Fig. 14 will show the construction of the tines *c* of the fork. These are each grooved throughout their length to make their cross-section V-shaped, the divergent walls of the fork-tines being so located that their free ends will lie toward the direction of movement of the revolving apple placed on them, and in this way resist the tendency of the fork to cut a continuous channel in a soft apple, which would prevent the proper rotation of the apple when it is being operated upon in the process of paring, coring, and slicing it. This form of fork-tines allows the firm adjustment upon them of small fruit without danger of splitting while undergoing the several operations to which they are subjected.

The rear end of the fork-spindle D is furnished with a spur-pinion, D^3, that is preferably made integral with it, this pinion being made to gear with the main gear-wheel C^6, and thus rotate the fork D^2 in a direction opposite to the movement of the wheel C^6.

Upon the standard A′ of the main frame A a guard-bracket, D^4, is bolted, which has a guard finger, D^5, that lightly bears against the outer surface of the pinion D^3, and holds this pinion and its attached hollow fork-spindle in place to freely rotate, but have no improper rearward movement in its boxes.

The paring mechanism is made as follows: Upon the right side of the gear-frame C, immediately in contact with fork-spindle box A^8, (see Figs. 1, 2, 7, and 8,) an arm, E, is outwardly and upwardly projected, and on the upper termination of this arm a horizontal tubular shaft-box, E′, is integrally formed. The box E′ is drilled centrally through its length, the perforation being of proper diametrical size to receive a shaft, E^2, that is attached to the rocking table-frame E^3, that has a depending limb, from which an integral pad, *d′*, is made to project at right angles to form a seat for the toothed segment E^4, the pad *d′* having an integral fulcrum-pivot, d^2, made to project from its top face to enter a hole in the toothed segment E^4, this hole being radially central to the toothed peripheral surface of this segmental gear E^4 to allow the gear to vibrate on the pivot-point d^2. The rocking table frame E^3 has an arm, d^3, integrally extended from its top surface opposite to the pad *d′*, this arm being perforated near its enlarged outer end to receive and support rotatively the turn-table frame E^5, this frame having a threaded stud-bolt, d^4, which passes through the boss d^5, and is secured in its place in the arm d^3 by a nut, *d*, that is jammed upon the top surface of the arm d^3. Integral with the turn-table frame E^5, at a proper point to mesh with the toothed segment E^4, a toothed arch, E^6, is formed, this latter fractional gear-wheel being preferably made of about one-third the radial diameter of the toothed segment E^4, that an increase of speed may be given to the rotary motion of the turn-table E^5. Upon the side of the turn-table E^5 two short bracket-arms, *e e*, are integrally formed in the same plane to permit a tapering shaft, F′, formed on the knife-stock F, to enter perforations made through the enlarged ends of these bracket-arms *e e*, the shaft F′ having connection with the knife stock F by one end, the opposite end being free to enter the holes in these bracket-arms.

In order to facilitate the insertion of the shaft F′ into its place in vibrating connection with the arms *e e* of the turn-table E^5, the holes made in these arms are of a size and form to fit the tapered cylindrical body of this shaft, so that an easy entrance can be effected and a neat working fit of the connected parts be afforded by this manner of constructing the adjustable knife-stock and the bracket arms of the turn table E^5.

The knife-stock F, composed of a shaft, shank, knife-holder, and guard, is shown in detail in Figs. 15 and 16, and it will be seen that the shank of this stock is curved from its point of connection with the tapered shaft F′ to a point, *f*, below, where it is enlarged to produce a curved heel, f^2, that corresponds in its curvature to the surface of the depending box *e′* of the turn-table E^5, on which it is made to bear. A spiral spring, *f′*, that has its looped ends hooked over the projecting studs *g g′*, made for their reception on the shank of the knife-stock, and the body of the depending box *e′* of the turn-table, respectively, by its tension holds the shank of the knife-stock yieldingly in contact with its support *e′*, the yielding movement being only in a rearward direction, as the peculiar form of connection of the stock and turn-table prevents any lateral motion, the stock being rigidly braced by its tapering shaft-connection that prevents any loose rattling motion when the knife is in operation.

The knife holder and guard consists of a rectangular flanged plate, F^2, that projects from the free end of the shank, and is given such an inclination to the shank that it will present the bevel cutting-edge of the knife-blade f^6 in a manner to afford a shear cut, the blade engaging the apple below its center to give a proper angle of inclination and allow the guard f^3 to regulate the depth of the peeling exactly, both the knife and guard being made easily removable by their set-screw connection with the stock-plate F^2, so that the knife-edge may be sharpened and the set of the blade accurately adjusted.

The paring apparatus is operated by the

gearing previously described through the medium of cams and lugs that are made integral with a reciprocating bar which is caused to slide at proper intervals of time back and forth, resting upon the sliding table B and moved with and by it, as will be explained.

The sliding table B (see Fig. 1, 3, and 13) is provided with a flanged projection, B^4, made to extend integrally from the right side of the sliding table B, near the forward end. It has a portion, *h*, horizontal to a point, *h'*, where it is curved upwardly to give an easy rising slope to the upper edge of the sliding table till the point h^2 is reached, from which point the flange is further extended horizontally or in the same level plane as the portion from *h* to *h'*, only it is somewhat above this latter-mentioned portion. The laterally-projecting flange B^4 is in effect a cam to give a limited vibratory motion to the rocking table E^3 when the sliding table B is moved back and forth by its rack-connection with the gearing, and to permit such a rocking of the table E^3 to take place an arm, E^7, is adjustably attached to the front face of the arm d^3, which latter is faced off perpendicularly to allow arm E^7 to be pivotally secured thereto and have its free end E^8 project over and lie on the surface of the cam-flange B^4 of sliding table B.

It should be noticed (see Fig. 10) that the rearward lower edge of the arm E^7 is scalloped to form a curved surface, which engages a corresponding-shaped lug, *i*, that projects to form the front surface of the arm d^3, this lug affording a heel for arm E^7, to prevent an improper upward movement of the free end E^8 of this arm. The stud-bolt *i'*, fixed in the body of the arm d^3 on its front face to engage a curved slot, i^2, made in the arm E^7, is so located in relation to the lug *i* that said lug *i* will form a pivotal point, on which the arm E^7 may vibrate, and by a clamping action of the nut on stud-bolt *i'* be held rigidly at any desired point. This provision for a change of secured position of the arm E^7 is very important, as by it an accurate adjustment for the cutting-edge of the knife-blade is afforded, as the knife-stock and its blade, which is made to project across the face of the pip end of the apple when it is beginning to pare, (see Fig. 2,) is lowered, so that in conjunction with the cams on the switch-bar G, as will be shown, the adjacent edge of the knife-stock will just clear the fork and the knife-blade will be about at right angles to the fork-spindle D to cut the paring close, and also cut off a projecting stem if it is not in position to enter the grooves in the fork-hub.

Upon the outer projecting end of the peripheral arch of the toothed segment E^4, the partial rotation of which back and forth gives a corresponding motion to the knife-stock F, an upwardly-projecting stud, *k*, is formed or affixed to engage a latch-bar, E^9, which is perforated at its outer end to allow the latch-bar to be loosely connected to the segment E^4 and vibrate on the stud *k* as a pivotal point, the latch-bar E^9 being secured from displacement by a split key or other suitable means. A pad-extension, *k'*, is formed at a proper point on the side edge of the latch-bar E^9 to bear on the top surface of the segment E^4, and thus affords a more extended surface of contact for stability of the latch-bar E^9.

Upon the outer projecting end of the latch-bar E^9 a notched lug, k^2, is formed integral with the bar to receive the looped end of a spiral spring, H, which has its opposite end similarly engaged by a hook, k^3, that extends from the rear end of the shaft E^2, which gives support to the rocking and turn tables of the paring machinery. The tensional strength of the spiral spring H is properly gaged to insure its positive action on the latch-bar E^9 and cause its free hooked end H' to slide up the incline K^4 when the knife-stock is in the position shown in Fig. 7, or the blade of this stock is in contact with an apple on the fork of the machine, and the paring of the same is about to commence. The hook k^5, formed on the upper or free end of the latch-bar E^9, is given such a set that it will slide up the incline k^4 onto the angular abutment k^6, made at the upper end of this incline, the engagement of the hook end k^5 of the latch-bar and the abutment k^6 taking place when the paring operation is completed and the knife-stock is withdrawn to allow the coring and slicing of the apple to take place.

Upon the upper end of the box a^2 of the bracket-frame C^9, an offset extension or upwardly-projecting arm, C^{12}, is integrally formed. This arm inclines with the frame at its lower end up to the top edge of the rack B' on sliding table B, and from this point upwardly it is extended vertically, (see Figs. 8 and 10,) the vertical portion *m* being cut with a bevel inner rear edge, *m'*, (see Figs. 1 and 3,) this bevel edge being provided to facilitate the operation of the machine, as will be made to appear.

The switch-bar G (shown in Figs. 2, 7, and 12) is an elongated bar of metal having an ear, *n*, formed on the inner surface of its front end, G', to engage a shouldered abutment, m^2, made on the adjacent side of the sliding table B, the ear *n* resting on the abutment m^2 as a support. The rear end of the switch-bar G is further constructed with a depending arm, *n'*, which slides behind an offset end, *x*, of the rack B', which extends rearward from the toothed portion of this rack, and, in fact, is an integral extension of the sliding table B.

Upon the upper surface of box *b*, formed on sliding table B to support it on the guide-rod A^{11}, an arm, n^2, is upwardly projected and so curved that its upper end overhangs toward the left side of the machine. This is perforated to receive a chain, I, which connects to a spiral spring, I', that has its rear looped end hooked in the arm I^3, adjustably secured by a set screw or other means to the guide-rod, which arm is an integral portion of the depending arm I^4, that is affixed to the front end

of the guide-rod A^{11}, the lower portion of arm I^4 being bent into a loop, I^5, which is provided to bear upon fruit that is pared, cored, and sliced, and thereby dislodge the same off of the corer-tube J when the fruit is ready for removal.

The switch-bar G has a laterally-extended lug, n^3, made to extend above the box *b* of the sliding table, and is notched on its rear edge to neatly fit the body of the arm n^2, formed on this box *b*, this connection of parts serving to hold the switch-bar firmly at the rear end of the same and prevent a yielding of said bar G laterally.

At the rear end of the cam-flange B^4, on the sliding table B, a notch, *o*, is cut on its inner portion to leave a projecting finger, *o'*, standing on the outer edge of the cam-flange. This finger is made to bear closely upon the outer surface of the depending arm K, that projects downwardly from the switch-bar G, and aids by its position to hold the bar G in stable position, so that while this bar G is readily removed when upwardly raised it will when in place remain there, as it is re-enforced by a flange, *c'*, that is integral with box *b'* of the sliding table B and projects outward a sufficient distance to bear on the side of the ear *n*, formed on the switch bar G, as has before been stated.

The flange *c'* is slightly curved on the face that bears upon the ear *n*, and its lower edge more sharply curved away from the engaged face of this ear to form a lock of these surfaces when the paring apparatus is brought into position to pare an apple, as shown in Fig. 7, an upward movement of the parts to easily change the position of the switch-bar G being afforded by the peculiar slope of the flange *c'*, when the paring, coring, and slicing operations are completed and the bar is elevated in bringing the working parts into adjustment to engage another apple.

An inspection of Fig. 12 will show a cam-shaped protuberance, L, made on the switch-bar G near its front end, which is extended to this front end, the top surface of this portion of the switch-bar G being inclined toward the right side of the machine, and the cam-like switch made on it being started from its front edge, L', sharply rises to the point L^2 near its center and falls away in a more gradual curvature of surface to the termination rearwardly at a point, L^3, which is adapted to engage the rounded front edge of the free end E^8 of the arm E^7, connected to the turn-table E^5 of the paring device.

At a point, *p*, the arm M is outwardly projected from the switch-bar G to engage the lug *p'* of the latch-bar E^9, this lug *p'* projecting vertically when the hook k^5 of the latch-bar is engaged with the abutment k^6, made on the turn-table frame.

On the lower edge of the arm M a depending finger, M', is formed, which is intended to abut against the toe M^2, that is projected from the inclined face of the toothed segment E^4, near the face of the switch-bar G, this contact being effected when an apple is placed on the fork and the switch-bar is rearwardly moved to bring the knife-stock in front of the pip end of the apple, ready to engage it and peel the apple. This position of the paring device is shown in Figs. 2, 6, and 7.

The coring device consists of a tube, J, made of any metal that will not readily corrode, and is of such a length as to have its cutter-edge *q* properly engage the apple after it is pared and the paring-knife is withdrawn from engagement with the apple.

The coring-tube J is held in position by a clamp, J', adjustably secured to the front end of the sliding table B. The arm J^2 of this clamp (see Fig. 13) is pivoted to the sliding table at the point *q'*, so that the lower clamping end of the arm may be laterally adjusted to cause the cutting end of the coring-tube J to line properly with the fork D^2 and have its circular edge *q* concentric with the cylindrical hub of the fork. The upper end of the arm J^2 is forked to produce two lugs, *r r*, which have set-screws *r'* inserted to bear upon the extended end of the sliding table B, and thus afford a ready means for correct adjustment of the tubular corer J. The cutting-edge of this tube is serrated with long sloping teeth 3 4, &c., (see Fig. 13,) so cut in relation to the rotative movement of the fork D^2 that the apple to be cored will engage these sloping edges that are made to engage the apple with a shear cut, which insures a proper action of the corer, the teeth being given a set to bend them slightly and alternately in opposite directions to cut a free track and prevent a clogging of the core in the tube while the machine is being rapidly operated.

The slicing-knife N is secured to a vibrating knife-stock, N', by a single set-screw to permit it to be removed, and it is so bedded between projections on the receiving-face of the knife-stock that it will not move from its secured position on the same. The face of the knife-stock N', that receives the blade N, is held vertically by the extended arm N^2 of the knife stock engaging a lug, *s*, that is made on the face of the sliding table B, to which the knife-stock arm N^2 is pivotally secured by a set-bolt, *s'*, which is screwed into a threaded hole made for it in the body of the sliding table. The position given the knife-blade N when it is ready to operate on the fruit is immediately in advance of the cutting-edge of the coring-tube J, and its length is such that its free end will just have clearance with the body and tines of the fork D^2.

It will be noticed that the pivoting of the knife-stock N' to the sliding table B in the manner described will allow it to rise out of the way when it is necessary, and when at work be held firmly in position by the locking contact of the end s^2 of the knife-stock arm N^2 with the lug *s*. (Shown clearly in the detached view, Fig. 9, of the drawings.)

The core-ejector rod D' has a flanged head,

t, made at the rear end to prevent it from being projected too far through the fork-tines, and this rod is shoved back through the hollow spindle D, that carries the fork-tines, by the act of placing an apple on these tines.

In order to eject the core at the instant that an apple is sliced and cored, the pusher-bar O is so located that it will effect this work reliably. The pusher-bar O (see Figs. 4 and 5) is constructed with its forward end, *u*, curved upwardly to produce an inclined lower surface to slidingly engage the rounded upper edge of the handle-bar P, which is integrally formed on the left side of the sliding table B, and is intended to move this bar reciprocally. The inclined surface *u'* of the curved end *u* is terminated at the shoulder u^2, which is intended to lock on the front face of the handle-bar P when the pusher-bar O is made to ride with its inclined face *u'* on the top edge of the arm, and finally drop at the point u^2 to engage its shoulder, as stated.

The pusher-bar O is made to rest on the projecting lug *v* and slide on this lug, a straight lower edge being there formed to allow a limited sliding movement of the bar O. At a point, *v'*, on the bar O its body is bent downwardly to be extended rearwardly on a lower horizontal plane. At a point, v^2, the offset finger v^3 is made to reach into the space below the upper main-frame bar, A^4, and extend forward to have a sliding bearing on the right side of front standard, A^2, of the main frame A. At a point, v^4, farther to the rear, on the top edge of the pusher-bar O, an upwardly-extended finger, v^5, is made to bear lightly upon the left side of the main-frame bar A^4, the location of the two fingers v^3 v^5 on each side of the main frame A having a tendency to hold the pusher-bar O in secure position on the lug *v*, the bar being further extended to the rear to engage slidingly with the upright guide-arm D^6 of the guard-bracket D^4, this arm D^6 being provided with two projecting ears, *w w*, that hold the body of the pusher-bar O loosely between them. The rear end of the pusher-bar O has a presser-foot, Q, made to extend in an inclined downward direction, and of such a length as to properly engage the rear end of the core-ejector rod D' when brought to bear upon it.

A lug, *w'*, is made on the outer face of the pusher-bar O at such a point as will cause it to strike the upright guide-arm D^6, which will restrict the rearward movement of the pusher-bar when it is pushed to the rear by the engagement of its forward inclined edge with the handle-bar P, as will be more fully explained in the description of the operation of the combined parer, corer, slicer, and core-ejector, that will now be given in their regular order.

In commencing the paring operation the combined devices are given the position shown in Fig. 1, and an inspection of this figure will show the corer-tube J thrown forward with its cutting-edge about in line with the face of the depending arm I^4, that pushes the apple off of the corer-tube when all operations are complete. The slicer-knife N is in its position about in a line with corer-tube cutting-edge. The apple-paring mechanism is drawn away from the fork to allow the apple to be properly forced upon the tines of the fork D^2, and it will be seen that the latch-bar E^9 has its hooked end k^5 in engagement with the abutment k^6, and firmly holds the knife-stock F, with its knife, in a retracted position, as stated. The switch-bar G has the front edge of its cam L in contact with the top surface of the cam-flange B^4, near the top of the curved slope of this flange, and the arm E^7 of the turn table is nearly in engagement with the front edge of the cam L. Arm M is now nearly in engagement with lug *p'*, formed on the latch-bar E^9, and the spiral spring H is extended so that its energy may be utilized to partially rotate the toothed segment E^4, when the hooked end of the latch-bar E^9 is released by a change of position of the switch-bar G. A view of the rear end of the switch-bar G now shows a curved cam, 6, that is cut on its lower edge in a manner to permit the entry of the top of the portion *m*, formed integrally on the top of the elongated box a^2 of the bracket-frame C^9, and at the forward termination of the curved cam 6 an offset shoulder, 7, is made, which is the rear edge of the inclined bearing-pad 8, that is also a portion of the body of the switch-bar G. The front terminating edge of this bearing-pad 8 is rounded from the outer face to the inner edge of the same to give it a sloping or wedge shape. The vertical piece *m* of the arm, made on the top of the box a^2 of the bracket-frame C^9, now rests upon a projecting flange, 9, which flange is formed integrally and extends laterally from the adjacent surface of the sliding table B, adjacent to box *b*, this contact of the piece *m* and flange 9 holding the bracket-frame in a position to prevent the spur-pinion B^2 from meshing with the rack B' of the sliding table B when the machine is in the position shown in Fig. 1.

In order to prepare the device for paring an apple placed on the fork-tines a change of position is necessary. This is effected by pulling the handle-bar P toward the operator, who stands at the rear of the machine and uses his left hand to pull the handle-bar. This movement of the handle-bar P has caused the sliding table B to move rearwardly a limited distance and forced the arm M of the switch-bar G, that was in engagement with hook P' of the latch-bar E^9, to push the latch-bar and cause its hooked end to slide down the incline k^4, this movement of parts being effected by the spiral spring H. (See Fig. 2.) When motion is communicated to the machine to revolve the driving-gear wheel C^6 toward the right side of the machine, the apple will be rotated to the left by the change of motion through the spur-pinion D^3 on the fork-spindle D. The change of position of the sliding table B has also changed the position of the knife-stock F, and the blade f^2 is now brought di-

rectly in front of the end of the apple that is in position to be engaged by this blade, and it will be seen that the stock passes the center of the apple toward the left side of the machine and holds the bevel-edge of the knife in line with the center of the fork. In this position of the machine, as shown in Fig. 10, the front edge of the cam L has passed under the arm E^7, and this arm E^7 has been raised to throw the knife-blade f^2 into the position above described. The vertical piece *m* of the box a^2 on bracket-frame C^9 is now dislodged from its position on flange 9, and has advanced to lie close to the sliding table B, thus allowing the spur-pinion B^2 to engage the rack on the sliding table at the rear end of the same. The toe M^2, on the inner edge of the toothed segment E^4, is now in engagement with the depending finger M′ of the switch-bar G, so that a rotation of the main driving-wheel in the proper direction will revolve the spur-pinion that engages the rack of the sliding table and draw this sliding table with the connected switch-bar G rearwardly, and by the action of the swell of the cam L of the switch-bar the arm E^7 is elevated, while the rotation of the apple and rearward movement of the switch-bar gives an orbital movement of the knife f^2 around the apple, the swell of the cam L near its center raising the knife somewhat at this point to cause it to bear firmly on apples of varying diameters. When the knife-stock and its attached knife f^2 is about at the termination of its curved sweep over the surface of the revolving apple, which contact commences at the center of the pip end of the apple, the edge of the knife is brought around so that it is at right angles to the fork-spindle and the adjacent corner of the knife f^2 is below the center of the fork, but in close proximity to the cylindrical surface of its hub.

When the operation of paring the apple is nearly completed, the hook end of the latch-bar E^9 has been forced up the incline k^4 to engage the abutment k^6 at the top of this incline, and in this manner be in engagement to hold the paring device in retracted position when the paring is finished. The knife-stock of the paring device is withdrawn by the rearward movement of the switch-bar G, dislodging the arm E^7 from the cam, which allows this arm to fall onto the cam-flange B^4 of the sliding table B, and, as this is on a lower plane than the cam L of the switch-bar G, it permits the paring mechanism to drop away by gravity. It will be seen that this position of the arm E^7 will bring it below the front end of the cam L, to slide under it when the switch-bar G is thrown forward. (See Fig. 3.) A continuation of the rotative movement of the main gear-wheel C^6 will draw the table B farther to the rear and cause the slicing and coring devices to come into action, as the corer-tube has now entered the apple. The rotation of the apple and progressive movement of the table B, to which the slicer-knife N is pivoted, will cause the pared apple on the fork to be cut spirally into a continuous ribbon, and at the same time the corer-tube is being inserted through the apple. When the operation of slicing is finished, the core will be cut from the apple and rest in the tubular corer J on the fork-tines, and, as the core-ejector rod D′ has been pushed rearward, it will rest against this core. Now, when the spur-pinion B^2 has drawn the rack B′ to the rear a proper distance, the bearing-pad 8 of the switch-bar G will clear the edge of the engaged vertical piece *m* of the arm C^{12}, and this release of the piece *m*, which was sliding behind the bearing-pad 8, will permit the spiral spring I′ to exert its tensional force to draw the sliding table B and switch-bar G forwardly, the spring I′ and chain I having been stretched by the rearward movement of the table B, while the paring, slicing, and coring operations were in progress. The release of the piece *m*, as just described, will cause its bevel-edge *m′* to engage a similar edge on the bearing-pad 8 of the switch-bar G, and the draft of the spring I′ will throw the piece *m* outwardly and make it slide over the surface of the bearing-pad to assume a position at the rear of the pad, which is illustrated in Fig. 3. To dislodge the apple, it is only necessary to grasp the handle-bar P and push the sliding table forward. The relative position of the paring, coring, and slicing devices will now be seen in Fig. 1, as it was when the apple was placed on the fork.

Just previous to the release of the spiral spring I′ and chain I by the dislodgement of the piece *m* from the bearing-pad 8 of switch-bar G the hook or shoulder w^2 on the pusher-bar O will be brought into proper position to drop over the handle-bar P, and when the spring I′ is allowed to retract the table B forcibly the pusher-bar O will receive a forward impetus that will push the core of the apple that is about finished well into the barrel of the corer, so that with a continuation of the paring, slicing, and coring operation the core-ejector rod will recede by contact with a placed apple and shove the pusher-bar O back into a proper position to repeat the core-ejecting operation just described.

Many slight changes might be made in the constructive features of this combined device, as well as the separate devices composing it; hence I do not wish to limit myself to the exact features shown; but,

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

1. In an apple-paring machine, the combination, with a frame and a sliding table having a rack mounted thereon, of a main gear-shaft, a swinging bracket mounted thereon, a gear-shaft adapted to rotate in this bracket, and thereby reciprocate the sliding table, and paring devices, substantially as set forth.

2. In an apple-paring machine, the combination, with a main frame, and a sliding table having a rack mounted thereon, of a main gear-shaft, a swinging bracket mounted thereon, a gear-shaft adapted to rotate in this bracket to

move the sliding table in one direction, a spring or similar means for returning the sliding table to its normal position, and paring devices, substantially as set forth.

3. In an apple-paring machine, the combination, with a main frame and a sliding table mounted thereon, said table having rack-teeth thereon, of a main gear-shaft, a swinging bracket mounted thereon, a shaft journaled in this bracket and provided with a pinion the engagement of which with the rack-teeth of the sliding table is adapted to operate the latter in one direction, a spring for holding the pinion normally in engagement with these rack-teeth, devices for removing the pinion from these teeth, and paring mechanism, substantially as set forth.

4. In a paring-machine, the combination, with a main frame and a sliding table having rack-teeth mounted thereon, of a main driving-shaft, a swinging bracket mounted thereon, said bracket having a shaft journaled therein, gear-wheels for communicating motion from one shaft to the other, a pinion on one shaft adapted to mesh with the rack-teeth, a spring for normally holding said pinion in engagement with said teeth, a cam for removing the pinion from the rack-teeth during the backward movement of the sliding table, and paring mechanism, substantially as set forth.

5. In an apple-paring machine, the combination, with a main frame and a main driving-shaft journaled therein, of a swinging bracket mounted on this main shaft, said bracket having an upwardly-projecting arm and a shaft journaled in the swinging bracket, of a sliding table mounted on the frame, said table having rack-teeth thereon adapted to mesh with a pinion on the shaft in the swinging bracket, a switch-bar removably secured to the carriage, said bar having a bearing-pad adapted to engage the end of the upwardly-projecting arm of the swinging bracket, and paring devices, substantially as set forth.

6. In an apple-paring machine, the combination, with a main frame, a forked spindle journaled therein, and gearing for communicating motion to said spindle, of a sliding table mounted on the frame, a coring-tube carried by the table, an apple-remover depending from the frame in position to abut against the apple when the machine assumes its normal position, a device for adjusting said apple-remover, and a spring or equivalent means for returning the table to its normal position, substantially as set forth.

7. In an apple-paring machine, the combination, with a main frame and a sliding table mounted thereon, said table carrying a coring-tube, of an apple-remover depending from the frame and in a position relative to the coring-tube to remove an apple from the latter when the machine assumes its normal position, a device for adjusting said apple-remover, and a spring or similar means for returning this table to its normal position, substantially as set forth.

8. In an apple-parer, the combination, with a frame, of a depending apple-remover and a device for adjusting said apple remover, substantially as set forth.

9. In an apple-parer, the combination, with a frame and a sliding table mounted thereon, of a coring-tube, said tube being removably secured to the table, and adjusting-screws, whereby the tube may be moved laterally, substantially as set forth.

10. In an apple-coring machine, the combination, with a frame and a sliding table, of an arm pivoted to one end of the table, said arm being forked at one end and provided with screws adapted to impinge against the end of the table to thereby laterally adjust the arm, and a coring-tube removably secured in the arm, substantially as set forth.

11. A coring device consisting, essentially, of a tube and an arm in which this tube is removably secured, said arm having adjusting-screws, whereby it is laterally shifted, substantially as set forth.

12. In an apple-paring machine, the combination, with a frame and a sliding table mounted thereon, of a coring-tube extending from the latter, an apple-remover depending from one end of the frame and provided at its lower end with a loop in position to allow the coring-tube to pass through it, and a device for adjusting said apple-remover, substantially as set forth.

13. In an apple-parer, the combination, with a main frame and a guide-rod extending the length of the latter, of a sliding table mounted on this guide-rod, said table having rack-teeth thereon, paring mechanism connected with the main frame and operated by the sliding table, a swinging bracket, a shaft journaled in this bracket and provided with a pinion adapted to mesh with the rack-teeth on the sliding table, and a spring and cams for varying the lateral position of the swinging bracket, substantially as set forth.

14. In an apple parer, the combination, with a main frame, a guide-rod secured therein, a sliding table mounted on said rod, this table having rack-teeth, a cam-plate thereon, a coring-tube at one end, and a main driving-shaft journaled in the frame, of a swinging bracket mounted on the driving-shaft, a shaft journaled therein, said shaft having a pinion on one end adapted to mesh with the teeth on the sliding table, a spring for normally holding the pinion in meshed contact with the rack-teeth, a switch-bar loosely secured to the sliding table, this switch-bar having cams thereon, a paring-knife, and mechanism for operating said knife by the passage of the switch-bar in contact therewith, substantially as set forth.

15. In an apple-parer, the combination, with a main frame, a guide-rod secured thereto, and a sliding table mounted on this rod, said table having an upwardly-projecting arm rigidly secured thereto, of an apple-remover adjustably secured on the guide rod and having an arm projecting therefrom, and a spring yield-

ingly connecting said arm with the arm projecting from the sliding table, substantially as set forth.

16. In an apple-parer, the combination, with a sliding table, of an apple-slicing knife pivoted to the table, and lugs by which the knife is automatically locked in position, substantially as set forth.

17. In an apple-parer, the combination, with the main frame, a sliding table, and paring mechanism, of a removable switch-bar composed of an elongated bar of metal having arm M, finger M′, arm K, ear *n*, lug n^3, depending arm *n′*, and bearing-pad 8, substantially as set forth.

18. In an apple-parer, the combination, with the main frame, a sliding table, and paring mechanism, of a removable switch-bar composed of an elongated bar of metal having arm M, finger M′, arm K, ear *n*, lug n^3, depending arm *n′*, and bearing-pad 8, cams L G′ 6, and shoulder 7, substantially as set forth.

19. In an apple-parer, the combination, with a sliding table having arm n^2, offset *x*, and notch *o*, and a paring mechanism, of a removable switch-bar having a depending arm, K, laterally-extended lug n^3, and depending arm *n′*, for the purpose substantially as set forth.

20. In an apple-parer, the combination, with a sliding table having rack-teeth, cam *h* h^2, arm n^2, offset *x*, and notch *o*, and a paring mechanism, of a removable switch-bar having a depending arm, K, laterally-extended lug n^3, and depending arm *n′*, for the purpose substantially as set forth.

21. In an apple-parer, the combination, with a frame and a shaft-box supported thereon, of a rocking-table frame supported in said box, a turn-table pivoted in the rocking-table frame, connected gearing for turning said table, and paring mechanism yieldingly supported in the turn-table, substantially as set forth.

22. In an apple-parer, the combination, with a main frame and a shaft-box supported thereon, of a rocking-table frame supported in said box, a turn-table pivoted in the rocking-table frame, connected gearing for turning said table, paring mechanism yieldingly supported on the turn-table, and an arm adjustably secured to said rocking-table frame, whereby the inclination of the latter is regulated, substantially as set forth.

23. In an apple-parer, the combination, with a main frame, a rocking-table frame supported thereby, and a toothed segment pivoted to the table-frame, of a turn-table pivoted also to the rocking-table frame in position to be turned by the toothed segment, substantially as set forth.

24. In an apple-parer, the combination, with a main frame, a rocking-table frame supported thereby, and a toothed segment, of a turn-table, also pivoted to the rocking table and provided with a toothed arc adapted to mesh with the teeth of the segment, whereby the turn-table may be turned, and a knife-stock pivoted to this turn-table, substantially as set forth.

25. In an apple-parer, the combination, with a main frame, a rocking-table frame supported thereby, and a toothed segment pivoted in said frame, of a turn-table having a toothed arc thereon which meshes with the teeth of the segment, a paring-knife stock pivotally and yieldingly supported on the turn-table, and cam mechanism for operating the paring mechanism, substantially as set forth.

26. In an apple-parer, the combination, with a main frame and a sliding table, the latter having an elongated cam-flange thereon, of a rocking-table frame supported by the main frame, a toothed segment pivoted on said frame, a turn-table having a toothed arc thereon which meshes with the teeth of the segment, a paring-knife stock pivotally and yieldingly supported on the turn-table, and an arm, E^7, secured to the rocking table frame and in position to be moved by the cam-flange on the sliding table, substantially as set forth.

27. In an apple-parer, the combination, with a main frame, a sliding table mounted thereon, the latter having an elongated cam-flange on its side, and a movable switch-bar having arms and cams thereon, of a rocking-table frame supported by the main frame, a toothed segment pivoted on said frame, this segment having a toe adapted to be engaged by an arm on the switch-bar for turning the segment, a turn-table having a toothed arc thereon which meshes with the teeth of the segment, a paring-knife stock pivotally and yieldingly supported on the turn-table, an arm, E^7, adjustably secured to the rocking-table frame and provided with a notch which receives the cam-flange on the sliding table, and a cam on the switch-bar, whereby the rocking-table frame is rocked, substantially as set forth.

28. In an apple-parer, the combination, with a main frame, a rocking-table frame supported by the main frame, said frame having the incline K^4, a toothed segment pivoted on this rocking frame, and a turn-table carrying a yieldingly-pivoted knife-stock, said turn-table being operated by the segment, of a spring-actuated latch-bar pivoted to the rocking table and provided with a hook adapted to travel up the incline K^4 and be engaged by the shoulder formed at the upper end of this incline, substantially as set forth.

29. In an apple parer, the combination, with a main frame, a sliding table mounted thereon, this table having an elongated cam-flange, and a removable switch-bar having projecting arms and cams thereon, of a rocking table frame pivotally supported on the main frame, a toothed segment pivoted on this rocking frame, a spring-actuated latch pivoted to the segment and provided with a hook adapted to ride over an incline on the rocking-table frame and be engaged there, a turn-table pivoted in the rocking frame, and an arm adjustably secured to the rocking table, all these parts being operated,

engaged, and disengaged periodically by the contact of arms and cams on the sliding table and switch-bar, with projections on the segment, the spring-actuated latch, and the rocking table, substantially as set forth.

30. In an apple-parer, the combination, with a main frame, a sliding table, said table having a laterally-projecting arm, a hollow forked spindle journaled in the main frame, and a core-ejector therein, of a pusher-bar having a hook adapted to be caught by the laterally-projecting arm of the sliding table when the latter is assuming its normal position, thereby driving the core-ejector forward through the forked hollow spindle, and a lug for automatically disconnecting the hook of the pusher-bar from the arm on the sliding table, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

BYRON D. TABOR.

Witnesses:
ORRIN QUICK,
GEORGE MAUL.