

No. 693,778.

Patented Feb. 18, 1902.

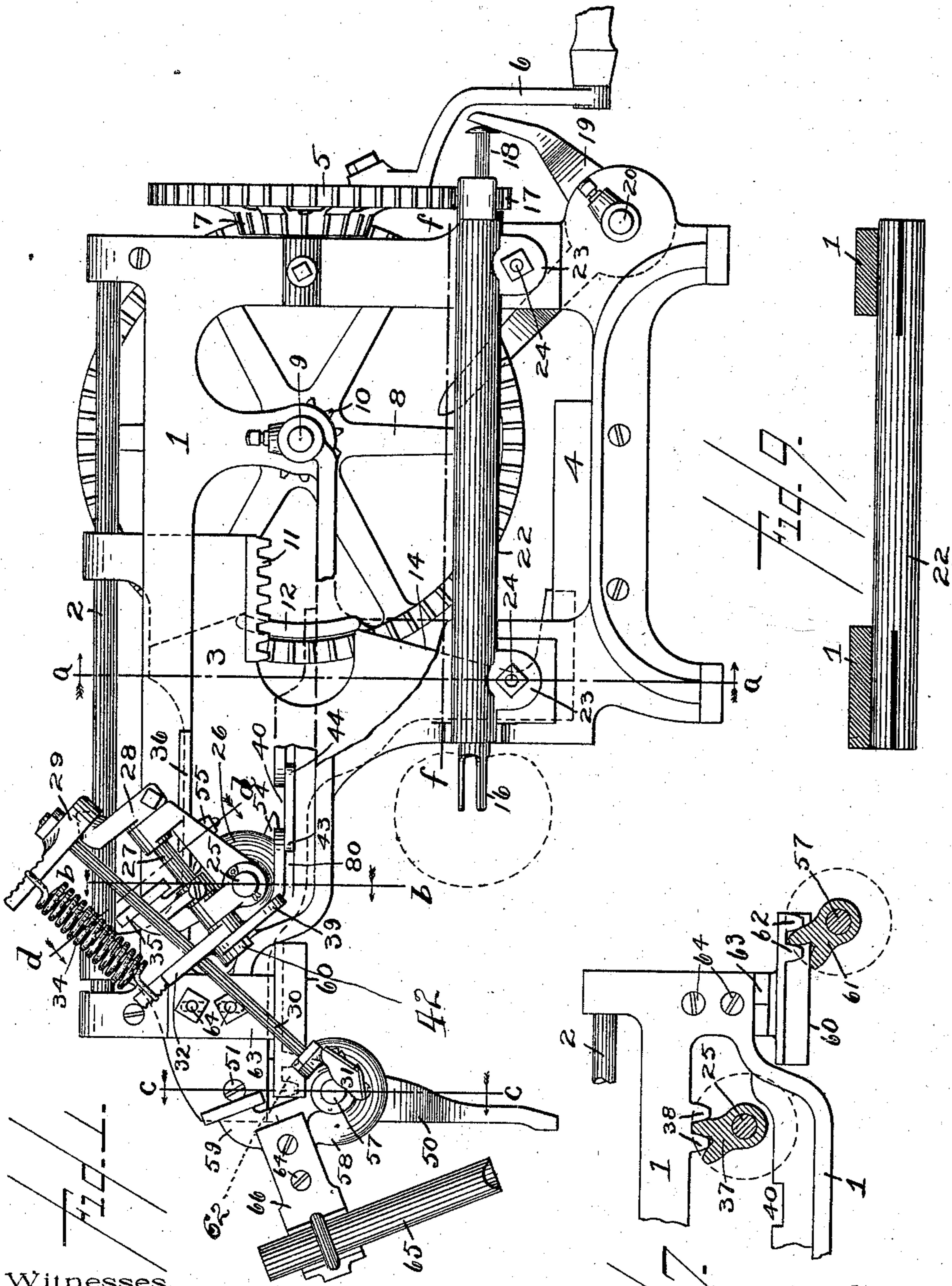
W. H. BOUTELL.

PARING AND CORING MACHINE.

(Application filed Mar. 23, 1898. Renewed Aug. 2, 1901.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses.

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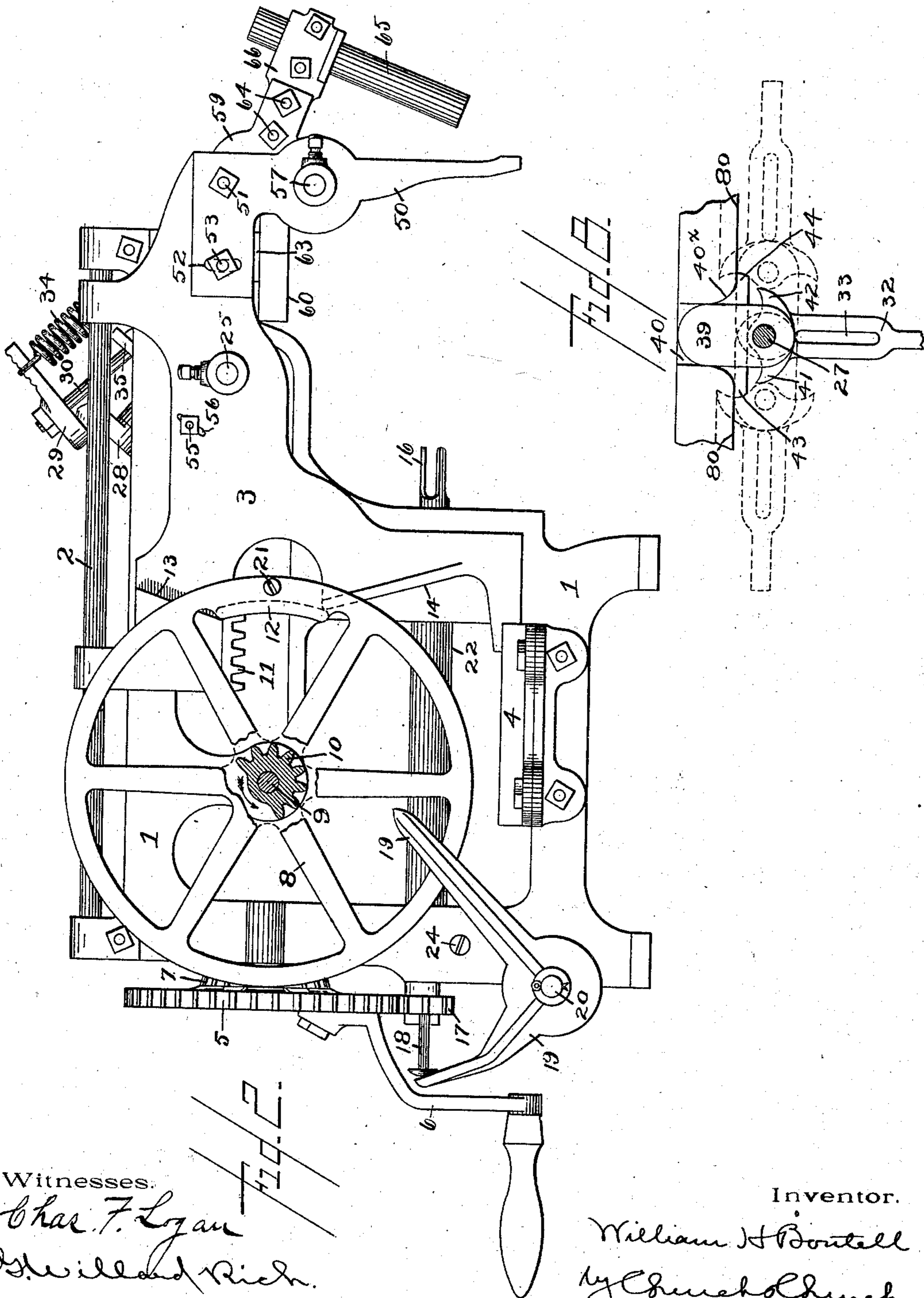
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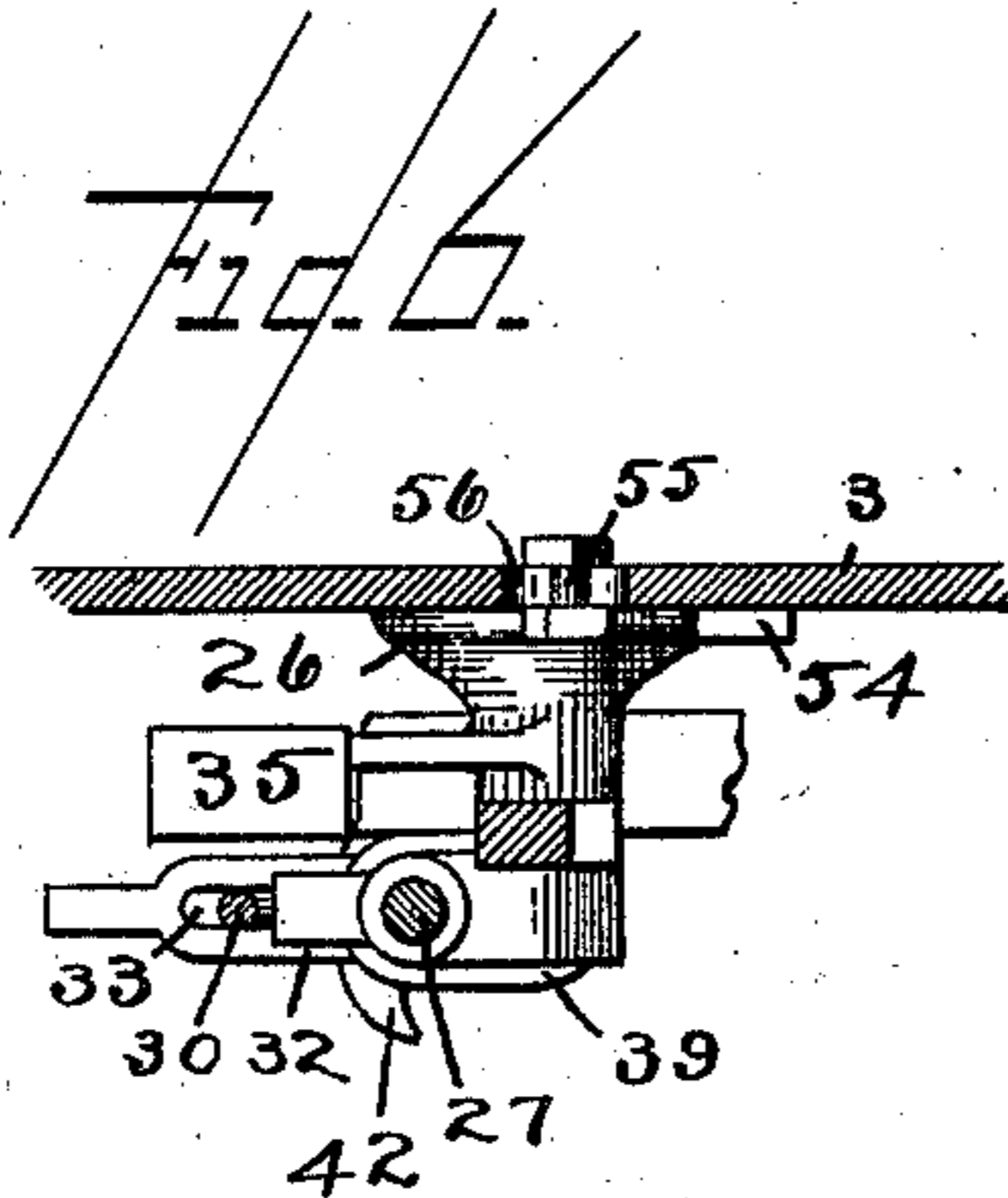
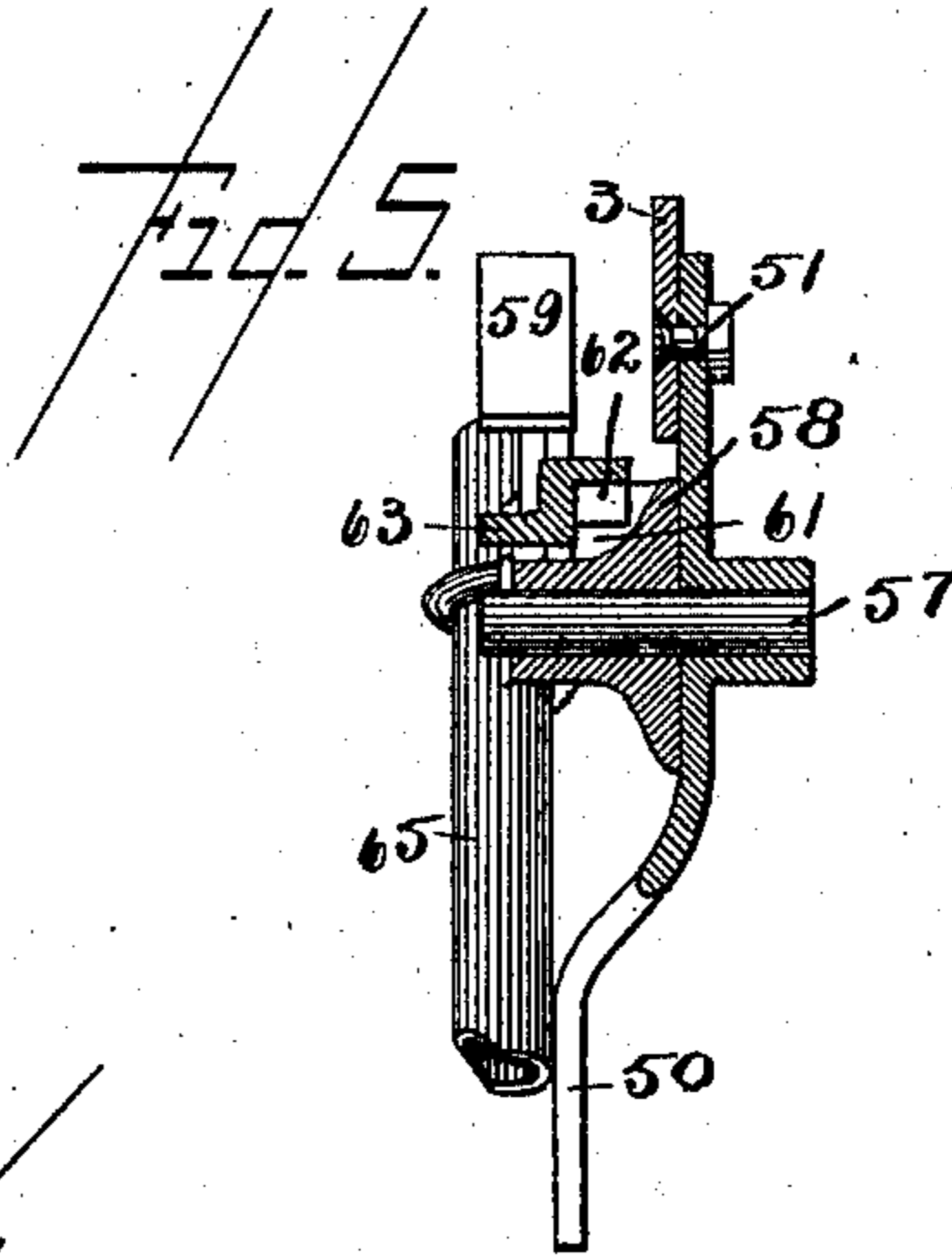
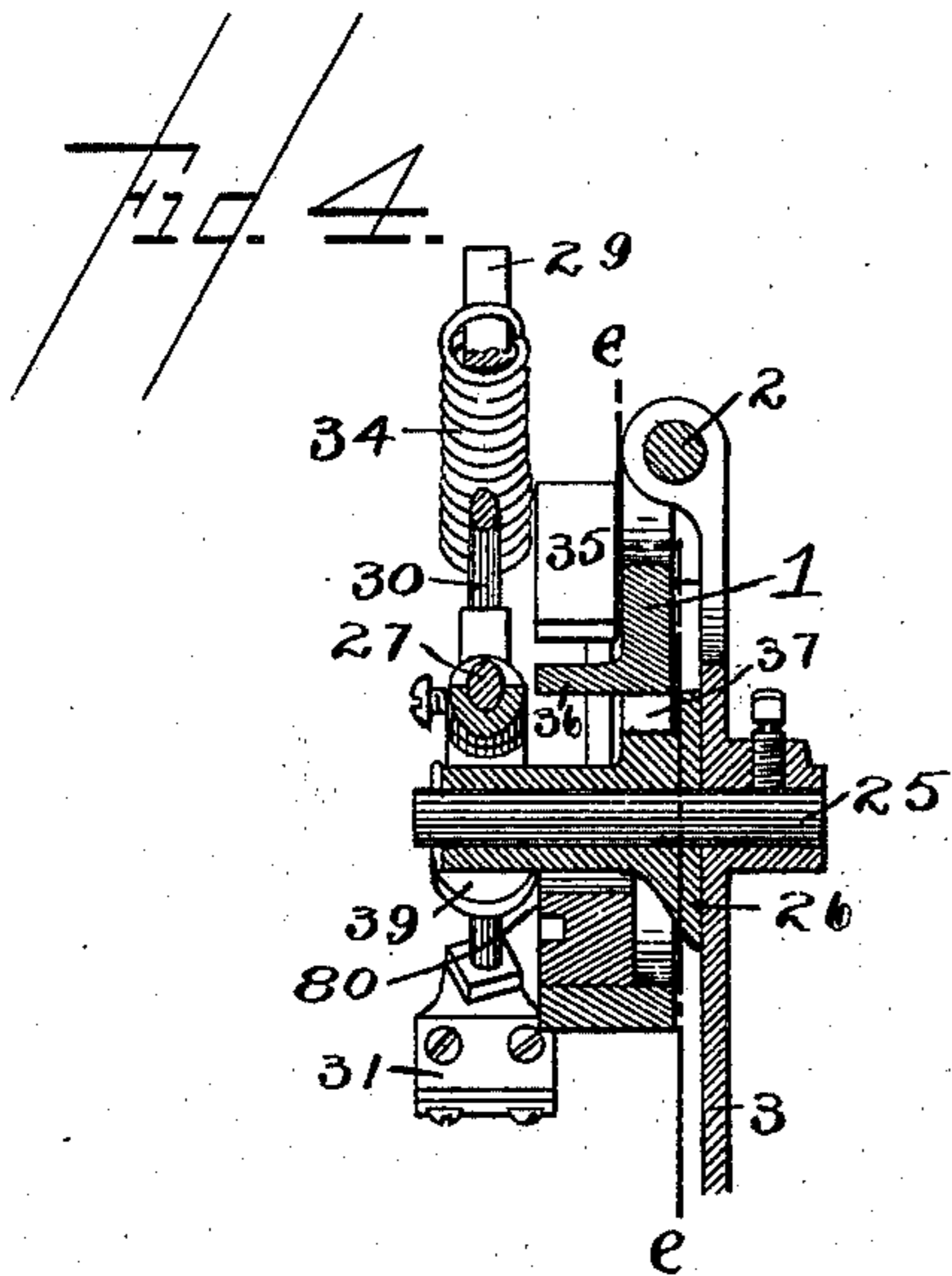
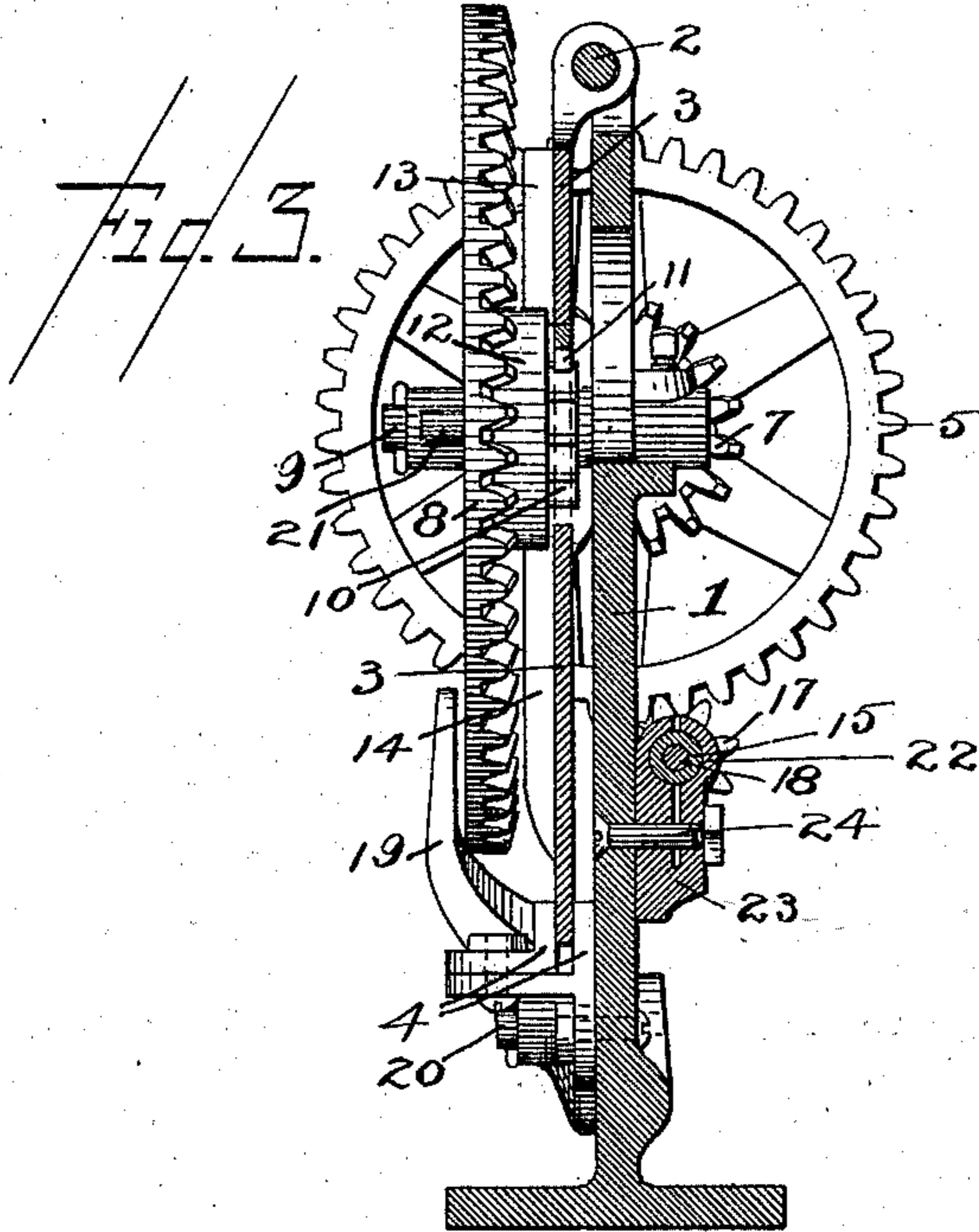
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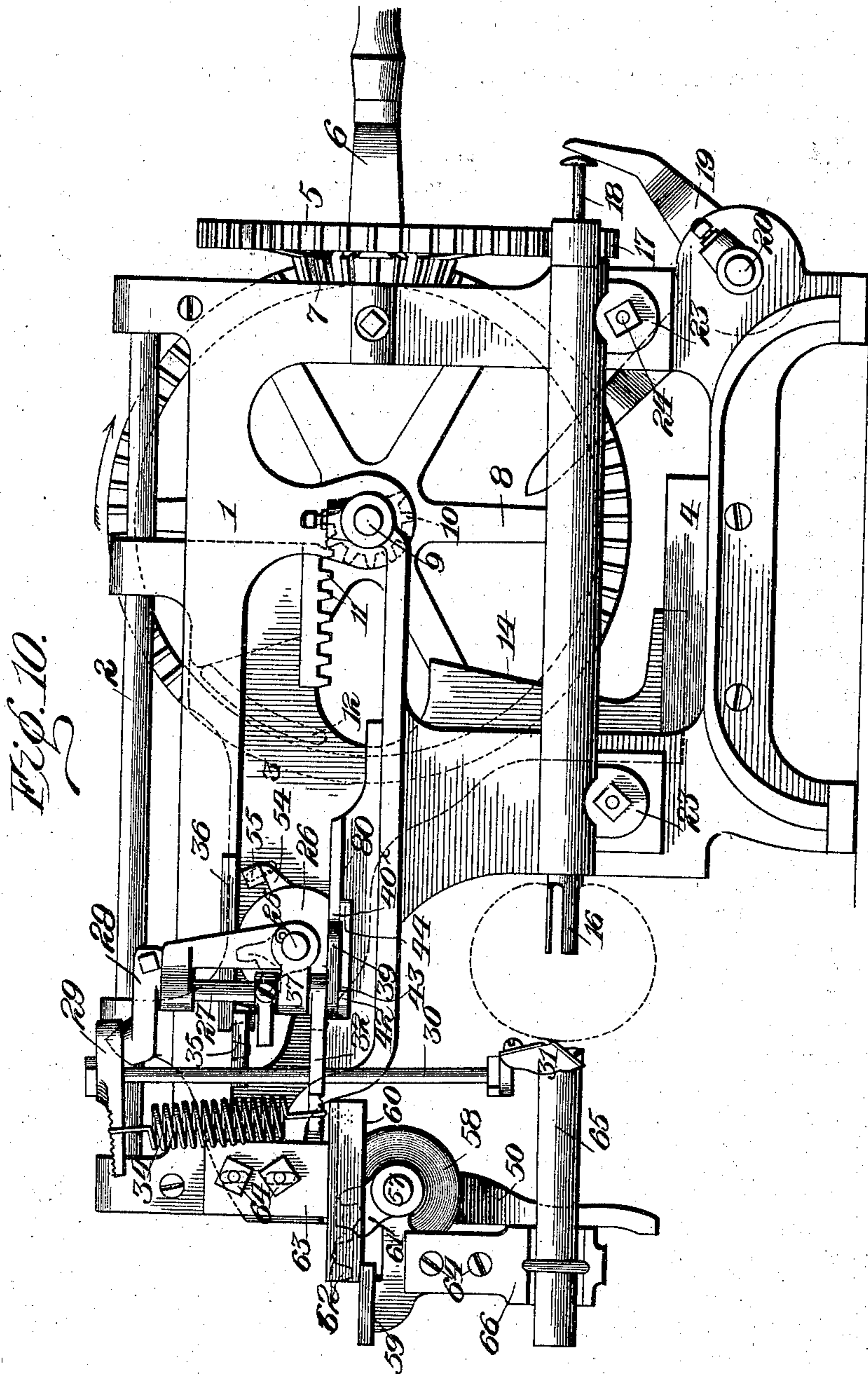
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(No Model.)

4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

WILLIAM H. BOUTELL, OF ROCHESTER, NEW YORK.

PARING AND CORING MACHINE.

SPECIFICATION forming part of Letters Patent No. 693,778, dated February 18, 1902.

Application filed March 23, 1898. Renewed August 2, 1901. Serial No. 70,680. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BOUTELL, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Paring and Coring Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention relates to machines for paring and coring apples or similar fruit; and it has for its object to improve their construction and operation, whereby the construction is facilitated and the various movements and adjustments necessary to operate upon the fruit in the best manner are provided, all as will be hereinafter fully described, the novel features being pointed out in the claims at the end of this specification.

In the accompanying drawings, Figure 1 is a front elevation of a paring and coring machine embodying my improvement with a portion of the frame broken away; Fig. 2, a rear view of the same; Fig. 3, a vertical sectional view on the line *a a* of Fig. 1; Fig. 4, a sectional view on the line *b b* of Fig. 1; Fig. 5, a sectional view on the line *c c* of Fig. 1; Fig. 6, a sectional view on the line *d d* of Fig. 1; Fig. 7, a sectional view on the line *e e* of Fig. 1; Fig. 8, a sectional view taken just above the cam devices for rotating the knife-carrying arm, showing the means for causing the variable operation of the knife; Fig. 9, a sectional view of the main frame, taken on the line *f f* of Fig. 1, showing the construction of the sleeve for carrying the fork-shaft. Fig. 10 is a side elevation of the machine, showing the position of the parts at the commencement of the paring operation.

Similar reference-numerals in the several figures indicate similar parts.

1 indicates the main frame of the machine, of the usual or any preferred construction, provided with suitable supporting-legs adapted for attachment to a base and having at its upper portion a removable rod or way 2, upon which slides a movable carriage 3, supporting the paring and coring devices, said carriage being provided at its upper end in the present instance with apertures or eyes en-

circling the rod or way 2, while its lower end operates in guides 4 4 at the lower portion of the frame, as shown. Mounted in suitable bearings formed in the main frame is a stud-shaft carrying a large gear 5, to which is attached an operating-handle 6 and also a beveled pinion 7, meshing with corresponding teeth on a large operating-wheel 8. This wheel 8 extends in a plane parallel with that of the main frame, being journaled on an arbor or pin 9, mounted on the main frame, and is provided with a small mutilated pinion 10, adapted to mesh with a short rack 11, formed upon the carriage 3, and just inside of the beveled teeth of the gear is provided a segmental rib or cam 12, arranged to cooperate with the ribs or cam-surfaces 13 and 14, located on the rear side of the carriage 3 and above and below the center of rotation of the gear 8. This arrangement of the cam-surfaces upon opposite sides of the center of rotation permits them to operate conjointly with the rack and pinion to affect the variations of speed in the carriage. The segmental rib 12 first engages the cam-surface 13, sliding the carriage inwardly until the rack 11 is engaged by the pinion 10, and the movement in the same direction continues at a decreased speed until the latter parts are disengaged and the carriage is returned to its normal position by the action of the rib 12 on the lower cam-surface 14. It will be noticed that the rib 12 is continuous between its ends and is concentric with the axis of the wheel 8, and while this arrangement is not essential to the operation of the device I prefer this construction, as I am enabled to hold the carriage extended in the outward position while the operating-wheel is being revolved a distance equal to the length of the rib, thereby arresting the movement of the carriage sufficiently to allow the operator ample opportunity to apply the fruit to the fork without interfering with the constant rotation of the driving mechanism.

15 indicates the hollow fork-shaft, having at one end the fruit-fork 16 and at the other a pinion 17, meshing with the operating-gear 5, and 18 indicates the usual core-doffer, passing longitudinally through said fork-shaft and operated in a direction to eject the core from the fork by means of the bell-crank lever 19,

pivoted at 20 to the main frame and having one of its arms in position to be operated upon by a stud or projection 21 on the main gear 8, as shown in Fig. 2. As a means for supporting the fork-shaft, attaching it to the frame, and at the same time providing for such adjustment as may be necessary to take up wear of the parts, I mount said shaft in a long bearing-sleeve 22, having the lugs or feet 23 at the ends, said sleeve being split at the ends from the upper side downward and nearly through the lugs 23, as shown in Fig. 3, and through these split portions I pass bolts 24, having nuts on their outer ends, as shown. This construction provides for attaching the bearing-sleeve to the main frame and also provides for the necessary adjustment to take up the wear at the ends of the sleeve by the adjustments of the nuts on the securing-bolts 24, thereby materially simplifying the parts and reducing the number of castings. I prefer that the bearing-sleeve be cored out at the center, so that the only bearing portions that engage the shaft will be near the extreme ends of the split portions.

I find that it is desirable in machines of this description that when the carriage is moved in a direction to cause the cooperation of the paring devices with the fruit on the fork-shaft the first portion of said motion be comparatively rapid to bring the knife into engagement with the fruit, then that the paring operation be accomplished at an even and slower speed, and that the return or outward movement of the carriage be considerably more rapid than the inward movement, and in the present machine this is caused by the instrumentalities employed, the cooperation of the cam 12 with the surface 13 on the carriage moving the latter rapidly and until the rack 11 and pinion 10 engage, then the comparatively slow movement caused by the rack and pinion, which have a considerably smaller radius than the cam 12, completes the paring and coring operations, then the rapid outward movement of the carriage caused by the engagement of the cam 12 with the surface 14. The cam 12, it will be noted, is long enough to contact with both the surfaces 13 and 14 on the carriage, so that when in the position shown in Figs. 1 and 2 it will lock the latter at the outer extreme of its movement, and also that the carriage is held stationary while the wheel is rotating a distance equal to the length of the cam 12, thereby allowing time for the application of the fruit to the fork without arresting the operation of the handle.

Mounted upon the stud or arbor 25, secured to the carriage, is the rocking head 26, carrying the paring-knife and operating parts, embodying the sleeve portion, and capable of a rotary movement on the stud 25 and having bearings extending at right angles to said stud for the accommodation of the rotary arbor 27, having the oscillatory head carrying the paring-knife. The paring-head embodies

the arm 28, adjustably attached to the upper end of the arbor 27, on which is pivoted the arm 29, carrying the knife-arm 30, having the paring-knife 31 at its lower end. The lower end of the head is provided with the outwardly-extending arm 32, having the slot 33 for the passage of the knife-arm 30 and serrated on its under side for the engagement of the end of the spring 34, the upper end of said spring engaging the arm 29 for the purpose of keeping the knife pressed toward the center of the paring-head. The rocking head 26 is further provided with a shoe 35, adapted when the carriage is moved toward the fruit-fork to cooperate with the under side of the way or rib 36, formed on the main frame, as shown in Figs. 1 and 4. For the purpose of operating the rocking head 26 to move the paring-knife into and out of contact with the fruit I provide it on its rear side with a mutilated pinion 37, adapted to engage with a corresponding rack 38, formed on the main frame, said pinion in the present instance embodying but two teeth, as shown in Fig. 7.

The rotation of the paring-head carrying the knife is caused by arranging upon the lower end of the head a tooth or projection 39, adapted to cooperate with a recess 40, formed in the main frame, and beneath and at opposite sides of said tooth or projection I arrange two hook-shaped projections or teeth 41 and 42, cooperating with corresponding shoulders or lugs 43 and 44, arranged at the sides of and beneath the recess 40, as shown particularly in Fig. 8. Said teeth or projections 41 and 42 are shorter and nearer to the center of rotation of the spindle 27 than the tooth 39, so that as the carriage moves inward toward the fork the side of the tooth 39 will engage ways or bearing-surfaces 80, formed upon the frame on one side of the recess 40. Then the tooth 41, engaging the projection 43, will turn the head quite rapidly until the elongated tooth 39 enters the recess 40. As the engaging line of the tooth 39 and the sides of the recess 40 are farther removed from the center of rotation, the rotary movement of the head will be slower until the tooth 39 is operated upon by the inner side 40^x of the recess 40, which is nearer the center of rotation, and the head is caused to rotate more rapidly again until the side of the tooth 39 cooperates with the surface 80 on the main frame and the paring-knife moves parallel with the fork and away from the fruit. The first portion of the movement of the head in each direction is caused more rapidly by the engagement of the teeth 41 and 42 and lugs 43 and 44, the inward and reverse movements being plainly shown in dotted lines in Fig. 8. This varying movement is particularly advantageous in a machine of this kind, as it prevents the reparing of the ends of the fruit, the knife moving more quickly at the extremes or shorter circumference of the fruit. The shape and manner of cooperation of the carved projections 41 and 42 with the pro-

jections or surfaces 43 and 44 and the projection 39, operating in the recess 40, are advantageous whether or not the relative lengths of these parts are as shown and described in that the wear upon this portion of the machine which is subjected to the corroding action of the fruit - juices is materially decreased or is decreased to such an extent that the parts will not wear sufficiently to become loose. This result is obtained by reason of the fact that the projections 41 and 42 have their engaging faces curved to substantially the curves of the ends of the projections 43 and 44, so that a broad wearing-surface is afforded and the parts are not merely in point-contact, as is the case, for instance, with such a machine as that shown in my re-issued patent, No. 11,798. As the carriage moves outward the rocking head is tilted to the position shown in Fig. 1 by the reengagement of the pinion 37 and rack 38, the shoe 35 having moved off the bearing-surface 36 on the main frame.

In order to properly limit the rocking motion of the rocking head carrying the paring devices, I provide the sleeve 26 with a stop-arm 54, adapted to cooperate with the head of an adjustable stop in the form of a bolt 55, passing through and adjustable in a slot 56, formed in the carriage, as shown in Figs. 1, 2, and 6.

50 indicates the doffer-arm, adjustably secured to the outer end of the carriage by bolts 51 and 53, the latter passing through a perforation in the carriage and through a segmental slot 52 on the arm, whereby by loosening the nut on the bolt 53 the arm may be adjusted on the bolt 51 as a pivot, this construction providing means whereby the doffer and the corer mounted thereon may be adjusted with relation to the fork and rigidly secured in position. The arm 50 is provided with a stud 57, on which is mounted an oscillating corer-head 58, having an arm 59, with a shoe at the end thereof arranged to cooperate when the carriage is moved inward with a bearing-surface 60, formed on the lower side of a bracket 63, adjustably secured to the main frame by the bolts 64 on the main frame operating in slots in the bracket, as shown in Figs. 1 and 7. The corer-head 58 is also provided with a mutilated pinion 61, (embodying two teeth in the present instance,) engaging with teeth 62, formed upon the under side of the bracket 63, for causing the oscillation of said head on the stud 57 when the carriage is near the outer end of the frame, as in Figs. 1 and 7. The coring knife or tube 65 is adjustably secured to the arm 66, bolted to an extension of the head, said tube being of any approved construction and forming no portion of my present invention.

The operation of the coring device will now be understood. As the carriage moves inward the rack 62 on the frame causes the downward movement of the corer-head until the corer is in line with the fork. Then the

shoe on the arm 59, engaging the surface 60, maintains it in this position during the inward movement to core the fruit and remove it from the fork, and as the carriage moves outward again the pinion 61 and rack 62 engage and cause the corer-head to move up to the position shown, the doffer-arm 50 engaging the outer side of the fruit and causing its removal from the corer in the usual manner.

The various adjustments permitted the bearing for the fork-shaft and the doffer-arm and its connected parts enables me to take up any lost motion due to the wear of the parts and also to cause the proper alinement of the coring-tube and fork-shaft.

I claim as my invention—

1. In a paring-machine, the combination with the main frame, the rotary wheel mounted thereon having the mutilated pinion and the rib thereon, of the reciprocating carriage on the frame having the rack, and the ribs or projections arranged on opposite sides of the center of rotation of the wheel and operated upon successively by a single rib on the wheel to cause the reciprocation of the carriage in opposite directions at different speeds, substantially as described.

2. In a paring-machine, the combination with the main frame, the rotary wheel mounted thereon, having the mutilated pinion and the rib thereon concentric with the axis, of the reciprocating carriage on the frame having the rack and the ribs or projections arranged on opposite sides of the center of the wheel, the space between the proximate ends of said ribs being less than the length of the rib on the wheel, whereby the carriage will be operated in opposite directions by the continued rotation of the wheel and at different speeds when moved in one direction and held by the rib on the wheel when moved outward, substantially as described.

3. In a paring-machine, the combination with the frame, the fork-shaft thereon, the core-doffer, the lever for actuating the latter, and the wheel mounted on the frame having the mutilated gear, the rib concentric with the axis of the wheel and the pin, of the carriage mounted on the frame carrying paring devices thereon, and having the rack and the ribs on opposite sides of the axis of the wheel with which latter the rib on the wheel cooperates simultaneously, whereby the carriage will be operated in opposite directions at different speeds and held in its outward position, and the core-doffer operated by the rotation of the wheel in one direction, substantially as described.

4. In a paring-machine, the combination with the main frame and the carriage reciprocating thereon, of the paring-head rotatable on the carriage having the paring-knife thereon and cooperating projections between the paring-head and frame for causing the rotation of the paring-head, at a variable speed during the reciprocation of the carriage

whereby a more rapid rotary movement is imparted to the paring-head during the operation upon the ends of the fruit.

5. In a paring-machine, the combination with the frame and the carriage reciprocating thereon, of the paring-head rotatable on the carriage having the paring-knife, and the long and short teeth cooperating with corresponding surfaces on the frame for causing the rotation of the head at a variable speed during the reciprocation of the carriage, substantially as described.

6. In a paring-machine, the combination with the frame having the recess and the teeth on opposite sides thereof, of the carriage, the paring-head rotatable thereon, having the knife, the projection or tooth cooperating with the recess on the frame and the relatively shorter teeth cooperating with those on the frame for rotating the head at greater speed at the ends of its rotation, substantially as described.

7. In a paring-machine, the combination with the frame, having the recess 40, the ways at the sides thereof, and the projections 43 and 44 out of line with said ways, of the carriage, the paring-head thereon having the tooth 39 cooperating with the ways and recess, and the relatively shorter teeth 41 and 42, substantially as described.

8. In a paring-machine, the combination with the main frame and the rotary fruit-fork, of the reciprocating carriage, the rotatable paring-head thereon, having the paring-knife movable longitudinally and rotarily of the fork, and connections, substantially as described between the head and frame consisting of the long and short teeth cooperating with corresponding surfaces on the frame for causing the more rapid rotation of the head when the knife is moved toward the fork and longitudinally of the axis thereof.

9. In a paring-machine, the combination with the main frame and the rotary fruit-fork, of the reciprocating carriage, the rotatable paring-head thereon, the pivoted knife-arm and the knife movable radially of the paring-head, and cooperating long and short projections and recesses arranged on the head and frame respectively for causing the rotation of said head at greater speed, when the knife-arm is moved toward the fork and longitudinally of the axis thereof.

10. In a paring-machine, the combination with the main frame, and the rotary fork, of the reciprocating carriage, the rotatable paring-head thereon, the pivoted knife-arm having the knife and movable radially of the head, and cooperating teeth between the head and frame for causing the more rapid rotation of the head when near the extremes of its movement, thereby preventing reparing of the ends of the fruit.

11. In a paring-machine, the combination with the main frame having the teeth 38 thereon, of the carriage movable on the frame, the rocking head pivoted on the carriage and re-

ciprocating with the latter as it is moved on the frame having the gear engaging the teeth on the frame to revolve the head upon its pivot and throw the paring-knife into and out of engagement with the fruit, and the paring-head having the paring-knife and pivoted on the rocking head.

12. In a paring-machine, the combination with the main frame and the carriage movable thereon, of the rocking head pivoted on the carriage, the adjustable stop, as 55, for limiting the movement of said head, the paring-head on the rocking head and connections between the frame and rocking head for operating the latter.

13. In a paring-machine, the combination with the main frame, of the reciprocating carriage thereon, the rocking head pivoted on the carriage, connections between it and the frame for causing its rocking movement, and an adjustable stop between said head and the carriage for limiting the movement of the former in one direction.

14. In a paring-machine, the combination with the main frame, having the teeth, as 38, and the reciprocating carriage thereon, of the rocking head pivoted on the carriage having the gear-teeth, as 37, the paring-head mounted on the rocking head, and the adjustable stop, as 55, on the carriage for limiting the movement of the rocking head in one direction.

15. In a paring-machine, the combination with the main frame, having the teeth, as 38, and the bearing-surface, as the rib 36, thereon, of the reciprocating carriage, the pivoted rocking head having the teeth engaging the teeth on the main frame, the shoe engaging the bearing-surface, and paring devices carried on said rocking head.

16. The combination with the main frame, and the vertically-adjustable bracket 63 thereon, having the teeth 62, of the reciprocating frame and paring devices mounted thereon, the corer-head pivoted on the carriage and having the gear 61 cooperating with the teeth 62 on the bracket.

17. The combination with the main frame, and the vertically-adjustable bracket 63 thereon, having the teeth 62 and the surface 60, of the reciprocating frame and paring devices mounted thereon, the corer-head pivoted on the carriage and having the gear 61 cooperating with the teeth 62 on the bracket and the arm cooperating with the surface 60.

18. The combination with the main frame, the carriage movable thereon, the fork-shaft, and paring devices on the carriage, of the fruit doffer-arm, the corer pivoted upon and supported by the doffer-arm, adjustable connections between the doffer-arm and the carriage whereby both parts may be simultaneously adjusted relatively to the fork-shaft and means on the frame for turning the corer on its pivot.

19. The combination with the main frame, of the fork-shaft, the bearing-sleeve therefor,

having the split ends, and securing-bolts passing through said ends and serving to secure the sleeve to the frame and adjust the bearings for the shaft.

5 20. The combination with the main frame, of the fork-shaft, the bearing-sleeve therefor, having the lugs formed integral therewith upon opposite ends, and split part way through said lugs, and the bolts passing
10 through said split lugs and the frame and serving to adjust the bearing and secure the sleeve to the frame, substantially as described.

15 21. In an apple-parer, a frame, a carriage movable thereon, a knife supported by the carriage, and means for controlling the knife to give it a more rapid movement in paring the ends of the fruit than when paring the bilge.

20 22. In an apple-parer, a frame, a carriage movable thereon, a knife, a swinging knife-frame having two projections at different distances from its axis, and cam-grooves with which said projections successively cooperate to vary the speed of the knife in paring.

25 23. In a paring-machine, the combination with the frame, the reciprocating carriage having the recess 40 and the rounded pro-

jections at the sides thereof, of the carriage, the rotary paring-head thereon having a tooth adapted to enter the recess in the frame, and
30 the teeth curved to correspond to and cooperating with the rounded projections on the frame.

24. The combination with the frame, having the recess therein, and curved projections
35 at opposite sides thereof, of the carriage, the rotary paring-head thereon having the projection adapted to enter the recess in the frame, and the teeth thereon curved to correspond to and cooperate with the projections
40 on the frame at the sides of the aperture.

25. In a paring-machine, the combination with a frame having the recess 40, the ways at the sides thereof, and the curved projec-
45 tions 43 and 44 out of line with said ways, of the carriage, the paring-head thereon having a tooth 39 cooperating with the ways and recess, and the teeth 41 and 42 curved to fit over the projection.

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Witnesses:

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