No. 645,607. Patented Mar. 20, 1900.

C. E. SANDSTROM.

SAWING MACHINE.

(Application filed Oct. 2, 1897.)

(No Model.) 4 Sheets—Sheet 1.

Fig 1

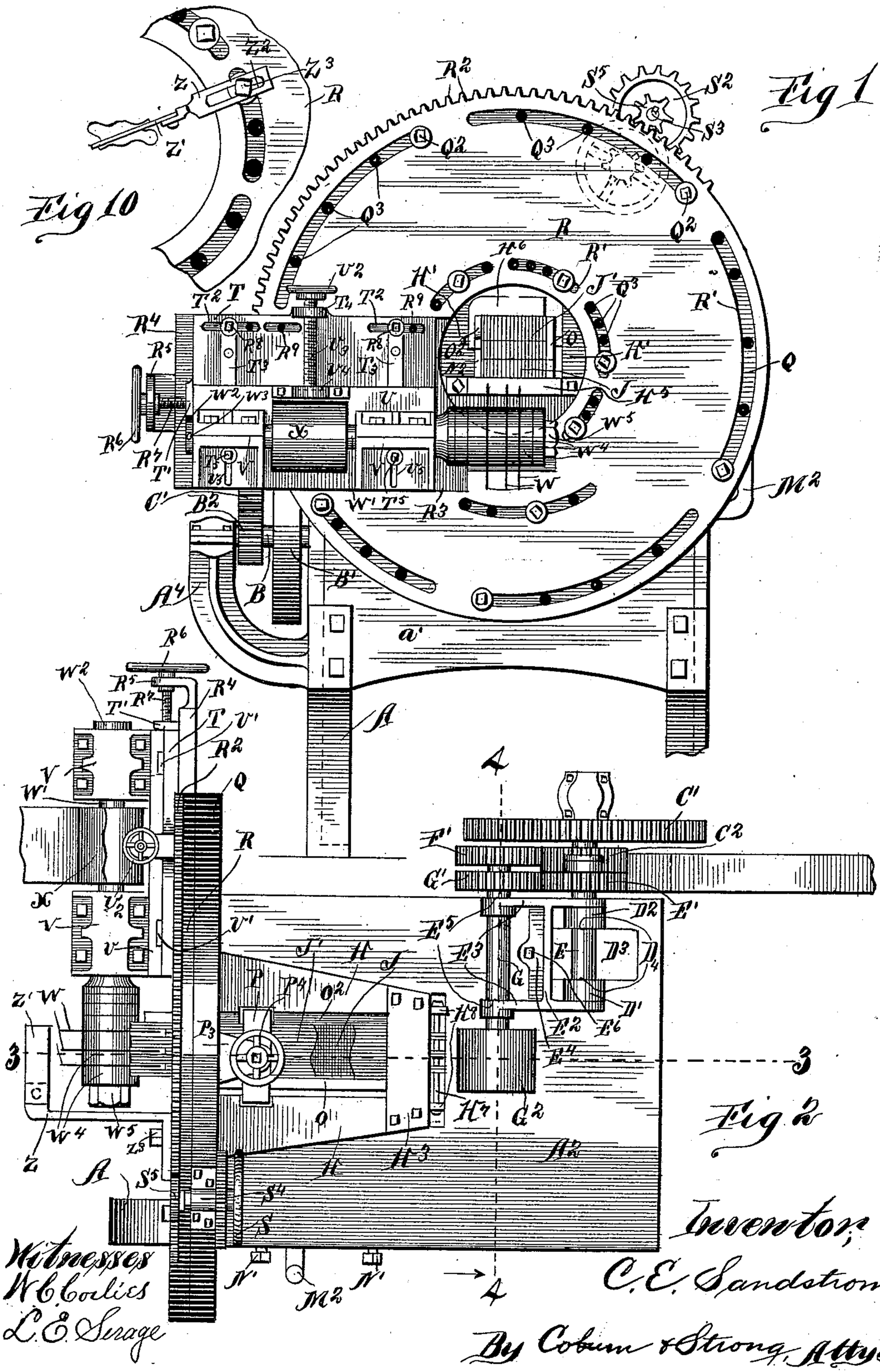

Fig 10

Fig 2

Witnesses
W. C. Collins
L. E. Savage

Inventor:
C. E. Sandstrom,
By Coburn & Strong, Attys.

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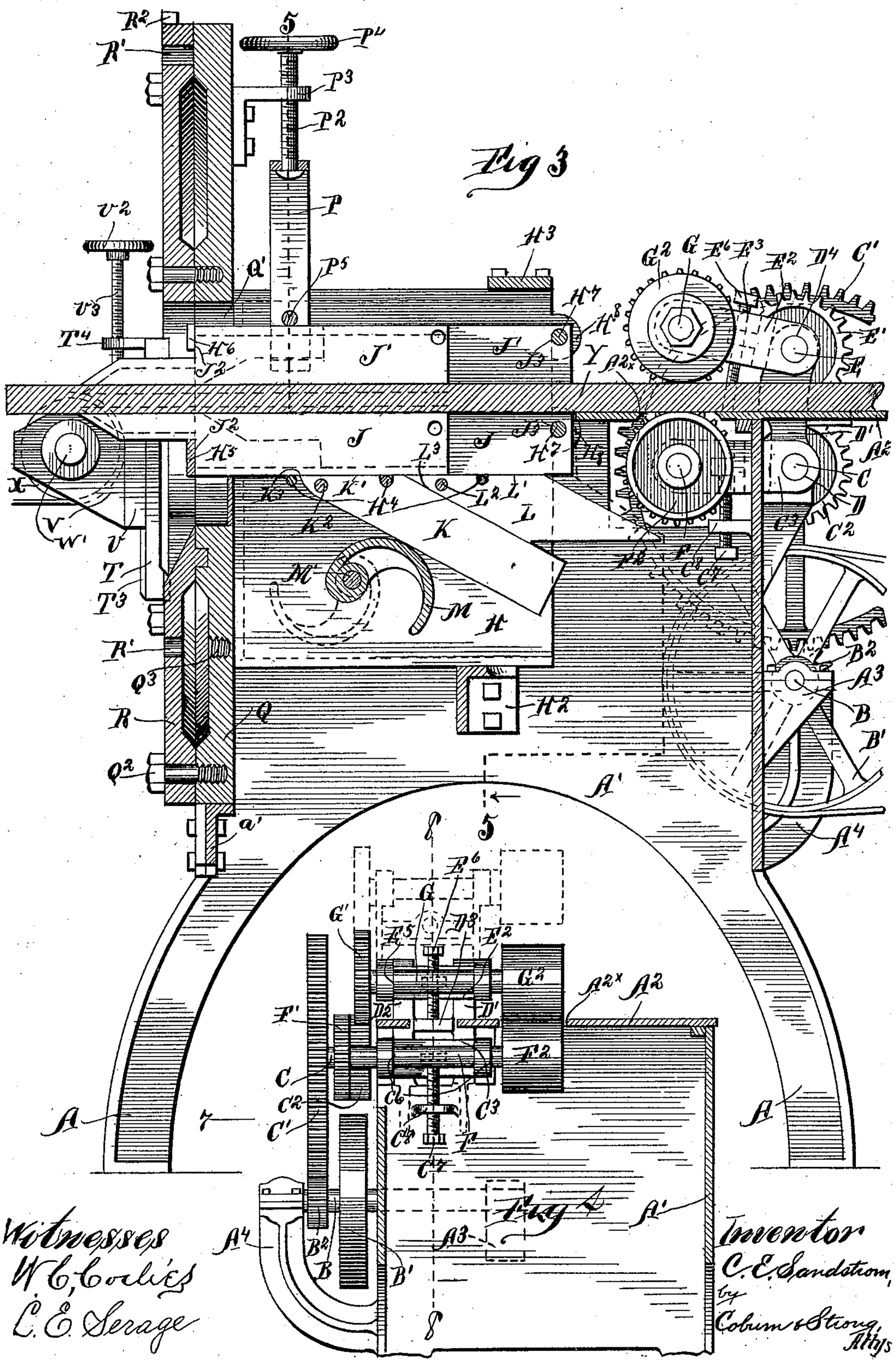

Fig 3

Fig 4

Witnesses
W. C. Curtis
L. E. Serage

Inventor
C. E. Sandstrom,
by
Coburn & Strong,
Attys

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C. E. SANDSTROM.

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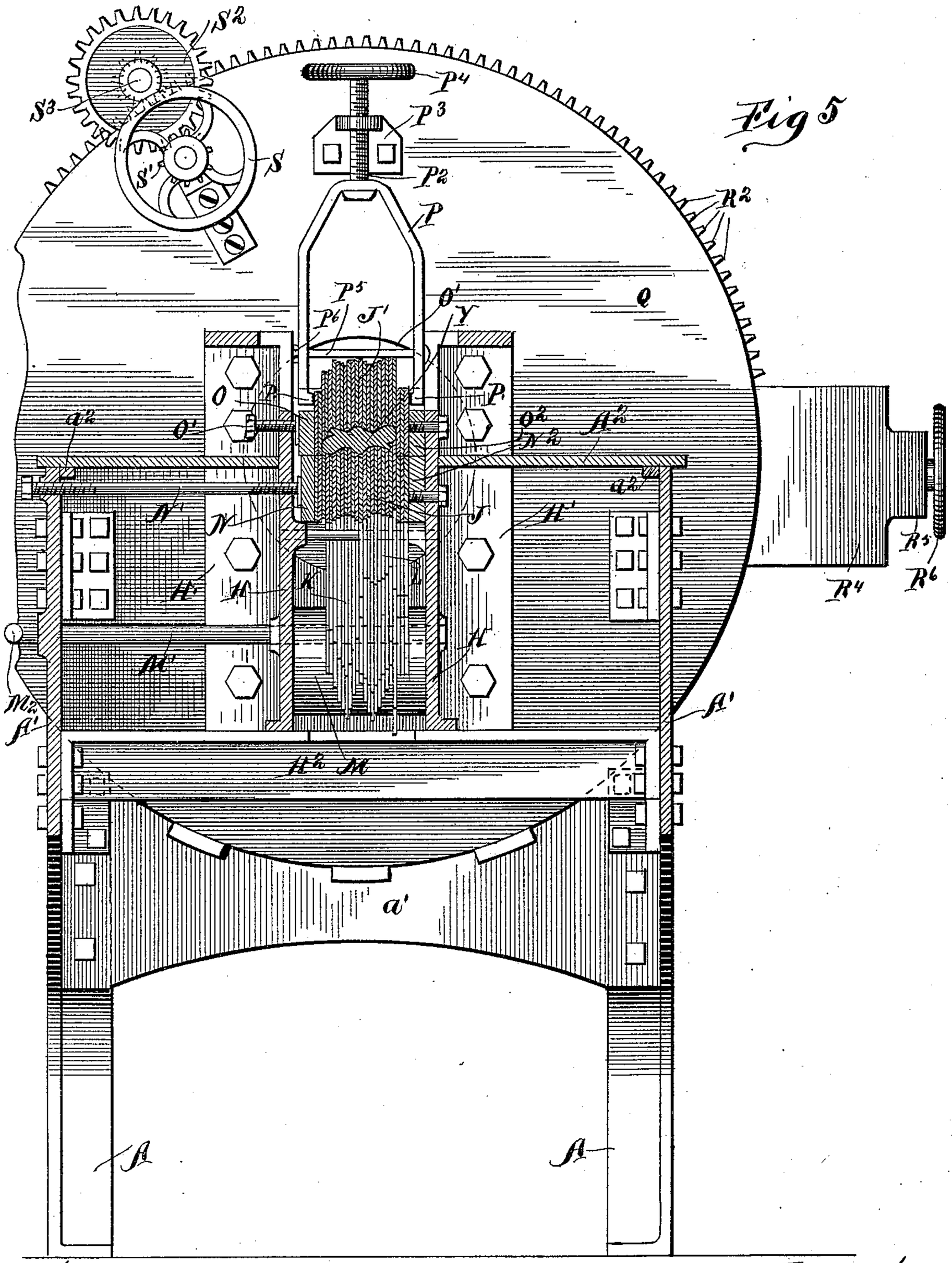
(Application filed Oct. 2, 1897.)

(No Model.) 4 Sheets—Sheet 3.

Fig 5



Witnesses
W. C. Corlies
L. E. Serage

Inventor,
C. E. Sandstrom,
by Coburn & Strong Att'ys.

No. 645,607. Patented Mar. 20, 1900.

C. E. SANDSTROM.

SAWING MACHINE.

(Application filed Oct. 2, 1897.)

(No Model.) 4 Sheets—Sheet 4.

Fig 6

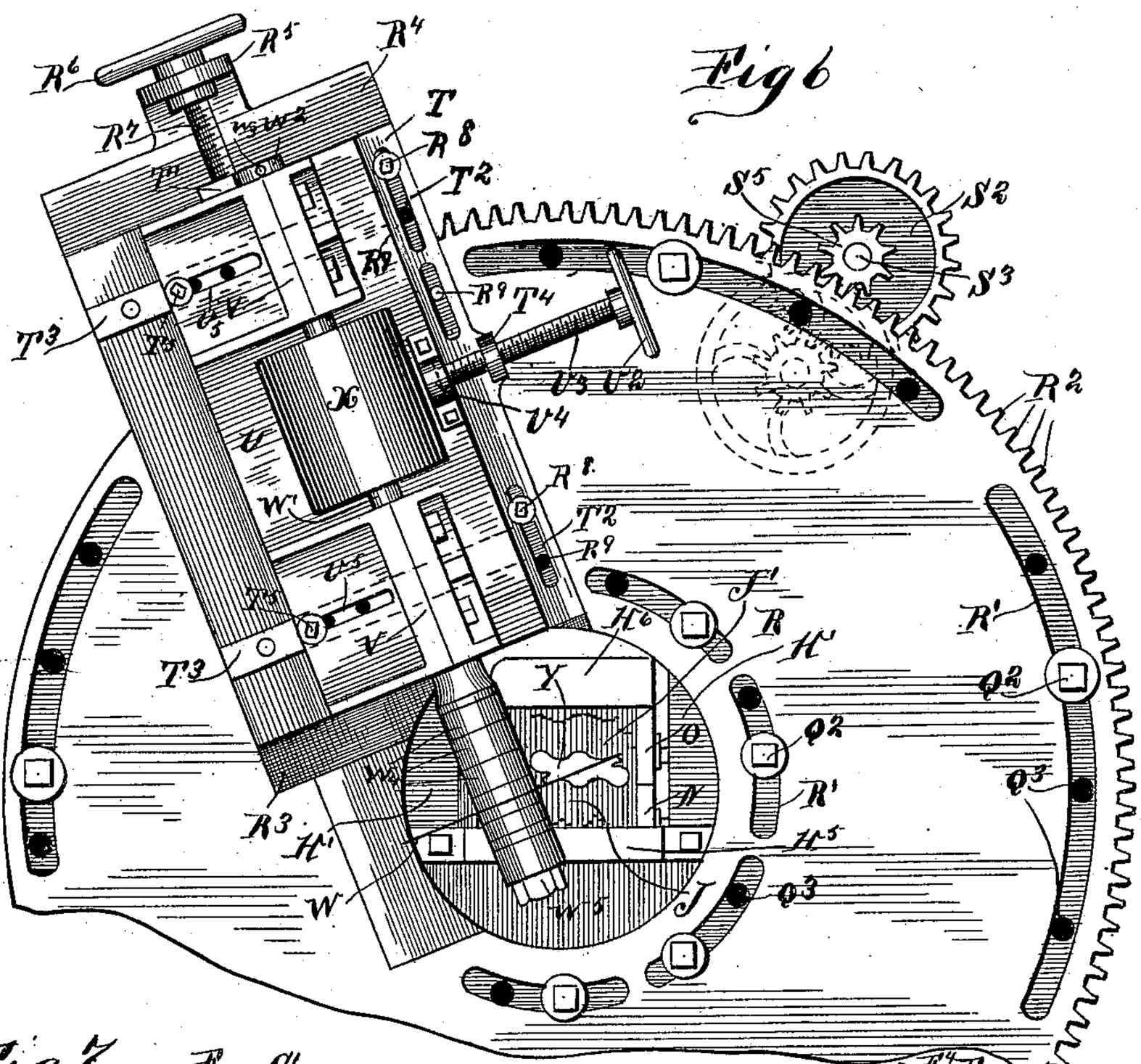


Fig 7

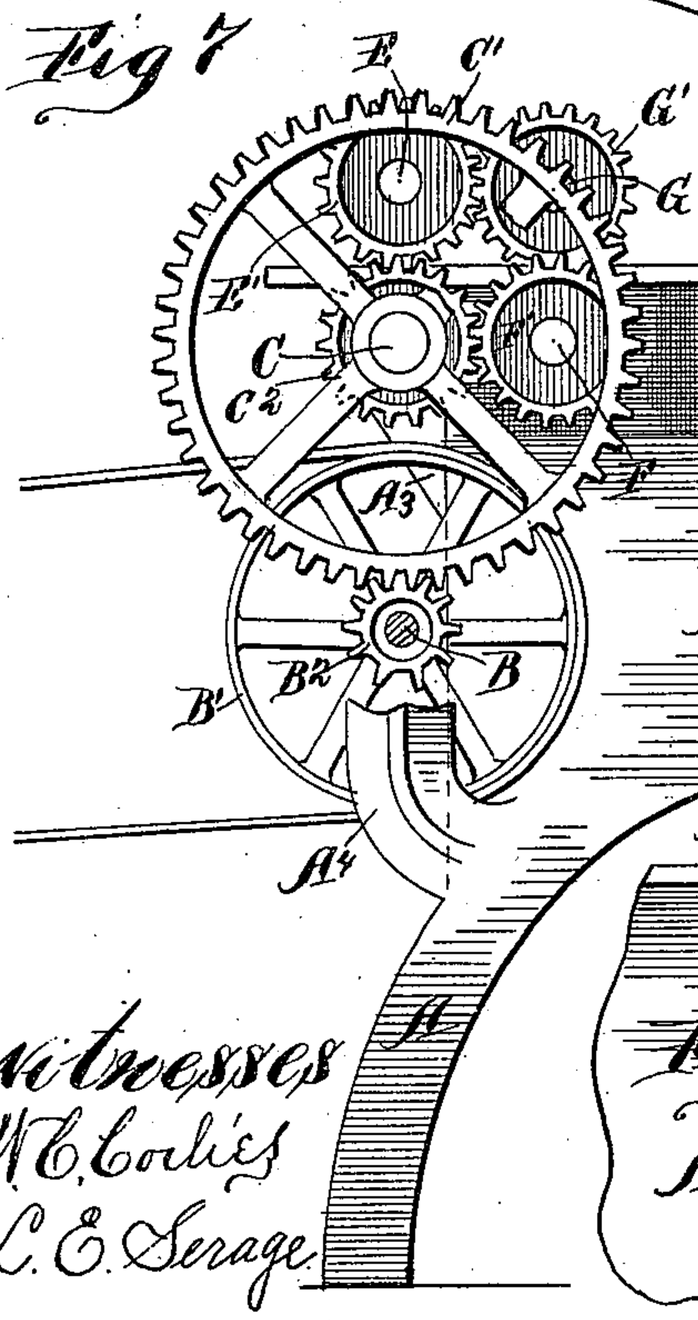


Fig 8

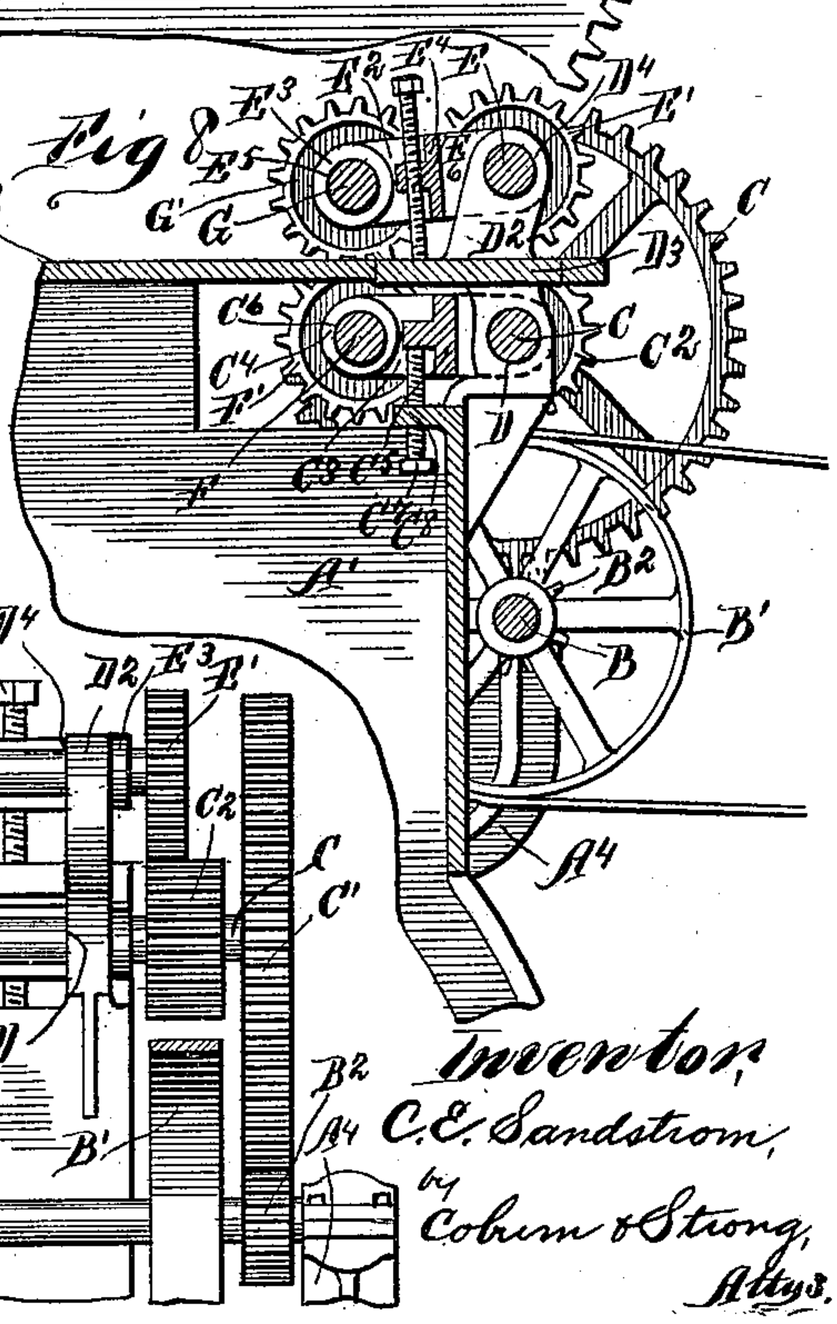


Fig 9

Witnesses
W. C. Curlies
L. E. Serage.

Inventor:
C. E. Sandstrom,
by Coburn & Strong,
Attys.

UNITED STATES PATENT OFFICE.

CHARLES E. SANDSTROM, OF CHICAGO, ILLINOIS.

SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 645,607, dated March 20, 1900.

Application filed October 2, 1897. Serial No. 653,847. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SANDSTROM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Sawing-Machines, which is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of my machine arranged to make three vertical cuts. Fig. 2 is a plan view of the machine arranged as in Fig. 1. Fig. 3 is a vertical section, on an enlarged scale, on the line 3 3 of Fig. 2. Fig. 4 is a section showing the feeding mechanism on the line 4 4 of Fig. 2. Fig. 5 is a rear elevation of the machine in section, on an enlarged scale, on the line 5 5 of Fig. 3. Fig. 6 is a front elevation of the machine arranged to make a single oblique cut. Fig. 7 is a side elevation of the feeding mechanism. Fig. 8 is a sectional view of the feeding mechanism on the line 8 8 of Fig. 4. Fig. 9 is a rear elevation of the feeding mechanism, and Fig. 10 is a detail view showing the guide in position for holding the parts of the molding apart after they have been sawed.

My invention relates to an improved sawing-machine designed for use principally in sawing moldings of that class where a piece of material is formed so as to constitute when properly split two or more pieces. The ordinary form of molding upon which I have designed this machine to operate consists of a duplicate design which when sawed in two makes two separate moldings of the same design, and in sawing these it is necessary to saw them at different angles, owing to the different designs. My invention is designed to be placed in immediate proximity to the molding-machine, so that a strip of molding from the machine will pass directly to the sawing-machine and there be sawed into the two pieces.

My machine consists of three principal parts—the feeding mechanism for feeding the strip received from the molding-machine to the saw, the guiding mechanism, which can be adapted to receive moldings of any desired shape and support them directly up to the saw, and the sawing mechanism proper, which is arranged so that it can be adjusted for any desired position.

The frame of the machine is of a generally-rectangular shape and is supported by the four legs A, carrying the sides and one of the end pieces A', which support the flat top A^2, which may be metallic, but which I preferably make of wood, and hold it in place on the sides by the cleats a^2, (seen in Fig. 5,) so that it is readily removable. The other end of the rectangular box is formed by the plate a', to be subsequently described. Mounted in a bearing A^3, arranged at the end of the casing next to the molding-machine, and in an arm A^4, projecting from the left-hand side of the machine, is arranged a shaft B, which carries the belt-wheel B', by which the feeding mechanism is operated. This belt-wheel B' is preferably operated by a belt from the molding-machine, as it is desired that the molding and sawing machines shall be operated in unison and in connection with each other. A gear-pinion B^2 is also fastened upon this shaft B and meshes with a gear-wheel C', upon the end of the shaft C, which is journaled in bearings D, which may be supported by the end plate A' in any desired manner, but which I have shown as cast integral therewith. The bearings D are in the two vertical plates D' and D^2 of the shape best shown in Figs. 3, 8, and 9, which are connected by the metallic plate D^3, which may be integral therewith or otherwise fastened thereto. In the upper portion of the plates D' and D^2 are arranged the bearings D^4, which are directly above the bearings D and contain the shaft E. The shafts C and E, respectively, carry the smaller gear-wheels C^2 and E', of the same size, meshing with each other, the shaft C thus communicating its motion to the shaft E. Pivotally mounted upon the shafts C and E, respectively, just outside of the bearings D and D^4, are the frames C^3 and E^2, which consist of the arms C^4 and E^3, respectively, which are united at their middle portions by the T-shaped bars C^5 and E^4, respectively. Journaled in the bearings C^6 and E^5, respectively, at the ends of the arms C^4 and E^3, respectively, are the shafts F and G, which carry the gear-wheels F' and G', which are of the same size, and intermesh with the gear-

wheels C^2 and E', respectively, thus transmitting the motion of the shafts C and E to the shafts F and G, respectively. These shafts F and G terminate at their inner ends in the feed-rolls F^2 and G^2, which are of the same size and one of which, G^2, is preferably rubber coated. These feed-rolls may contact through an aperture $A^{2\times}$ in the top A^2 of the casing. These rolls are adjustable to any desired position relative to the top A^2 and distanced apart by means of set-screws, one of which, C^7, is mounted in the lug C^8 and takes against the cross-piece C^5 and the other of which, E^6, is mounted in the cross-piece E^4 and takes against the plate D^3. It will readily be seen from this construction that the feed-rolls F^2 and G^2 are moved in unison to feed any molding which may be passed between them toward the driving mechanism and saw. It will also be seen that the frame E^2 and its feed-roll G^2 may be swung back out of the way, as indicated by the dotted lines in Fig. 4, whenever it is desired.

The guiding mechanism (best shown in Figs. 2, 3, and 5) consists of a framework composed of two vertical plates H, which are fastened by means of flanges H' to the circular plate Q, to be subsequently described, and which are also supported by the cross-piece H^2, which is fastened between the sides A'. These plates H are connected at their upper ends by the cross-piece H^3. A series of rods H^4, whose upper surfaces are on the same level, connect the plates H and serve as a support for the lower guide-plates J, which are of the shape shown in Fig. 3. These lower guide-plates J consist of thin strips of metal, and as many of them are employed as may be necessary for the width of molding which is operated upon. The upper set of guide-plates J' correspond to the lower ones, except that their shape is reversed, as clearly shown in Fig. 3. As above stated, these guide-plates J are normally supported by the rods H^4, and the guide-plates J' in turn are supported either directly or indirectly by the guide-plates J. In addition to these rods H^4, however, the guide-plates J are supported by the horizontal bearing-surfaces K' and L' of the plates K and L, which are pivoted on the rods K^2 and L^2, mounted in the plates H. These plates K and L are normally held with their horizontal bearing portions K' and L' supporting the guide-plates J by means of the cam M, underlying the plates K, which are so shaped as to in turn support the plates L, as clearly shown in Fig. 3. This cam M is mounted upon the rod M', which has bearings in the plates H and in one of the side frames A' and terminates in an arm M^2, just outside of the side frame A'. When the rod M' is turned to the position shown in Fig. 5 and in dotted lines in Fig. 3, the cam M does not support the plates K, and through them the plates L, in their position where their horizontal surfaces K' and L' support the guide-plates J; but these plates K and L swing down about their pivot-rods K^2 and L^2, and their points K^3 and L^3 lift up the guide-plates J and through them the guide-plates J'. From this construction it will now be seen that if a molding such as shown in Fig. 5 be placed upon the guide-plates J when they are in the position of Fig. 3 and the guide-plates J' be then placed upon the molding and the cam M be dropped the guide-plates J will be carried up varying distances until their upper surfaces contact with the lower surface of the molding, while the guide-plates J' will fall down until their lower surfaces contact with the upper surface of the molding or of the guide-plates J, as the case may be. While the guide-plates J are in this position they are secured by means of the clamping-plates N, which are controlled by the screw-rods N', threaded in one of the plates H and in the side frame A', and the fixed clamping-plates N^2, which may be integral with but which are preferably adjustably secured to the other vertical plate H, as shown in Fig. 5. The upper guide-plates J' are secured loosely between the plates O and O^2, which correspond to the plates N and N^2; but the guide-plates J' are not clamped rigidly in position, as it is desired that they may be able to yield vertically, so as to accommodate any possible variation of thickness of the molding, and thus prevent any clogging or stopping of the feed. To enable me to handle the guide-plates J' as a body, I employ the yoke P, which terminates in the jaws P', which are preferably suitably roughened to increase the grip upon the guide-plates J'. This yoke is supported by means of the screw P^2, carried in the screw-threaded lug P^3 and operated by the hand-wheel P^4 to raise or lower the yoke P, as may be desired. To control the jaws of the yoke P, I employ the bolt P^5, passing through the arms of the yoke P and supplied with the nut P^6, by the operation of which the jaws P' may be drawn together or apart, as may be desired.

The front portion of the framework of the machine is formed mostly by the circular plate Q, which is rigidly fastened to the framework. This circular plate Q has a central opening Q' and serves as a bearing for an adjustable circular disk plate R, which is supported by and connected to the plate Q by means of screw-bolts Q^2, which pass through segmental slots R' in the disk plate R and are adjusted as may be desired in the screw-threaded holes Q^3 in the front of the plate Q. It is desirable to adjust this disk plate R at any angle to the plate Q, and for this purpose a hand-wheel S is employed, which is mounted in a bearing on the rear of the plate Q and has a gear-pinion S', which meshes with a gear-wheel S^2, mounted upon a shaft S^3, having a bearing S^4 upon the periphery of the plate Q and terminating in a pinion S^5, which meshes with gear-teeth R^2 upon a portion of the periphery of the disk plate R. The object of the construction now under description being to furnish an adjustable bearing for the

saw or saws, it may be stated that while the construction so far described furnishes an adjustment whereby the saw can be placed at any desired angle it becomes necessary to employ mechanism whereby the saw can be adjusted at any desired position relative to the molding, and for this purpose I employ the rectangular plate T, which has bearings in the rectangular cut-away portion R^3 of the disk plate R and upon the extension R^4 of the said disk plate R. This extension R^4 terminates in an outwardly-turned lug R^5, in which is mounted a hand-wheel R^6, carrying the screw R^7, which takes into a screw-threaded bearing T′ upon the outer end of the rectangular plate T. It will thus be seen that by means of this hand-wheel R^6 if the saws to be subsequently described are in the position of Fig. 1 they may be adjusted to the right or left, as may be desired, to cut the molding at different places, as may be desired. The position of the rectangular plate T upon the extension R^4 and in the bearing portion R^3 of the disk plate R is maintained by means of the bolts R^8, which pass through the slots T^2 in the rectangular plate T and are placed in the holes R^9 in the disk plate R or the extension R^4, as the case may be. Mounted upon the raised ways T^3 of the rectangular plate T by means of the channels U′ is the rectangular plate U, which carries the bearing-boxes V for the shaft W′ of the saw W. The position of this rectangular plate U upon the plate T is controlled by means of the hand-wheel U′ upon the screw U^2, which works in the screw-threaded lug T^4 upon the plate T and has its bearings U^3 upon the edge of the plate U, and it will be readily seen that by turning the hand-wheel U^2 the plate U may be adjusted backward and forward or up and down, as the case may be, to vary the position of the saw W. The screw-bolts T^5, passing through the slots U^5 and into the guideways T^3, serve to aid these guideways in holding the plate U in proper position relative to the plate T. A collar W^2 is fastened upon the outer end of the shaft W′ by means of the set-screw W^3, and, acting against the outer bearing-box V, serves to hold the shaft W′ in place. A series of collars W^4 are placed upon the lower end of the shaft W′ and are held in position by the nut W^5 at the end of said shaft. By the employment of these collars any desired number of saws may be employed, or the saws may be placed in almost any desired position relative to the end of the shaft. A pulley X is fastened to the shaft W′ between the bearing-boxes V and by it power is transmitted to the circular saw or saws W.

In the operation of my invention the machine, as above stated, is set in proximity to the molding-machine, so that the strip of molding therefrom may be fed by the feed-rolls F^2 and G^2 directly between the guide-plates J and J′, which are adjusted to the particular form of molding employed in the manner above described. The saw or saws are then adjusted by the three adjustments described so as to cut the molding in any manner which may be desired. In Figs. 1 and 2 I have shown three saws adjusted in vertical planes, so as to split the molding into four parts, while in Figs. 5, 6, and 10 I have shown a single saw adjusted to split the molding Y into two parts. In setting up the guide-plates J and J′ it is desirable to bring the pointed ends thereof out into as close proximity to the saw or saws as possible, and with the arrangement shown in Figs. 1, 2, and 3 it will be seen that all but six of the guide-plates J and J′ are advanced into their outermost position, where the shoulders J^2 thereof take against the cross-piece H^5, fastened to the surfaces of the flanges H′ and the arm H^6, supported by the plate O^2. The six guide-plates J and J′, referred to, are held back out of the way of the saws by means of the pins H^7, which are passed through the holes J^3 in the guide-plates J and J′ and holes in the lugs H^8, formed in the ends of the plates H. When it is desired to employ a single saw in the manner shown in Figs. 5 and 6, it becomes necessary to set the guide-plates J and J′ somewhat differently, but as many of them are set in their extreme outward position as can be without interfering with the saw, so that the molding may be supported as firmly as possible where the saw is operating upon it.

In order to prevent the weight of the upper strip of the molding that has been sawed pressing down upon the saw, especially when it is in a horizontal position or substantially horizontal, as in Figs. 5 and 6, and thus causing it to bind, I employ an arm Z, which consists of a blade portion Z′, which is arranged in the plane of the saw W, and the slotted shank portion G^2, by which it is adjusted at any desired angle by means of the bolt Z^3, passing through one of the inner segmental slots R′ and into one of the holes Q^3. (Shown in Fig. 10.) The position of this arm Z is indicated in dotted lines in Fig. 2; but it would not be so positioned with the saws adjusted as in that figure. It is important that this arm Z be adjusted independently of the saw, inasmuch as it is necessary that it be employed to carry the weight of the part above the saw, and owing to the wide range of adjustment of the saw it is possible that where the arm Z is in the correct position to support the material from the saw in one adjustment in another position of the saw a different relative adjustment of the arm will be necessary to support the material.

The saw or saws W are driven by a belt attached to any suitable source of power coöperating with the belt-pulley X.

It will be seen that my invention comprises a sawing-machine that is capable of any desired adjustments, as well as a guiding mechanism, together with a set of adjustable feed rollers, all of which parts can be varied widely without departing from the scope of my invention. Therefore

What I claim as new, and desire to cover by Letters Patent of the United States, is—

1. In a feeding mechanism for a sawing-machine, the combination of the shaft, B, the belt-wheel, B′, and the pinion, B^2, with the shaft, C, mounted in suitable bearings and carrying the gear-wheel, C′, and the pinion, C^2, the shaft, E, mounted in suitable bearings and carrying the pinion, E′, the frames, C^3 and E^2, mounted upon the shafts, C and E, respectively, and the shafts, F and G, mounted in the frames, C^3 and E^2, respectively, and carrying the pinions, F′ and G′, and the feed-rolls, F^2 and G^2, respectively, and the set-screws, C^7 and E^6, suitably mounted in connection with said frames, C^3 and E^2, substantially as and for the purpose described.

2. In a guiding mechanism for woodworking machinery, the plates J arranged side by side and capable of individual adjustment vertically to accommodate material of any desired cross-section, and capable of individual adjustment longitudinally to bring some of them close to the cutting-tool to support the material in immediate proximity thereto, with means for holding them in their adjusted positions.

3. In a guiding mechanism for woodworking machinery, the plates J arranged side by side and capable of adjustment in one direction to accommodate material of any desired cross-section, and in another direction to bring some of them close to the cutting-tool to support the material in immediate proximity thereto, and having their ends adjacent to said tool reduced, with means for holding them in their adjusted positions.

4. In a guiding mechanism for woodworking machinery, the plates J arranged side by side and capable of adjustment in one direction to accommodate material of any desired cross-section, and capable of longitudinal adjustment to bring some of them close to the cutting-tool to support the material in immediate proximity thereto, with means for holding them in their adjusted positions, and stops to limit their longitudinal adjustment to prevent too near an approach to the cutting-tool.

5. In a guiding mechanism for woodworking machinery, the plates J arranged side by side and capable of individual adjustment in one direction to accommodate material of any desired cross-section, and capable of individual longitudinal adjustment to bring some of them close to the cutting-tool to support the material in immediate proximity thereto, and having their ends adjacent to said tool reduced, with means for holding them in their adjusted positions, and stops coöperating with the shoulders formed by the reduced portions to limit the longitudinal adjustment of the plates to prevent too near an approach to the cutting-tool.

6. In a guiding mechanism for sawing-machines, the combination of the plates, J, capable of being adjusted to accommodate material of any desired cross-section, with means for holding said plates in their adjusted positions, and the plates, J′, capable of adjusting themselves upon and being supported by the material, and the plates, J.

7. In a guiding mechanism for sawing-machines, the combination of the plates, J, capable of being adjusted to accommodate material of any desired cross-section, with means for clamping and holding said plates in any position to which they may be adjusted, the plates, J′, supported by the material and by the plates, J, and mechanism for holding said plates, J′, above the material and the plates, J, so as to permit of the vertical and independent movement of said plates, J′, as may be desired.

8. In a machine of the class described, the combination of the cutting-tool, with a yielding support for the work in proximity thereto composed of a series of plates J arranged side by side and provided with means for automatically elevating them to accommodate them to material of any desired cross-section, and means for feeding the work over the yielding support and to the cutting-tool.

9. In a machine of the class described, the combination of the cutting-tool, with a yielding support for the work in proximity thereto, composed of a series of plates J arranged side by side and provided with means for automatically elevating them to accommodate them to material of any desired cross-section, together with the plates J′ similar to the plates J but located above the work and capable of adjustment to accommodate them to the cross-section of the work passing beneath them, and means for feeding the work between the two series of plates, substantially as described.

10. In a guiding mechanism for sawing-machines, the combination of the guide-plates arranged side by side and capable of being adjusted to accommodate material of any desired cross-section, with the pivoted plates coöperating therewith and capable of automatically elevating said guide-plates, and means for holding said pivoted plates in a non-operative position.

11. In a guiding mechanism for sawing-machines, the combination of the guide-plates arranged side by side and capable of being adjusted to accommodate material of any desired cross-section, with the pivoted plates coöperating therewith and capable of automatically elevating said guide-plates, and the cam for holding said pivoted plates in their non-operative position and for releasing said plates.

12. In a guiding mechanism for sawing-machines, the combination of the plates, J, capable of being adjusted to accommodate material of any desired cross-section, with the plates, K and L, pivoted beneath said plates, J, and normally held in a non-operative position, the plates, K and L, being so shaped that in this non-operative position the plates,

L, are sustained by the plates, K, and means for holding the plates, K, in said non-operative position and for releasing said plates, K.

13. In a guiding mechanism for sawing-machines, the combination of the plates, J, the rods, H^4, for supporting said plates, with the elongated plates, K and L, pivoted beneath said plates, J, and means for holding said plates, K and L, in a non-operative position and for releasing said plates.

14. The guiding mechanism for a sawing-machine, comprising the plates, J, arranged side by side and capable of being adjusted to accommodate material of any desired cross-section, the cross-piece, H^5, coöperating with the guide-plates, J, to prevent their movement beyond a certain position, and the pins coöperating with apertures in said plates to hold them in another position, substantially as described.

15. In a guiding mechanism for a sawing-machine, the combination of the plates, J′, with the yoke, P, having the jaws, P′, coöperating with the plates, J′, and means for clamping said jaws upon said plates consisting of the bolt P^5 passing through the sides of the yoke in proximity to the jaws P′.

16. In a guiding mechanism for a sawing-machine, the combination of the plates, J, with the yoke, P, having the jaws, P′, coöperating with the plates, J′, means for clamping said jaws upon said plates, consisting of the bolt P^5 passing through the sides of the yoke in proximity to the jaws P′ and mechanism for raising or lowering said yoke as may be desired.

17. In a guiding mechanism for a sawing-machine, the combination of the plates, J′, with the yoke, P, having the jaws, P′, coöperating with the plates, J′, means for clamping said jaws upon said plates, consisting of the bolt P^5 passing through the sides of the yoke in proximity to the jaws P′ and mechanism for raising and lowering said yoke as may be desired comprising the hand-wheel, P^4, and the screw, P^2, coöperating with the lug, P^3, substantially as and for the purpose described.

18. In a sawing-machine, the combination of the guiding mechanism, with the saw angularly adjustable relative to said guiding mechanism, and the spreading-arm, Z, also angularly adjustable relative to said guiding mechanism and independently of the adjustment of the saw.

19. A sawing-machine comprising the feeding mechanism, having a pair of coöperating rollers, and means for adjusting said feeding-rollers in any desired position and at any desired distance apart; with the guiding mechanism adjustable to accommodate material of any desired cross-section, and the saw adjustable at any desired angle relative to said guiding mechanism.

20. A sawing-machine comprising the feeding mechanism, having a pair of coöperating rollers, and means for adjusting said feeding-rollers in any desired position and at any desired distance apart; with the guiding mechanism adjustable to accommodate material of any desired cross-section, and the saw adjustable at any desired angle relative to said guiding mechanism and tangentially relative to said angular adjustment.

21. A sawing-machine comprising the feeding mechanism, having a pair of coöperating rollers, and means for adjusting said feeding-rollers in any desired position and at any desired distance apart; with the guiding mechanism comprising a series of plates adjustable to accommodate material of any desired cross-section; and the saw adjustable at any desired angle relative to said guiding mechanism and radially relative to said angular adjustment.

22. A sawing-machine comprising the feeding mechanism, having a pair of coöperating rollers, and means for adjusting said feeding-rollers in any desired position and at any desired distance apart; with the guiding mechanism comprising a series of plates adjustable to accommodate material of any desired cross-section; and the saw adjustable at any desired angle relative to said guiding mechanism and radially and tangentially relative to said angular adjustment.

CHARLES E. SANDSTROM.

Witnesses:
F. E. BROM,
L. E. SERAGE.