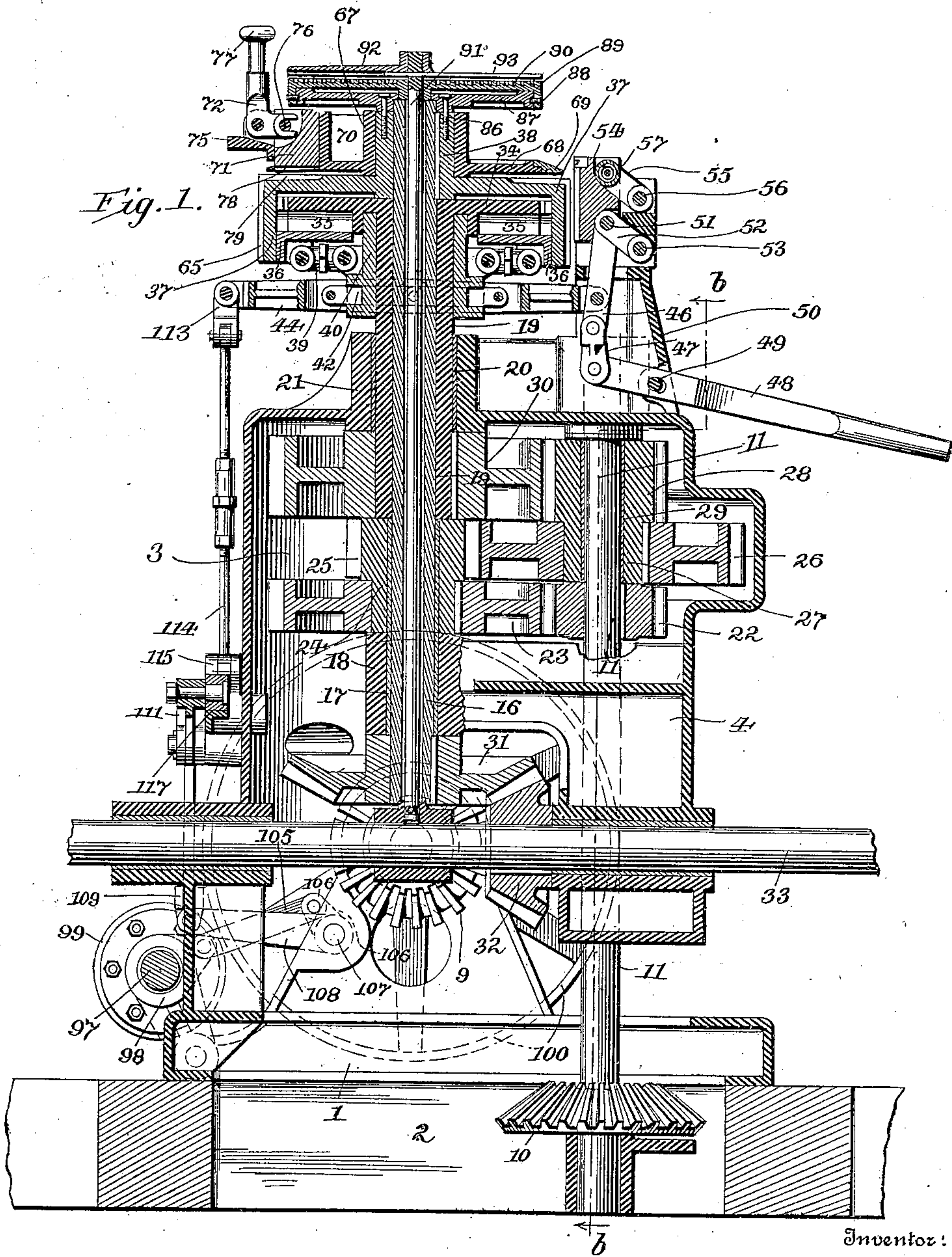


C. E. CLEVELAND.
SAWMILL SET WORKS.
APPLICATION FILED DEC. 10, 1908.

923,408.

Patented June 1, 1909.

6 SHEETS—SHEET 1.



Witnesses
E. Rauder

Fannie Wise

By

Charles E. Cleveland,
Sodgers & Sons,

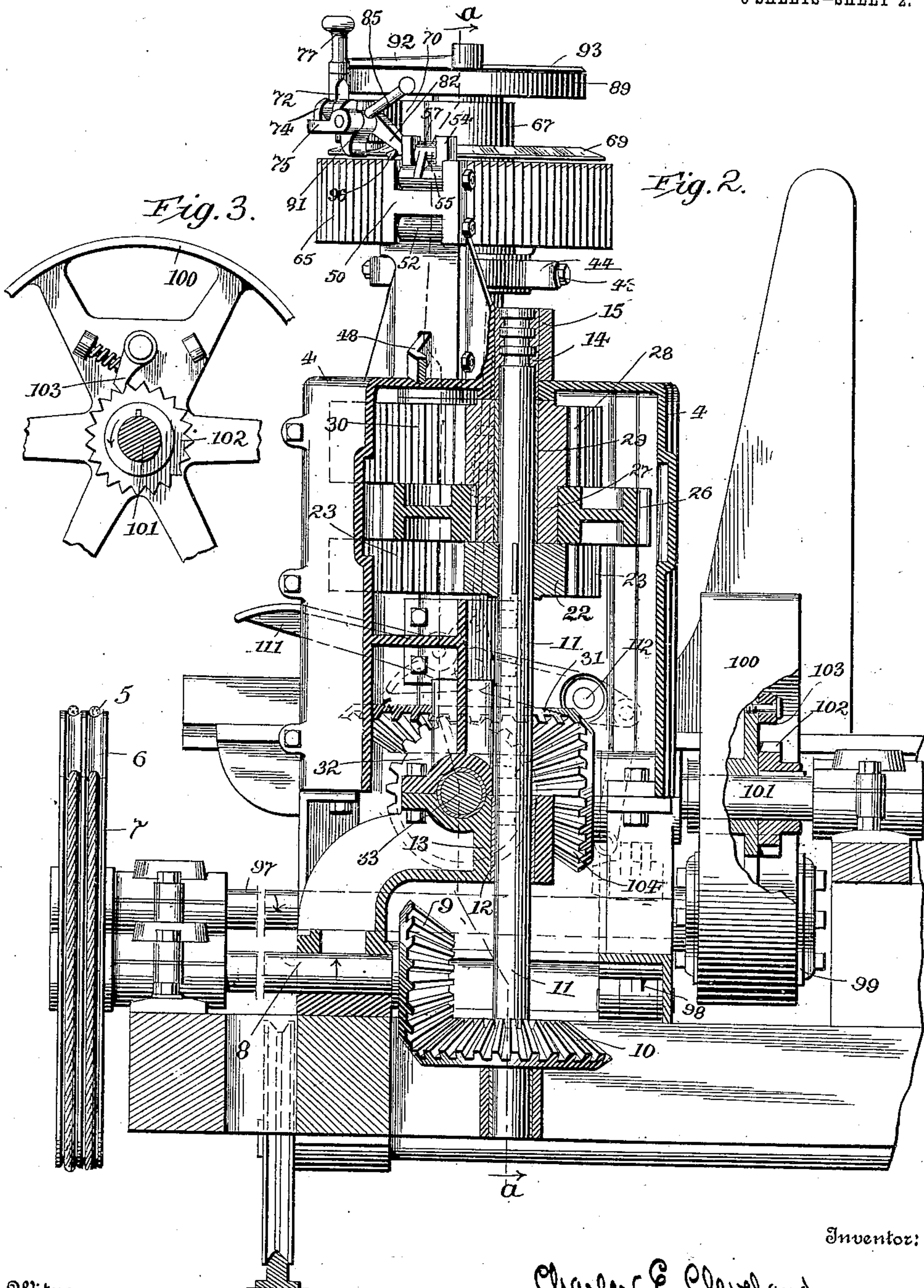
Attorneys

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5 SHEETS—SHEET 2.



Inventor:

Charles E. Cleveland,

By

Lodge and Sons,

Attorneys

Witnesses
C. H. Rader

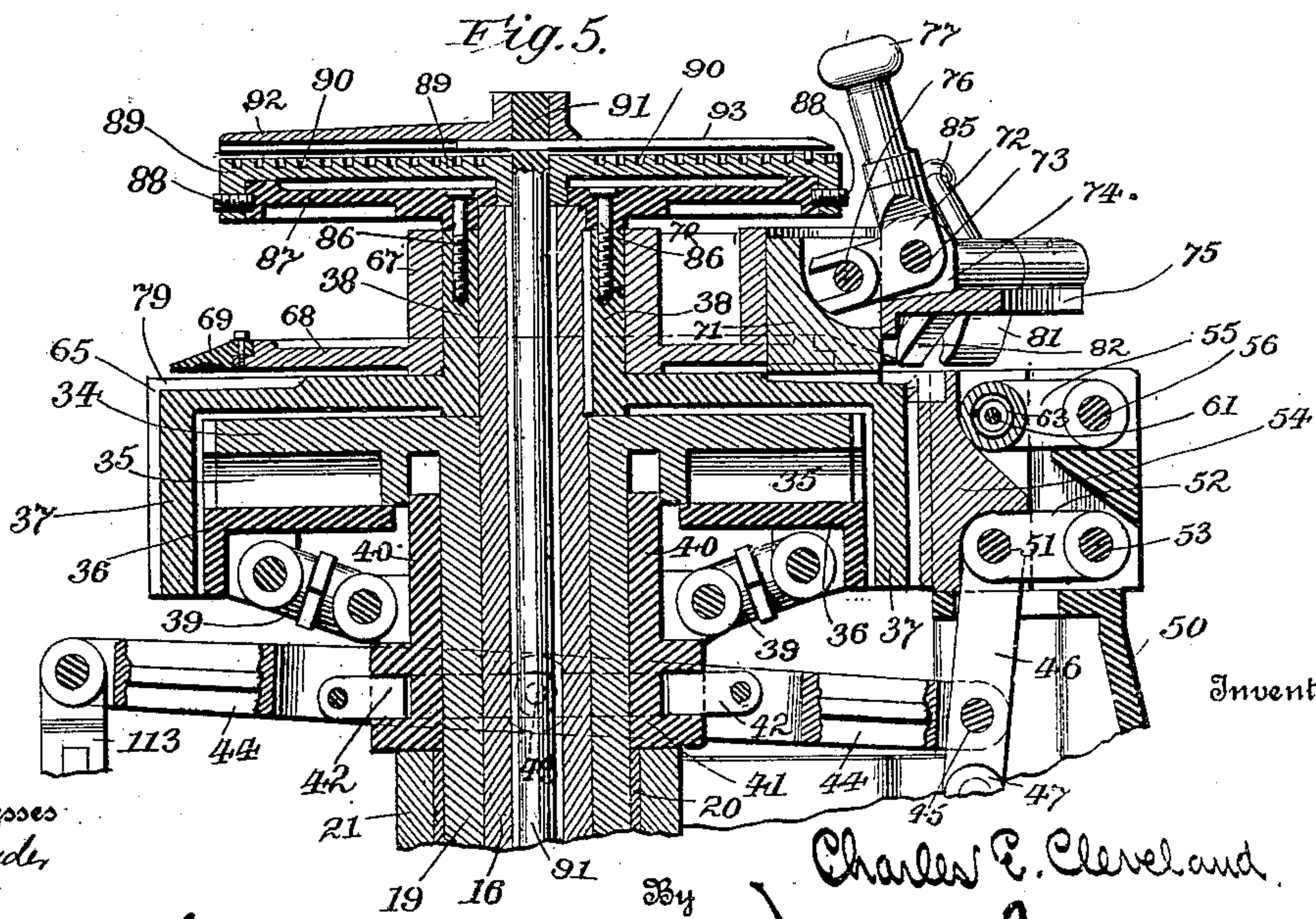
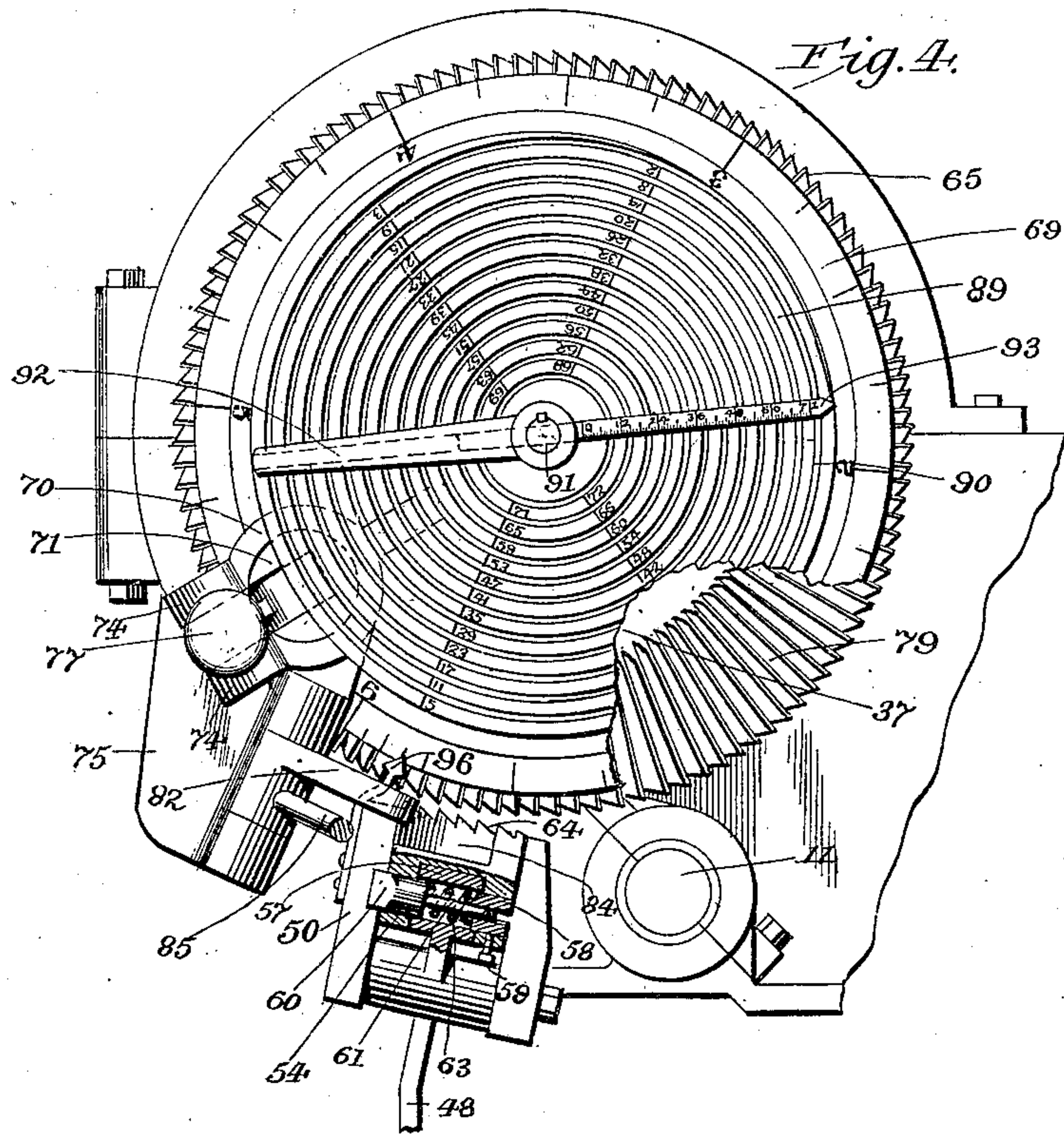
Fannie Wise

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Patented June 1, 1909.

5 SHEETS—SHEET 3.



Witnesses
Charles E. Cleveland

Fannie Rice

Charles E. Cleveland
Dodge and Sons

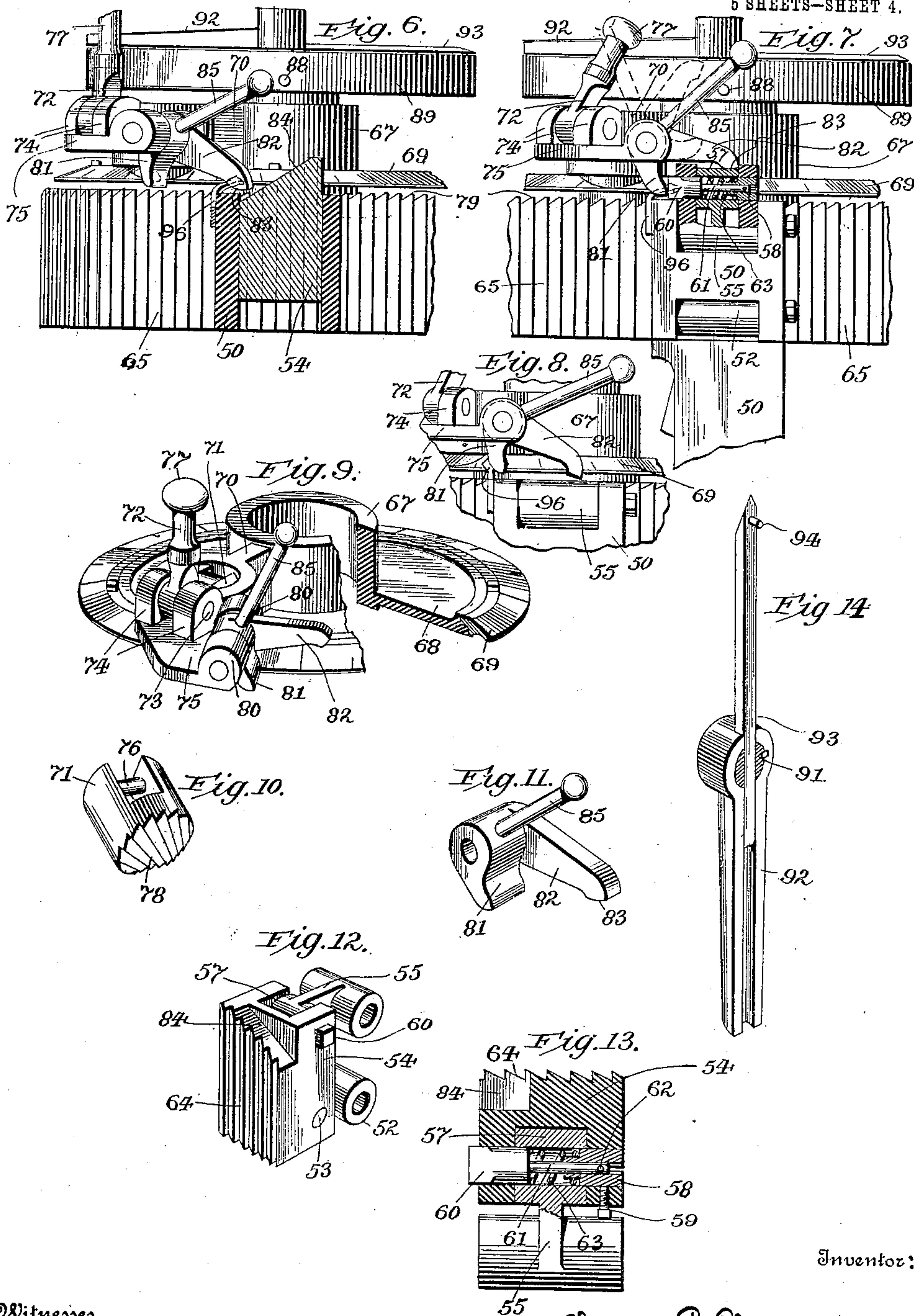
Attorneys

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5 SHEETS—SHEET 4.



Witnesses
Chas. Rauder

Fannie Wise

By

Charles E. Cleveland,
Sodge and Sons,

Inventor:

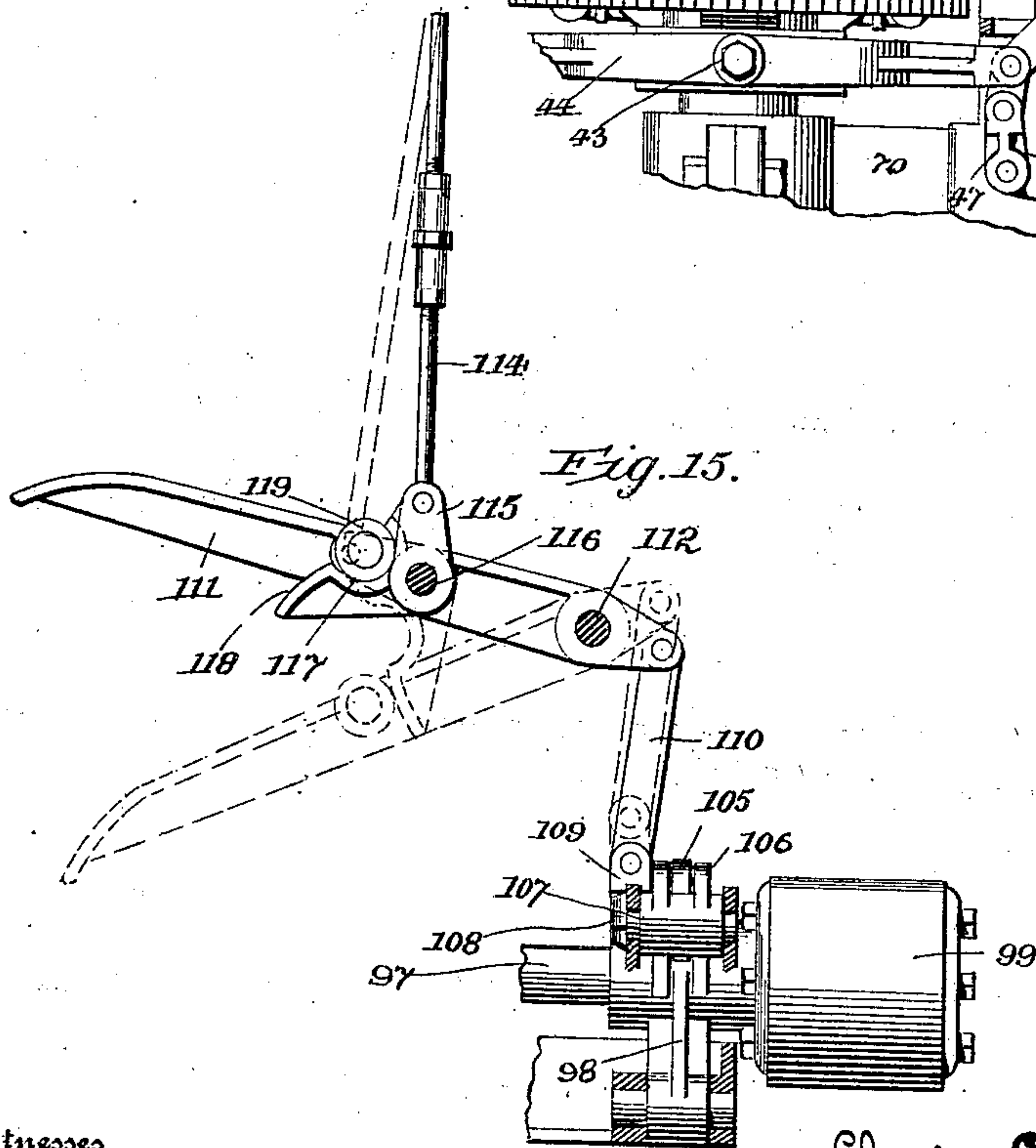
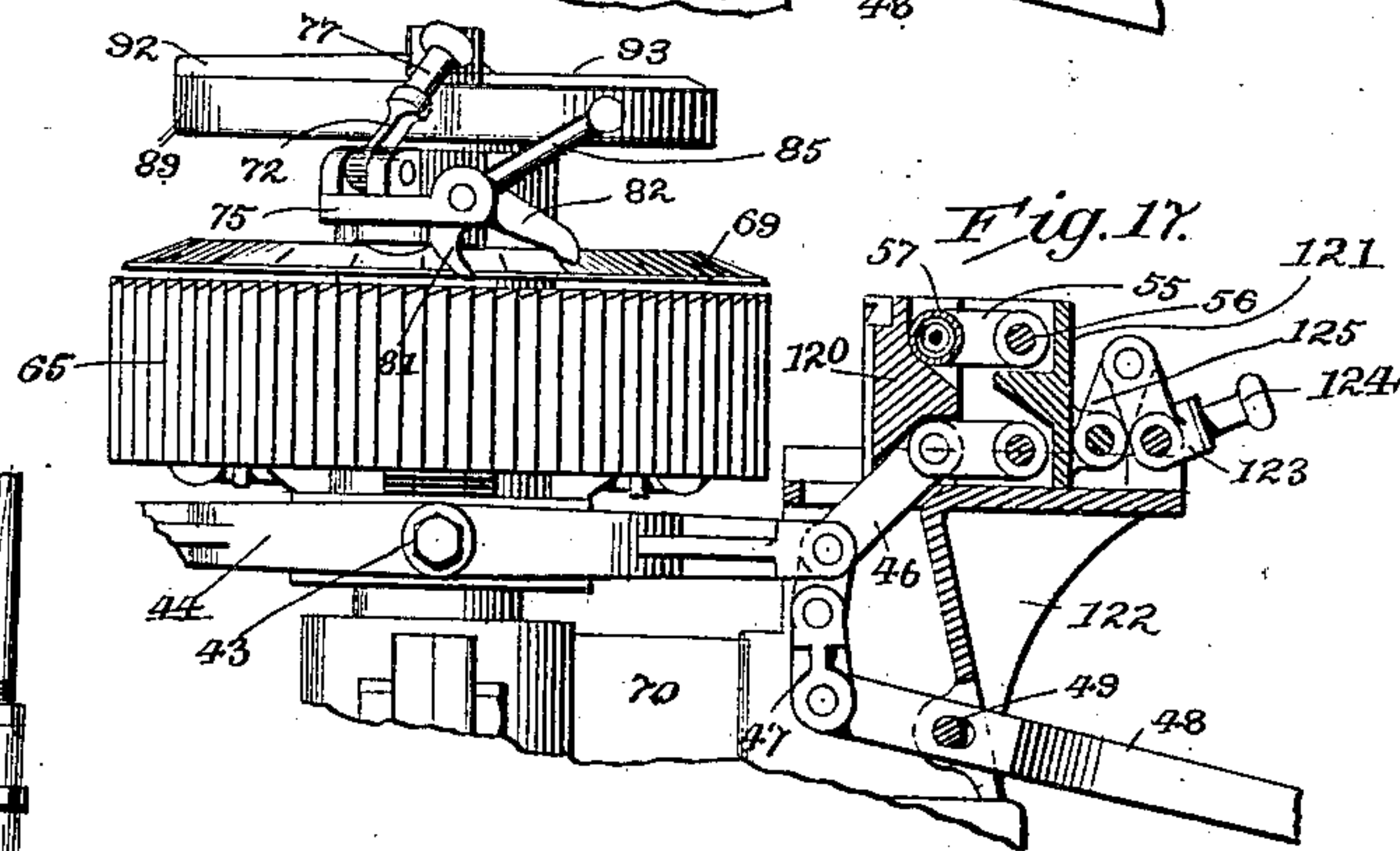
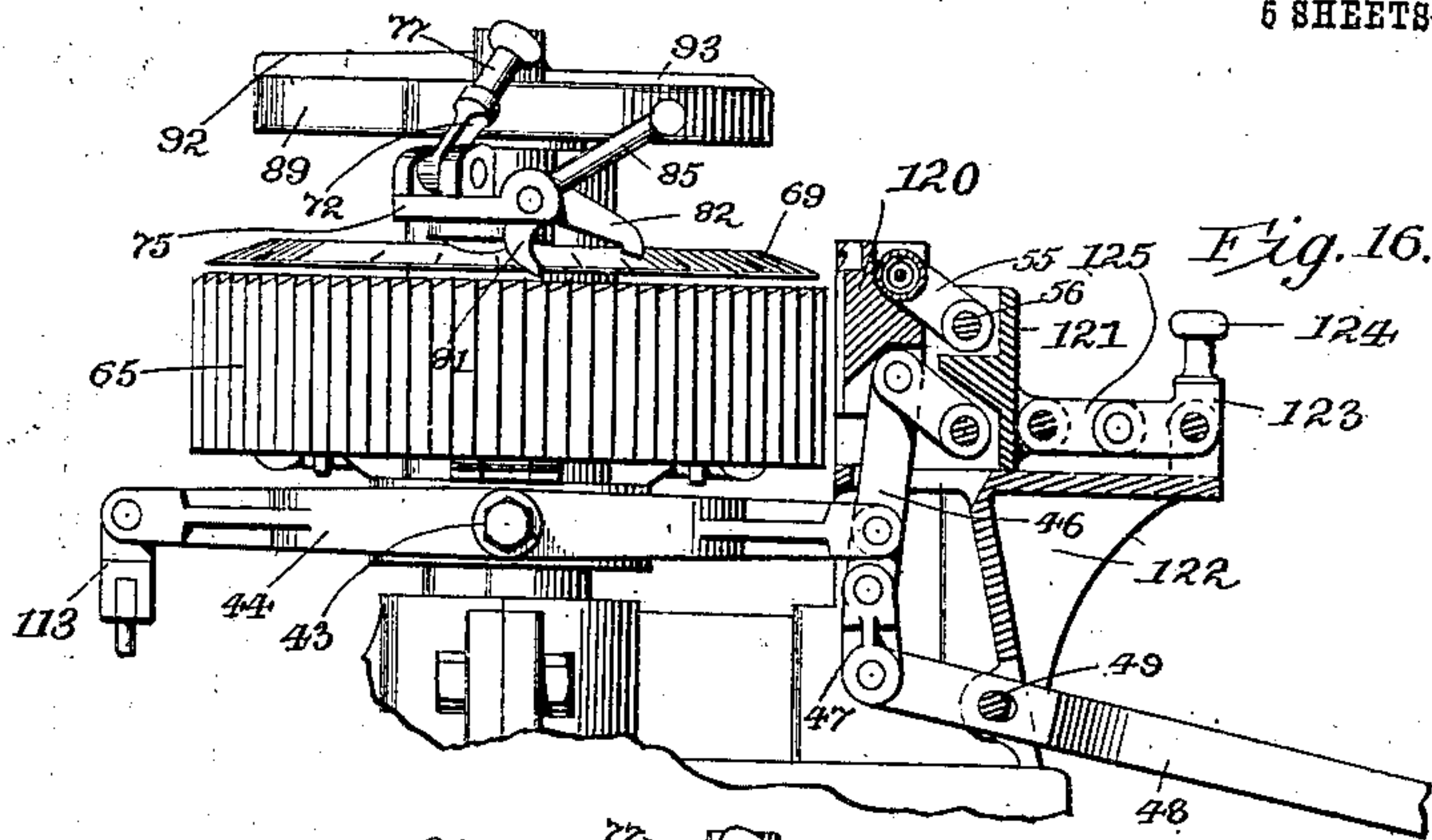
Attorneys

C. E. CLEVELAND.
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923,408.

Patented June 1, 1909.

6 SHEETS—SHEET 5.



Witnesses
C. E. Cleveland

Fannie Wise

By

Charles E. Cleveland
Dodge and Sons,

Inventor:

Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES E. CLEVELAND, OF FOND DU LAC, WISCONSIN.

SAWMILL SET-WORKS.

No. 923,408.

Specification of Letters Patent.

Patented June 1, 1909.

Application filed December 10, 1908. Serial No. 466,839.

To all whom it may concern:

Be it known that I, CHARLES E. CLEVELAND, a citizen of the United States, residing at Fond du Lac, in the county of Fond du Lac and State of Wisconsin, have invented certain new and useful Improvements in Sawmill Set-Works, of which the following is a specification.

My present invention pertains to improvements in power or rope-driven sawmill set-works, the construction and advantages of which will be hereinafter set forth, reference being had to the accompanying drawings, wherein:

Figure 1 is a vertical sectional view, taken on the line *a-a* of Fig. 2; Fig. 2 a similar view, taken on the line *b-b* of Fig. 1; Fig. 3 a detail view showing the means employed to secure the receding drum to the shaft employed for receding the knees; Fig. 4 is a top plan view of the setting mechanism; Fig. 5 a vertical sectional view of the upper portion of said mechanism, the parts being shown in the positions which they occupy when the set arm has come into contact with the stop-block or pawl and has released the clutches; Fig. 6 a sectional elevation of the upper portion of the setting mechanism, showing the position of the parts as the mechanism nears its limit of movement; Fig. 7 a similar view, showing the parts slightly more advanced; Fig. 8 a detail view, showing the position of the parts when they come to rest; Fig. 9 a perspective view, partly broken away, of the combined set arm and setting dial; Fig. 10 a perspective view of the locking block or pawl employed in conjunction with the set arm to lock the same to the clutch drum; Fig. 11 a similar view of the actuating member used to release the locking block, which is employed in conjunction with the clutch-drum; Fig. 12 a perspective view of the locking-block used in connection with said clutch-drum; Fig. 13 a horizontal sectional view of said block, showing the bolt which is employed to hold said block in its elevated position; Fig. 14 a perspective view, seen from the under side, of the indicator and its guide, which are employed in conjunction with the scale that shows the distance the knees have traveled; Fig. 15, a detail sectional view of the mechanism employed to throw the receding drum into operation; and Figs. 16 and 17 modifications of the upper portion of the setting mechanism, showing a modified form of the

locking block employed in conjunction with the clutch drum.

In the employment of power-driven set-works, it is desirable that the mechanism should be so arranged that the set-arm may make more than a complete revolution in order that the knees may be advanced a distance greater than they would be upon a complete revolution of the set-arm, and the principal object of this invention is to produce a mechanism wherein the setting may be so effected.

Assuming, for instance, that the set-works are so constructed that for a complete revolution of the set-arm the knees would be advanced six inches, and assuming further that it is desired to saw timber say twelve inches square, it will be necessary, under the ordinary construction of set-works, to advance the knees six inches, then to disengage the mechanism, re-engage it and cause the knees to be advanced a second distance of six inches. With the arrangement set forth in the present case, this is not necessary, and the knees may be continuously advanced any required distance, and then positively stopped. It is to be understood, moreover, that the knees may be advanced any distance less than that which would be effected by a complete revolution of the set-arm.

A further object of the invention is to so mount the heavy drum which is usually employed in receding the knees that it may have a rotation free of the shaft upon which it is mounted, when said shaft is moving in a direction to set the knees, whereby the vibrations and strains which are imparted to the mechanism when the drum is positively fixed to the shaft are avoided. Such arrangement, therefore, obviates the vibration and reacting motion which are present in machines of this type where the drum is rigidly fixed to its shaft.

Referring to the construction shown in Figs. 1 to 15 inclusive, 1 denotes the base, which is mounted upon a carriage 2. Said base carries a frame or housing, preferably composed of two parts, 3 and 4, secured together in any suitable manner and provided with extensions, as shown, for the reception of the gears. The driving rope or cable passes about the sheave wheels 6 and 7, the latter being the driver, and rotating counterclockwise. The sheave 7 is secured to a shaft 8, carrying at its inner end a bevel pinion 9, which meshes with a similar gear 10,

mounted upon the lower portion of a vertically-disposed shaft 11. Said shaft passes through a sleeve 12, mounted in a bearing 13, formed as a part of the frame or housing, while the upper end of the shaft passes through a sleeve or bushing 14, which finds its bearing in a box or projection 15.

A second vertically-disposed hollow shaft 16 has a bearing at its lower end in a brass sleeve 17, the latter in turn being mounted in a box or bearing 18 formed as a portion of the frame or housing. The shaft, adjacent to its upper end passes through a quill 19, the latter in turn finding its bearing in a brass sleeve or bushing 20, supported by a box or housing 21, formed as an upward extension of the frame or housing.

Secured to the shaft 11 is a pinion 22, said pinion meshing with a gear 23 attached to the lower end of the projecting hub 24 of a pinion 25, the hub finding its bearing upon the upper end of the sleeve 17. Pinion 25 meshes with a gear 26 secured to the lower or extended end of the hub 27 of a pinion 28, the hub finding its bearing upon a sleeve 29, mounted upon the shaft 11. Pinion 28, in turn, meshes with a gear 30 secured to the lower end of the quill 19. Thus it will be seen that so long as the rope or cable is in motion, as it is at all times in practice, a constant rotation will be imparted to the quill 19 and through the mechanism hereinafter to be described a rotation of the shaft 16 will be effected, the movement of shaft 16 being a fraction of the complete rotation, or a movement to any desired or required extent.

To the lower end of shaft 16 is secured a bevel gear 31, which meshes with a bevel pinion 32 carried by a set shaft 33 passing through bearings formed in the lower portion of the frame or housing.

The upper end of the quill 19 has formed therewith a head or disk-like member 34, best shown in Fig. 5, provided on its under face with a plurality of ways or guides 35, and upon each pair of said ways is slidably mounted a shoe or clutch member 36, the outer face of each shoe being formed upon a curve which, when the shoes are moved outwardly, contact with the inner face of a drum 37, the hub 38 of the drum being keyed or otherwise secured to the upper end of the hollow shaft 16. Adjustable links 39 connect each of the radially-movable shoes 36 with a vertically-movable sleeve 40, the latter being mounted upon the quill 19. As the sleeve or collar is raised, the clutch shoes will be moved outwardly into contact with the inner face of the clutch drum and will impart a rotary motion to said drum, inasmuch as the quill 19 and its head 34 are constantly rotating.

A collar 41 is formed upon the lower end of the sleeve 40, and a two-part ring 42 is

seated in the collar, said collar being free to rotate within the ring. Trunnions 43 extend outwardly from the collar, see dotted lines Fig. 5, and a yoke-shaped frame 44 is swiveled upon said trunnions and passes about the various members. An eye 45, formed at one end of the yoke or frame, embraces a link 46 to which it is pivotally connected. The lower end of the link 46 has pivoted thereto a short link 47, which in turn is pivotally connected to the inner end of a lever 48, fulcrumed upon a pin 49 which passes through a projection 50 extending upwardly from the frame or housing.

The upper end of the link 46 is pivotally connected to a pin 51 which pin passes through the inner end of a link 52, said link at its opposite end being fulcrumed upon a pin 53 which is mounted in the extension 50. The pin 51 likewise passes through and has its bearings in a locking block 54, shown in detail in Fig. 12, the block having pivotally secured to its upper end a second link 55, which at its outer end is mounted upon a pin 56, secured in the extension 50. The inner, barrel-shaped member 57 of the link 55 is hollow, see Fig. 13, and a spring-pressed bolt is mounted therein, the parts of said bolt forming the fulcrum or attachment between said link 55 and the upper portion of the locking block. The bolt may be said to comprise a sleeve 58, which is secured in position by a set-screw 59, and a sliding member or bolt proper 60, the outer portion of which is square, see Fig. 12, while the inner portion is rounded and projects back into the barrel-shaped member 57 of the link, the bolt proper being provided with a stem 61 which passes through the sleeve 58 and is provided with a transverse pin 62 which projects into slots formed in the sleeve 58. A coiled spring 63 bears at one end against the sleeve 58 and at its opposite end against the bolt 60, and tends normally to protrude the same. Said bolt 60, when the locking-block is elevated and the teeth 64 on the forward face of the block are out of contact with the corresponding teeth 65 formed on the periphery of the clutch-drum 37, overlies the upper face of the projection 50, as shown in Fig. 7, thereby holding the block and its allied parts in an elevated position. This elevation of the block is brought about by a downward movement of the outer end of the arm or lever 48, which movement raises the yoke-shaped frame 44 and throws the clutch shoes into operative relation with the clutch-drum, thereby imparting a rotative movement to the clutch-drum by reason of the fact that the drum becomes locked to the quill 19, which is constantly rotating.

Upon the hub 38 of the clutch-drum is swiveled a combined dial and set-arm, shown

in detail in Fig. 9. Said member comprises a sleeve 67 which encircles the hub 38 when the parts are positioned, and is normally free to be moved about said hub. A web or flange 68 extends outwardly from the lower portion of the sleeve, and a dial comprising a ring-shaped member 69, is secured upon the outer edge of the web 68. A vertically-disposed web 70 extends outwardly from sleeve 67, the web being enlarged adjacent to the outer end and provided with a vertically-disposed opening in which is mounted a locking-pawl 71, of the form shown in Fig. 10. The pawl is provided with a recess into which extends one arm of an elbow-lever 72 fulcrumed upon a pin 73 secured in ears 74 which extend upwardly from an outwardly-projecting plate 75, preferably formed as an integral part of the casting. The inner end of the elbow-lever, as will be seen upon reference to Fig. 5, is slotted and straddles a pin 76 which is secured in the locking-pawl 71. The upper end of the elbow-lever will preferably be formed with a handle 77 by which the locking-pawl may be raised or lowered as required. The lower end of the locking-pawl is provided with a series of radiating teeth 78 which, when the pawl is lowered or drawn to the position shown in Fig. 5, come into locking engagement with a series of teeth 79 formed upon the upper face of the clutch drum 37.

Extending upwardly from the plate or member 75 is a pair of lugs 80, between which is pivotally mounted the actuating member shown in detail in Fig. 11. Said actuating member may be said to comprise two connected arms or levers 81 and 82, the arm 81 being relatively short and adapted, when the parts are properly positioned, to contact with the locking bolt 60 and to force the same inwardly into the locking-block, while the arm 82 is somewhat longer and is provided at its outer end with a flat face 83 which, under certain conditions or adjustments of the parts, will contact with and ride up along an inclined face 84 formed upon the upper portion of the locking-block 54. This actuating member is provided with an upwardly-extending rod or handle 85, the parts being so proportioned that when the handle is drawn backwardly or into the position shown in dotted lines in Fig. 7, the arms 81 and 82 will be held in a plane above the locking-block and its bolt, so that the actuating member may pass freely over the block without in any manner coming into contact with the same, thereby permitting the block to remain in its elevated locked position.

Mounted upon the upper end of the hub 38 and secured thereto by screws 86 is a disk-like member 87, having adjustably secured thereto by set-screws 88 an index-plate 89, said plate being provided in the upper

face with a spiral groove 90 which, as will be seen upon reference to Fig. 4, is graduated. A shaft 91 extends freely through an opening formed in the center of the index-plate 89 and has keyed thereto a hollow arm 92 which forms the housing and guide for an index finger or pointer 93, which extends through a square opening formed in the shaft 91, and is provided at its outer end with a downwardly-extending pin 94 which enters the groove 90. The shaft being fixed against rotation, holds the housing against movement, and any rotation of the index as the knees are moved toward the saw will cause the finger to be moved inwardly and thereby indicate the extent of movement of the knees.

The upper face of the finger or pointer 93 may likewise be graduated, as shown in Fig. 4, so that the extent of movement of the knees may be read directly from this member if so desired.

A pointer or finger 96, Figs. 4 and 6, on the projection 50, extends inwardly in line with the dial 69.

The sheave 6 is mounted upon a shaft 97, the inner end of the shaft, as will be seen upon reference to Figs. 1 and 15, being carried in a swinging box or bearing 98, and a friction pulley 99 is mounted upon the shaft. Said pulley normally stands in the position shown in Fig. 1, out of contact with the receding drum 100, which is loosely mounted upon a shaft 101, which shaft has keyed to it a ratchet-wheel 102. A spring-pressed pawl 103 is mounted upon the drum and coacts with the teeth of the ratchet-wheel, permitting the shaft to rotate independently of the drum when the shaft is rotated in the direction of the arrow, as shown in Fig. 3, or in the setting direction, to lock the parts together, when the friction pulley is thrown into contact with the drum and the shaft will be caused to rotate in the opposite direction.

A bevel pinion 104, Fig. 2, is secured to the inner end of the receding shaft 101, and meshes with the gear 31, so that motion is imparted to the shaft 101 each time the set-works are operated to advance the knees. The arrangement of the parts is such, however, that the shaft 101 and the ratchet wheel 102 may rotate independently of the drum 100 and thus the jar and strain which would be incident to the sudden stopping of the heavy drum 100, if the drum were made fast to the shaft, is avoided. On the other hand, immediately the friction pulley 99 is thrown into contact with the drum the parts are locked together by the ratchet and the receding movement begins immediately the pulley comes into contact with the drum. In order to throw the pulley into operative relation with the drum and at the same time to positively withdraw the clutch shoes from

the clutch drum and throw the locking-block out of operative relation with the other parts, the mechanism shown in Figs. 1 and 15 is employed. A link 105 is pivotally connected to the swinging box 98 and at its opposite end is connected to the short arm 106 of a bell-crank lever, said lever being fulcrumed upon a fixed pivot 107. The longer arm 108 of said bell-crank is pivotally connected at its outer end to a block 109, which block in turn is pivotally connected to a link 110. The upper end of the link is pivotally connected to a foot-lever 111, fulcrumed upon a fixed pin 112.

A block 113 (Fig. 1) is pivotally connected to the outer end of the yoke or frame 44 and an adjustable link 114 is pivotally connected to the block and in turn pivotally connected to one arm of an elbow-lever 115, fulcrumed upon a stud or bearing 116 extending outwardly from the frame of the machine. The lever 115 is provided with a rounded seat or recess 117 and with a curved face 118, to one side of said seat or recess.

A roller 119 is secured to the foot-lever 111, and under normal conditions rests within the seat or recess 117, but when said foot-lever is depressed, to throw the pulley 99 into contact with the receding drum, the roller rides out of the recess and onto the curved face 118, as shown in dotted lines in Fig. 15, thereby rocking the elbow lever 115 and drawing down upon the yoke 44 so that the lower face of the sleeve 40 comes into contact with the upper portion of the box or housing 21, and at the same time throws the link 46 upwardly, carrying the locking block 54 to such position that there is no possibility of engagement with the teeth upon the clutch drum.

It is conceivable that instead of employing the arrangement above set forth to permit the clutch drum to make more than a complete revolution before the parts are positively arrested, other constructions may be employed. In Figs. 16 and 17 such a modified construction is illustrated. The locking block, designated by 120, is vertically movable in a carriage 121, being mounted upon links, the same as in the former construction, and connected to the operating lever in the same manner, said carriage being movable toward and from the clutch drum in ways or guides formed in an upward extension 122 similar to the projection 50 hereinbefore referred to, but slightly enlarged to accommodate the movement of the carriage 121. An elbow-lever 123, provided with a handle 124 at its outer end, is connected at the opposite end by a link 125 to the carriage, so that when the parts are brought to the desired positions, shown in Fig. 17, the locking-block and the carriage will be out of alinement with the actuating member which may at such times be dropped

down into a position where it will normally engage the parts carried by the block. As the carriage is moved outwardly the links which support the block are drawn to the position shown in Fig. 17. When the carriage is moved inwardly so as to bring the block into position where it will be thrown downwardly by the actuating member, the block will be protruded and moved upwardly beyond the upper face of the carriage, into alinement with the actuating member, as shown in Fig. 16. Where a laterally-movable carriage for the block is employed, it will be readily appreciated that the set arm may be provided with a fixed device rather than a pivoted actuating member, as shown.

Under the construction just set forth and that previously described the knees may be advanced the desired distance and then all motion thereof positively arrested. Thus overthrow of the parts is prevented and an accurate setting of the knees is effected, notwithstanding slippage in the clutch mechanism, inasmuch as the motion will continue until the set arm comes into contact with the locking-block, at which time the parts will positively lock against further movement.

While I have described two forms of apparatus for accomplishing the action set forth, other forms will readily suggest themselves to those skilled in the art, and so far as the generic invention is concerned the broader claims are intended and designed to cover the same broadly.

The operation of the mechanism shown in Figs. 1 to 15 inclusive is as follows: As before noted, constant rotary motion is imparted to the quill 19 and to the head 34 carried thereby. The operator, if the knees are to be set for a distance greater than that which would be accomplished by one complete revolution of the set arm, will throw the actuating member back into the position shown in dotted lines in Fig. 7. The lever 48 will, of course, at such time be in its uppermost position, so that the locking block will be in locking engagement with the clutch-drum, or in the position shown in Fig. 5. Assuming that it be desired to set the knees say six and three-sixteenths inches, the operator will move the set arm around to the position shown in Fig. 4 and throw the lever or handle 77 inwardly so as to bring the locking-pawl into engagement with the teeth on the upper face of the clutch-drum. This, of course, locks the set arm to the clutch-drum. The actuating member will be thrown back into the dotted line position shown in Fig. 7, which will permit the arm 82 to clear the locking-block and the arm 81 to be thrown out of alinement with the bolt 60, so that they may pass freely over the same. The depression of the lever 48

will then elevate the sleeve 40 and cause the shoes to move outward into contact with the clutch-drum. At the same time, the locking-block will be moved upwardly into the position shown in Fig. 1, free of contact with the clutch-drum, and the bolt 60 will pass out over the upper face of the projection 50, so that the block will be rigidly held in such elevated position. The quill 19 will then impart motion to the clutch-drum and the parts, through the gearing before described, will impart motion to the set-shaft and advance the knees until such time as the actuating member comes into contact with the bolt and releases the parts. The actuating member is permitted to stand in the dotted line position until it has passed the bolt, after which it is thrown down into the position shown in full lines in the drawings. As the actuating member moves with the set arm, the flat face 83 thereof will contact with the inclined or cam face 84 of the locking-block, and throw the actuating member up into the position shown in Fig. 7, so that the arm 81 comes into contact with the face of the bolt 60 and moves the same inwardly, thereby releasing the locking-block and permitting the same to drop down by gravity into locking engagement with the teeth upon the clutch-drum. The downward movement of the block will, through the link connection 46, carry the frame or yoke 44 down with it and as a consequence will release the clutch shoes and no further motion will be imparted to the clutch drum, and, therefore, no further movement will be given to the knees. During this movement of the mechanism motion will be imparted to the receding drum 100, and as this is relatively heavy it would impart considerable vibration and exert a strain upon the machine were it not for the employment of a clutch which permits the motion of the shaft to be arrested while the drum may continue to rotate. With the construction shown in Figs. 16 and 17, the carriage, as before noted, is moved away from the actuating member so that the actuating member may pass the locking block without in any way affecting the same. After it has passed the point once, assuming that it be desired to rotate the set arm for one complete revolution, or a fraction of a revolution, the carriage is moved inwardly so that the locking block will be brought into alignment with the teeth of the actuating member, whereupon the actuating member will contact with the same and move it downwardly to effect a release of the clutch shoes and the locking of the clutch drum.

No claim is made herein broadly to the combination of an actuating member, a set shaft, means for connecting the shaft to the actuating member, a set arm, a fixed stop,

and means controlled by the set arm for automatically releasing the connecting means when the arm has traveled a predetermined distance and comes into contact with the stop, as such matter forms no part of my invention, but is that of one Ulrich Anderson, application for patent on which was filed March 23, 1908, Serial No. 422,863.

Having thus described my invention, what I claim is:

1. In a saw-mill set-works, the combination of a set-shaft; power mechanism; means for connecting said mechanism to the set-shaft; a locking member to arrest the movement of the set-shaft when the shaft has been moved a predetermined distance; and an actuating member for moving the locking member into locking position, one of said members being manually movable into and out of engaging relation to the other, whereby the actuating member may be caused to pass said locking member one or more times and the parts thereafter, while the set shaft is still moving, be so positioned as to cause the actuating member to function.

2. In a saw-mill set-works, the combination of a set-shaft; power mechanism; a clutch for connecting said mechanism to the set-shaft; a locking member to arrest the movement of the set-shaft when the shaft has been moved a predetermined distance; and an actuating member for moving the locking member into locking position and also serving to release the clutch, one of said members being manually movable into and out of engaging relation to the other, whereby the actuating member may be caused to pass said locking member one or more times, and the parts thereafter, while the set-shaft is still moving, be so positioned as to cause the actuating member to function, thereby releasing the clutch and throwing the locking member into operative position.

3. In a saw-mill set-works, the combination of a set-shaft; power mechanism; a locking member to arrest the movement of the set-shaft when the shaft has been moved a predetermined distance; a clutch for connecting the power mechanism to the set-shaft, said clutch being likewise connected to the locking member; and an actuating member for moving the locking member into locking position, and serving at the same time to release the clutch, one of said members being manually movable into and out of engaging relation to the other, whereby the actuating member may be caused to pass said locking member one or more times and the parts thereafter, while the set-shaft is still moving, be so positioned as to cause the actuating member to function, thereby releasing the clutch and throwing the locking member into operative position.

4. In a saw-mill set works, the combination of a set-shaft; power mechanism; a

locking member to arrest the movement of the set-shaft when the shaft has been moved a predetermined distance; a clutch for connecting said power mechanism to the set-shaft; connections between said clutch and the locking member; a set arm; an actuating member carried by said arm for moving the locking member into locking position, and at the same time serving to release the clutch, one of said members being manually movable into and out of engaging relation with the other, whereby the actuating member and the set arm may be caused to pass said locking member one or more times and the parts thereafter, while the set-shaft is still moving, be so positioned as to cause the actuating member to function, thereby releasing the clutch and throwing the locking member into operative position.

5. In a saw-mill set works, the combination of a set-shaft; power mechanism; means for connecting said mechanism to the set-shaft; a locking member to arrest the movement of said shaft when the shaft has been moved a predetermined distance; and a pivotally-mounted actuating member, said member being manually movable into and out of engaging relation with the locking member, whereby the actuating member may be caused to pass said locking member one or more times, and said actuating member thereafter, while the set-shaft is still moving, be so positioned as to cause the actuating member to function.

6. In a saw-mill set-works, the combination of a set-shaft; power mechanism; means for connecting said mechanism to the set-shaft; a locking member to arrest the movement of the set-shaft when the shaft has been moved a predetermined distance; means for positively holding said locking member out of locking position; and an actuating member for releasing the means for holding the locking member, one of said members being manually movable into and out of operative relation with the other, whereby the actuating member may be caused to pass said locking member one or more times and the parts thereafter, while the set-shaft is still moving, be so positioned as to cause the actuating member to function.

7. In a saw-mill set-works, the combination of a set-shaft; power mechanism; means for connecting said mechanism to the set-shaft; a locking member to arrest the movement of the set-shaft when the shaft has been moved a predetermined distance; a bolt for holding said locking member out of locking position; an actuating member for releasing the bolt, said actuating member being movable into and out of engaging relation with the bolt, whereby the actuating member may be caused to pass the locking member one or more times and the parts thereafter, while the set-shaft is still moving, be so positioned

as to cause the actuating member to function with the bolt.

8. In a saw-mill set-works, the combination of a set-shaft; power mechanism; means for connecting said mechanism to the set-shaft; a locking member to arrest the movement of the set-shaft when the same has been moved a predetermined distance; a set-arm; an actuating member carried by said set-arm, said actuating member being movable into and out of operative relation with the locking member; and connections between said locking member and the means for connecting the power mechanism to the set-shaft, whereby when the locking member is thrown into locking engagement the power mechanism will be disconnected from the set-shaft.

9. In a saw-mill set-works, the combination of a set-shaft; a power mechanism for actuating the same; a set-arm; means for securing the set-arm in an adjusted position with relation to the power mechanism; a locking member for arresting the movement of the set-shaft when the set-arm has moved the predetermined distance; an actuating member for throwing the locking member into engagement with the power mechanism, said member and the locking member being relatively movable by a manual adjustment into and out of operative relation with each other, whereby the set-arm may make one or more complete movements prior to manual restoration of the parts to bring the same into such relation that the actuating member will function with the locking member, and cause an arrest of the movement of the set-shaft.

10. In a saw-mill set-works, the combination of a set-shaft; a clutch drum; a clutch movable into and out of operative relation with said drum; means for driving said clutch; a locking block adapted to be brought into operative relation with the drum and to arrest the movement thereof; connections between said block and the clutch, whereby as the block is thrown out of operative relation with the drum the clutch will be thrown into operative relation, and vice versa; a set-arm; means for connecting said arm to the drum; and an actuating device carried by the set-arm, said actuating device being manually movable into and out of operative relation with the locking-block, whereby the actuating member and the set-arm may be caused to pass said locking block one or more times, and the actuating member thereafter, while the shaft is still moving, be so positioned as to cause the same to function with the locking-block, and to thereby lock the clutch-drum against further rotation and simultaneously to release the clutch.

11. In a saw-mill set-works, the combination of a set-shaft; a clutch-drum; connections intermediate said drum and the shaft; a clutch; a locking-block adapted to coöper-

ate with the drum to hold the same against movement; connections between the block and the clutch, whereby when the block is thrown out of operative relation with the drum the clutch will be thrown into operative relation therewith, and vice versa; a set-arm; means for connecting said arm to the drum; and a pivoted actuating member carried by the set-arm, said actuating member being so arranged as to be capable of being thrown out of and into alinement with the locking-block.

12. In a saw-mill set-works, the combination of a set-shaft; a clutch-drum in operative relation with said shaft; a clutch adapted to be brought into operative relation with the clutch-drum; means for applying power through said clutch; a locking-block for arresting the motion of the clutch-drum; connections between said block and the clutch, whereby as one is thrown into operative relation the other is thrown out of operative relation with the drum; a bolt carried by the locking-block and adapted, when the block is thrown out of operative relation with the drum, to hold the same in such position; a set-arm; means for securing the set-arm to the drum; and an actuating member carried by the set-arm, adapted to contact with the bolt and to release the same.

13. In a saw-mill set-works, the combination of a set-shaft; a clutch-drum in operative relation therewith; a clutch adapted to cooperate with the drum; means for applying power through said clutch; a vertically-moving locking-block to arrest the movement of the clutch-drum when the block is brought into operative relation therewith; connections between said block and the clutch for throwing the clutch into operative relation with the drum as the block is elevated and vice versa; a bolt carried by the block and adapted to hold the same in an elevated position; a set arm; means for connecting said arm to the clutch drum; and an actuating member pivoted upon the set-arm, said member being provided with two arms, the lower shorter arm being adapted to contact with the bolt and the upper longer arm being adapted to ride over an inclined face formed upon the upper edge of the locking-block, and to thereby swing the actuating member and bring the lower arm into proper operative relation with the bolt.

14. In a saw-mill set-works, the combination of a set-shaft; a clutch-drum in operative relation therewith; a clutch; means for applying power through said clutch; a ver-

tically-movable locking-block adapted to arrest the movement of the clutch-drum; connections intermediate said block and the clutch, whereby when the block is raised out of locking position the clutch will be thrown into operative relation with the drum, and vice versa; a bolt carried by the block and adapted, when the same is elevated, to hold it in such position; a set-arm; a pivoted actuating member carried by the set-arm for operating the bolt, said member being capable of adjustment into and out of operative relation with the bolt, whereby the set-arm may make one or more revolutions prior to the engagement of the actuating member with the bolt; a dial carried by the set-arm; a pointer arranged adjacent to the locking-block and cooperating with the dial to indicate the position of the set-arm; an index-plate provided with a graduated spiral groove in its upper face, said plate being connected to the clutch-drum; a finger overlying said plate, provided with a pin extending into the groove; and a housing for said finger.

15. In a saw-mill set-works, the combination of a set-shaft; means for rotating the same in a direction to advance the knees; means for arresting the motion of said shaft when the knees have been advanced a predetermined distance; a drum in operative relation with the set-shaft; means for rotating said drum in such direction as will cause the set-shaft to rotate in a direction which will recede the knees; and a yielding connection between said drum and its supporting shaft, permitting the shaft to rotate independently of the drum when the parts are moving in that direction which will advance the knees.

16. In a saw-mill set-works, the combination of a set-shaft; means for rotating the same to advance the knees; means for arresting the motion of said shaft when the knees have been moved a predetermined distance; a countershaft; a reversing drum mounted upon said countershaft; and a pawl-and-ratchet connection between said countershaft and the drum, said connection being such as to permit the countershaft to move freely in one direction independently of the drum.

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

CHARLES E. CLEVELAND.

Witnesses:

FRANK J. WOLFF,
HENRY RUEPING.