

L. H. LANDRY.

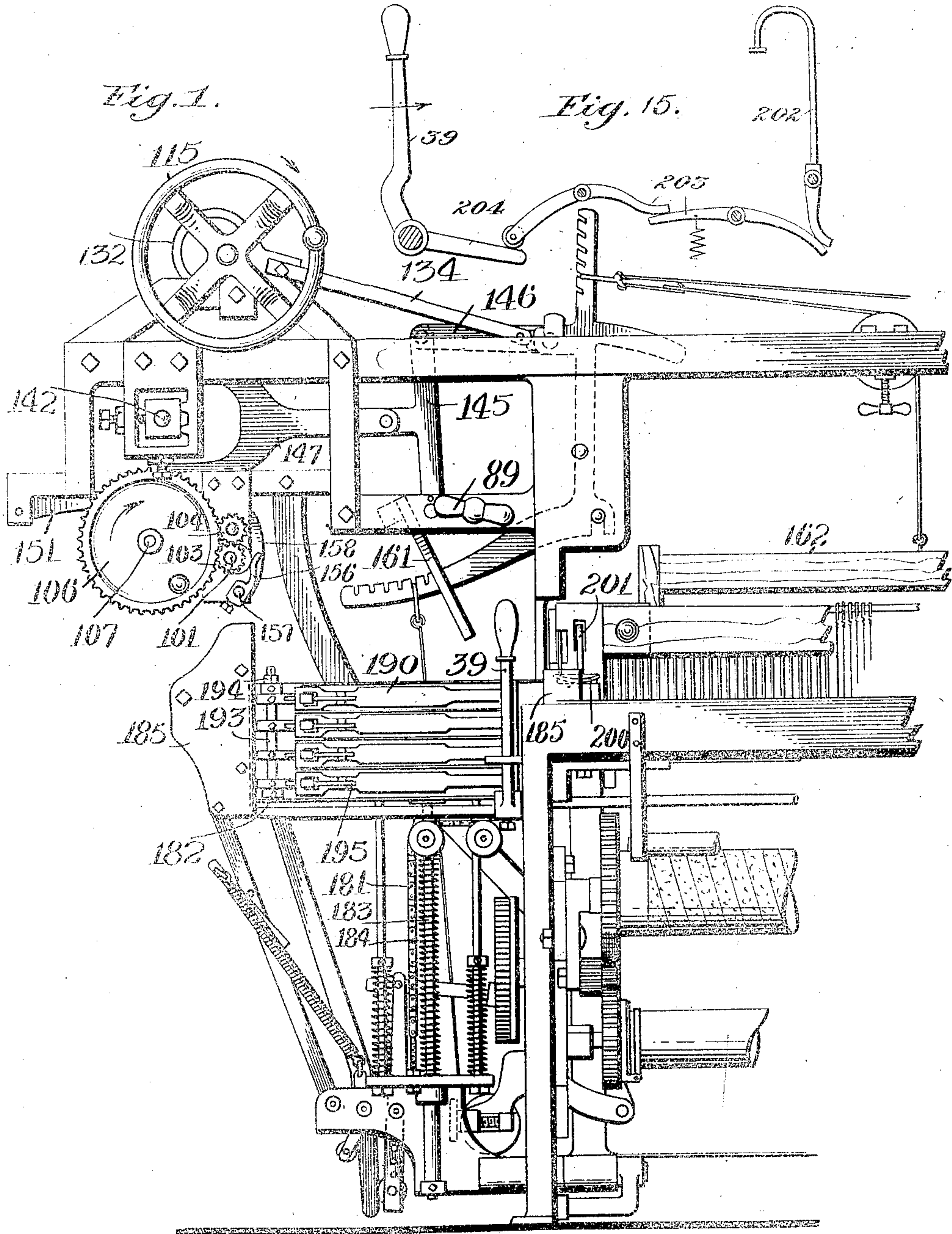
LOOM.

APPLICATION FILED JULY 24, 1908.

Patented Dec. 14, 1909.

5 SHEETS—SHEET 1.

943,028.



Witnesses:

C. F. Mason
E. M. Allen

Inventor:
L. H. Landry.
by Attorneys
Southgate & Southgate

L. H. LANDRY.

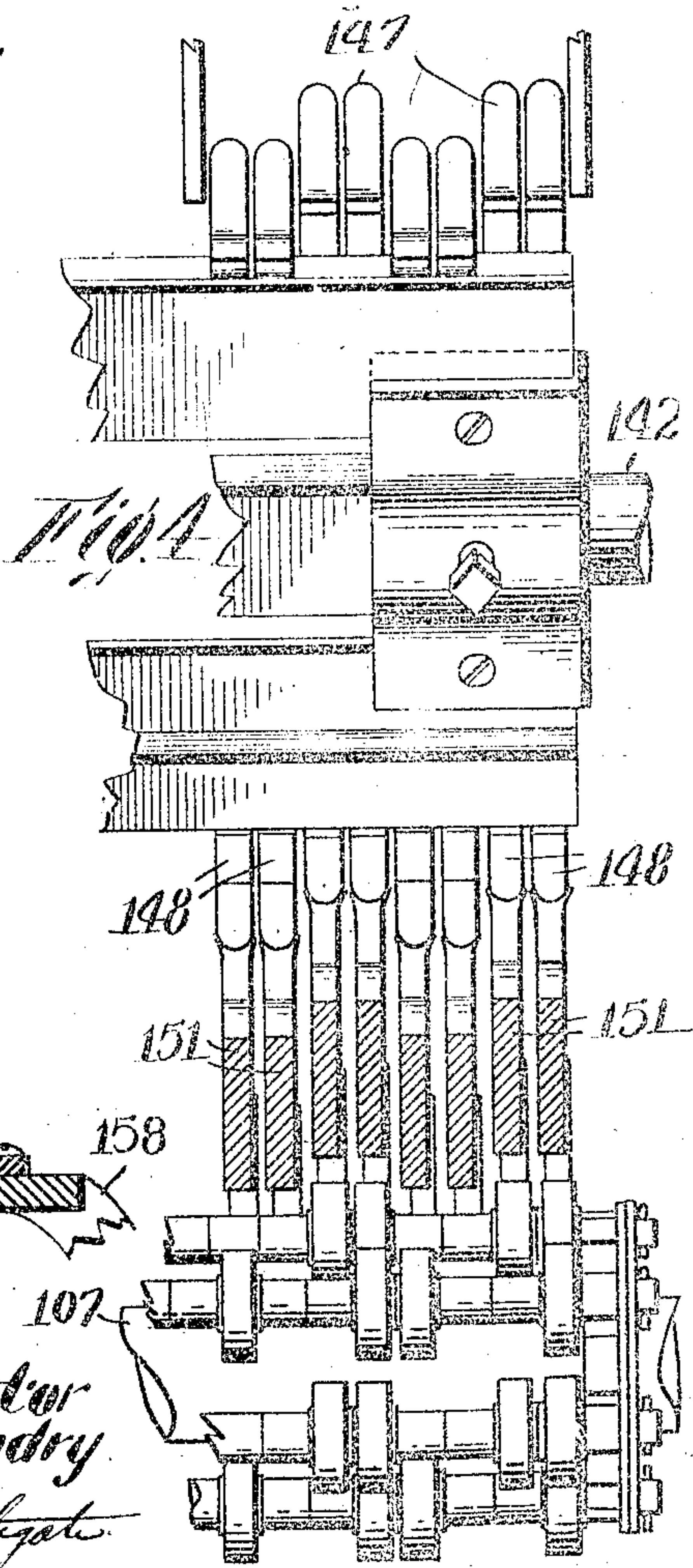
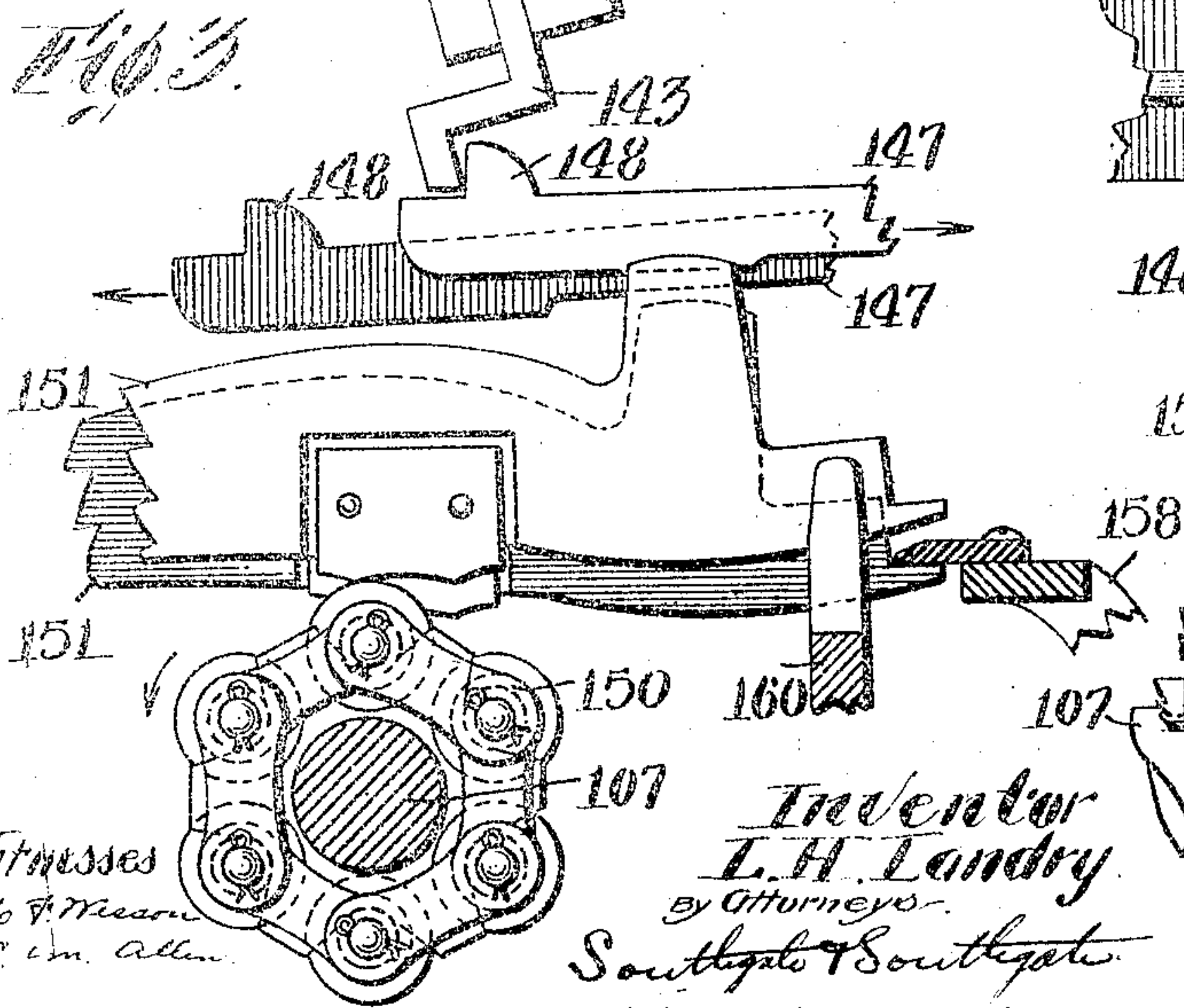
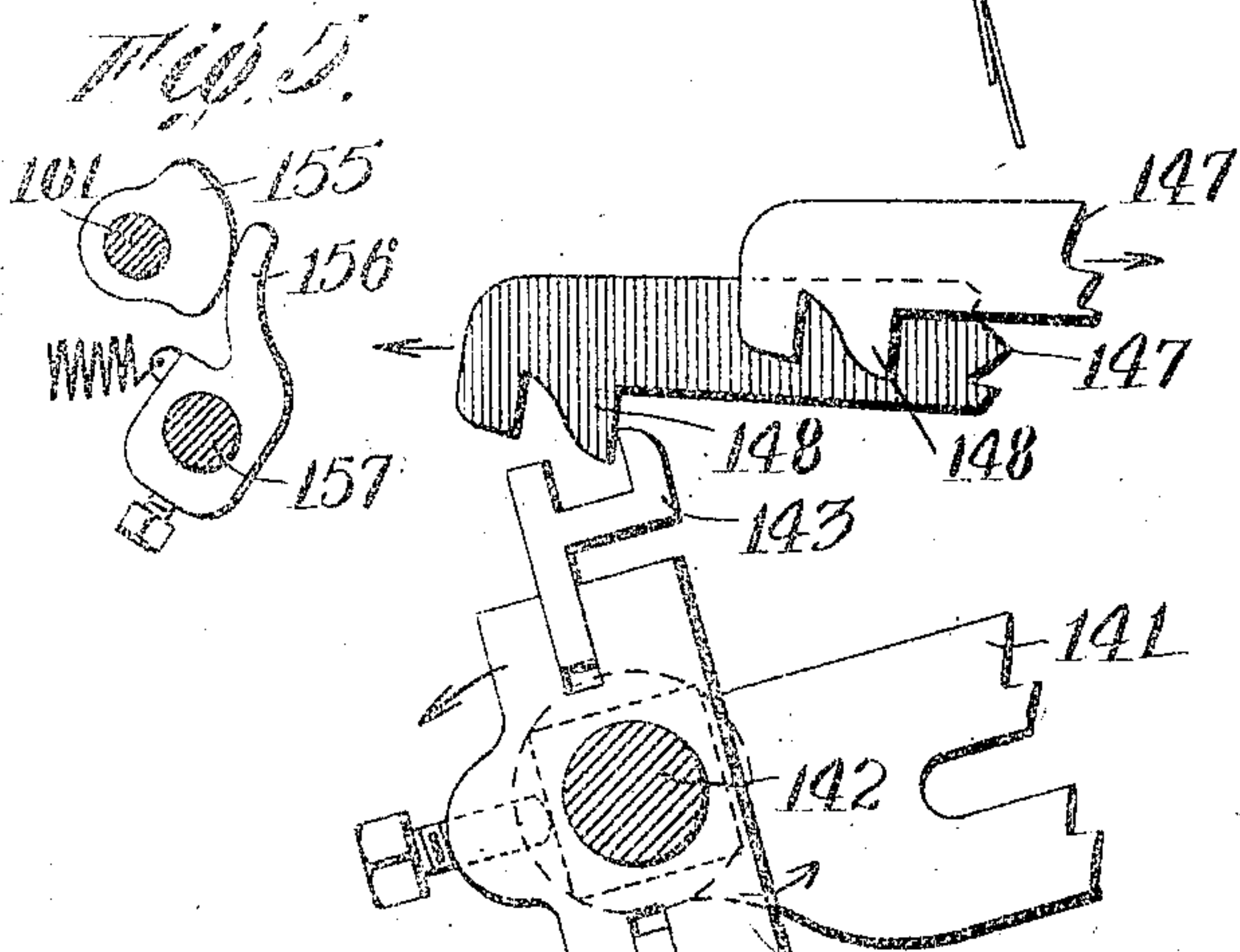
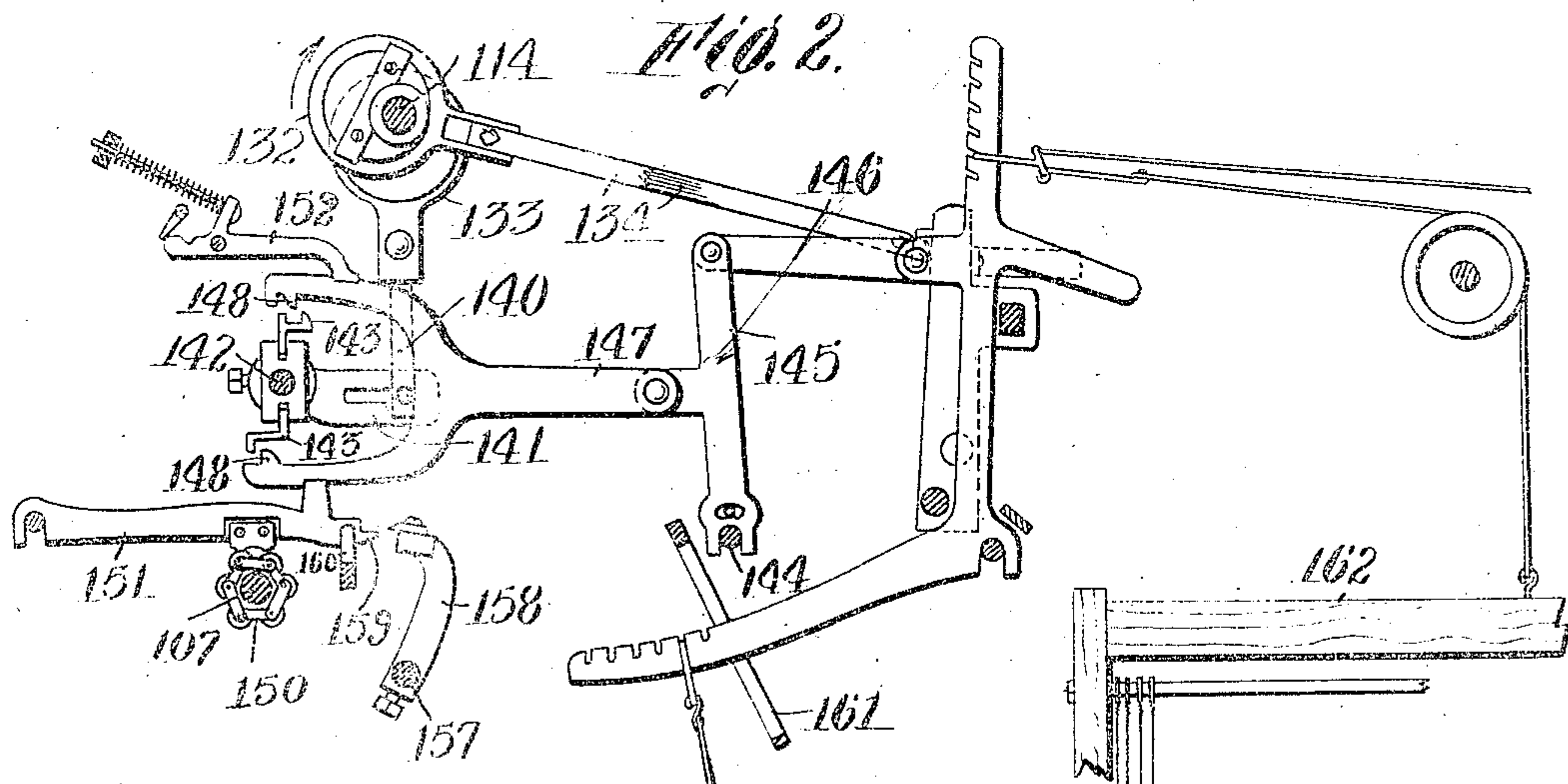
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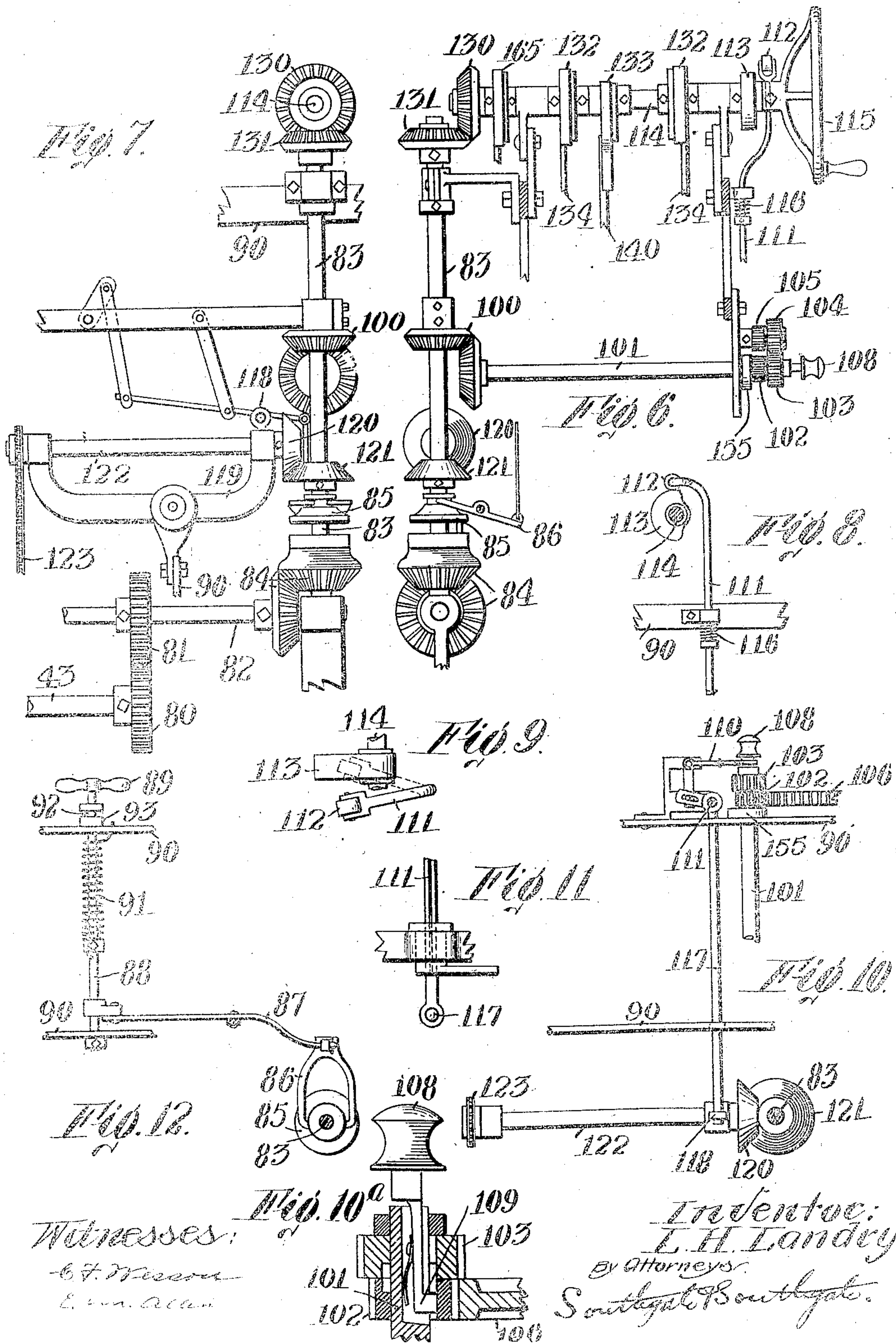
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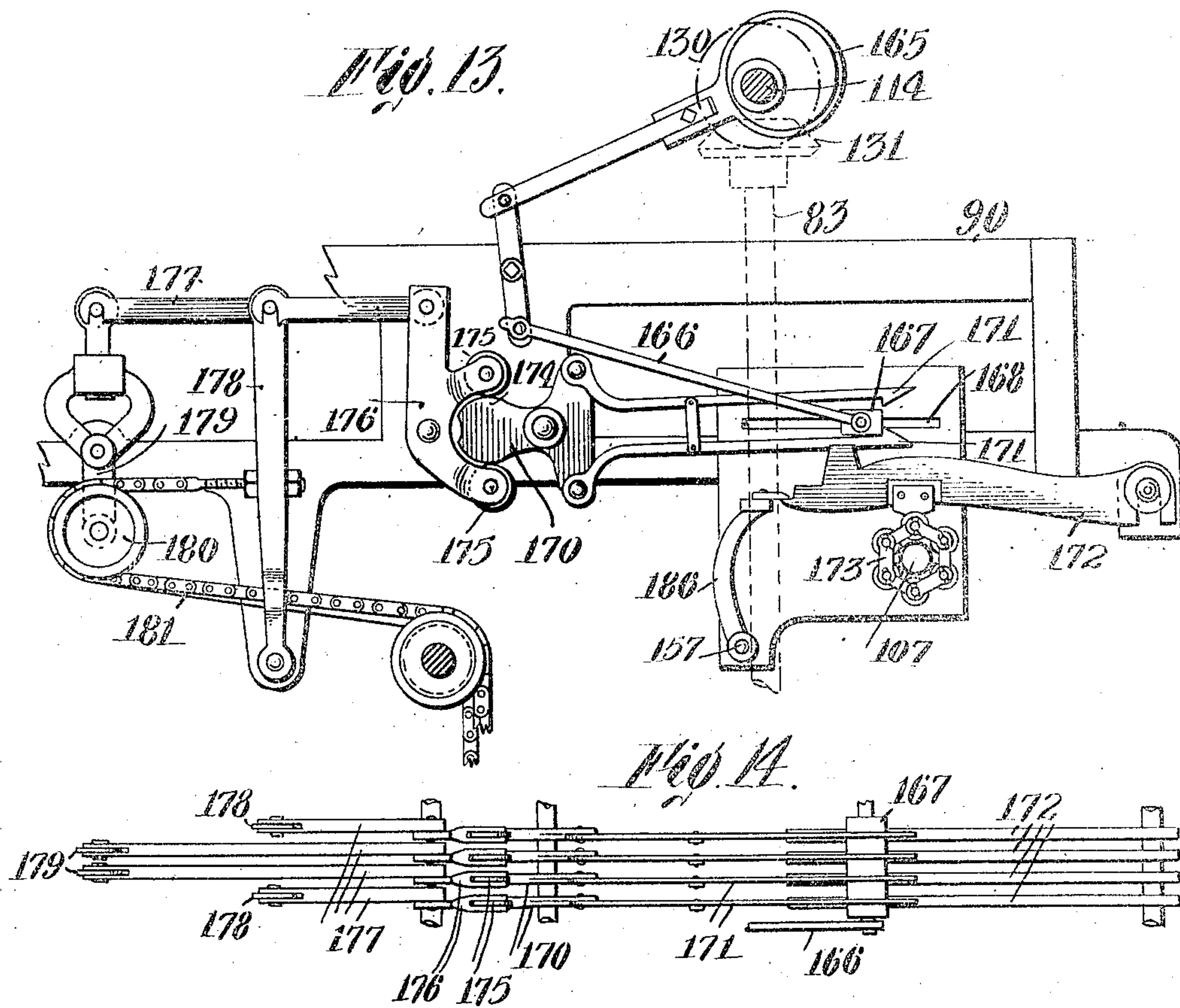
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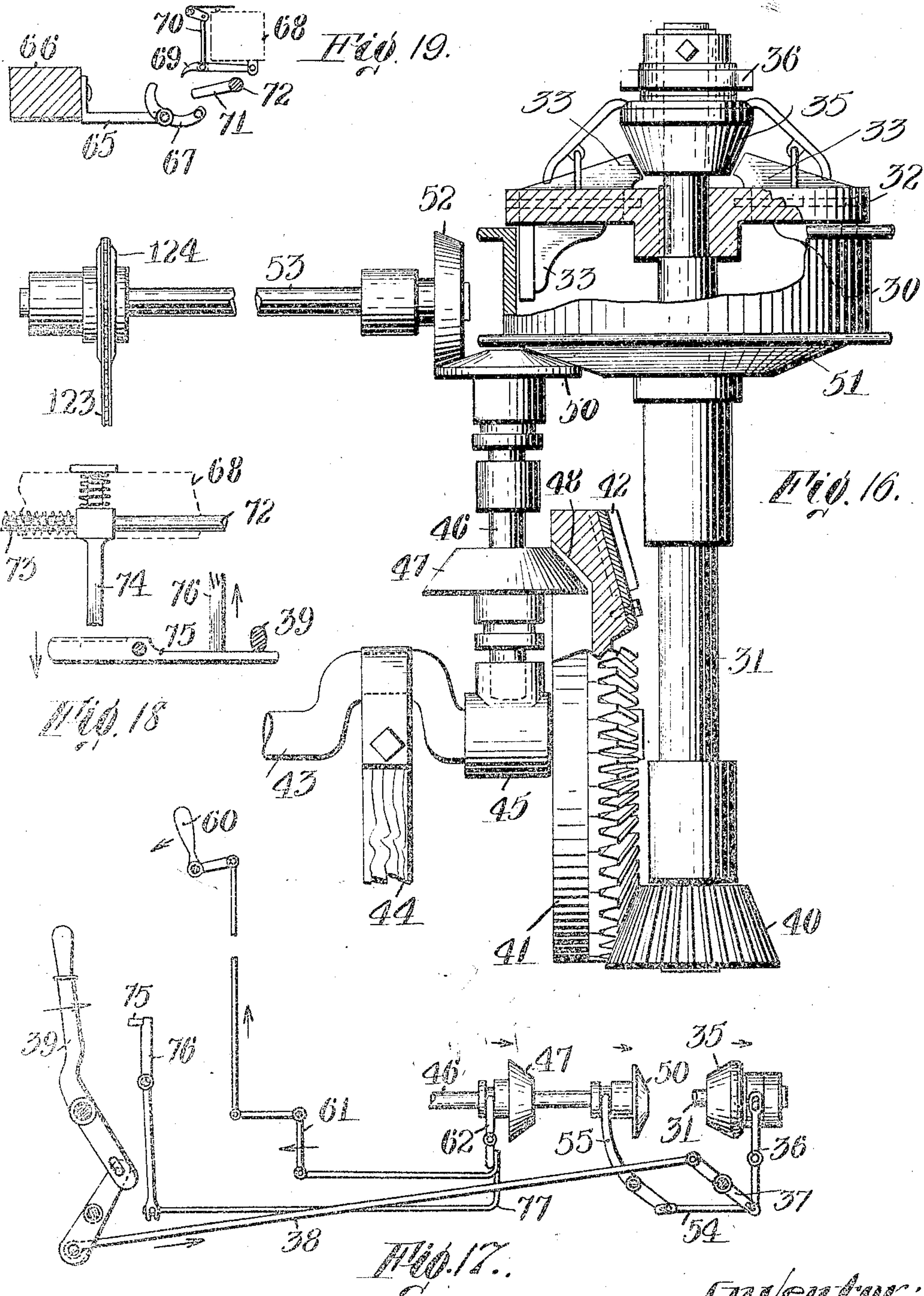
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LOOM.

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5 SHEETS—SHEET 5.

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UNITED STATES PATENT OFFICE.

LOUIS H. LANDRY, OF UXBRIDGE, MASSACHUSETTS ASSIGNOR OF ONE-HALF TO SAMUEL B. TAFT, OF UXBRIDGE, MASSACHUSETTS, ONE-EIGHTH TO UGAIL LAROCQUE, AND ONE-EIGHTH TO LOUIS BOUSQUET AND THEODORE BOUSQUET, BOTH OF BURRILLVILLE, RHODE ISLAND.

LOOM.

943,028.

Specification of Letters Patent.

Patented Dec. 14, 1909.

Application filed July 24, 1908. Serial No. 445,155.

To all whom it may concern:

Be it known that I, LOUIS H. LANDRY, a citizen of the United States, residing at Uxbridge, in the county of Worcester and State of Massachusetts, have invented a new and useful Loom, of which the following is a specification.

This invention relates to a loom suitable for weaving all kinds of fabrics.

The principal objects of the invention are to provide improvements of such a character that the construction of the loom will be greatly simplified and the expense of manufacturing correspondingly decreased; that the repairs will be materially lessened so that a loom fixer can keep a larger number of looms in repair; that the loom will be capable of operating at a higher speed; that there will be fewer occasions on which the loom will be stopped and the duration of stopping will be shorter so that the production will be increased in these ways in addition to the increase due to the higher speed; and that in the simpler types of looms an attendant can operate a larger number.

An important feature of the invention is the improved pick-out motion which closes and opens the harness without any vibrating gear and which has means whereby it can be connected in a very simple manner with the loose pulley when the machine is stopped, and is provided with a cam which assists the operator to open the harnesses, and then automatically lets go when they have been entirely opened. This can be repeated as often as necessary. It is so arranged that it can be attached to any make of loom, and it will close the shed each time the lay comes up to the cloth, thus helping the weaver to pass the broken threads through the harnesses and through the reed. This is an important advantage as heretofore the weaver has had to level the harnesses each time a thread was passed through, and this saving in time results in an increase in production.

Another feature of this part of the invention is the reduction in the cost of manufacture and generally in the cost of repairs and the construction thereof in such a manner that it will run at higher speed than heretofore without slipping of the harnesses or breakage in the head motion.

The invention also is applicable to an improved box motion which will open and close the levers without the use of vibrator gears, and which is so connected up that it can be caused to operate from the loose pulley of the loom through said friction shaft when the machine is stopped without interfering with the shuttle driver or picker.

Bands are provided to hold the picks in without weights.

Reference is to be had to the accompanying drawings which show one form of this invention as applied to a broad heavy worsted loom and in which,

Figure 1 is a front elevation of one end of the same showing the head motion. Fig. 2 is a front elevation of a portion of the head motion with the frame shown in Fig. 1 removed. Fig. 3 is a similar view on enlarged scale. Fig. 4 is a fragmentary end view of the same partly in section. Fig. 5 is a front view partly in section of a detail. Fig. 6 is a view from the end of the loom showing a part of the pick out motion and driving connections for the same and for the head motion. Fig. 7 is a rear elevation of the same. Fig. 8 is a front elevation of a cam and connected mechanism belonging to the pick-out motion. Fig. 9 is a plan thereof. Fig. 10 is a fragmentary plan showing the connections for throwing the pick-out motion into and out of operation. Fig. 10^a is a sectional view showing a detail. Fig. 11 is an elevation of a portion of the same. Fig. 12 is a plan of a hand-operated clutch and connected mechanism. Fig. 13 is an elevation of a modification of certain features of the invention in a form suitable for a box-motion. Fig. 14 is a plan of the same. Fig. 15 is an elevation showing connections for stopping the loom. Fig. 16 is a plan of the driving mechanism partly in section. Fig. 17 is an elevation thereof partially diagrammatic showing the connection of the shipper, stop motion and the like with the driving mechanism. Fig. 18 is a plan showing a portion of the stop motion, and Fig. 19 is an end elevation showing the rest of the stop motion.

The loom is designed to operate without a so-called tight pulley, the power being applied through a loose pulley which receives the driving belt and which is

mounted to freely rotate on the driving shaft 31. The power is transmitted directly to this driving shaft from this loose pulley by means of a clutch which consists of a
 5 slotted disk 32 keyed to the shaft and having radially sliding dogs 33 extending through the slots into the loose pulley and adapted to be forced against the walls thereof by means of a double wedge block 35
 10 which acts directly on the dogs to clutch the pulley and operates levers 34 for withdrawing the dogs inwardly when the wedge block moves back.

The wedge block is operated by a lever 36
 15 or the like. This lever is shown in Fig. 22 as designed to be operated by a swinging lever 37, link rods 38, and shipper handle 39 or in any other convenient manner. On the driving shaft is mounted a bevel pinion 40
 20 which preferably is driven on to a tapered square end on the shaft so that it will not work loose in operation. This pinion meshes with the driving gear 41 which preferably has removable teeth 42. These teeth
 25 are preferably made in pairs and are bolted or otherwise secured removably to the base of the gear so that if one or more of them break they can readily be replaced by new ones without dismounting or replacing the
 30 whole gear. This driving gear is mounted on the crank shaft 43 which operates the machine and which has links 44 connected with the lathe for moving it in the usual way. A bearing 45 for the crank shaft is
 35 provided with an end bearing for a friction shaft 46. This friction shaft is provided with a bevel friction disk 47 slidingly keyed thereon and adapted when pushed backward on the shaft 46 to engage a corresponding
 40 friction surface 48 on the rear of the main friction gear. The shaft is provided also with a second bevel friction wheel 50 fixed thereon and meshing with a friction surface 51 on the loose pulley and with a friction
 45 wheel 52 on a shaft 53.

When the lever 39 is thrown to force out the wedge 35 to stop the machine it also acts through a link 54 and lever 55 to throw the
 50 friction wheel 50 into engagement with the friction surface 51 and wheel 52 which will cause the shafts 46 and 53 to rotate while the driving shaft is at rest. If while the machine is stopped it is desired to turn the crank shaft, it is necessary only to turn a
 55 small lever or finger 60 which operates through link connections 61 to turn a lever 62 and push the friction wheel 47 into engagement with the friction surface 48 so that although the loose pulley is not operating the driving shaft, this shaft can be
 60 turned by the loose pulley through the shaft 46. If upon stopping the machine, the lathe is found to be forward, the lever 60 is pushed down long enough to cause the lathe
 65 to be swung back. This occupies only an

instant of time and is of great assistance to the operator as in the heavier types of looms it requires considerable force to push the lathe back. An improved stop motion is
 70 also provided which acts in such a way that the loom will stop with the lathe back. This stop motion is shown as comprising a bracket 65 on the breast-beam 66 and a stop motion rocker 67 on the bracket. On the
 75 lathe 68 is pivoted a tongue 69 normally held up by the filling thread through connections 70. When the filling thread breaks these connections and tongue are permitted to drop so that the tongue engages the upper
 80 end of the rocker 67 during the next forward motion of the lathe which operates the lower end to engage an arm 71 on a rock shaft 72. This rock shaft is provided with a spring 73 for holding it in proper position
 85 and a dagger 74 which is turned by the above mentioned operation in position to engage a lever 75 which operates the shipper handle 39 and also operates a lever 76 which has connections 77 for operating the
 90 lever 62 in a manner which has been described above so as to cause the friction to work and the lathe to beat back. When the lathe starts back there is no longer any force acting to hold the wheel 47 against the friction surface 48. Consequently the lathe will
 95 stop at the end of the back stroke.

Near the end of the machine the crank-shaft 43 has a gear 80 indicated in Fig. 7 meshing with a gear 81 on a head motion driving shaft 82. This shaft drives an up-
 100 right shaft 83 through bevel gears 84. One of the gears 84 runs loose on the shaft 83 and is connected therewith by a clutch 85 which is operated by a yoke 86 and a lever 87 adapted to be controlled by a shaft 88
 105 having a handle 89 on the outside of the frame 90 of the machine. A spring 91 normally tends to hold the shaft 88 in such position that a pin 92 thereof will be in a corresponding depression in a collar 93 on the
 110 shaft so that the handle will turn the shaft. Of course this pin connection or clutch on the handle 89 can be readily disengaged by pulling the handle out and turning it slightly.
 115

The shaft 83 is provided with a bevel gear 100 which drives a shaft 101 carrying a pair of gears 102 and 103. Located on a stud near these gears are a pair of
 120 gears 104 and 105. The gears 103 and 104 are constantly in mesh with each other. The gears 102 and 105 are constantly in mesh with a gear 106 on the chain cylinder shaft 107. On the end of the shaft 101 is a stud 108 having a key 109 for fixing
 125 either of the gears 102 or 103 with respect to the shaft 101. When the stud is pushed in the gear 102 is fixed to the shaft and it is loose when the stud is pulled out. The gear 103 is tight when 102 is loose and vice versa,
 130

but when the key is half way out both gears are loose which permits the wheel 106 to be operated by hand. This is brought about by having annular grooves in the adjacent edges of the gears which together are wide enough to receive the key. Any device for connecting one of a pair of loose gears to a shaft may be employed in place of this construction. When the stud is pushed in the gear 106 will be driven directly from the shaft 101 through the gear 102 and when it is pulled out it will be driven indirectly in a reverse direction through the gears 103, 104 and 105. The pulling out of the stud 108 also has another result; that is, it swings a lever 110 which rocks a shaft 111 and turns a roller 112 thereon in position to be engaged by a cam 113 on a shaft 114 which can be operated manually by a hand wheel 115 to control the pick-out motion.

The spring 116 is shown for pulling the rod 111 and roller 112 down. The bottom of the rod 111 is connected with a lever 117 so that when the cam 113 pulls up the rod 111 during a half revolution the opposite end of the lever 117 will be depressed so as to act on an eye 118 and swing down a frame 119 which is pivoted on the frame 90 of the machine until a bevel friction wheel 120 thereon engages with a wheel 121 fixed to the shaft 83. This causes a shaft 122 on which the wheel 120 is mounted to drive the shaft 83. The shaft 122 is driven through a sprocket chain 123 which is connected with a sprocket wheel 124 on the shaft 53. It will be seen, therefore, that by pulling out the stud 108 when the machine is stopped the shaft 107 will be reversed which will reverse the operation of the harnesses as will be described hereinafter and then if the hand-wheel 115 is rotated by hand the rotation of shaft 114 will be assisted by the power derived from the shaft 122 during a half revolution and will not be assisted during the other half.

The lever 110 can be swung out from the stud 108 if desired so that the motion can be reversed by that stud without throwing the power on the shaft 83 from the shaft 53.

The results to be obtained by these operations will now be described. The shaft 114 which has been referred to is provided with bevel gear 130 deriving power, when the machine is running, from a gear 131 on the shaft 83. This shaft 114 in addition to the cam 113 is provided with eccentrics 132 and 133 for opening and closing the shed, respectively. Two eccentrics 132 are shown which, as indicated in Figs. 1 and 2, are provided with rods 134 connected with a pivoted frame 135 which has a cross-bar 136 adapted to engage the several jacks 137 to pull them up into position to close the shed.

The eccentric 133 for opening the shed is connected by its rod 140 with an arm 141

projecting from a shed opener shaft 142. This shaft is provided with a pair of oppositely extending projections 143 moving in opposite directions as the shaft 142 oscillates. Pivoted on a rod 144 are center connections 145 each of which is connected with one of the jacks by a front connecting link 146. Each of these center connections is also pivotally connected with a shed opener finger 147 having two branches provided with teeth 148, one adapted to cooperate with one of the projections 143 and the other with the other. These fingers are located above the chain cylinder shaft 107 on which is mounted a chain cylinder 150. Above the chain cylinder are indicator levers 151. The rollers comprising the chain 150 are set on the chain cylinder in such manner as may be necessary in order to produce a fabric of the desired weave, then as the chain cylinder turns these rollers will come under the levers 151 and raise certain of them in each position of the chain cylinder. Those which are raised engage the under sides of the corresponding shed opener fingers and raise them so that the lower teeth thereof will engage the corresponding projections 143 while the upper teeth will be raised free of the upper projections. The shed opener fingers which are not so raised will be pushed down by means of a set of spring fingers 152 so that the upper teeth thereof will engage the upper projections 143 and the lower teeth will be free of the lower projections. Now as the eccentric shaft 114 operates during the connection thereof with the crank shaft through the clutch 85, the shed opener shaft 142 will be oscillated by the eccentric 133 and this will cause the shed to be opened in the appropriate order for producing a fabric of the desired weave, the shed being closed periodically by the eccentrics 132 in the manner above described. It is to be observed (reference being had to Figs. 1 and 5) that the shaft 101 has a cam 155 thereon which at each rotation of that shaft presses outwardly a cam lever 156 on a rock shaft 157 which carries a lock 158 adapted to engage a projection 159 on each of the chain operating levers 151 which is not raised by the chain cylinder. This is indicated in Fig. 3. This holds the inoperative levers down and would prevent the others from coming down on that pick if anything should happen to break or displace one of the chain rollers. A guide 160 is shown for the levers 151 and a comb 161 for the jacks. The jacks are shown as connected with the harness 162 in a well known manner.

It will be seen that during the operation of the machine from the main crank-shaft 43, the shed will be opened and closed periodically in a very simple manner without employing the usual vibrator gears and

that when the power is shut off from the main crank shaft 43 the auxiliary shaft 53 will still be turning and consequently when the clutch 86 is thrown in, the head motion shaft 83, the eccentric shaft 114, and the shaft 101 can be caused to turn independently of the drive. Thus the harnesses can be operated by power simply by throwing in the clutch handle 89. Moreover, by manipulating the stud 108 and turning the hand-wheel 115 the power can be employed while the machine is not operating to turn the pick-out through half a revolution while during the other half of the revolution it has to be turned by hand. This pick out motion is an important feature because by the automatic operation of the cam 113 the operator can turn the hand wheel 115 and have the power help him operate the harnesses during the part of the revolution when there is the greatest resistance and yet the power will be automatically thrown out when that part of the revolution is completed and the operator can tell by the pull of the hand-wheel when the shed has been closed so that the thread can be passed through and the machine started. Or if he has reversed the drive through the gear 106 and wishes to go back two or three picks, he can do this very readily with no danger of the power carrying the mechanism back too far. The box motion is also driven from the eccentric shaft 114 through an eccentric 165 (see Figs. 7 and 13.) The eccentric rod connected with it operates a link 166 which reciprocates a block 167 to slide in ways 168 on the frame. The box motion is controlled in a way similar to that shown in Figs. 2 and 3 for opening the shed but in this case there is a tilting frame 170 having a pair of hooks 171 above and below the block 167 and sufficiently far apart to prevent both of them engaging the block at the same time. Under the frame 170 or preferably under the lower hook are located a series of operating levers 172 which are controlled by a chain cylinder 173 on the shaft 107. The rotation of the shaft 107 actuates the levers 172 through the chain cylinder 173 in the same manner as that described above with reference to the other chain cylinder 150 and causes any one or more of the frames 170 to be tilted up so that their lower hooks engage the block 167 and move with it. The frames 170 are provided with projections 174 engaging rollers 175 on a corresponding number of bell cranks 176. These bell cranks operate links 177 two of which are supported on pivoted rods 178 and the others on levers 179 which operate swinging sprocket wheels 180. These sprocket wheels engage chains 181 fixed adjustably to the bars 178 and pull the shuttle box up a greater or less distance according to which ones of the frames 170 are moving up. It will be seen

that the links 177 are shown in Fig. 14 as of two different lengths to provide for four shuttles and four positions of the shuttle box. This can be varied in case a different number of shuttles is employed. A lock 186 on the shaft 157 acts to hold the levers 172 like the lock 158.

In order to stop the loom in case a shuttle is left part way in or part way out of the shuttle box as the latter rises, a feeler is provided on the lathe above the path of the shuttle so that as the shuttle box rises, if a shuttle is under the feeler it will cause the feeler to swing on its pivot against a spring and to turn a lever 202. The end of this lever operates through a system of levers 203 on a finger 204 to turn the shipper lever 39 and stop the loom. This also constitutes a smash protector to stop the picking motions at both ends of the loom in case both shuttles should start to enter the shed at once.

From the description which has been given, it will be seen that the above mentioned advantages can be secured in a very simple manner, and in such a way that each of the improvements can be applied to practically all types of looms.

While I have illustrated and described a preferred embodiment of the invention and shown it as applied to a particular type of loom, I am aware that it can be carried out in many other ways and applied to other types of looms without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of construction shown, but

What I do claim is:—

1. In a loom, the combination of a driving member, a crank shaft driven thereby, a pick out motion for operating the harness of the loom operated by said crank shaft, an auxiliary shaft, means for operating the auxiliary shaft from the driving member independently of the crank shaft, and means for operating the pick-out motion from this auxiliary shaft.

2. In a loom, the combination of a head motion shaft, with means for operating said shaft when the loom is stopped said means comprising a second shaft, a tilting frame having means for connecting the head motion shaft with said second shaft, and a stud for operating said tilting frame.

3. In a loom, the combination of a head motion shaft, a second shaft adapted to operate when the loom is stopped, a tilting frame having means for connecting the head motion shaft with said second shaft, a stud for operating said tilting frame, a head motion reversing gearing for the head motion, and means connected with said stud for operating the reversing gearing.

4. In a loom, the combination of a mov-

able stud, a head motion, means controlled by the stud for reversing the head motion, an auxiliary shaft adapted to be driven when the loom is stopped, means whereby said auxiliary shaft may be connected with the head motion for driving it, and means whereby the operation of the stud to reverse the head motion will connect the head motion with said auxiliary shaft so as to operate the head motion when the loom is stopped.

5. In a loom, the combination of a head motion, a shaft, means for turning said shaft when the loom is stopped, and means for reversing the head motion and connecting the same with said shaft to operate the head motion backwardly when the loom is stopped.

6. In a loom, the combination of a driving member, a crank shaft driven thereby, a head motion operated by said crank shaft, an auxiliary shaft, means for operating the auxiliary shaft from the driving member independently of the crank shaft, and means for operating the head motion from the auxiliary shaft.

7. In a loom, the combination of a driving member, a crank shaft driven thereby, a lathe driven by the crank shaft, a head motion connected with the crank shaft and driven thereby, and means for driving the head motion from the driving member independently of the crank shaft.

8. In a loom, the combination of a driving member, a crank shaft driven thereby, a lathe driven by the crank shaft, a head motion connected with the crank shaft and driven thereby, means for driving the head motion from the driving member independently of the crank shaft, and means for operating the head motion by hand.

9. In a loom the combination of a shaft, a hand wheel thereon, means for operating said shaft when the loom is operating, a clutch for disconnecting the shaft from the power, means adapted to be connected with the shaft for operating it when the loom is stopped, and means connected with said shaft for opening and closing the shed.

10. In a loom the combination of an eccentric shaft, a hand wheel thereon, means for operating said shaft when the loom is operating, a clutch for disconnecting the shaft from the power, means adapted to be connected with the shaft for operating it when the loom is stopped, and means on said shaft for opening and closing the shed, said means comprising a shed opening eccentric, and a shed closing eccentric, a series of jacks, and means connected with the shed closing eccentric for simultaneously pulling all of said jacks together to closing position.

11. In a loom the combination of an eccentric shaft, an eccentric thereon, a pivoted frame having a bar thereon, a series of piv-

oted jacks in position to be adapted to be engaged by said bar and means operated by the eccentric for operating said frame.

12. In a loom, the combination of an eccentric shaft, an eccentric thereon, a frame having a bar thereon operated from said eccentric, a series of jacks in position to be engaged by said bar, a pivoted center connection for each jack, a finger connected with each center connection, and means controlled by said eccentric shaft for operating said fingers in a predetermined order to open the shed.

13. In a loom, the combination of an eccentric shaft, an eccentric thereon, a frame having a bar thereon operated from said eccentric, jacks in position to be engaged by said bar, a center connection for each jack, and means controlled by said eccentric shaft for operating said center connection.

14. In a head motion for a loom, the combination of a series of pivoted jacks, a shaft, means connected with said shaft for simultaneously operating all the jacks to close the shed, a center connection for each jack, a shed opening finger connected with each center connection, a shaft having means for operating said finger, and means connected with the first named shaft for oscillating the last named shaft to move selected fingers and jacks.

15. In a head motion for a loom, the combination of a shaft having projections thereon, jack-operating fingers adapted to engage projections, means for lifting said fingers in a predetermined order to engage the projections, and means for automatically engaging all the finger-operating means at the end of each motion thereof to lock them.

16. In a head motion for a loom, the combination of an eccentric shaft, a cam thereon, a movably mounted cam roller, a pick out motion for operating the harnesses of the loom, means connected with said roller for operating the pick out motion, and means for moving said roller into position to be engaged by the cam.

17. In a head motion for a loom, the combination of an eccentric shaft, a cam thereon, a movably mounted cam roller, a pick out motion for operating the harnesses of the loom, means connected with said roller for operating the pick out motion, means for moving said roller into position to be engaged by the cam, and a hand wheel on said shaft whereby the pick-out motion may be operated by the hand.

18. In a head motion for a loom, the combination of an eccentric shaft, a cam thereon, a movably mounted cam roller, a pick-out motion, means connected with said roller for operating the pick-out motion for operating the harnesses of the loom, and means for drawing said roller into position to be engaged by the cam, a hand wheel on said

shaft whereby the pick-out motion may be operated by hand, said cam being substantially semi-circular in form, whereby said shaft may be driven by hand, and the automatic operation of the pick-out motion will take place while the shed has changed.

19. In a loom the combination of a shaft, a hand wheel thereon, means for operating said shaft when the loom has stopped, a pick-out motion for operating the harnesses of the loom, means connected with said shaft for operating the pick-out motion, a cam on the shaft, and means controlled by the cam for operating the pick-out motion from the power when the loom is stopped.

20. In a loom, the combination of a pick-out motion for operating the harnesses of the loom, a shaft, a stud, means controlled by said stud for connecting the shaft with the pick-out motion, and means also controlled by the stud for causing the pick-out motion to be operatable by hand.

21. In a loom, the combination with the main shaft, of a pick-out motion for operating the harnesses of the loom, means for connecting said pick-out motion with the main shaft, means for disconnecting it therefrom, and means for causing the pick-out motion to operate when the loom is stopped.

22. In a loom, the combination of a pick-out motion for operating the harnesses of the loom, means for operating it by hand, and means adapted to be operated by power for automatically assisting the hand operation of the pick-out motion.

23. In a loom, the combination of a pick-out motion for operating the harnesses of the loom, means for operating the pick-out motion by hand, and means for assisting the operation of the pick-out motion by power during a definite part of each complete cycle of operations of the loom.

24. In a loom, the combination of a pick-out motion for operating the harnesses of the loom, means for operating the pick-out motion by hand, and means for assisting the operation of the pick-out motion by power during part of each complete cycle of operations of the loom, and for throwing automatically the assisting means out of connection with the pick-out motion during the remainder of the time.

25. In a loom, the combination of a pick-out motion for operating the harnesses of the loom, means for operating the pick-out

motion by hand power operated, means for assisting the operation of the pick-out motion during part of each complete cycle of operations of the loom, and hand-operated means for throwing said assisting means into and out of connection with the pick-out motion.

26. In a loom, the combination with the head motion for operating the harnesses of the loom, of a pick-out motion, means for operating the pick-out motion by hand power operated, means for assisting the operation of the pick-out motion during part of each complete cycle of operations of the loom, and hand-operated means for throwing said assisting means into and out of connection with the pick-out motion and for simultaneously reversing the head motion.

27. In a loom, the combination of a pick-out motion for operating the harnesses of the loom, a shaft for controlling the operation thereof, means for turning said shaft by hand, and means controlled by said shaft for connecting the pick-out motion with the power during substantially half of each revolution of the shaft and disconnecting it therefrom during the other half revolution.

28. In a loom, the combination with a shaft, a pick-out motion for operating the harnesses adapted to be operated thereby, a means for turning the shaft by hand, means for simultaneously turning the shaft by power, and means for automatically disconnecting the shaft from the power at a certain point while the shaft is being turned by hand.

29. In a loom, the combination of a block, means for moving the block, a plurality of bifurcated levers having inwardly extending projections adapted to engage the block, a series of operating levers, one for each bifurcated lever, a chain cylinder for lifting the operating levers in a predetermined order so as to periodically lift the bifurcated levers, and means for locking said operating levers periodically in their lifted and depressed positions to hold the bifurcated levers during one entire operation of the block.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

LOUIS H. LANDRY.

Witnesses:

ADOLPHE H. LANDRY,

WM. J. TAFT.