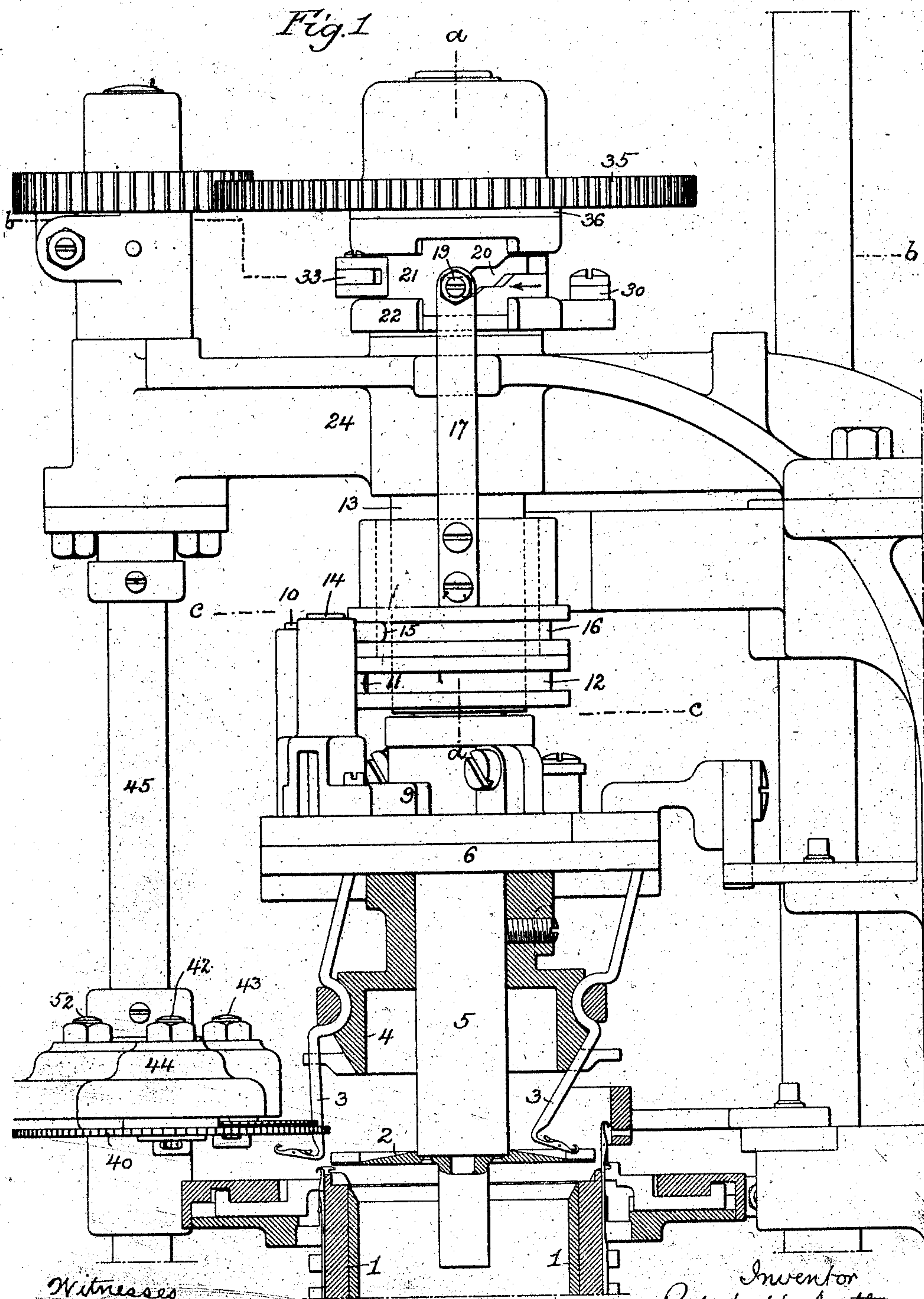


976,607.

R. W. SCOTT.
KNITTING MACHINE.
APPLICATION FILED MAY 15, 1907.

Patented Nov. 22, 1910.

6 SHEETS—SHEET 1.



Witnesses
Camille D. Turner
Kate A. Beadle

Inventor
Robert W. Scott
by his attorneys
Smith & Taylor

976,607.

R. W. SCOTT.
KNITTING MACHINE.
APPLICATION FILED MAY 15, 1907.

Patented Nov. 22, 1910.

5 SHEETS—SHEET 2.

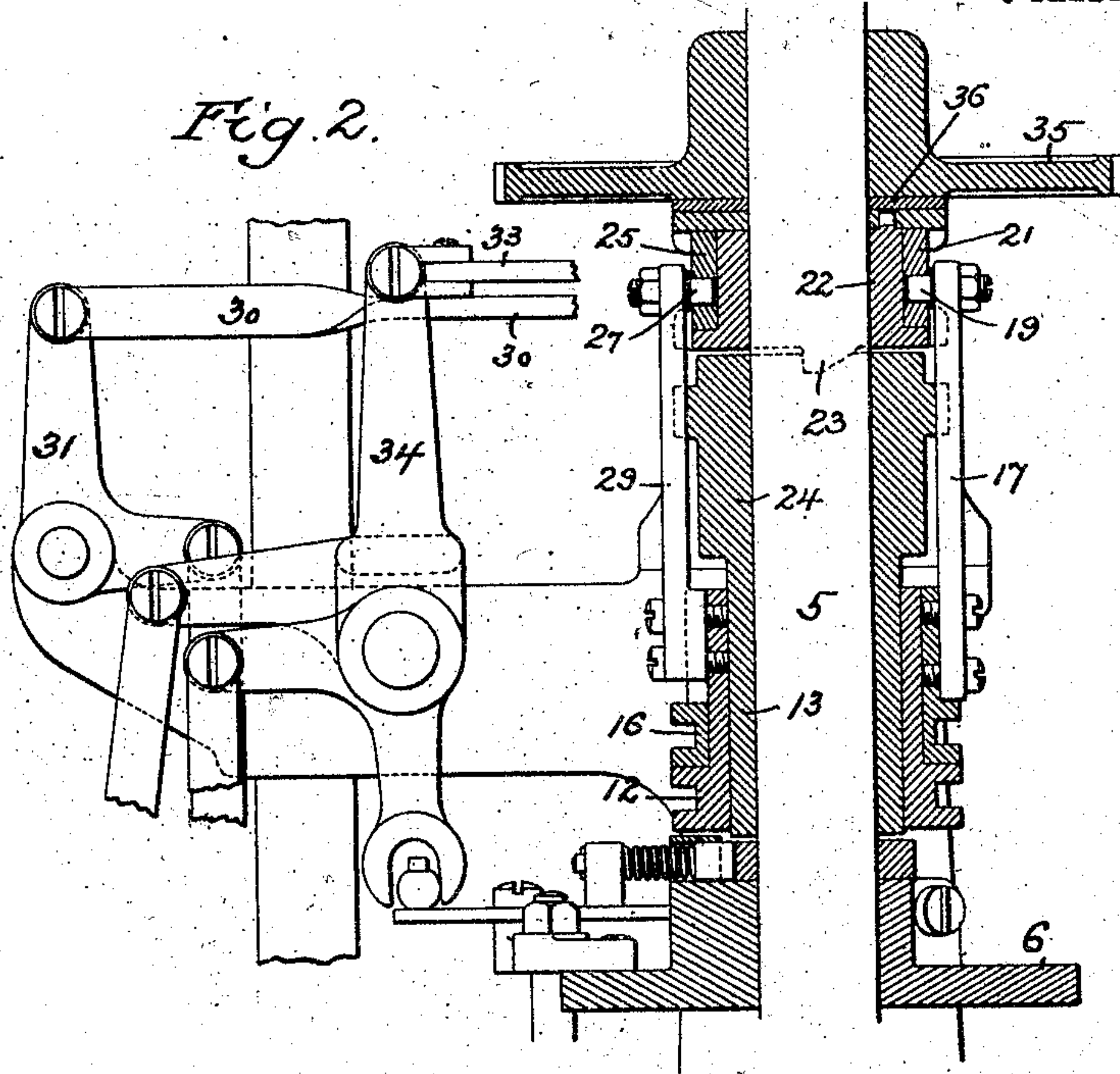


Fig 13.

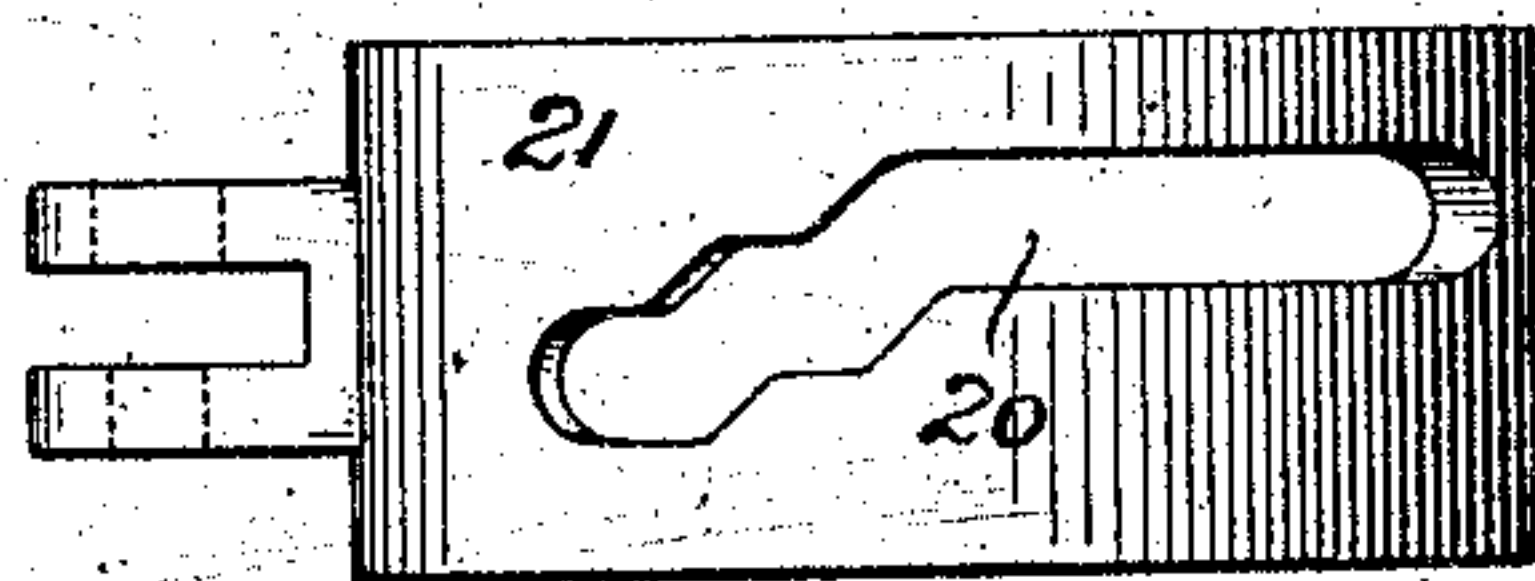
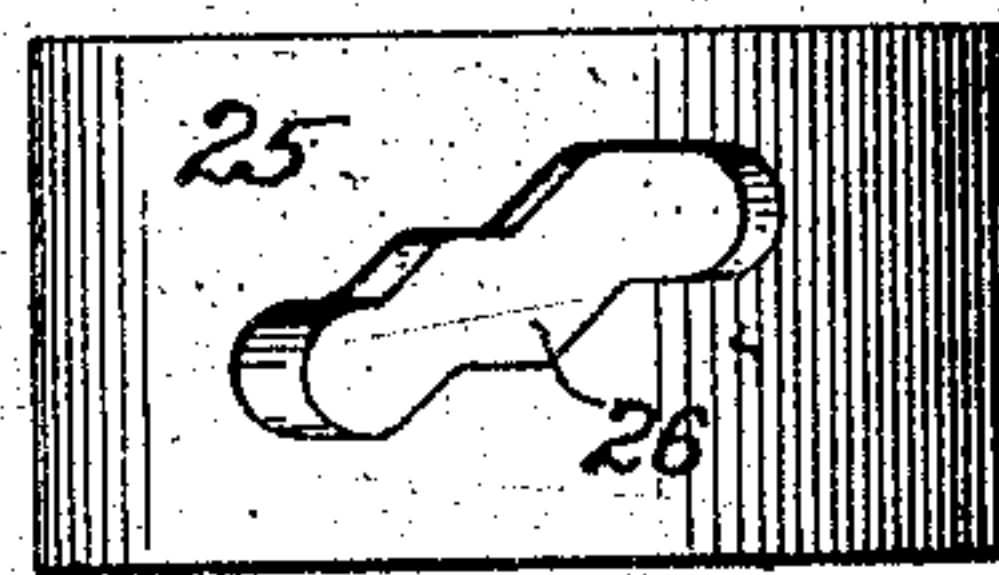


Fig 14.



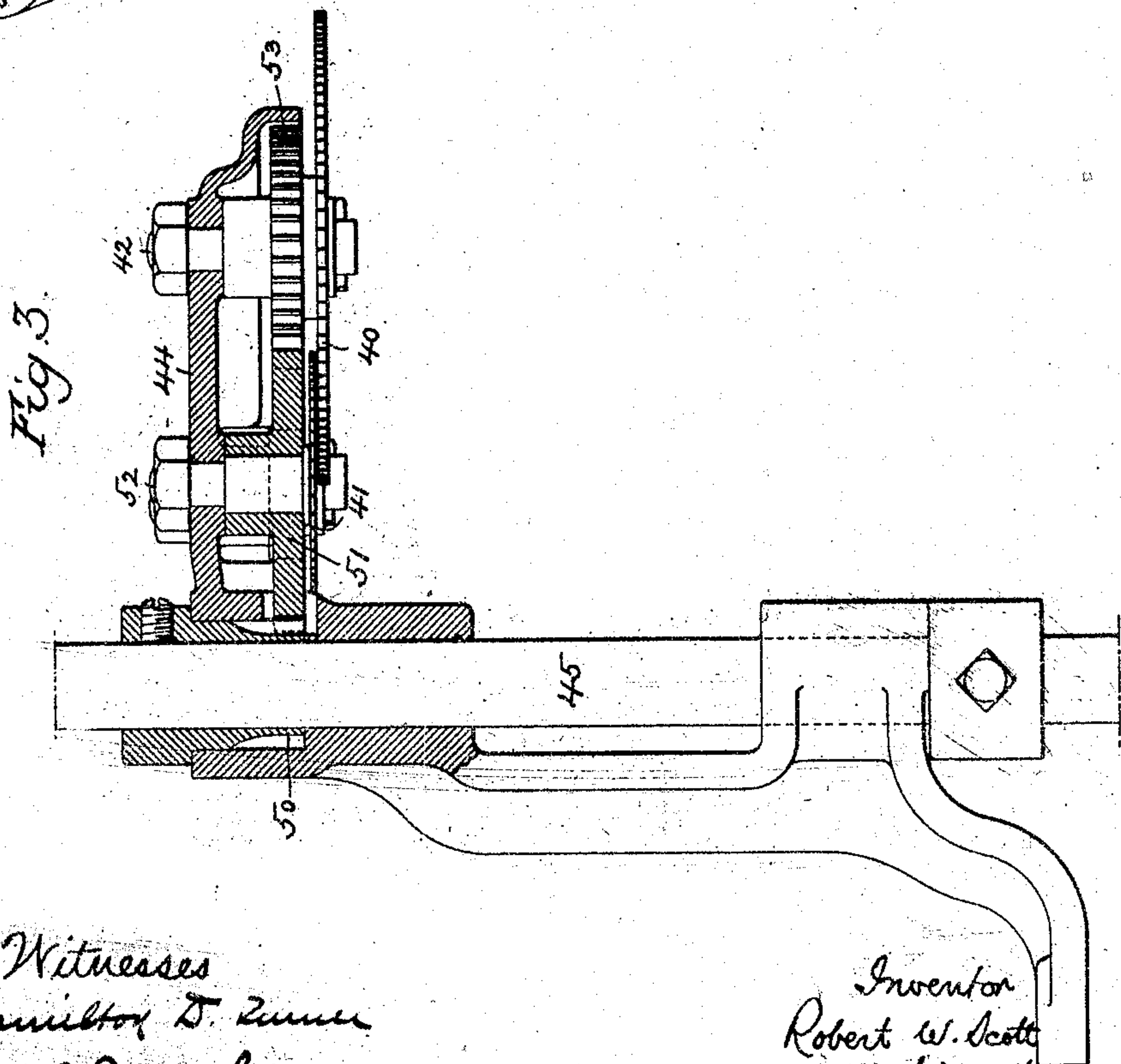
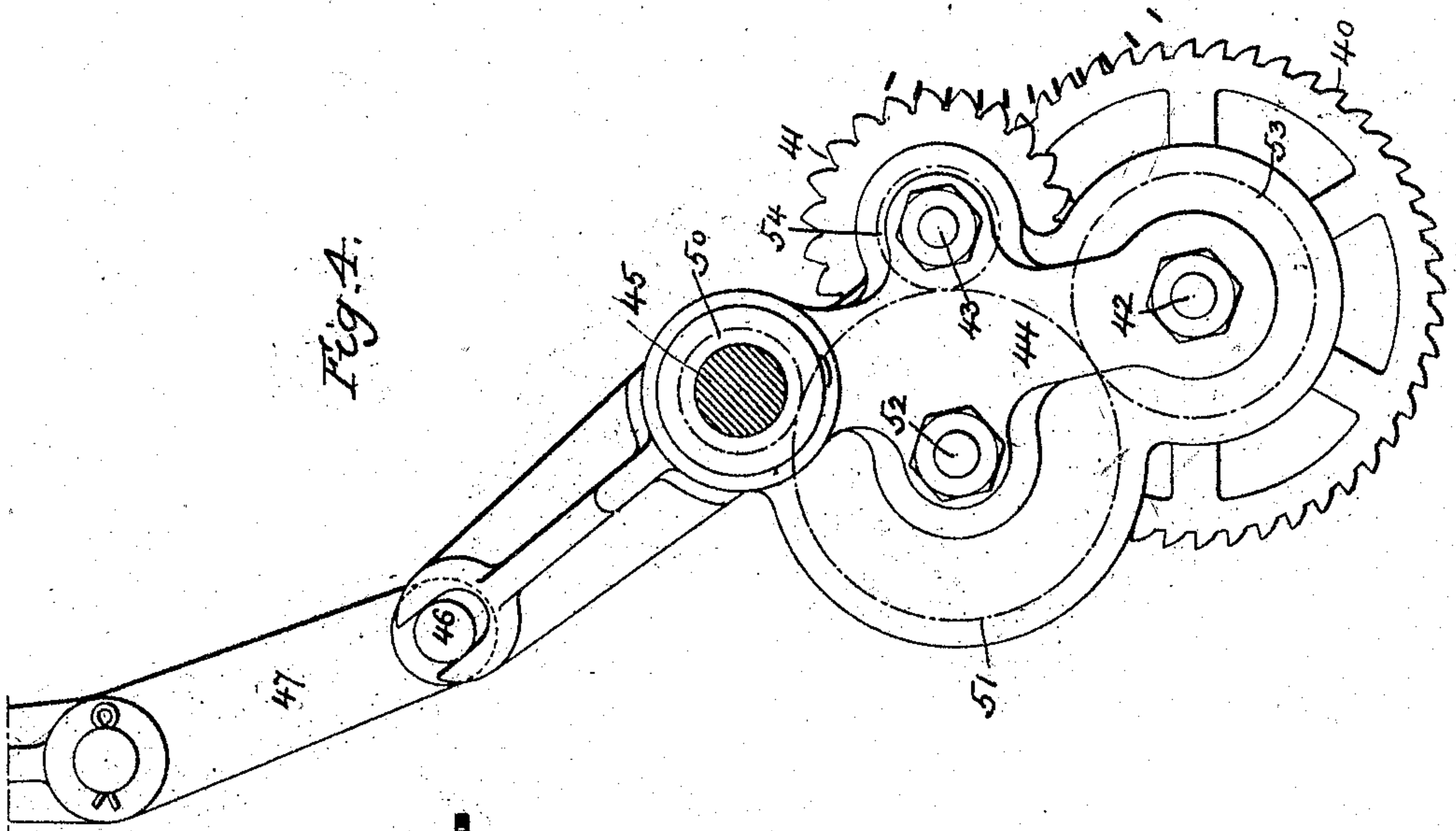
Witnesses
Cammie D. Turner
Kate A. Beadle

Inventor
Robert W. Scott
by his Attorneys
Smith & Pagier

R. W. SCOTT.
KNITTING MACHINE.
APPLICATION FILED MAY 15, 1907.

Patented Nov. 22, 1910.
5 SHEETS—SHEET 3.

976,607.



Witnesses
Gambel D. Zinner
Kate A. Beadle

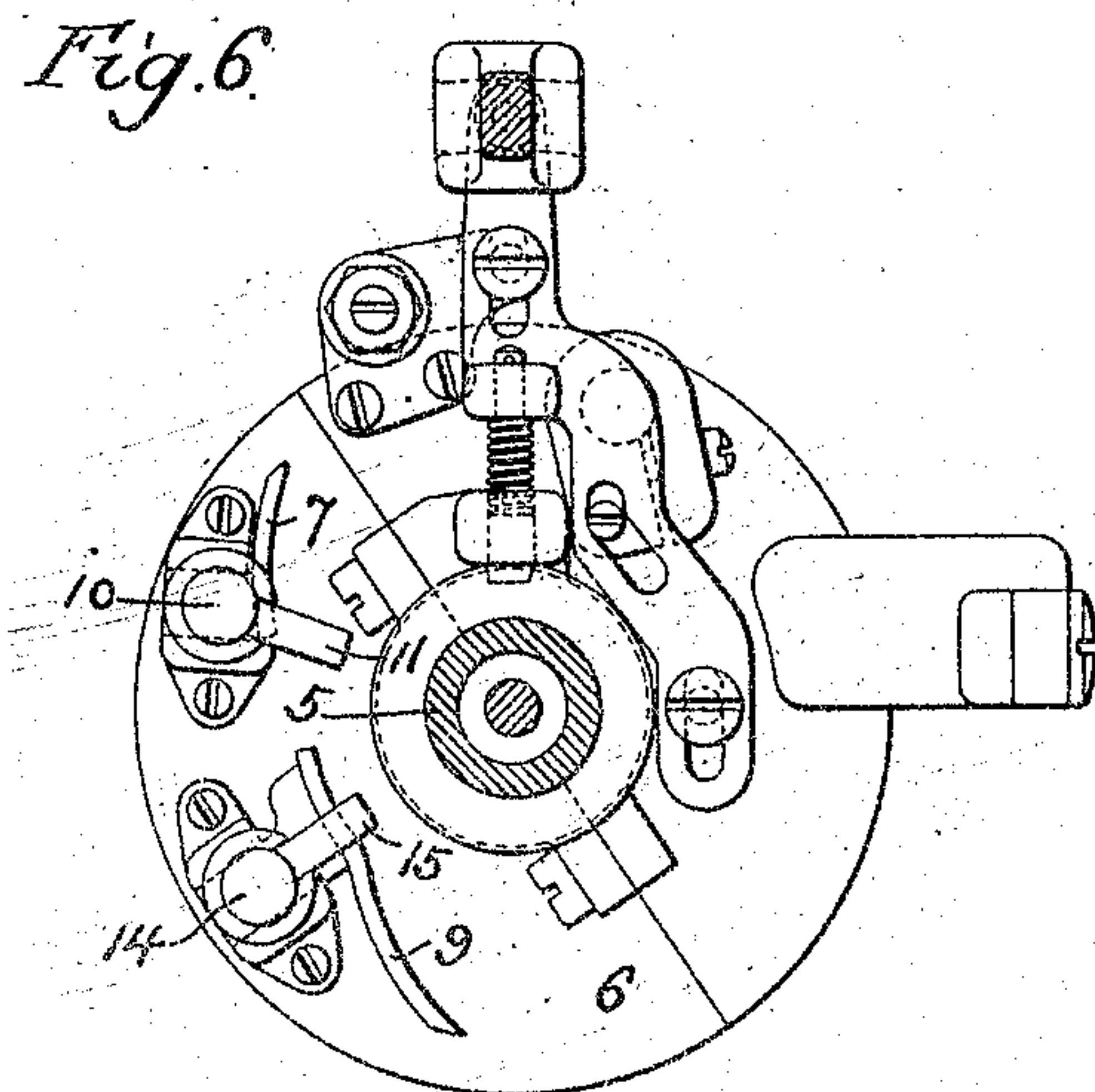
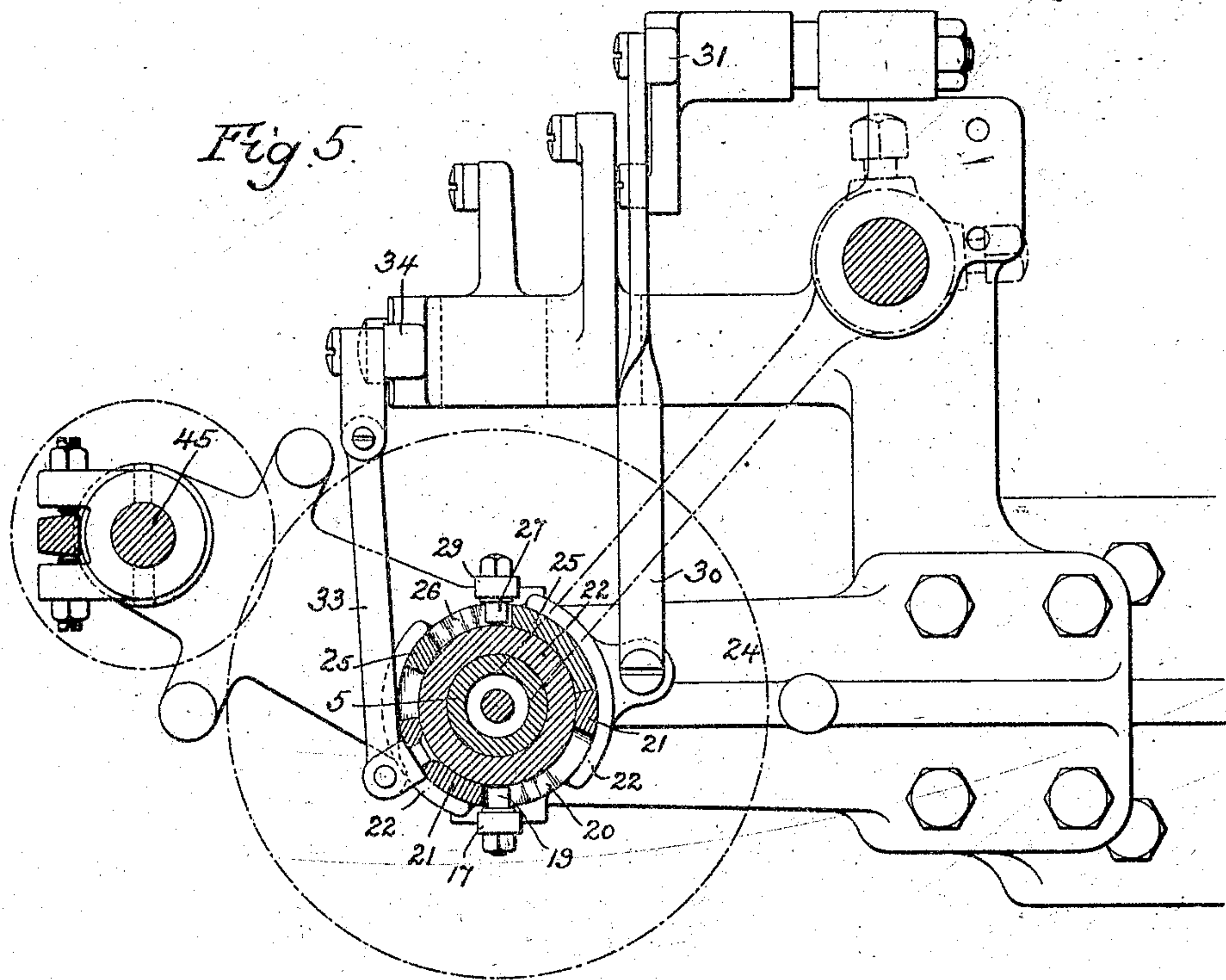
Inventor
Robert W. Scott
by his attorneys
Smith & Bagley

976,607.

R. W. SCOTT.
KNITTING MACHINE.
APPLICATION FILED MAY 15, 1907.

Patented Nov. 22, 1910.

5 SHEETS—SHEET 4.



Witnesses
Hamilton D. Turner
Kate A. Beadle

Inventor
Robert W. Scott
by his Attorneys
Smith & Tracy

976,607.

R. W. SCOTT.
KNITTING MACHINE.
APPLICATION FILED MAY 15, 1907.

Patented Nov. 22, 1910.

5 SHEETS—SHEET 5.

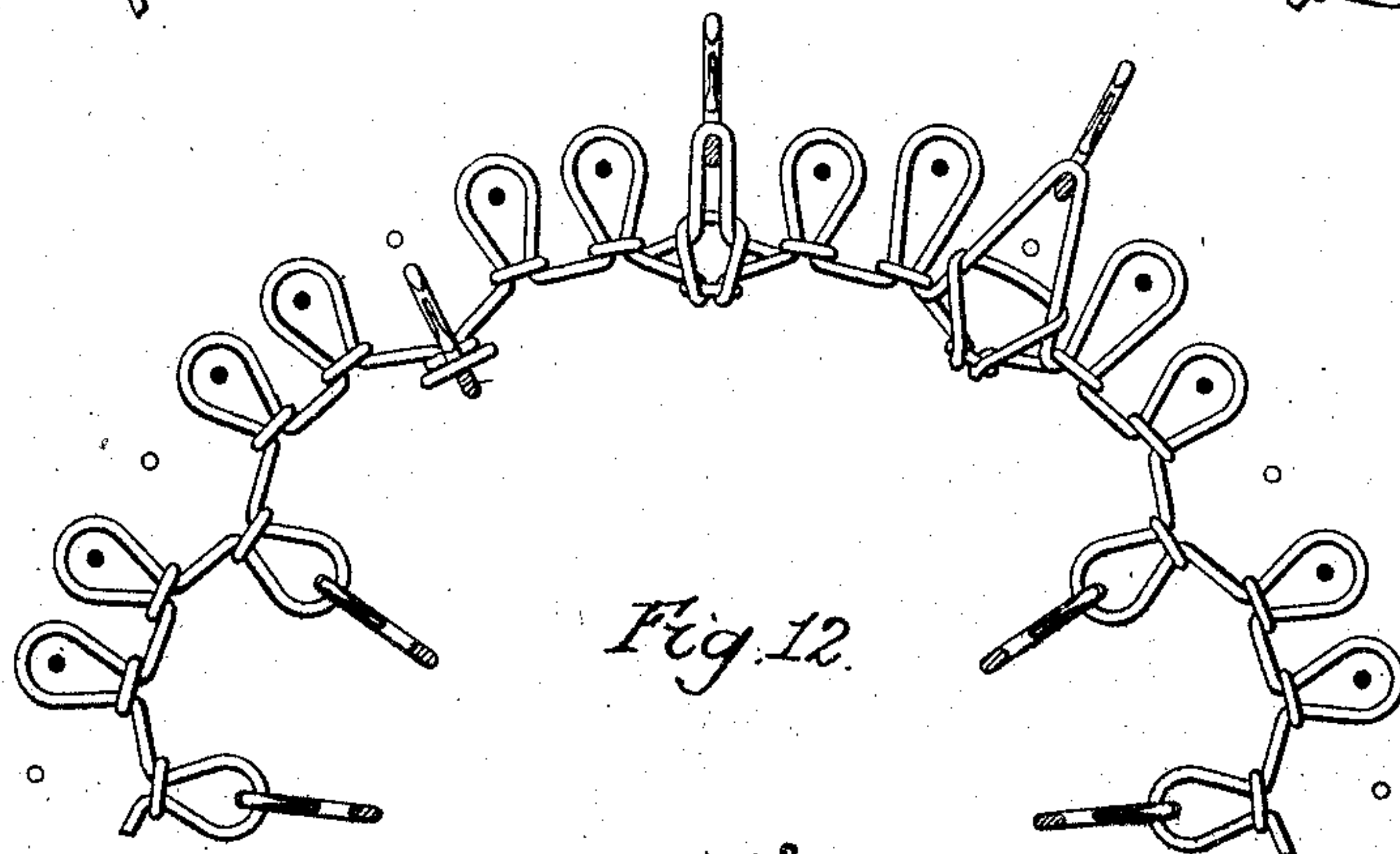
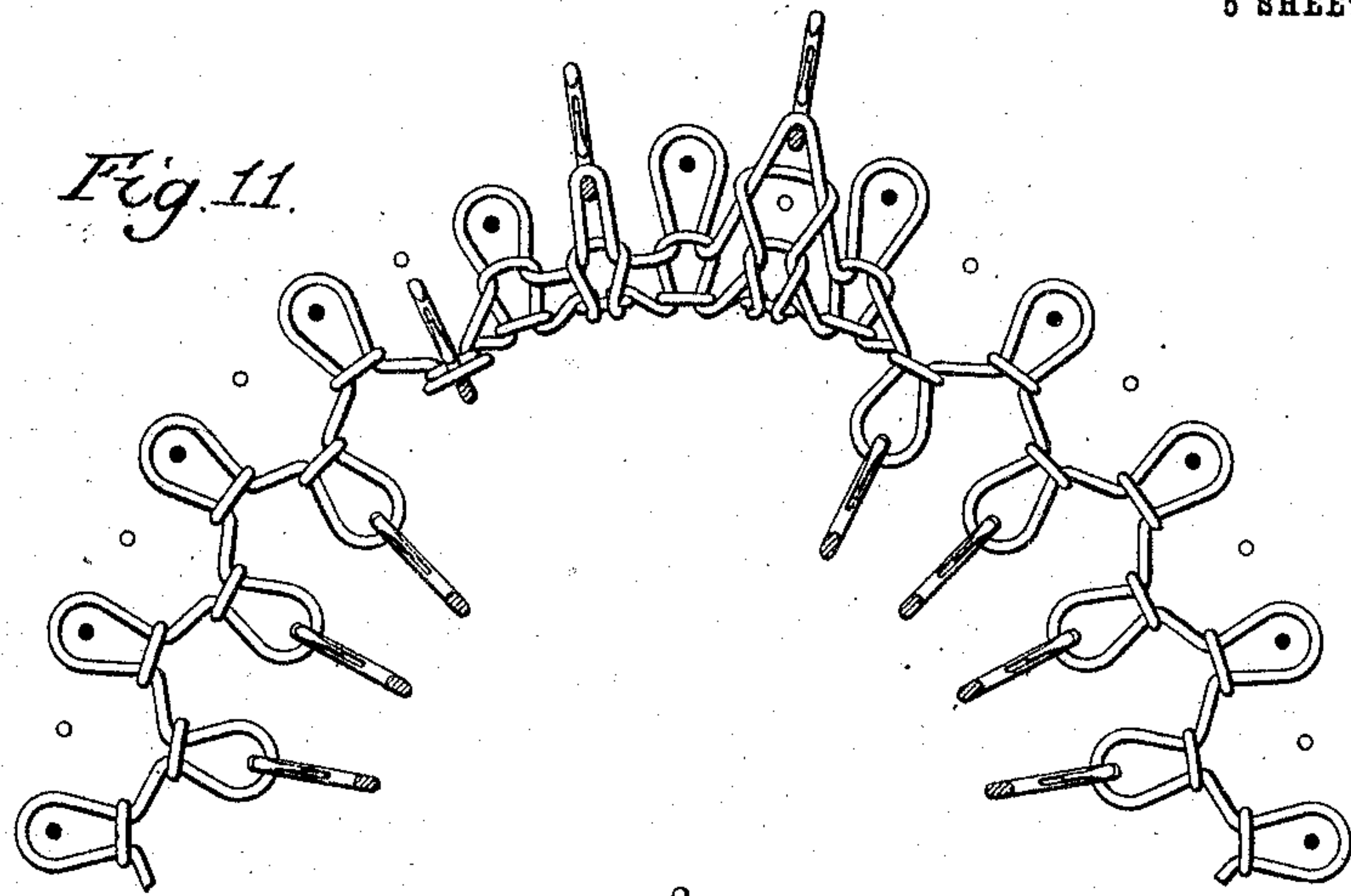


Fig. 9.

Fig. 8.

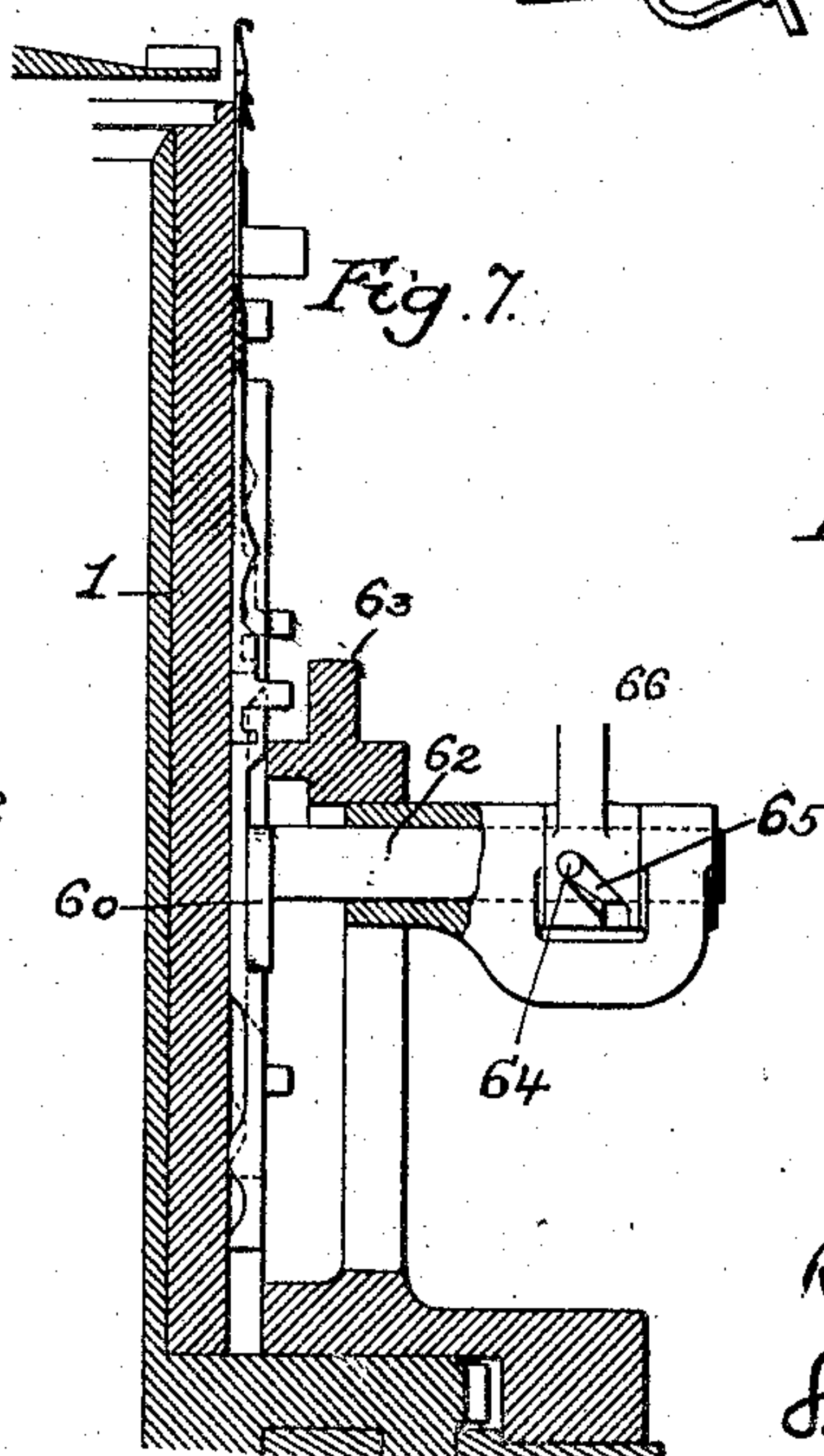
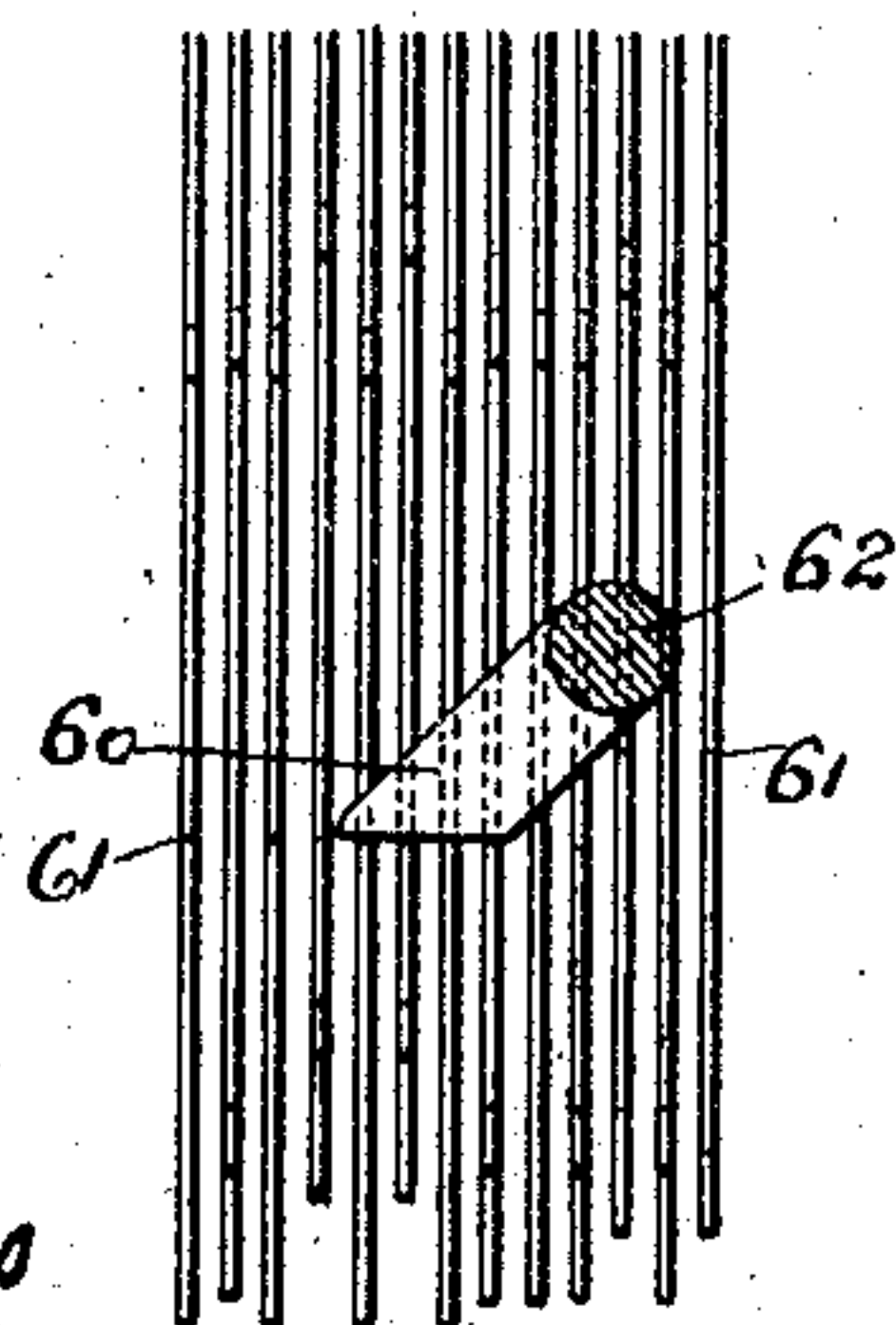


Fig. 10.



Witnesses
Hamilton D. Turner
Kate A. Besse

Inventor
Robert W. Scott
by his attorneys
Smith & Paget

UNITED STATES PATENT OFFICE.

ROBERT W. SCOTT, OF LEEDS POINT, NEW JERSEY, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO SCOTT & WILLIAMS, INCORPORATED, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

KNITTING-MACHINE.

976,607.

Specification of Letters Patent.

Patented Nov. 22, 1910.

Application filed May 15, 1907. Serial No. 373,876.

To all whom it may concern:

Be it known that I, ROBERT W. SCOTT, a citizen of the United States, and a resident of Leeds Point, Atlantic county, New Jersey, have invented certain Improvements in Knitting-Machines, of which the following is a specification.

My invention consists of certain features of a machine of the character shown in my previous Patent No. 834,763, dated October 30, 1906, and which may be briefly described as a machine having two sets of needles for the production of ribbed fabric, and provided with means whereby stitches may be transferred from needles of one set to needles of the other set, in order to effect change in the character of the web which is being produced.

My present invention comprises means for effecting the shogging of the transfer needles in order to cause a doubling of these stitches with the stitches already upon the needles to which they are transferred, also means for insuring the proper action, under all conditions of working of the machine, of the cams which move the dial needles to transfer position and then to inoperative position, and also means for so manipulating the stitches on either side of the stitch which is being transferred as to facilitate such transfer and increase the accuracy of the transfer operation.

In the accompanying drawings: Figure 1 is a view, partly in side elevation and partly in section, of sufficient of a machine to illustrate certain features of my invention; Fig. 2 is a view, partly in elevation and partly in vertical section, on the line *a—b*, Fig. 1; Fig. 3 is a view, partly in elevation and partly in vertical section, of the needle shogging devices; Fig. 4 is a plan view of said needle shogging devices illustrating the action of the same upon the dial needles; Fig. 5 is a sectional plan view on the line *b—b*, Fig. 1; Fig. 6 is a sectional plan view on the line *c—c*, Fig. 1; Fig. 7 is a sectional view of part of the needle cylinder and cam ring of the machine illustrating one of the features of my invention; Fig. 8 is a view of a cam forming part of said mechanism; Figs. 9 and 10 are views of two different types of needles employed in the machine; Figs. 11 and 12 are exaggerated diagrams illustrating the operation performed by the mechanism shown in Fig. 7; and Figs. 13 and 14

are side elevations of a pair of cam segments forming part of the mechanism for adjusting certain cams which act upon the dial needles of the machine. Figs. 2, 5 and 6 are on a smaller scale than Fig. 1, and Figs. 9 and 10 are on a larger scale than said figure.

Referring first to Figs. 1 and 2 of the drawings, 1 represents the needle cylinder of the machine, 2 the needle dial, and 3 the dial needle jacks mounted so as to swing on a ring 4 secured to the dial-carrying spindle 5 of the machine, these needle jacks being actuated by cams carried by a cam disk 6, also mounted upon the spindle 5, of which cams it will be necessary to refer herein only to the vertically adjustable cams 7 and 9 whereby the dial needles are abnormally projected in order to engage their stitches with the cylinder needles, and are then retracted in order to cast said stitches and become inoperative.

In the operation of the machine it is necessary at times to raise the dial needles in respect to the cylinder needles in order to form a slacker web, and in the machine of my former patent such operation effected a change in the relation of the cams corresponding to the cams 7 and 9 to the butts of the dial needle jacks, and one of the objects of my present invention is to overcome this objection, an object which I attain in the following manner: The retracting cam 7 is carried by a vertical stem 10 which has a pin 11 projecting into the groove of a ring 12 surrounding the sleeve 13 which constitutes part of the top frame 24, and serves as a bearing for the dial-carrying spindle 5. The cam 9 is carried by a stem 14 which has a pin 15 engaging a groove in a ring 16 which surrounds the hub of the ring 12, as shown by dotted lines in Fig. 1, and by full lines in Fig. 2. The ring 16 has an upwardly projecting bar 17 vertically guided in a slot in the top frame 24, and having a projecting pin 19 which engages a cam slot 20 in a segment 21, confined between upper and lower flanges of a ring 22, the latter being mounted upon the dial spindle 5 so as to be free to turn thereon and having, at the bottom, a cam 23 engaging with a corresponding cam surface in the top frame 24, as shown in Fig. 2. Between the flanges of the ring 22 is also mounted another seg-

ment 25, which has a cam slot 26 for the reception of a pin 27 on a bar 29, the latter being contained in a slot in the ring 16, and connected at its lower end to the hub of the lower ring 12, (see Fig. 2).

The flanges of the ring 22 are slotted for the reception of the bars 17 and 29, and the lower flange of said ring is connected, by a link 30, to a lever 31, which is operated, at the proper times and through suitable connections, by the general pattern drum of the machine, and the segment 21 is connected, by means of a link 33, to a similarly operated lever 34. The segments 21 and 25 do not completely embrace the ring 22, (see Fig. 5) and there is consequently provision for a certain amount of lost motion between said segments. The cam groove of each segment has a double lift, as shown in Figs. 13 and 14, and the cam groove 20 has a longer dwell portion than the cam groove 26, the purpose of this construction, in connection with the lost motion between the segments, being to effect independent movement of the two cams 7 and 9. As shown in Figs. 1 and 2 both cams are depressed and the first movement of the segment 21 in the direction of the arrow, Fig. 1, will have the effect of lifting the projecting cam 9 without affecting the position of the retracting cam 7, but the same movement will bring the forward end of the segment 21 into contact with the adjoining end of the segment 25 and further forward movement of said segment 21 will, therefore, be imparted to the segment 25 and the cam 7 will be lifted, the pin 19 of the bar 17, being, during this movement, contained in the dwell portion of the cam groove 20. The first portion of the reverse movement of the segment 21 will be devoted to taking up the lost motion between what is now the forward end of the same and the adjoining end of the segment 25, the pin 19 being still contained in the dwell portion of the cam slot 20, and the following portions of said movement will effect first a partial depression of both cams and then a complete depression of the same, for the purposes clearly set forth in my former patent.

The driving pinion 35, which is secured to the upper end of the dial spindle 5, rests upon a washer 36 supported upon the upper flange of the ring 22, hence when said ring is partially turned around the spindle in order to raise the same the dial needles, and their cam disk, by reason of the action of the cam 23, there will, at the same time be a corresponding lift of the segments 21 and 25, and of the rings 12 and 16 which control the operation of the cams 7 and 9, consequently the latter will always bear their proper and intended relation to the upper ends of the dial needle jacks whether the latter occupy the raised or the lowered position.

The shogging of the dial needles is effected by means of a pair of rotating wheels 40 and 41, (Fig. 4), each having beveled teeth and each driven so their peripheral portions move at the same speed as the dial needle jacks with which they engage, when said jacks are abnormally projected the teeth of the wheel 40 being beveled in one direction to correspondingly deflect said jacks in respect to the cylinder needles and the teeth of the wheel 41 being beveled in the opposite direction in order to restore said jacks to their former position before they are again retracted into the grooves of the dial. The wheels 40 and 41 are mounted respectively, upon studs 42 and 43 secured to and depending from one arm of a lever 44, which is pivotally mounted upon the driving shaft 45, at one side of the machine, the other arm of said lever 44 having a forked end for engaging a pin 46 on one arm of a lever 47 whose other arm is under control of a suitable cam on the pattern drum spindle, whereby it can be moved so as to carry the shogging wheels into and out of position to engage the needle jacks. Constant rotation of the shogging wheels 40 and 41 is effected by gearing them to the shaft 45, such gearing comprising a spur pinion 50 on said shaft, said pinion meshing with a spur wheel 51, which is mounted on a stud 52 carried by the lever 44 and meshes with spur pinions 53 and 54, secured, respectively, to the shogging wheels 40 and 41.

The diagram, Fig. 11, illustrates the transfer of rib stitches of a one-and-one ribbed web to theretofore inoperative cylinder needles alternating with the active cylinder needles, and Fig. 12, illustrates the transfer to like needles of the rib stitches of a two-and-one ribbed web, the stitches transferred in the operation shown in Fig. 11 being those of a course preceding that upon the needles, and the stitches transferred in the operation shown in Fig. 12, being those carried by the needles. Long stitches are drawn upon the cylinder needles on each side of that to which a dial needle stitch is being transferred, the purpose being to impart additional tension to the stitch upon the transfer needle so as to laterally distend the same and thereby provide an opening of increased area for the entrance of the receiving cylinder needle, the effect being the same whether said receiving needle enters a stitch of the course preceding that upon the transfer needle, as in Fig. 11, or the stitch carried by the needle as in Fig. 12. In order to effect this result extra draft is imparted to the cylinder needle on each side of the receiving needle and this extra draft is imparted by means of a cam 60 which acts upon a shoulder 61, (Figs. 7 and 9) formed on a jack of the needle on each side of that to which the stitch which

is to be transferred, the jacks of the receiving needles being without such shoulders but being cut away on their front sides to a greater depth, as shown in Fig. 10, so that the necessary movement can be imparted to them by the cams which move them into receiving position without bringing them into contact with the cam 60. Said cam 60 has two movements imparted to it, namely, a movement from and toward the needle jacks, and a swinging movement caused by partial rotation of the cam stem 62 around its axis, said stem being mounted in suitable bearings in the cam ring 63 of the machine, and having a projecting pin 64 which is under the influence of a cam slot 65 in the hub of a lever 66, capable of being moved in one direction or the other by suitable means under control of the pattern mechanism of the machine.

As shown in Fig. 7 the cam is in the operative position, but, by backward movement of the lever 66, said cam will first be withdrawn from engagement with the shouldered portions of the needle jacks and will then be turned up to the inoperative position shown by dotted lines in Fig. 8, movement of the lever 66 in the opposite direction effecting first a forward thrust of the cam so as to bring it into position above the shouldered portions of the jacks and then a downward movement which will adjust it to position for depressing said jacks as they successively come under its influence, the cam being so formed as to retain at least two adjoining needles in such depressed position during the time the stitch is being transferred to the needle between them.

I claim:—

1. The combination, in a knitting machine, of dial needles, cams for operating the same to transfer their stitches, cam-adjusting devices, and means for effecting a common rise and fall of said dial needle cams and cam-adjusting devices.

2. The combination, in a knitting machine, of dial needles, cams for operating the same to transfer their stitches, cam-adjusting devices, dial needle raising and lowering devices, and means engaged by the latter for imparting a like movement to the cam-adjusting devices.

3. The combination, in a knitting machine, of dial needles, cams for operating the same to transfer their stitches, dial needle raising and lowering devices, and cam-adjusting devices engaging, but susceptible of movement independently of, said raising and lowering devices.

4. The combination, in a knitting machine, of dial needles, cams for operating the latter to transfer their stitches, dial needle raising and lowering devices, and cam-adjusting devices comprising cam seg-

ments engaging said raising and lowering devices but movable independently of the same, said cam segments being constructed to provide lost motion between them.

5. The combination, in a knitting machine, of dial needles, cams for operating the latter to transfer their stitches, and means for imparting to said cams a two-stage movement whereby they are caused to engage the needles.

6. The combination, in a knitting machine, of dial needles, cams for operating the latter to transfer their stitches, raising and lowering devices for said dial needles, and cam-segments movable with said devices, each segment controlling one of the dial-needle-operating cams and each being so formed as to impart a two-stage movement to the cam controlled thereby.

7. The combination, in a knitting machine, of dial needles, cams for operating said needles to transfer their stitches, and means for moving said cams simultaneously into operative position and successively to inoperative position.

8. The combination, in a knitting machine, of dial needles, cams for operating said needles to transfer their stitches, dial needle raising and lowering devices, cam segments movable with the latter, and means for operating said cam segments whereby they are caused to impart simultaneous movement to the dial-needle-operating cams in one direction and successive movement in the opposite direction.

9. The combination, in a knitting machine, of dial needles, cams for operating the same to transfer their stitches, rings for controlling said cams, devices for raising and lowering the dial needles, and a cam structure engaging said devices and constructed to control, independently, the rings which govern the operation of the dial-needle-operating cams.

10. The combination, in a knitting machine, of dial needles, cams for operating the same to transfer their stitches, a cam ring for raising the dial needles, a cam structure engaging said ring and imparting movement to the dial-needle-operating cams, and means for independently operating said cam structure and cam ring.

11. The combination, in a knitting machine, of two sets of needles, those of one set being movable into position to transfer stitches to needles of the other set, and a pair of toothed and rotatable shogging wheels for acting upon the needles from which said transfer is effected.

12. The combination, in a knitting machine, of two sets of needles, those of one set being movable into position to transfer stitches to needles of the other set, a pair of toothed and rotatable shogging wheels for

acting upon said transfer needles, a shogging wheel carrier, and means for moving the latter so as to adjust its shogging wheels into or out of position to engage the transfer needles.

13. The combination, in a knitting machine, of two sets of rotating needles, those of one set being adjustable into position to transfer stitches to needles of the other set, a pair of toothed shogging wheels acting upon said transfer needles, and means for rotating said wheels whereby their toothed portions will move in unison with the rotary movement of the transfer needles.

14. The combination, in a knitting machine, of two sets of needles, those of one set being movable into position to transfer stitches to needles of the other set, and a pair of toothed and rotatable shogging wheels for engaging said transfer needles, the teeth of one of said wheels being beveled in a direction the reverse of those of the other wheel.

15. The combination, in a knitting machine, of two sets of needles, means for transferring stitches from needles of one set to needles of the other set, and means for imparting draft to the needles flanking a receiving needle during the time that a stitch is being transferred thereto.

16. The combination, in a knitting machine, of two sets of needles, means for transferring stitches from needles of one set to needles of the other set, a cam for imparting draft to the needles which flank a receiving needle at the time of the transfer of the stitch thereto, and means for moving said cam into and out of operative position.

17. The combination, in a knitting machine, of two sets of needles, means for transferring stitches from needles of one set to needles of the other set, a cam for imparting draft to the needles flanking a receiving needle at the time that the stitch is being transferred to the latter, and means

for moving said cam from and toward said needles.

18. The combination, in a knitting machine, of two sets of needles, means for transferring stitches from needles of one set to needles of the other set, a cam for imparting draft to the needles which flank a receiving needle at the time of the transfer of the stitch thereto, and means for swinging said cam.

19. The combination, in a knitting machine, of two sets of needles, means for transferring stitches from needles of one set to needles of the other set, a cam for imparting draft to the needles which flank a receiving needle at the time of transfer, and means for imparting to said cam a swinging movement and a movement from and toward the needles.

20. The combination, in a knitting machine, of two sets of needles, means for transferring stitches from needles of one set to needles of the other set, and a cam for imparting draft to the needles which flank a receiving needle at the time of transfer, the latter needles having shoulders for engaging said draft cam, which shoulders are independent of the butts upon which the knitting cams act.

21. The combination, in a knitting machine, of two sets of needles, means for transferring stitches from needles of one set to needles of the other set, and a cam for imparting draft to the needles which flank a receiving needle at the time of transfer, said latter needles having recessed jacks for receiving said draft cam.

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

ROBERT W. SCOTT.

Witnesses:

HAMILTON D. TURNER,
KATE A. BEADLE.