

Feb. 28, 1939.

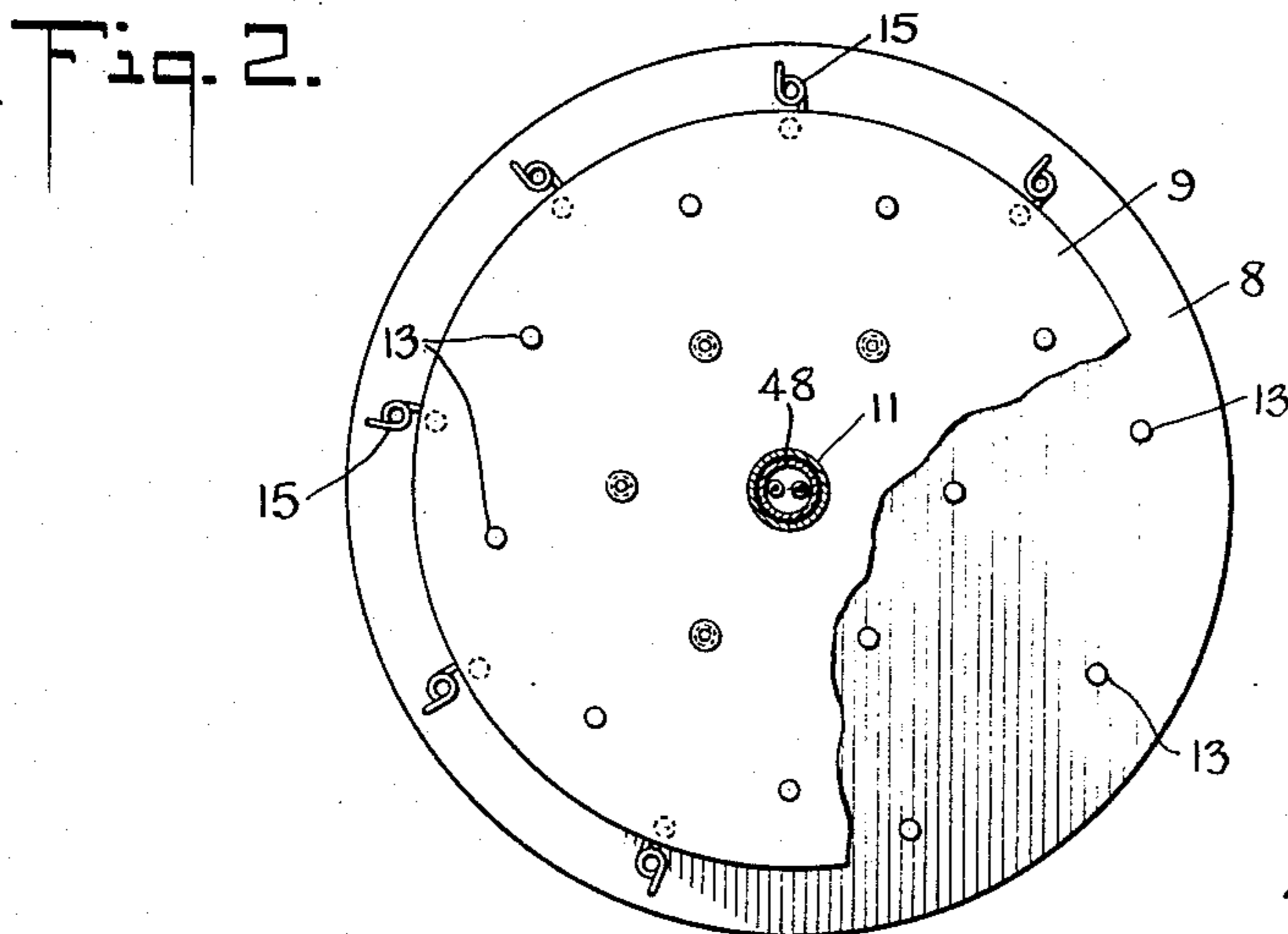
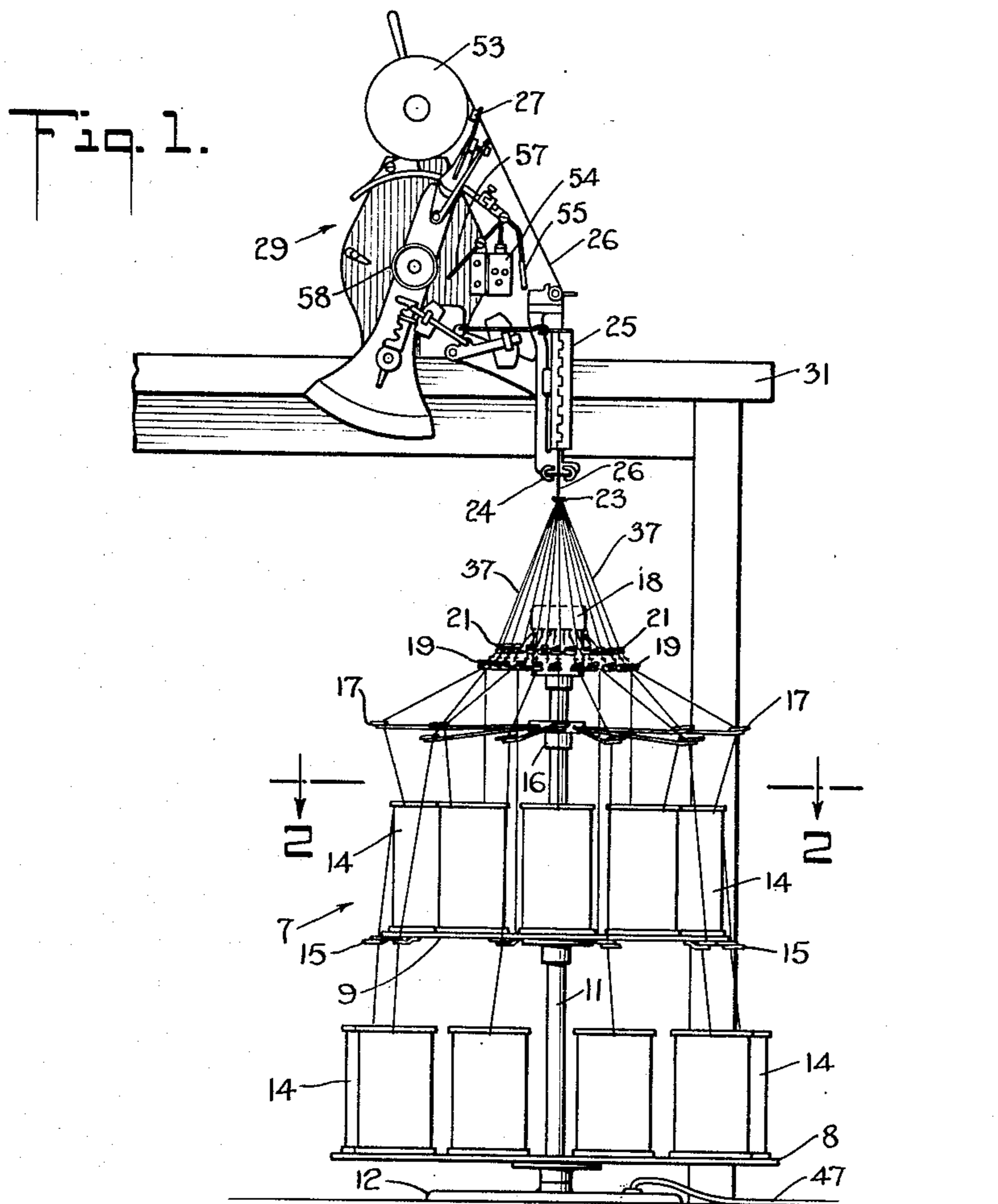
K. A. WOLFE

2,148,665

STOP MOTION

Filed Aug. 17, 1937

2 Sheets-Sheet 1



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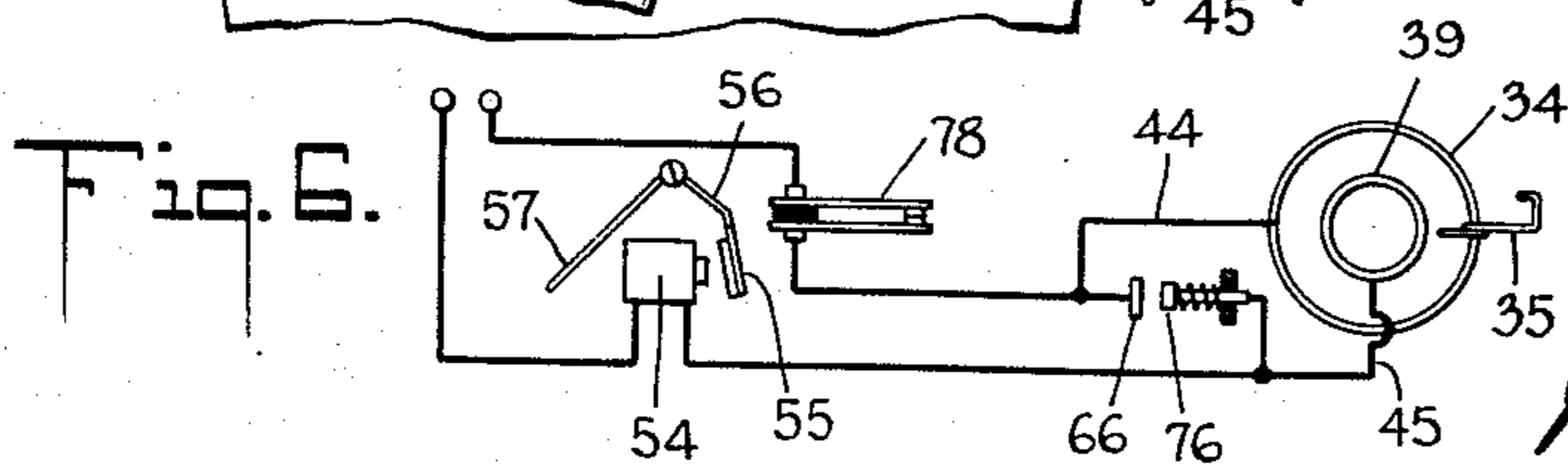
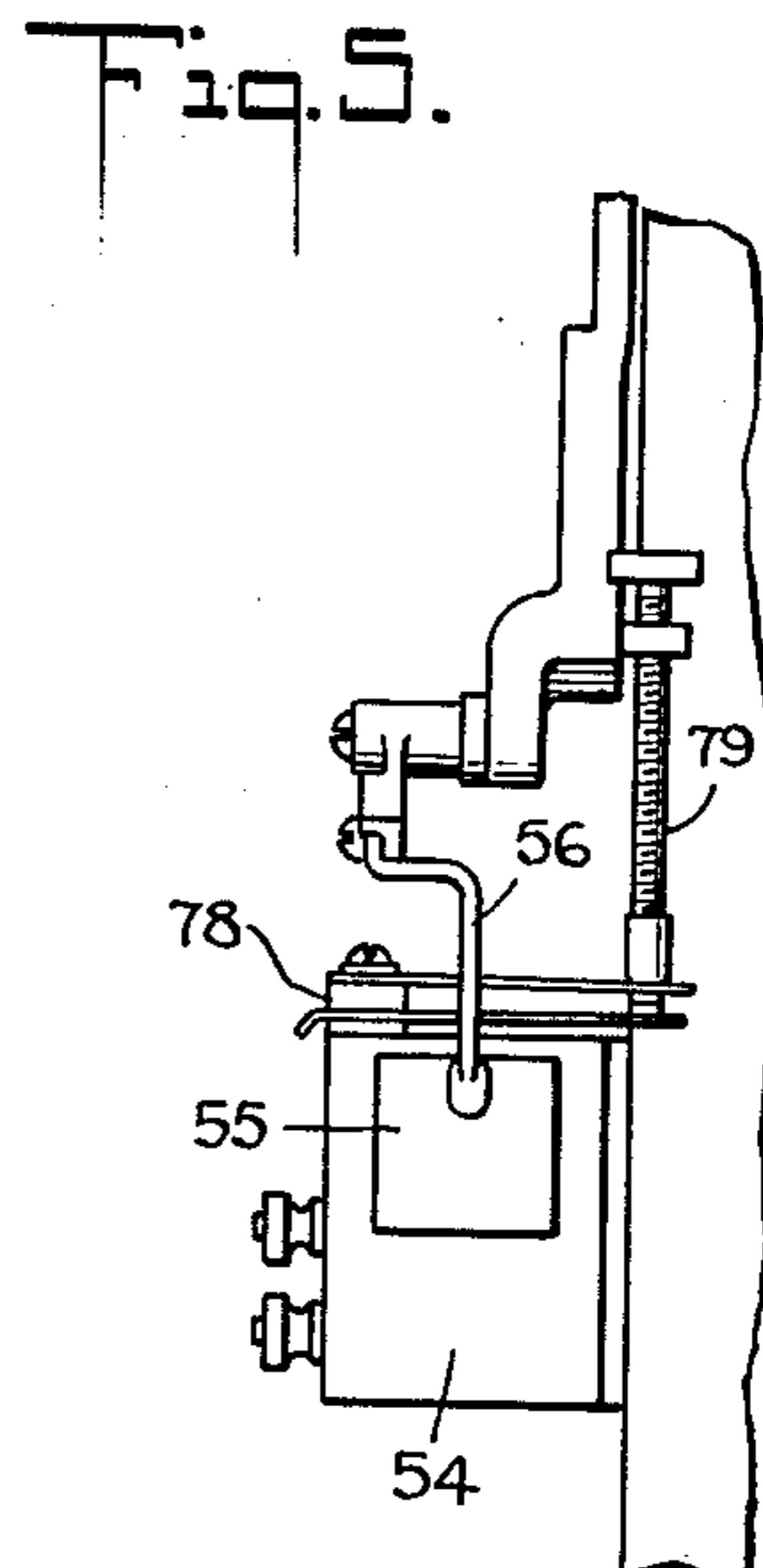
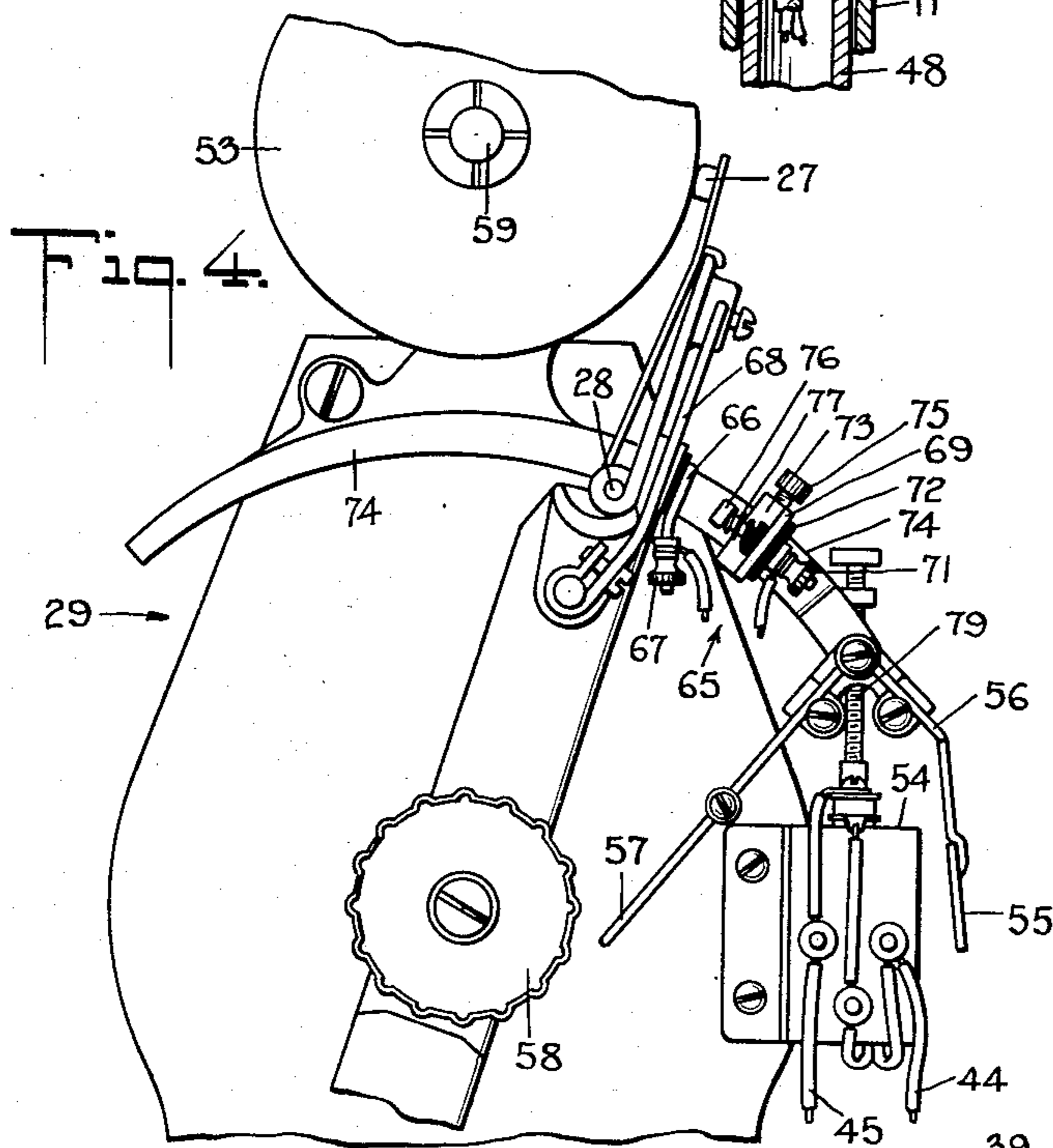
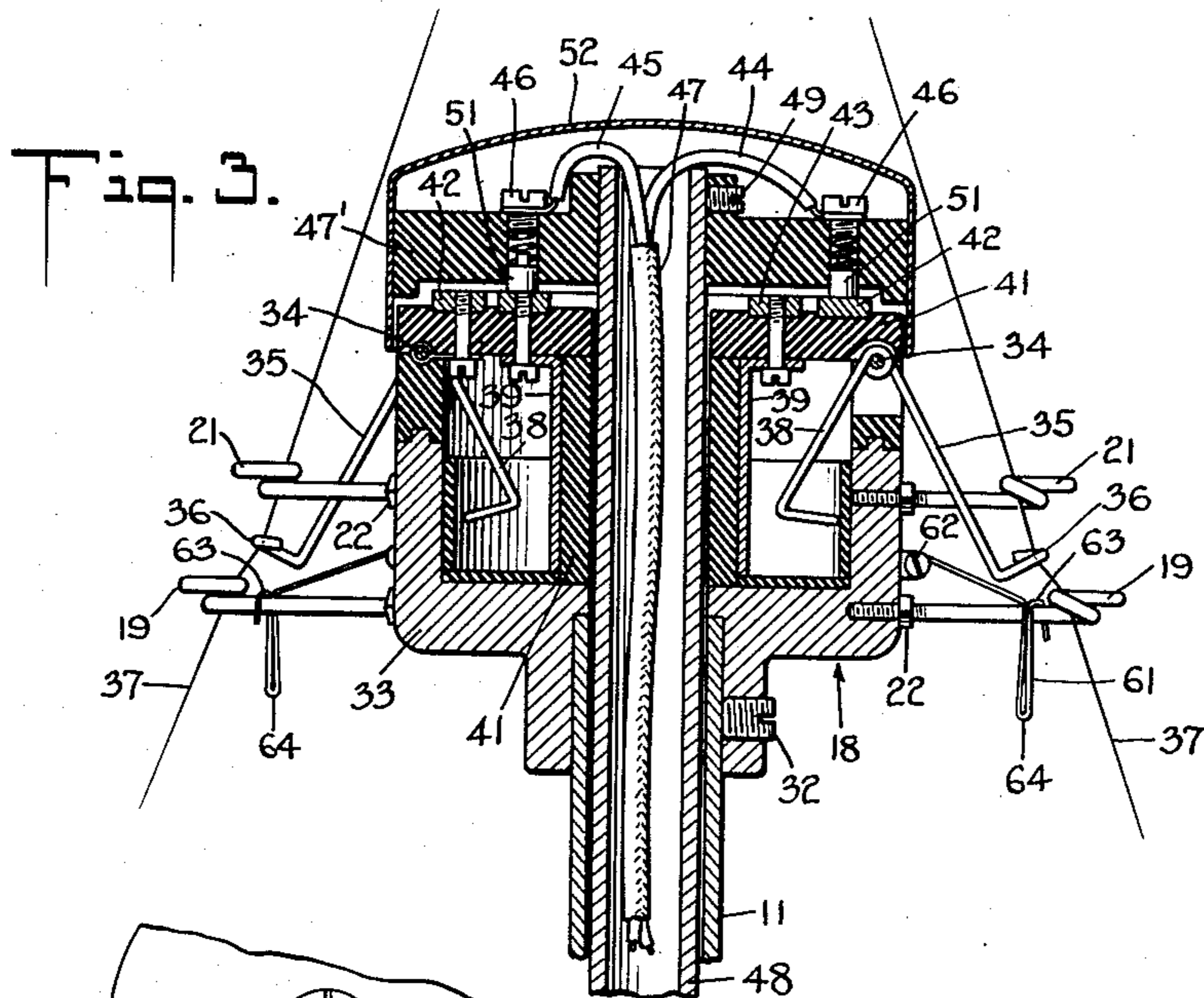
K. A. WOLFE

2,148,665

STOP MOTION

Filed Aug. 17, 1937

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,148,665

STOP MOTION

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6 Claims. (Cl. 242—38)

This invention relates to textile machinery, and in particular to winding mechanisms for winding cheeses and like packages in which a thread or a number of threads are taken from a package or a number of packages and are wound into a cheese.

It is an object of this invention to provide an improved stop motion that is operable upon the breakage of a thread to stop the winding of the thread onto the thread package.

Another object of this invention is the provision of means for stopping the winding of the thread when the thread package has reached a predetermined size or diameter.

Still another object of this invention is the provision of an improved cheesing tree.

Other objects of this invention, together with certain details of construction and combinations of parts, will appear from the following detailed description and the appended claims.

In one aspect this invention comprises the provision of a multiple end cheesing tree designed to support a predetermined number of supply packages. The number of packages which may be supported by and regularly spaced on the cheesing tree is governed by the fixed height of and the distance between the centers of the winding machines' take up spindle driving assemblies. The cheesing tree comprises in general a revolving stand having two decks upon which the packages of thread or yarn are supported, the upper deck being smaller and therefore adapted to support a lesser number of packages than the lower or larger deck. The cheesing tree of the instant invention is designed to furnish from two to twenty-four ends.

In order to maintain and insure a full complement of ends at all times, the cheesing tree is provided with a stop motion device cooperating with means on the take-up mechanism for stopping the operation of the take-up device in the event that an end breaks or the yarn on the supply package fails.

In another aspect the invention relates to the provision of an electrically operated sizing gauge which cooperates with, but which operates independently of, the end breakage stop motion to stop the operation of the take-up mechanism when the diameter of the cheese or other package being wound reaches a predetermined diameter.

The invention will now be described in greater detail, particularly with reference to the accompanying drawings, wherein the preferred embodiment of my invention is shown. It is to be understood, however, that this description is given by

way of example only and is in no way limitative.

In the drawings:

Figure 1 is a view showing a unit assembly comprising the cheesing tree and the take-up winding mechanism,

Figure 2 is a view taken on line 2—2 in Figure 1, a portion of the upper deck of the cheesing tree being broken away,

Figure 3 is a cross-sectional view of the turret head,

Figure 4 is a detail view, on an enlarged scale, of the take-up winding mechanism showing the electro-magnet operated stopping lever and wheel arrangement and the switch for causing the winding operation to stop when the cheese or cone being wound has reached a predetermined diameter,

Figure 5 is a detail view of the electro-magnet arrangement showing the spring bar switch and means for operating the same, and

Figure 6 is a wiring diagram for the operation of the electro-magnet.

Like reference numerals indicate like parts throughout the several views of the drawings.

Referring to Figures 1, 2 and 3 of the drawings, the cheesing tree, generally indicated by reference numeral 7, comprises a lower deck 8 and upper deck of smaller diameter 9 which are suitably supported on a tube 11 held in at base plate 12 of any suitable material, which plate may be fastened to the floor. The lower and upper decks of the cheesing tree are provided with supply package spacing and supporting pins 13. In the modification shown in the drawings, the lower deck is provided with fifteen spacing and supporting pins arranged in staggered relationship and the upper deck is provided with nine pins equally spaced in a circle. Thus, each supply package 14 on the multiple cheesing tree is provided with an individual support so that there will be no interference between the yarns taken from supply packages.

Along the periphery of the upper deck 9, and preferably at regular intervals, are fixed yarn guides 15. At a point above the upper deck 9, suitably fixed to tube 11, are additional yarn guides 17. Yarn guides 15 and 17 are arranged to permit of a substantially direct overhead yarn take-off from each supply package. The turret head, generally indicated by reference numeral 18, also carries two sets of yarn guides 19 and 21 which are screwed into the turret head at regular intervals around the same and are held therein by means of locknuts 22. Yarn guides 19 and 21, together with yarn guide 23 supported from a

bracket 24 carried by a gate tension device 25, direct the ends into a multiple strand yarn 26 prior to their entry into and through the gate tension device 25 and over a pick-up guide 27 attached to traverse bar 28 of the take-up winding mechanism generally indicated by reference numeral 29, which winding mechanism is supported on a table or bench 31.

The turret head 18 mounted at the top of the cheesing tree and fastened to the tube 11 by means of a set screw 32 is a multiple single throw switching or circuit controlling device and comprises primarily a circular fibre case or insulating shell 33 which contains the terminals of a portion of an electrical circuit. The terminals are two separated annular rings. The outer ring 34, preferably formed of bronze wire, supports the middle section of a series of radially spaced, unbalanced knee-shaped drop wires 35, each having a pigtail end 36, which are free to move independently in a vertical arc. The drop wires 35, corresponding to the blade of a single pole, single throw switch are heavier at the external pigtail end, and, when unsupported or not raised by yarn 37 from supply packages 14, permit the knee-like opposite end 38 to make contact with and press against the outer wall surface of the inner terminal ring 39 which is preferably made of copper and is insulated from the outer terminal ring 34 by means of suitable insulating material 41. The terminal rings 34 and 39 are separately connected to concentric flat copper rings 42 and 43, respectively, which in turn are connected to lead wires 44 and 45, respectively, through the medium of binding posts 46 held in a fibre disc 47. The lead wires 44 and 45 have a covering 47 pass through an insulating tube 48 which extends through the turret head and down through tube 11, the wires coming out at the base 12 as shown in Figure 1. Set screw 49 is adapted to hold insulating tube 48 in position within tube 11.

The binding posts are each provided with a spring pressed terminal shoe 51. The purpose of the concentric flat rings 42 and 43 and terminal shoes 51 is to provide movable current conductors in order that the cheesing tree may be revolved about its axis without twisting the wires 44 and 45 which extend through the tube and are connected to the binding posts 46, as noted above. A fibre cap 52 completes the enclosure of the fibre case 33 and conceals the wire ends and binding posts.

The individual single pole switches formed by the drop wires 35 are, therefore, current controlling links in an electrical circuit and are motivated by the continuity of the yarn which passes through the pigtail end or ends 36 of the drop wires. Thus, so long as the yarn is being taken up on to the package or cheese 53 and is accordingly under tension, the drop wire is in the raised position shown in Figure 3 of the drawings and the knee-like portion 38 of the drop wire has moved away from the inner terminal ring 39 thus breaking contact therewith. As long as the drop wires are out of contact with the inner terminal ring 39, the draw-off from the supply packages 14 and the rewinding on to the cheese 53 will continue with the machine running. However, in the event that an end breaks or slackens unduly, the drop wire will fall or rotate about terminal ring 34, the portion 38 of the drop wire will contact terminal ring 39 thus completing an electrical circuit which causes electro-magnet 54 to become energized. The en-

ergized electro-magnet attracts iron plate or armature 55 which is attached to breakage lever 56. The movement of plate 55 causes the breakage lever to move downward in an arc to raise stopping lever 57 into contact with the continuously rotating stopping wheel 58. The progressive stages of stopping the winding from this point are similar in every respect to those effected in a standard winding machine, i. e. such as the machine manufactured by the Universal Winding Company. The winding spindle 59 of the winding machine will remain at a stand-still until continuity of yarn is reestablished and the operation of the machine manually started.

As shown in Figure 3 of the drawings the drop wires 35 are held out of contact with terminal ring 39 by the yarn 37. However, it is often desired to wind a number of ends which is less than the maximum capacity of the cheesing tree. To this end steel drop wire lifters 61, which are pivoted at 62 on the turret head, are provided. The drop wire lifter is provided with a hook 63 adapted to rest on yarn guide 19 when its complementary drop wire is in use. When the drop wire is not in use, the lifter is raised and hooked on to yarn guide 21, the drop wire being held in raised, or inoperative position, in bend 64 of the lifter 61. In this manner the switch assembly is suitable for use under a wide range of conditions of service. With the drop wire lifters, the drop wires may be individually or collectively held out of contact with the terminal ring 39, thereby permitting any number of ends to be successfully carried through the stop motion assembly.

The device of this invention is also provided with a sizing gauge for automatically stopping the winding of the package when it has reached a predetermined size. This sizing gauge, generally indicated by reference numeral 65, is a small, single circuit "make and break" contractor comprising two copper terminal plates. One terminal plate 66, having a binding post 67, is mounted on the balanced traverse frame casting 68. The companion terminal plate 69, having a binding post 71, is mounted on a fibre insulating base 72, which base is attached to an adjustable holding member 73. This portion of the switch member is movable along and is adapted to be held in adjusted position on the breakage lever supporting casting 74, the position depending on the size of the yarn package desired, by means of set screw 75. A button head contact pin 76 connected to binding post 71 extends through terminal plate 69 and fibre insulator 72. Between the head of the contact pin and the terminal plate, there is inserted a compression spring 77 which provides a cushioning effect when touched by the terminal plate 66 which is progressively advanced toward contact pin 76 by traverse frame 68 as the latter is moved clockwise and outward as the yarn package is built up on the spindle. Thus, when the yarn package has reached a predetermined size, the travelling terminal plate 66 contacts the head of pin 76 closing a normally open circuit, resulting in the energization of the electro-magnet 54 which, through the operations outlined above, causes the winding operation to stop.

Mounted on the electro-magnet 54 is a two-point parallel spring bar switch 78. The purpose of this switch is to serve as an automatic circuit breaker or secondary switch to interrupt the flow of current into the electro-magnet at any time when the machine is inactive and the spindle is

at rest. This secondary switch is adapted to interrupt the circuits of the drop wire switches on the cheesing tree and of the sizing gauge switch. The spring bar switch is adapted to be closed by means of a screw 79 (see Figure 5).

It is to be understood that the foregoing detailed description is merely given by way of illustration and that many variations may be made therein without departing from the spirit of my invention.

Having described my invention, what I desire to secure by Letters Patent is:

1. In a device of a character described, the combination with a take-up mechanism and means including an electrically operated member for cooperating with said take-up mechanism for stopping the operation thereof, of means for holding a supply of thread to be wound into a package by said take-up mechanism, said means comprising a tube, means mounted on said tube for supporting a plurality of thread packages, a head on said tube, said head having a plurality of concentric rings adapted to be electrically energized, and drop wires supported on one of said rings, said drop wires being adapted, upon failure or undue slackening of the thread, to come in contact with the other of said rings to close an electrical circuit so as to cause said electrically operated member to arrest the motion of said take-up mechanism.

2. In a device of a character described, the combination with a take-up mechanism and means including a lever operated by a solenoid cooperating with said take-up mechanism for stopping the operation thereof, of means for holding a supply of thread to be wound into a package by said take-up mechanism, said means comprising a tube, means mounted on said tube for supporting a plurality of thread packages, a head on said tube, said head having a plurality of concentric rings adapted to be electrically energized, and drop wires supported on one of said rings, said drop wires being adapted, upon failure or undue slackening of the thread, to come in contact with the other of said rings to close an electrical circuit to energize said solenoid whereby said lever operates to arrest the motion of said take-up mechanism.

3. In a device of a character described, the combination with a take-up mechanism and means including a lever operated by a solenoid cooperating with said take-up mechanism for stopping the operation thereof, of means for holding a supply of thread to be wound into a package by said take-up mechanism, said means comprising a tube, means mounted on said tube for supporting a plurality of thread packages, a head on said tube, said head having a plurality

of concentric rings adapted to be electrically energized, drop wires supported on one of said rings, said drop wires being adapted, upon failure or undue slackening of the thread, to come in contact with the other of said rings to close an electrical circuit to energize said solenoid whereby said lever operates to arrest the motion of said take-up mechanism, and means in the same electrical circuit for causing said lever to be operated to arrest the motion of the take-up mechanism when the take-up package has reached a predetermined size.

4. In a device of a character described, the combination with a take-up mechanism and means including a lever operated by a solenoid cooperating with said take-up mechanism for stopping the operation thereof, of means for holding a supply of thread to be wound into a package by said take-up mechanism, said means comprising a tube, means mounted on said tube for supporting a plurality of thread packages, a head on said tube, said head having a plurality of concentric rings adapted to be electrically energized, drop wires supported on one of said rings, said drop wires being adapted, upon failure or undue slackening of the thread, to come in contact with the other of said rings to close an electrical circuit to energize said solenoid whereby said lever operates to arrest the motion of said take-up mechanism, and means for holding said drop wires in inoperative position.

5. A cheesing tree comprising a base, a tube mounted on said base, a plurality of discs carried by said tube, said disc being adapted to support a plurality of thread packages thereon in spaced relation, a head carried on said tube, said head having a plurality of concentric rings adapted to be electrically energized, and drop wires supported on one of said rings, said drop wires being adapted when coming in contact with the other of said concentric rings to arrest the motion of a take-up mechanism when operatively connected thereto.

6. A cheesing tree comprising a base, a tube mounted on said base, a plurality of discs carried by said tube, said disc being adapted to support a plurality of thread packages thereon in spaced relation, a head carried on said tube, said head having a plurality of concentric rings adapted to be electrically energized, drop wires supported on one of said rings, said drop wires being adapted when coming in contact with the other of said concentric rings to arrest the motion of the take-up mechanism when operatively connected thereto, and means for holding the drop wires in inoperative position.

KINSEY A. WOLFE.