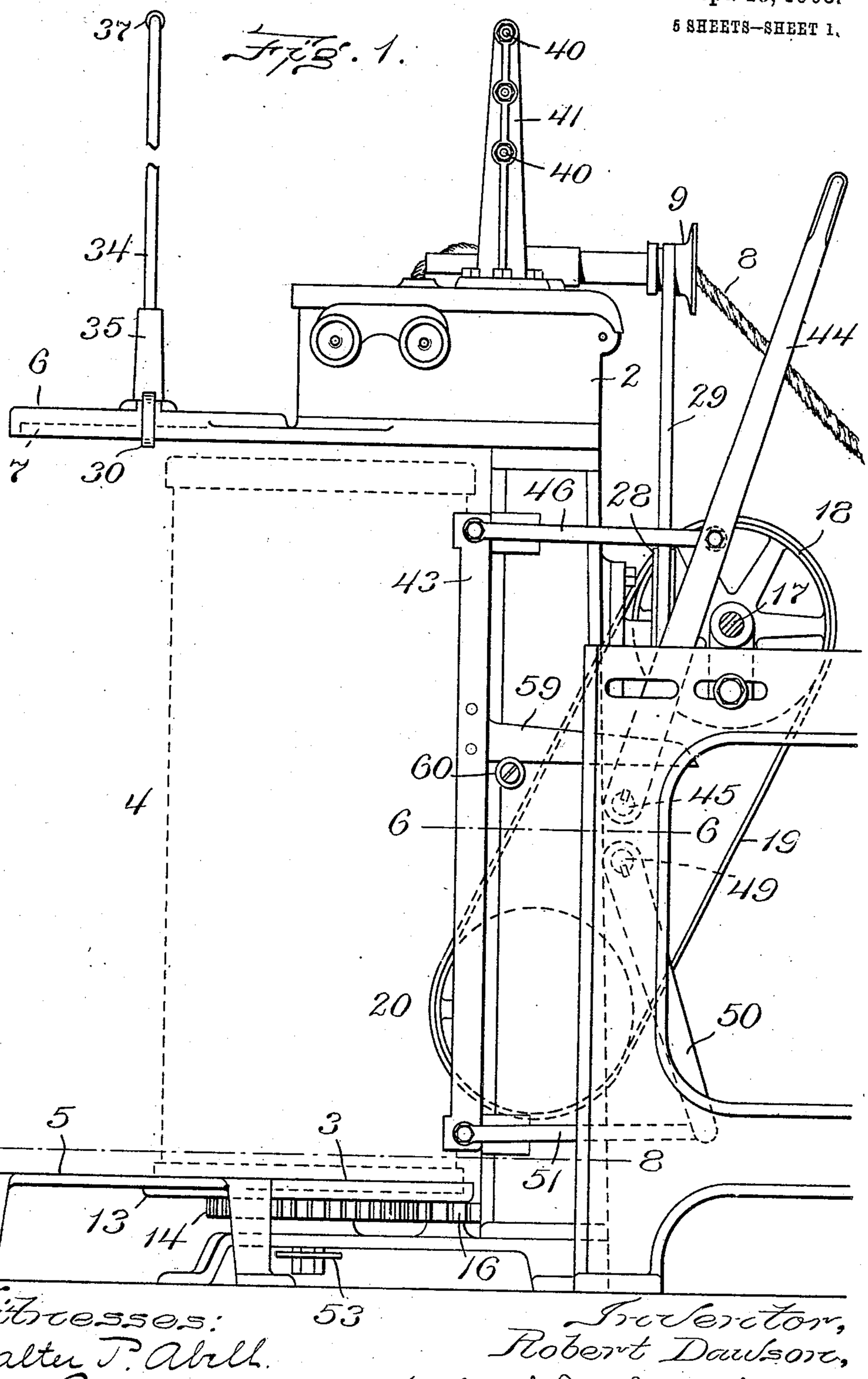
R. DAWSON, DEC'D.
F. E. DAWSON, EXECUTRIX.
MACHINE FOR LOOSELY PACKING FIBER.
APPLICATION FILED MAY 5, 1906.

898,841.

Patented Sept. 15, 1908.

5 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Walter J. Abell.
A. C. Ratigan

Inventor,
Robert Dawson,
by Langhorne Brown Dunlop & Hay
Attorneys.

R. DAWSON, DEC'D.

F. E. DAWSON, EXECUTRIX.

MACHINE FOR LOOSELY PACKING FIBER.

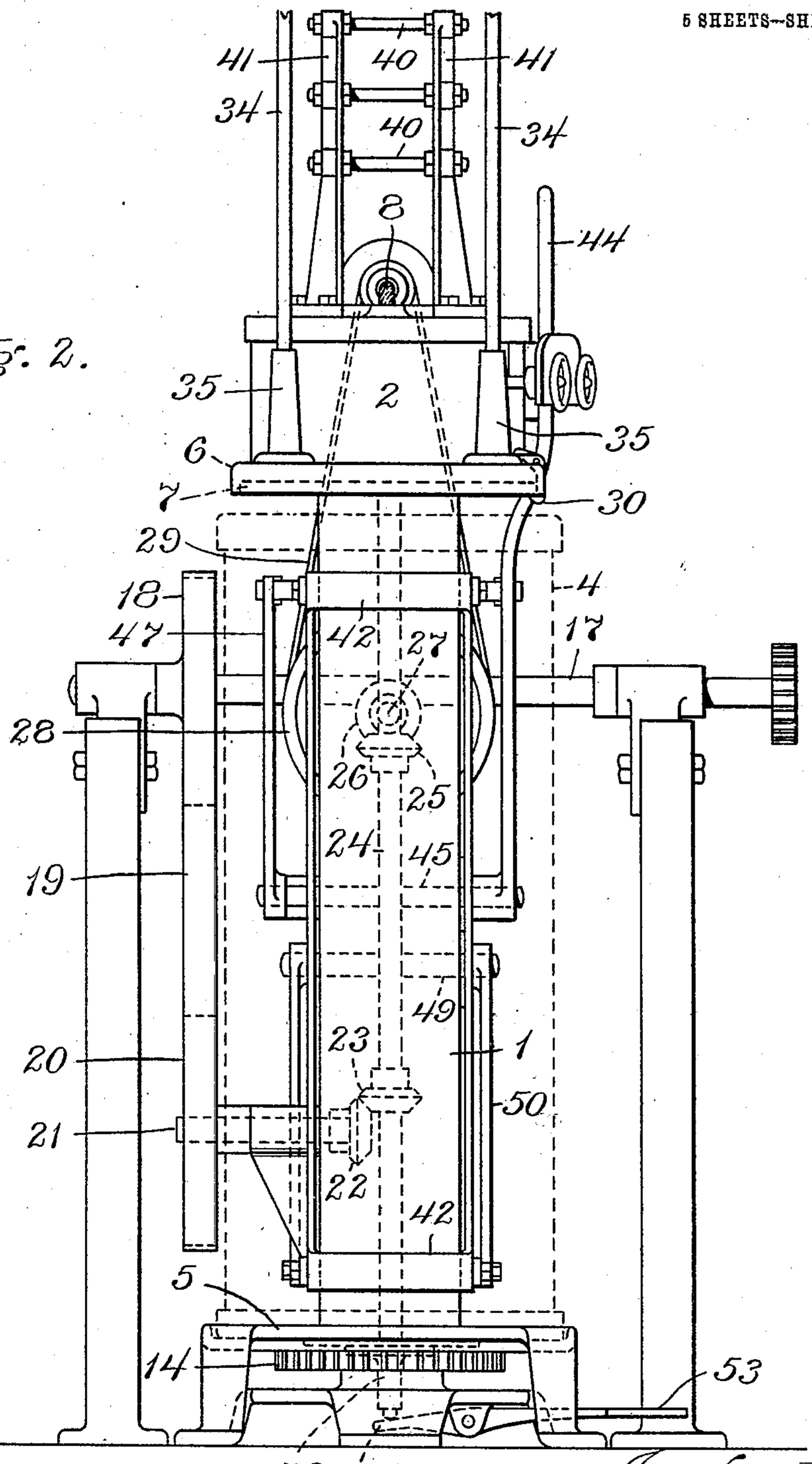
APPLICATION FILED MAY 5, 1906.

898,841.

Patented Sept. 15, 1908.

5 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
Walter P. Abell.
A. C. Religon

Inventor,
Robert Dawson,
by Wright Brown Quinby & May
Attorneys.

R. DAWSON, DEC'D.
F. E. DAWSON, EXECUTRIX.
MACHINE FOR LOOSELY PACKING FIBER.
APPLICATION FILED MAY 5, 1906.

898,841.

Patented Sept. 15, 1908.

5 SHEETS—SHEET 3.

Fig. 4.

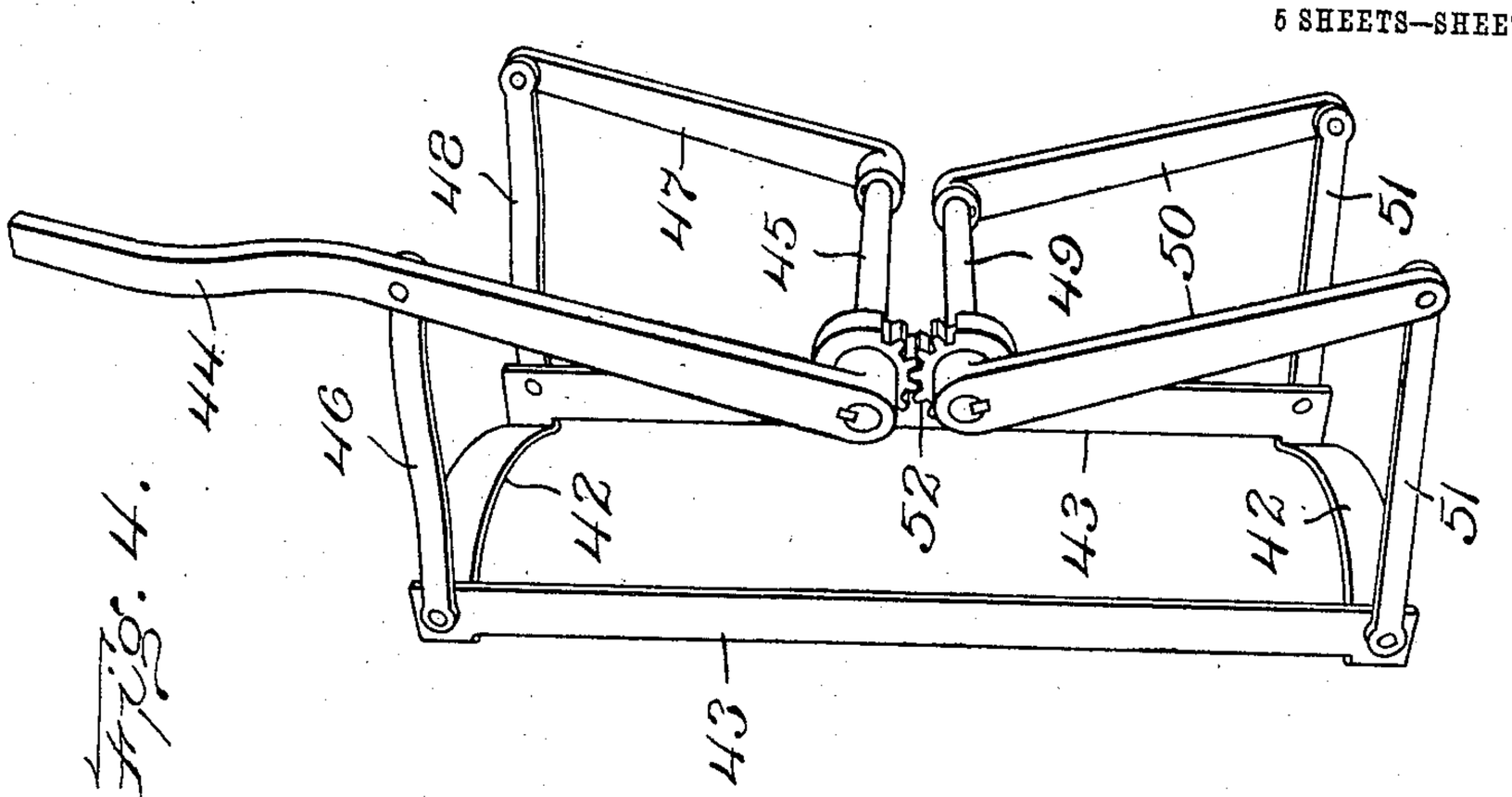
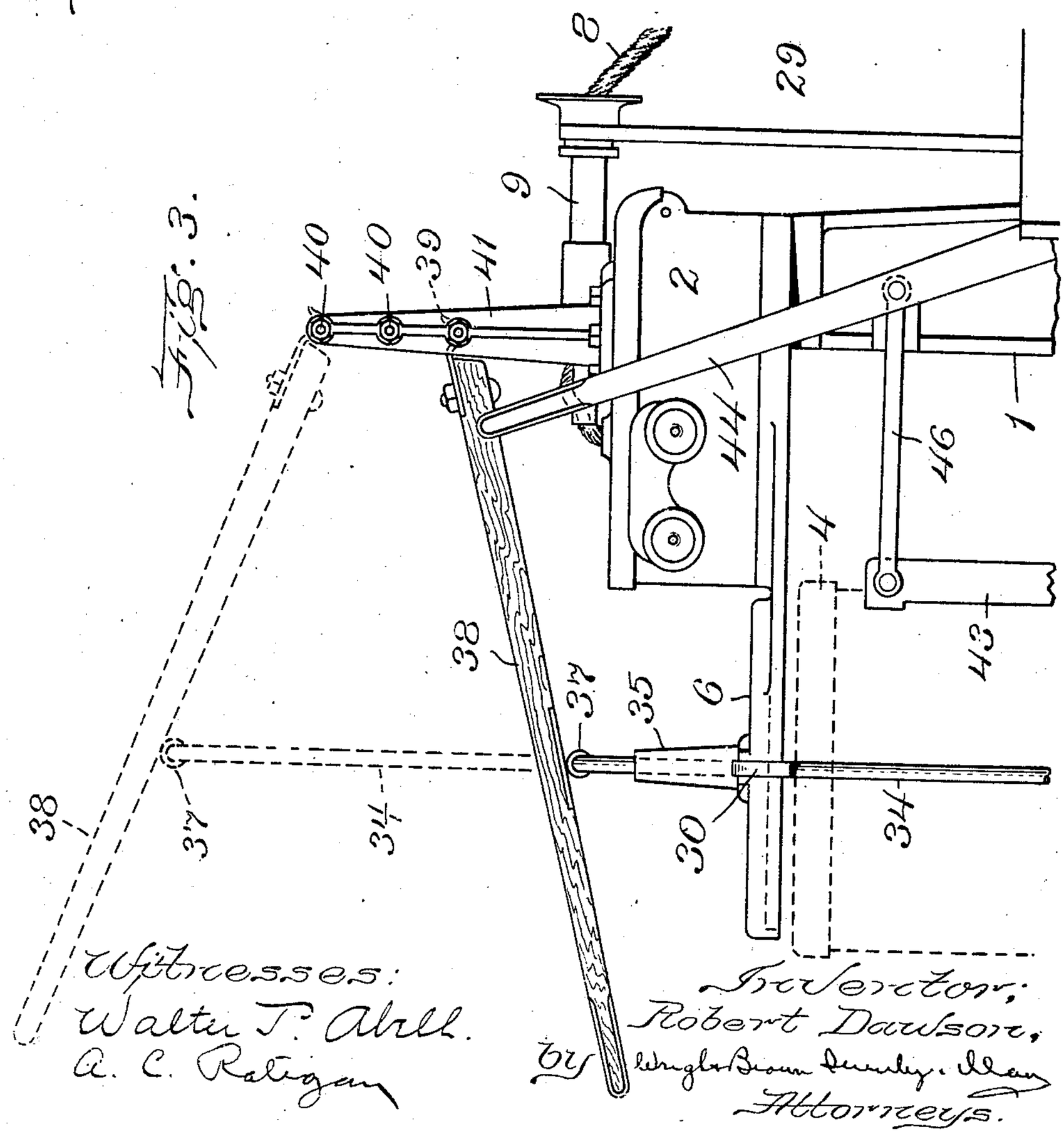


Fig. 3.



Witnesses:
Walter T. Abell.
A. C. Ralrigan

Inventor:
Robert Dawson,
by Albright Brown Dunlop & Mann
Attorneys.

R. DAWSON, DEC'D.

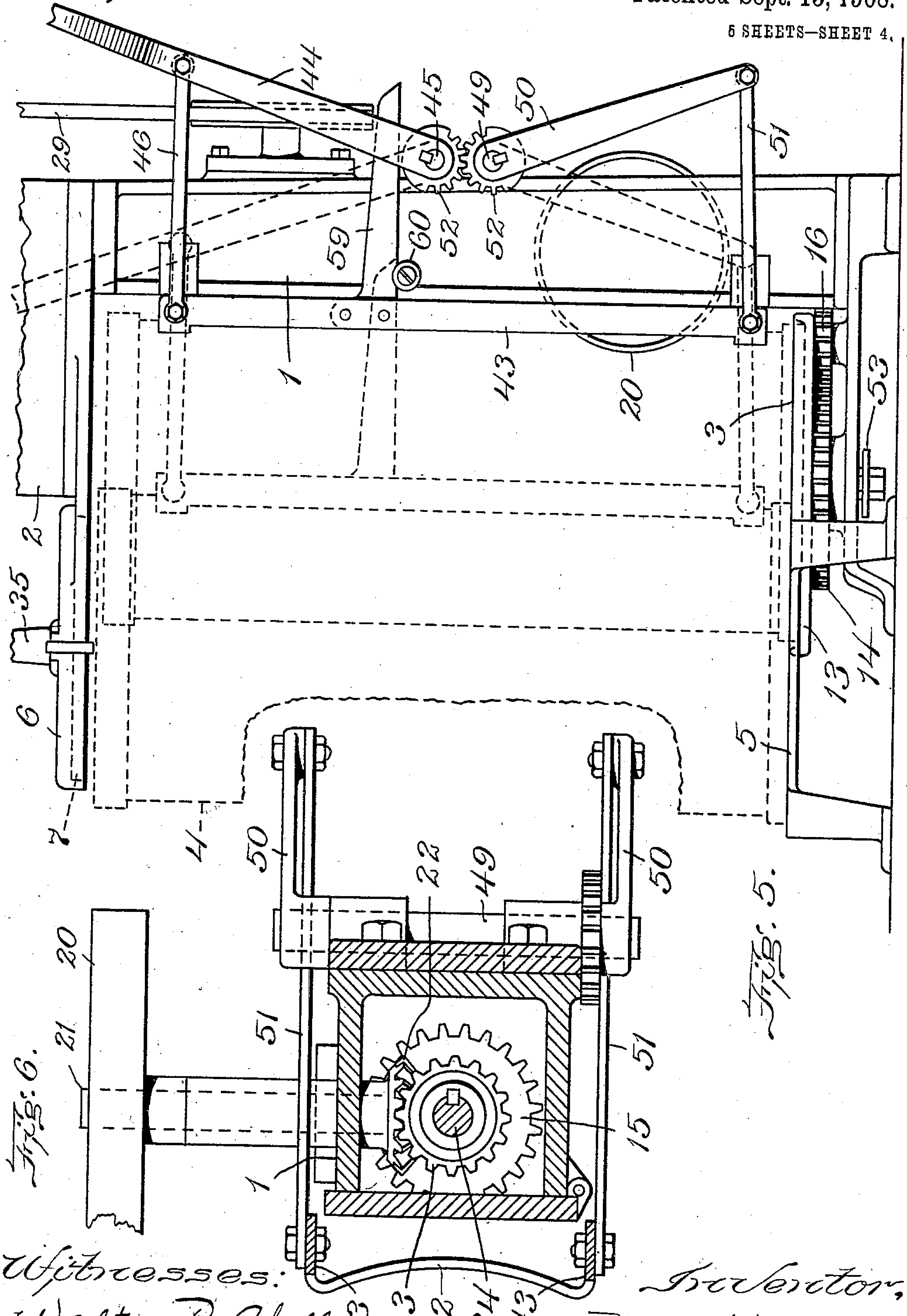
F. E. DAWSON, EXECUTRIX.

MACHINE FOR LOOSELY PACKING FIBER.

APPLICATION FILED MAY 5, 1906.

898,841. Patented Sept. 15, 1908.

5 SHEETS—SHEET 4.



Witnesses:
Walter P. Abell.
A. C. Ratigan

Inventor,
Robert Dawson
by Wingle Brown Innley & May
Attorneys.

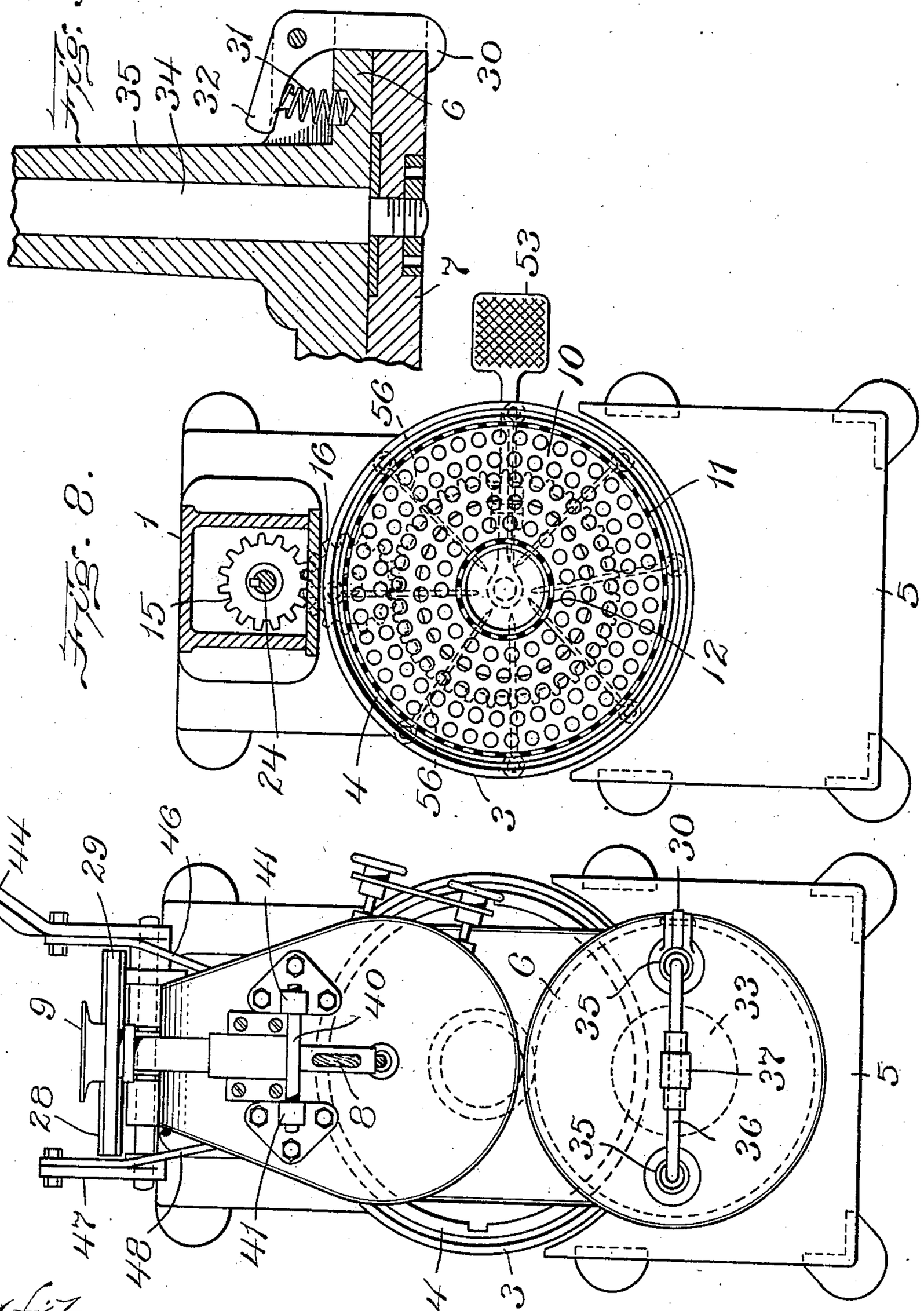
R. DAWSON, DEC'D.
F. E. DAWSON, EXECUTRIX.
MACHINE FOR LOOSELY PACKING FIBER.
APPLICATION FILED MAY 5, 1906.

898,841.

Patented Sept. 15, 1908.

5 SHEETS—SHEET 5.

Fig. 8.



Witnesses:
Walter P. Ahll
A. C. Ralfyan

Fig. 9.

Inventor,
Robert Dawson
by Wright Brown Quinby & Ulay
Attorneys.

UNITED STATES PATENT OFFICE.

ROBERT DAWSON, OF FRAMINGHAM, MASSACHUSETTS; FRANCES E. DAWSON EXECUTRIX OF SAID ROBERT DAWSON, DECEASED.

MACHINE FOR LOOSELY PACKING FIBER.

No. 898,841. Specification of Letters Patent. Patented Sept. 15, 1908.

Application filed May 5, 1906. Serial No. 315,453.

To all whom it may concern:

Be it known that I, ROBERT DAWSON, of Framingham, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Loosely Packing Fiber, of which the following is a specification.

This invention relates to apparatus and methods for putting wool or other fibrous material into receptacles, in which the fibers are to be held while being dyed, or for other suitable purpose.

In an application for patent filed by me January 10, 1906, Serial No. 295,422, I have described an apparatus and method of dyeing fibers, in which the fibers are loosely engaged together in a sliver or top which is loosely coiled in circular series of coils within annular spaces in foraminous cans, each of which has an outer perforated wall and an inner cylindrical perforated wall opening at both ends beyond the top and bottom can.

It is the object of the present invention to provide a machine by which the fibers of the wool or other material to be dyed or otherwise treated may be packed in the cans closely enough so that there will be no unnecessary spaces between the fibers, and also with sufficient looseness so that there will be no obstruction to the flow of dye liquor through the body of the fiber, and so that there will be no necessity for re-carding the fiber after the dyeing process has been finished.

When slivers or tops are loosely coiled in cans in the manner described in the application above referred to, the fibers are so loosely engaged with each other that there is ordinarily more space between them and between the successive convolutions of the fiber than is required for the purpose of dyeing without necessity of re-combing; and at the same time, the cans do not hold as much wool as could be conveniently and efficiently treated at one time, and thus the maximum efficiency is not attained.

The present invention is designed to cause the cans to be filled with a greater amount of fiber than they would naturally contain if loaded simply under the action of gravity, and to that end in the present machine, I provide not only means for feeding a sliver, but also means for pressing down the coiled sliver in the can after the latter has been filled, holding the material in a slightly compressed condition while more material is being fed to fill the space in the top of the can left by the first compression, and again compressing the mass sufficiently to permit the cover of the can to be applied.

A preferred form of machine for carrying out the above objects is illustrated in the accompanying drawings, in which,—

Figure 1 represents a side elevation of the machine. Fig. 2 represents a front elevation thereof. Fig. 3 represents a view similar to Fig. 1, but on an enlarged scale, of the upper part of the machine, showing the means for actuating the compressing plunger. Fig. 4 represents a perspective view of the mechanism for handling a can being filled. Fig. 5 represents a side elevation of the lower part of the machine, showing the can-shifting means in two different positions. Fig. 6 represents a cross-section of the column of the machine, on line 6—6 of Fig. 1. Fig. 7 represents a plan view of the machine. Fig. 8 represents a cross-sectional plan on line 8—8 of Fig. 1. Fig. 9 represents a detail sectional view of part of the compressing plunger.

The same reference characters indicate the same parts in all the figures.

In the drawings, 1 represents a supporting standard formed as a box column, carrying at its upper end a feeding and coiling box 2. Adjacent the lower end of the support 1 is a can-support 3 which is adapted to support a sliver can 4, shown in dotted lines in Figs. 1 and 5, in position beneath the feeding and coiling box so as to receive a sliver fed therefrom. The can-support 3 has an extension 5 projecting out and under a guide 6 which supports and guides a plunger 7. The part 5 extends sufficiently far to hold the can under and in alinement with the plunger so that the latter when depressed may enter the can.

Within the box 2 is contained mechanism for feeding and coiling a sliver of loosely engaged fibers of wool, etc., and discharging such sliver into a can. The coiling and feeding mechanism which is used may be of any desired known character. I do not claim the same specifically as my present invention, and it therefore needs no detailed description herein. It is sufficient for the present purpose to state that this mechanism draws a sliver 8 into and through a guide 9 and discharges the same from the lower side of the

feeding and coiling box 2 through a revolving outlet, so that the sliver falls therefrom in helical coils. The cans into which the material is thus fed, are constructed as shown in Fig. 8, and each has a perforated bottom 10, a perforated cylindrical outer wall 11, and a perforated cylindrical inner wall 12 extending lengthwise of the can in the center thereof and concentric with the outer wall. In the space between the inner and outer walls, the coiled sliver is contained. Accordingly the support for the can is so mounted that the sliver is caused to enter such space, and while the feeding continues, the can is rotated at sufficient speed so that successive coils are caused to rest in the can side by side, instead of one upon the other or overlapping.

In order to rotate the can, the portion 13 of the support which holds the can when under the feeding mechanism, is made separate from the part 5 and is rotatable by means of a gear 14 connected to it, which gear is driven from a pinion 15 through an intermediate idler 16. The driving gear 15 receives its power from a counter-shaft 17 on which is a pulley 18 connected by a belt 19 with a pulley 20 on a shaft 21, the latter carrying a bevel pinion 22 meshing with a pinion 23 on an upright shaft 24. Upon the latter shaft is keyed the driving pinion 15, which is thereby rotated, and the same shaft also carries a pinion 25 driving through a pinion 26 and shaft 27, a pulley 28, which by a belt 29 turns the receiving guide 9, for twisting the sliver so that the fibers of wool, etc., may be held together with sufficient friction to cause them to be drawn into the box 2. The same shaft 24 also actuates the coiling and feeding mechanism within the box 2. The rotatable supporting portion 13 is circular and is depressed at its central portion below the surface of the extension 5, thereby having a lower supporting surface surrounded by a peripheral flange slightly larger than the base of a can, so as to retain the latter and position it exactly beneath the sliver-feeding mechanism.

When the sliver of fibrous material is allowed to lie in the can simply under the force of gravity, a filled can does not contain as much material as is possible, and as much as it should contain for efficient and economical dyeing. Accordingly I provide means for compressing the fibrous material somewhat. This means consists of the plunger or piston 7 normally contained in a recess on the under side of the guide member 6 which projects laterally from the box 2. The piston is normally retained in its recess by a latch 30 pivoted to the guide and normally extending beneath a portion of the piston, being retained in such position by a spring 31 pressing against an arm 32 of the latch. When external force is applied to arm 32 against the spring, the toe of the latch is disengaged from the piston, and the latter is free to be lowered. The piston is made with such an external diameter that it will enter within the outer walls of a can and it has a central orifice 33 to surround the inner tubular wall 12 of the can. The plunger is therefore shaped and arranged to enter the annular space between the inner and outer walls of a can. For positively actuating and guiding the plunger, I provide two or more rods 34 connected thereto and passing through tubular shafts 35 extending from the guide member 6. These piston rods are connected at their upper ends by a cross bar 36 carrying a roll 37 to receive the pressure of an operating lever. The cross-bar thus constitutes a lateral abutment against which the force of the lever is applied. Such an operating lever is illustrated in Fig. 3 and designated by 38. It is normally disconnected from the machine and has at its fulcrum end a hook 39 adapted to engage any one of the cross rods 40 extending between posts 41 which rise from the top of the box 2. The rods 40 provide a plurality of fulcra with which the hook 39 of lever 38 may be engaged successively as the piston is lowered. Pressure by hand upon the free end of the lever causes the piston to be depressed against the yielding resistance of the fiber.

In order to remove the can from proximity to the feeding mechanism and into alinement with the piston, I provide a pusher consisting of cross bars or straps 42 adapted to engage the upper and lower portions of the sides of a can, and connected together by upright side bars 43. The straps and uprights constitute a pushing frame which is operated laterally by a lever 44 connected to a horizontal rock-shaft 45 and having pivoted to it a link 46 which is also connected to the pushing frame at one side thereof. The rock-shaft also carries an arm 47 connected by a link 48 with the other side of the pushing frame. Parallel to rock-shaft 46 is a second rock-shaft 49 having bars 50 connected by links 51 with the lower end of the pushing frame. The two shafts are joined together so as to be compelled to turn in unison, by gear segments 52 connected to them respectively. When the handle 44 is oscillated, the links 46 48 and 51 are reciprocated in the same direction, and the pushing frame is carried laterally to move a can from the feeding to the pressing means. Before the can may be so moved, it must be disengaged from the depressed portion of support 13. This disengagement is effected by means of a treadle 53, which has an arm 54 engaging a plunger 55 which extends through the rotating support 13 and is adapted when raised to elevate the bottom of the can to the level of support 5. After the treadle has been depressed, the pusher frame may be moved to shift the can.

When the loose fiber in a filled can has been compressed to a much less bulk, it is re-

tained in its compressed condition while the can is replaced under the feeding means and more fiber is fed into the space left by the compression. The retaining means consist of pins or rods 56 which are passed from the outside of the can through alining perforations in the outer and inner walls, after the mass has been packed as tightly as may be desired. The packing plunger may then be removed and the fiber will be prevented from expanding, while more is delivered into the can. After the can is again filled, the second charge is compressed sufficiently to allow a cover to be applied to the can, similar pins 56 being inserted, if necessary, to hold the mass down after the plunger has been removed and while the cover is being applied. When the cover is in place, the pins are removed and the can is then loaded with a charge of fiber ready to be placed in the dyeing apparatus or in any other relation, for acting upon the charge. When fiber is so packed, it is contained without being under any tensional stress whatever, and without being sufficiently twisted or compressed as to close the interstices and prevent thorough saturation by the dye liquid. Therefore, the dye liquid can flow freely through the mass, and has a tendency rather to keep the fibers separate than to mat them together in such a way as to render re-combing necessary. Accordingly, after fibers packed as above described have been passed through dye or other liquid, they are still uncompact and free to be separated without being carded or combed.

I claim:—

1. A machine for loosely packing fiber, comprising means for feeding and coiling a sliver of loosely-engaged fibers into a can having a cylindrical inner wall in its central portion, means for simultaneously rotating the can, whereby the sliver is deposited in a series of coils in the annular space surrounding the central portion of the can, and a presser shaped to fit the space occupied by the coiled sliver.

2. A machine for loosely packing fiber, comprising means for feeding and coiling a sliver of loosely-engaged fibers into a can, a support holding said feeding and coiling means, and means for pressing the coiled fiber into the can held by said support.

3. A machine of the character described, comprising means for feeding and coiling a sliver of loosely-engaged fibers into a can, means for simultaneously rotating the can, whereby the sliver is deposited in a series of coils surrounding the central portion of the can, means for pressing the coiled fiber into the can, and means for moving the can from the coiling and feeding means into proximity with the pressing means.

4. A machine of the character described, comprising means for feeding and coiling a sliver of loosely-engaged fibers into a can, means for simultaneously rotating the can, whereby the sliver is deposited in a series of coils surrounding the central portion of the can, means for pressing the coiled fiber into the can, and means adjacent the coiling and feeding means for pressing the coiled fiber into the can.

5. A machine of the character specified, comprising means for feeding in a coil a sliver of loosely-engaged fibers, a support for a can having in its central portion a cylindrical inner wall, said support arranged to hold the can in position to receive the sliver in the annular space between its inner and outer walls, means for rotating said support, whereby the coils of the sliver are deposited so as to surround the inner wall of the can, and an annular plunger arranged to enter the space between the walls of the can for pressing down the fiber therein.

6. A machine of the character specified, comprising means for feeding in a coil a sliver of loosely-engaged fibers, a plunger adjacent said means, a support for a can having provisions for holding the can in position to receive a sliver in annular series and extending so as to support the can adjacent the plunger, and means whereby the plunger may be moved into the can to press the fibrous material therein.

7. A machine of the character specified, comprising means for feeding in a coil a sliver of loosely-engaged fibers, a plunger adjacent said means, a support for a can having provisions for holding the can in position to receive a sliver in annular series and extending so as to support the can adjacent the plunger, and means for moving the can away from the feeding means into alinement with the plunger.

8. A machine of the character specified, comprising means for feeding in a coil a sliver of loosely-engaged fibers, a support for a can having in its central portion a cylindrical inner wall, said support arranged to hold the can in position to receive the sliver in the annular space between its inner and outer walls, means for rotating said support whereby the coils of the sliver are deposited so as to surround the inner wall of the can, and an annular plunger of less diameter than the outer walls of the can and having a central orifice to receive the inner wall, arranged to enter the space between the walls of the can for pressing down the fiber therein.

9. A machine of the character specified, comprising means for feeding in a coil a sliver of loosely-engaged fibers, a support having a stationary portion and a depressed rotary portion, the latter portion arranged to hold a can in position to receive a sliver delivered by the feeding means, mechanism for rotating said latter portion, and means for elevating a can thereon to the level of the stationary portion of the support.

10. A machine of the character specified,

comprising means for feeding in a coil a sliver of loosely engaged fibers, a support having a stationary portion and a depressed rotary portion, the latter portion arranged to hold a can in position to receive a sliver delivered by the feeding means, mechanism for rotating said latter portion, means for elevating a can thereon to the level of the stationary portion of the support, and means for shifting the can from said rotary to said stationary portion.

11. A machine of the character described, comprising feeding means for delivering a sliver of fibrous material in a coil, a guide beside said means, a plunger movably supported by said guide, a sliver can support beneath said feeding means and plunger, a portion being rotatable, adapted to hold a can and to rotate the same when beneath the feeding means, and a pusher for moving the can away from the feeding means into alinement with the plunger.

12. A machine of the character described, comprising feeding means for delivering a sliver of fibrous material in a coil, a guide beside said means, a plunger movably supported by said guide, releasable means normally holding the plunger elevated, and a sliver can support beneath said feeding means and plunger, a portion being rotatable, adapted to hold a can and to rotate the same when beneath the feeding means, the can being movable on the support from beneath the feeding means into alinement with the plunger.

13. A machine of the character described, comprising feeding means for delivering a sliver of fibrous material in a coil, a guide beside said means, a plunger movably supported by said guide, a detachable lever adapted to act on the plunger, and a plurality of fulcrum abutments for the lever.

14. A machine of the character described, comprising feeding means for delivering a sliver of fibrous material in a coil, a guide beside said means, a plunger movably supported by said guide, a sliver can support beneath said feeding means and plunger, a portion being rotatable, adapted to hold a can and to rotate the same when beneath the feeding means, the can being movable on the support from beneath the feeding means into alinement with the plunger, and a detachable lever adapted to be engaged with the plunger to force the same into a can.

15. A machine of the character described, comprising feeding means for delivering a sliver of fibrous material in a coil, a guide beside said means, a plunger movably supported by said guide, a lateral abutment connected with the plunger, a sliver can support beneath said feeding means and plunger, a portion being rotatable, adapted to hold a can and to rotate the same when beneath the feeding means, the can being movable from beneath the feeding means into alinement with the plunger, and a detachable lever adapted to bear on said abutment to force the plunger into the can.

16. A machine of the character described, comprising feeding means for delivering a sliver of fibrous material in a coil, a guide beside said means, a plunger movably supported by said guide, a sliver can support beneath said feeding means and plunger, a portion being rotatable, adapted to hold a can and to rotate the same when beneath the feeding means, the can being movable on the support from beneath the feeding means into alinement with the plunger, a detachable lever adapted to be engaged with the plunger to force the same into a can, and a series of fulcra arranged to hold the lever in any one of a number of positions.

17. A machine of the character described, comprising a supporting column, feeding mechanism, a guide and a series of fixed fulcrum members supported thereby, a plunger, parallel rods connected by a cross bar passing through said guide, a can support adapted to hold a can in position to receive material delivered by said feeding means and also in alinement with the plunger and rods, and a detachable lever adapted to be engaged with any one of said fulcrum members and to bear on said cross bar for pressing the plunger into a can.

18. In a machine of the character specified having means for feeding and coiling a sliver, packing means at one side thereof, and a support for a receptacle adapted to hold the same in one position to receive the sliver and in another position to receive the packing means, a displacing device adapted to engage the can at a plurality of points and move the same from one position to the other.

19. In a machine of the character specified having means for feeding and coiling a sliver, packing means at one side thereof, and a support for a receptacle adapted to hold the same in one position to receive the sliver and in another position to receive the packing means, a displacing device comprising upper and lower pushing members adapted to engage the can, and connected means for moving said members simultaneously to push the can from one position to the other.

20. In a machine of the character specified having means for feeding and coiling a sliver, packing means at one side thereof, and a support for a receptacle adapted to hold the same in one position to receive the sliver and in another position to receive the packing means, a displacing device comprising a frame having cross bars or straps adapted to engage a can and connecting members, and actuating arms engaged with different parts of said frame and connected to move in unison for carrying the can from one position to the other.

21. In a machine of the character specified having means for feeding and coiling a sliver, packing means at one side thereof, and a support for a receptacle adapted to hold the same in one position to receive the sliver and and in another position to receive the packing means, a displacing device comprising a frame having cross bars or straps adapted to engage a can and connecting members, and actuating arms linked to different parts of the frame and geared together for movements in unison to carry the can from one position to the other.

22. In a machine of the character specified having means for feeding and coiling a sliver, packing means at one side thereof, and a support for a receptacle adapted to hold the same in one position to receive the sliver and in another position to receive the packing means, the support being depressed to hold the can in the first position, a plunger for raising the can out of the depressed portion of the support, and a displacing device adapted to engage the can at a plurality of points and move the same from one position to the other.

23. In a machine of the character specified having means for feeding and coiling a sliver, packing means at one side thereof, and a support for a receptacle adapted to hold the same in one position to receive the sliver and in another position to receive the packing means, the support being depressed to hold the can in the first position, a plunger for raising the can out of the depressed portion of the support, a treadle for actuating the plunger, and a displacing device adapted to engage the can at a plurality of points and move the same from one position to the other.

24. In a machine of the character described, in combination with means for feeding a sliver into a can, a guide having a recess, extending over the can when the latter is in position to receive a sliver, a packing plunger adapted to occupy said recess, and a latch pivoted to the guide adapted to engage the plunger and retain the same in the recess.

25. An apparatus for loosely packing fiber, comprising a can having inner and outer perforated walls, means for depositing a sliver in coils side by side in the annular space between the walls, a presser for making the material more compact, and holding pins adapted to be detachably passed through alined perforations in the inner and outer walls while more of the material is deposited in the space provided by the first compression.

In testimony whereof I have affixed my signature, in presence of two witnesses.

ROBERT DAWSON.

Witnesses:
FRED L. OAKS,
LYNETTE CLARK.