

No. 713,360.

Patented Nov. 11, 1902.

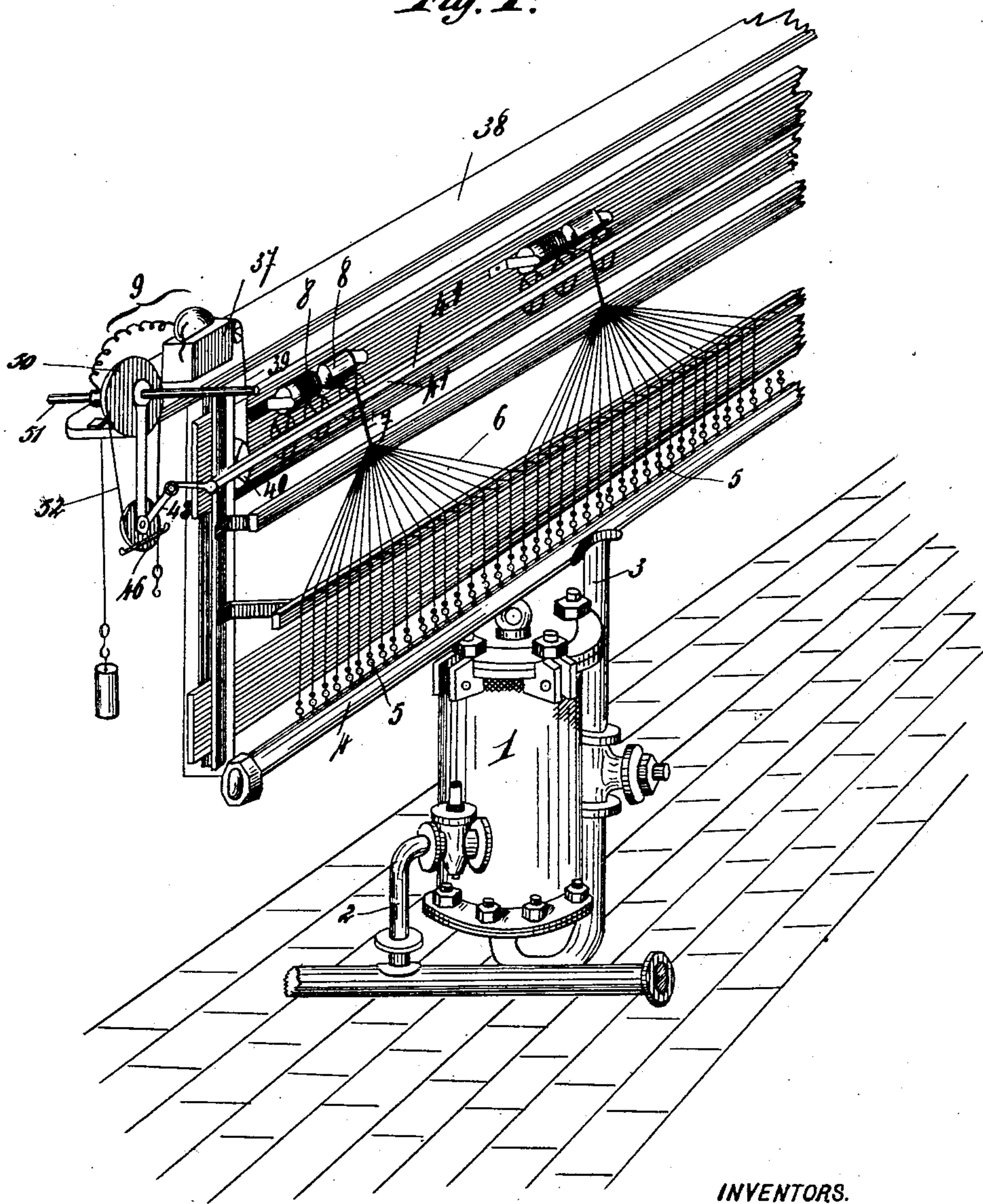
J. STOERK, G. DUBOIS & A. DE B. D'ASSON.
MACHINE FOR THE MANUFACTURE OF LUSTROUS YARNS.

(Application filed July 15, 1902.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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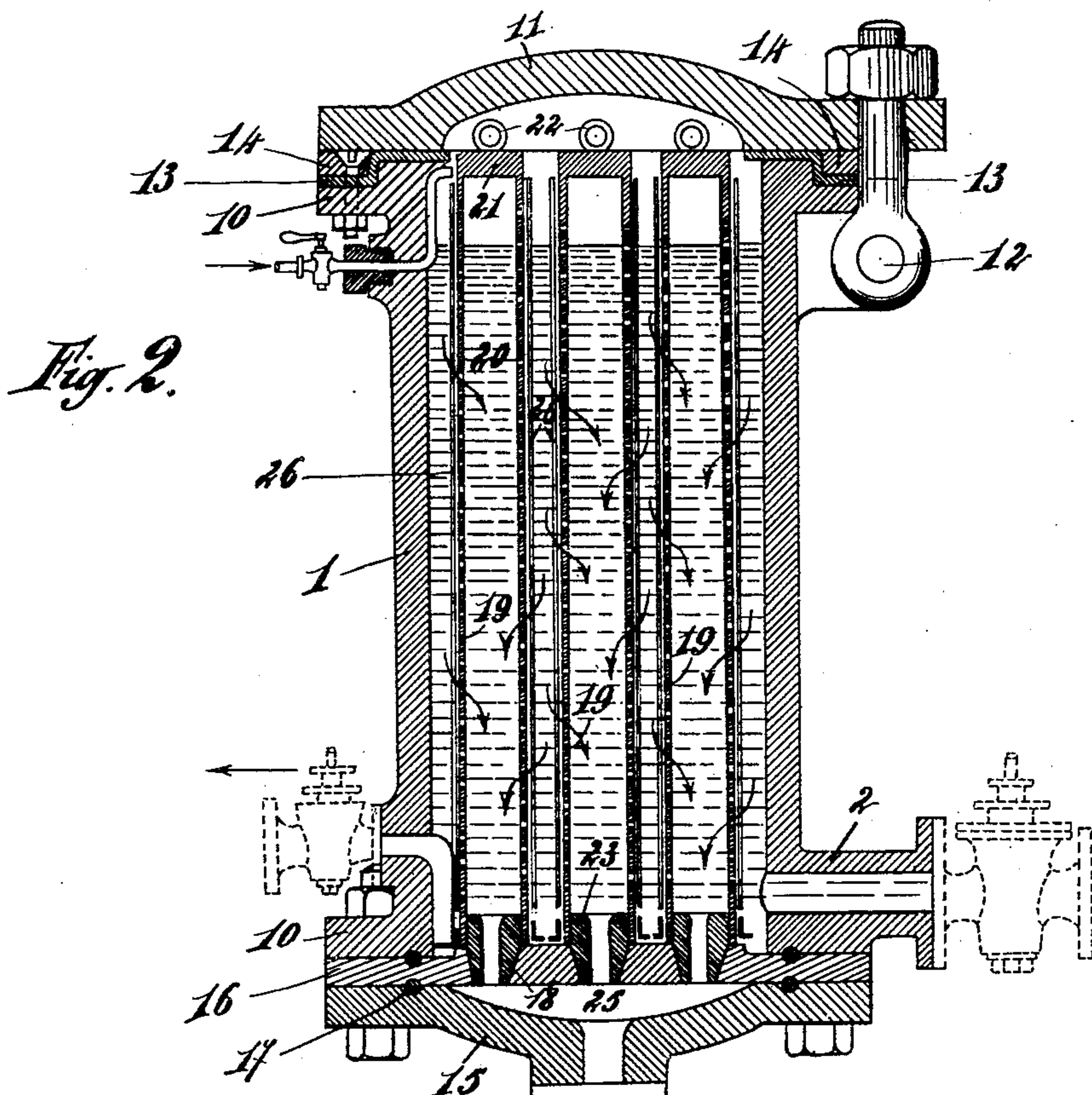


Fig. 3.

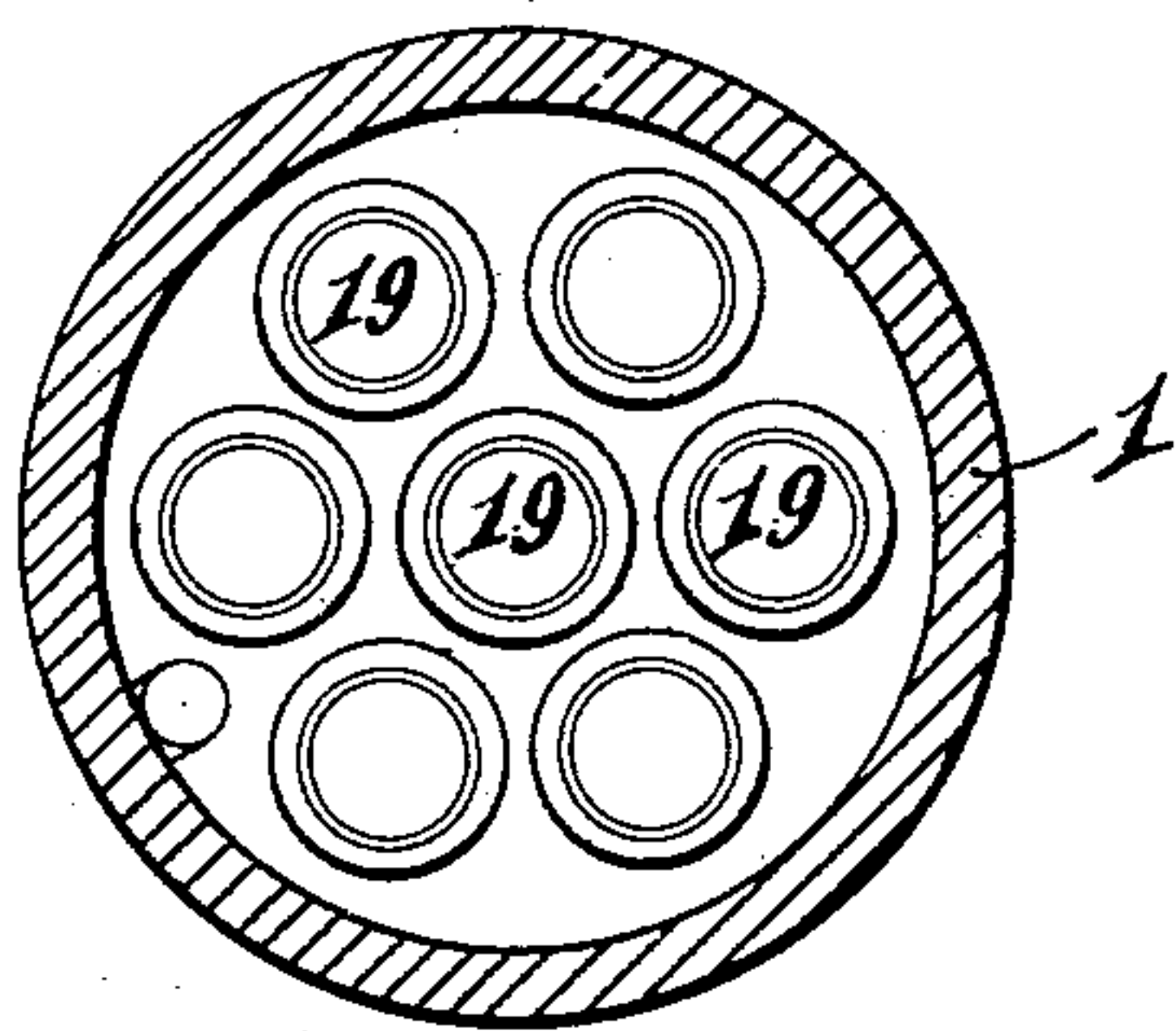
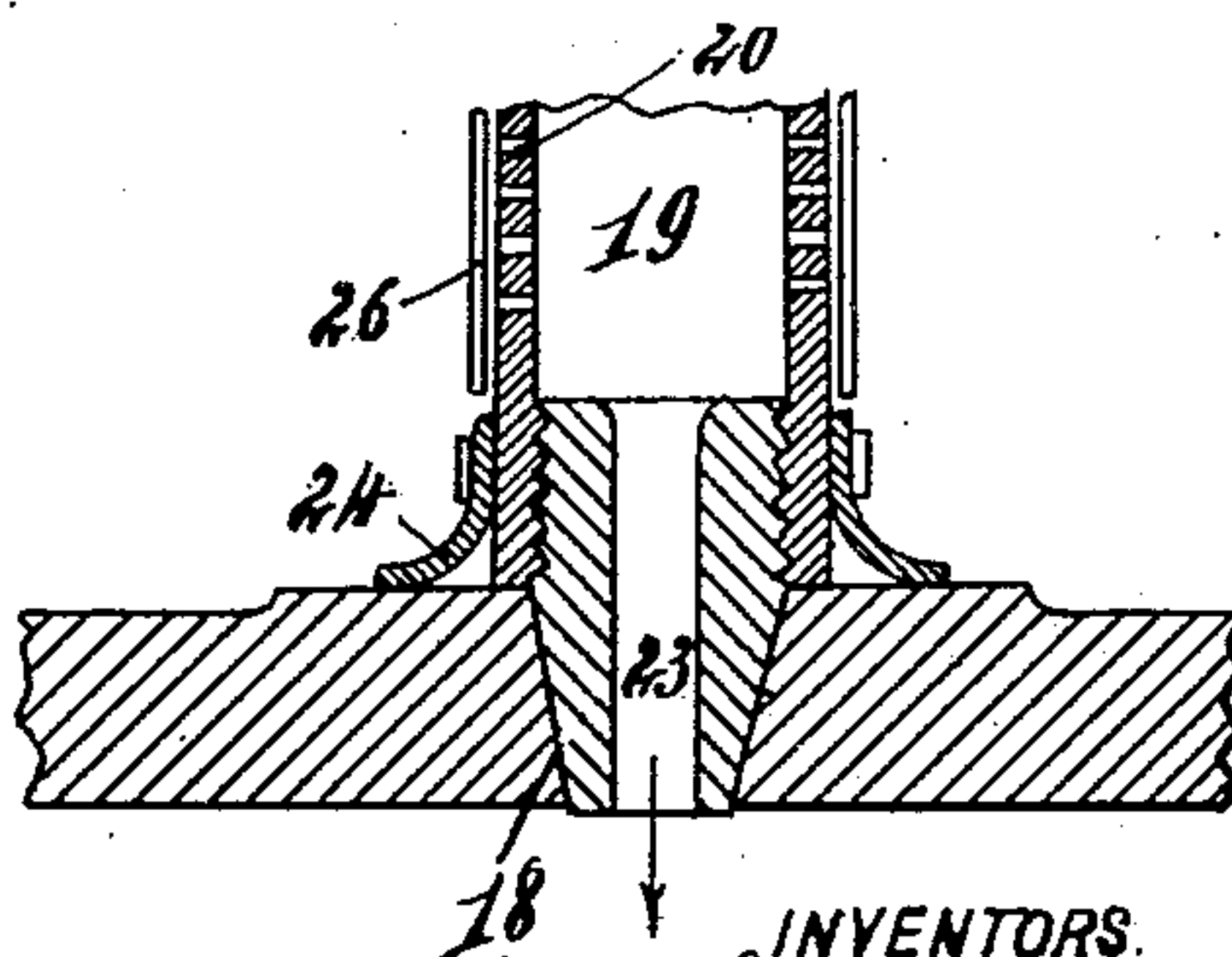


Fig. 4.



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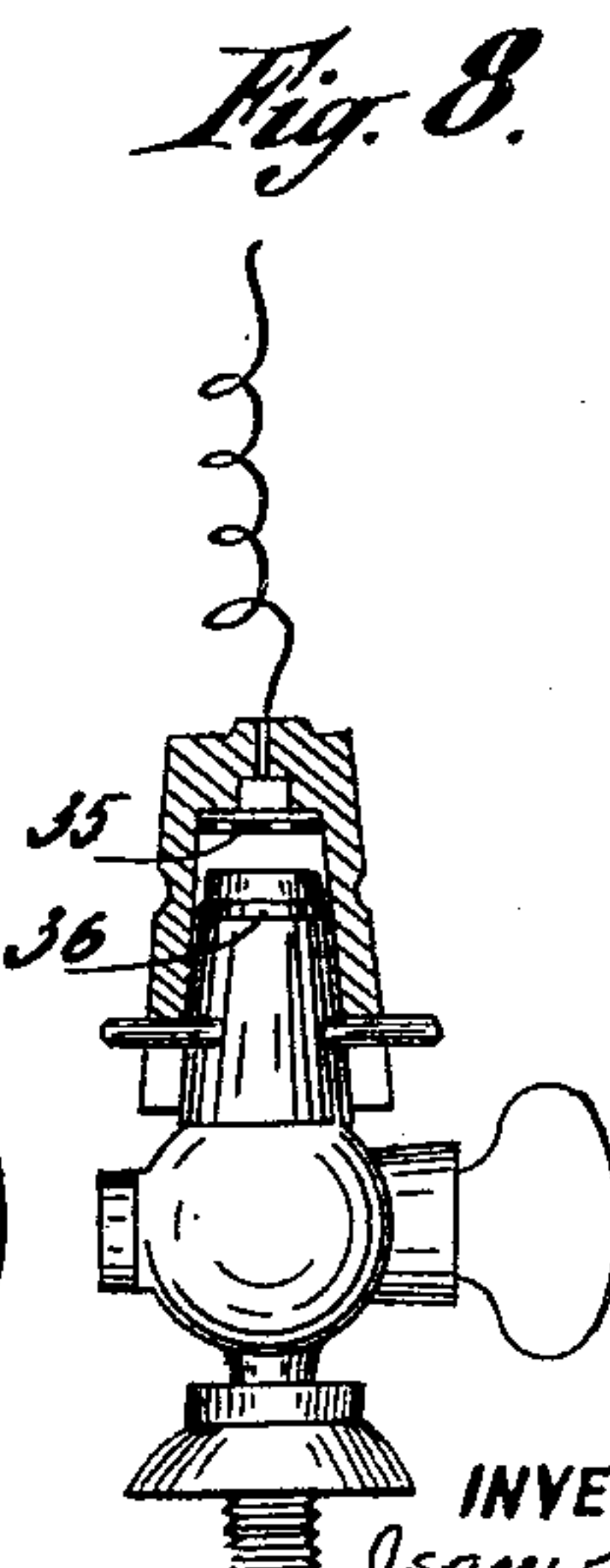
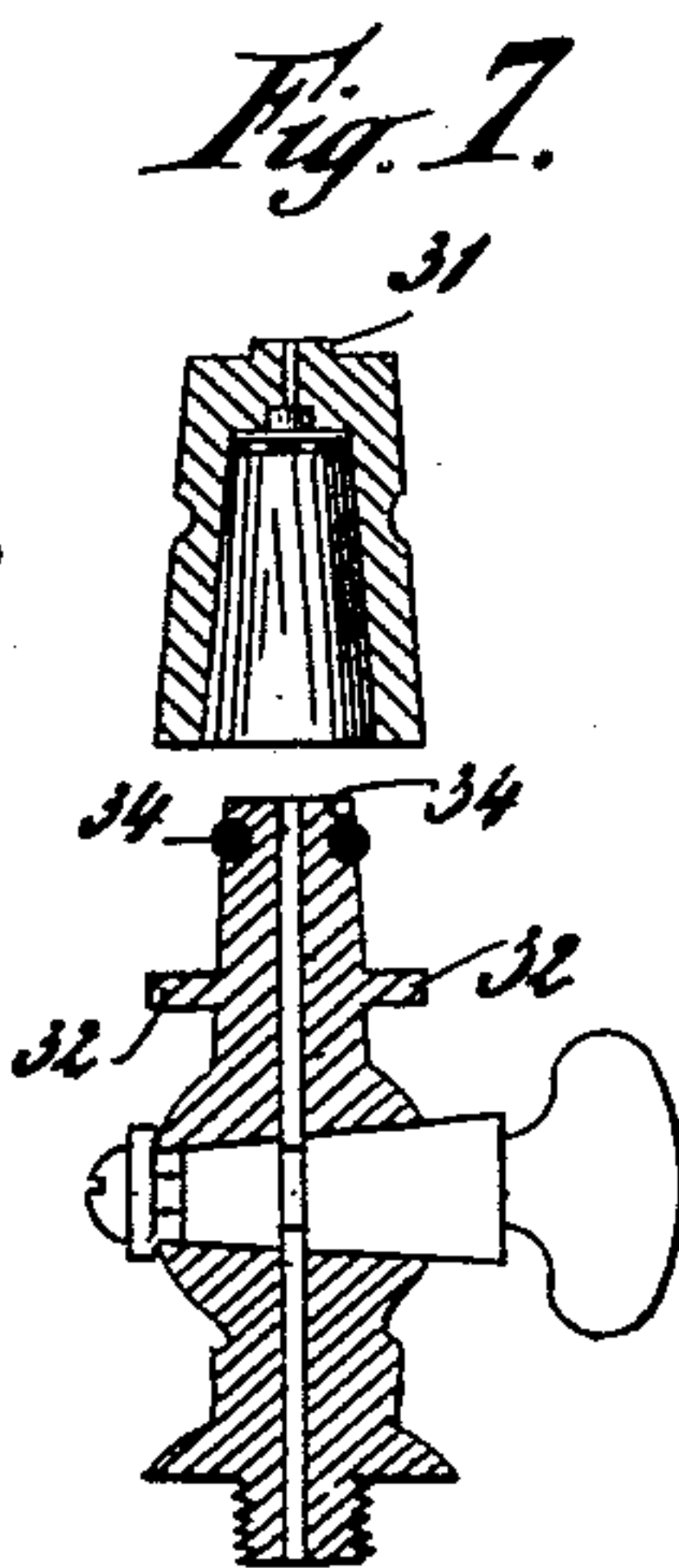
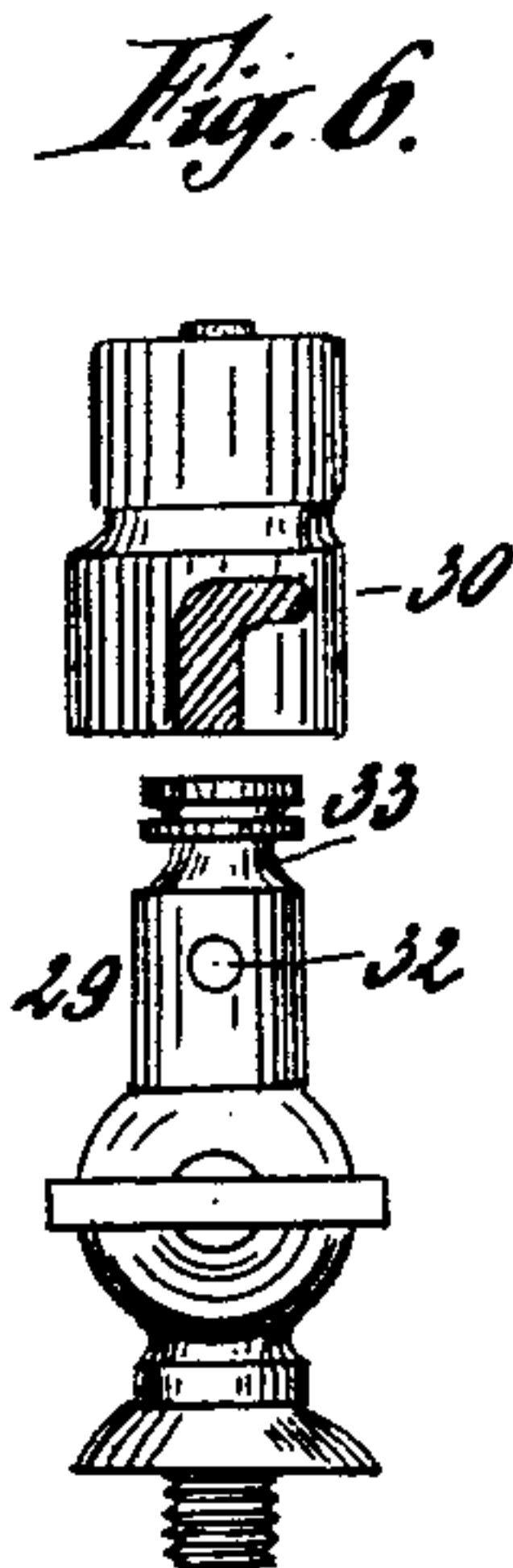
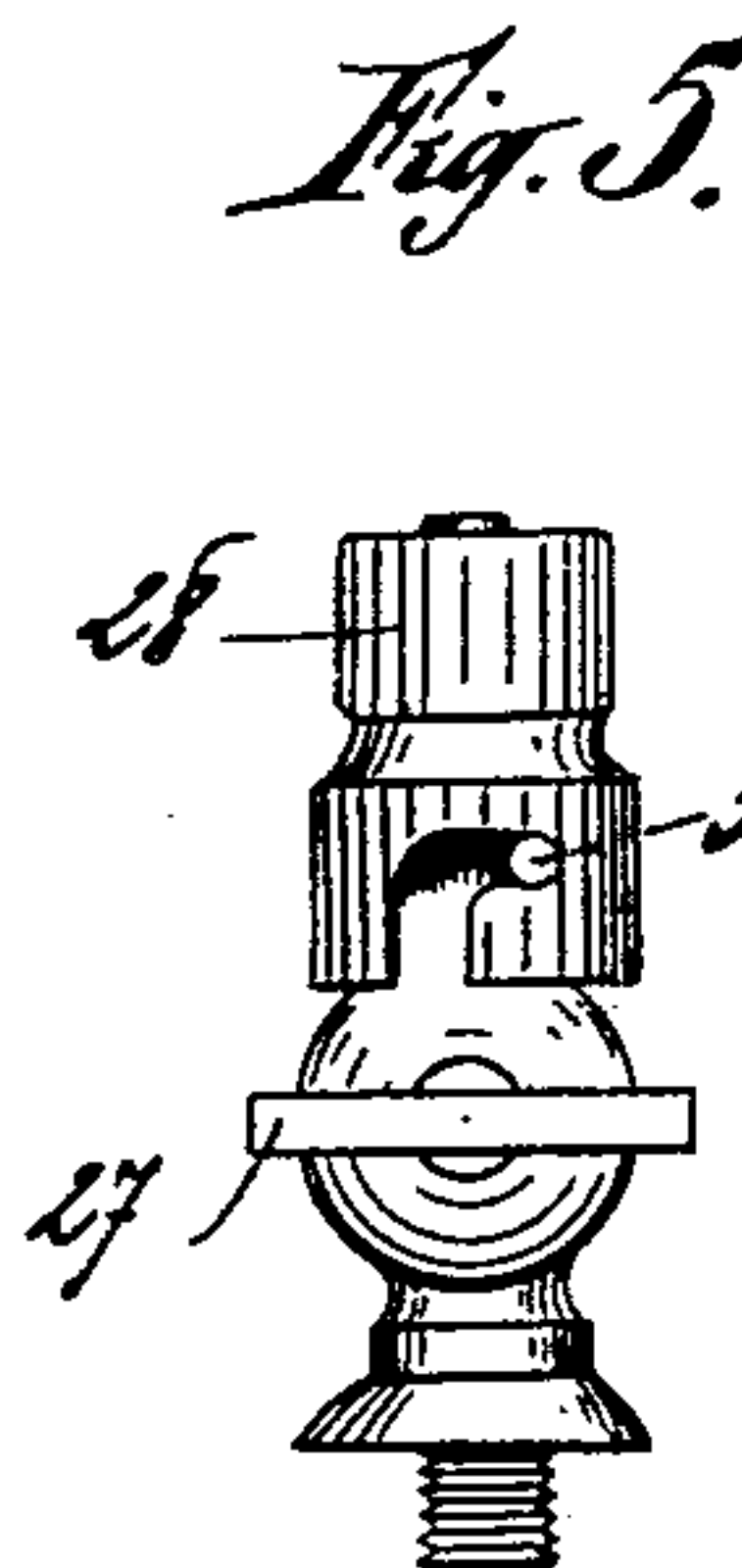
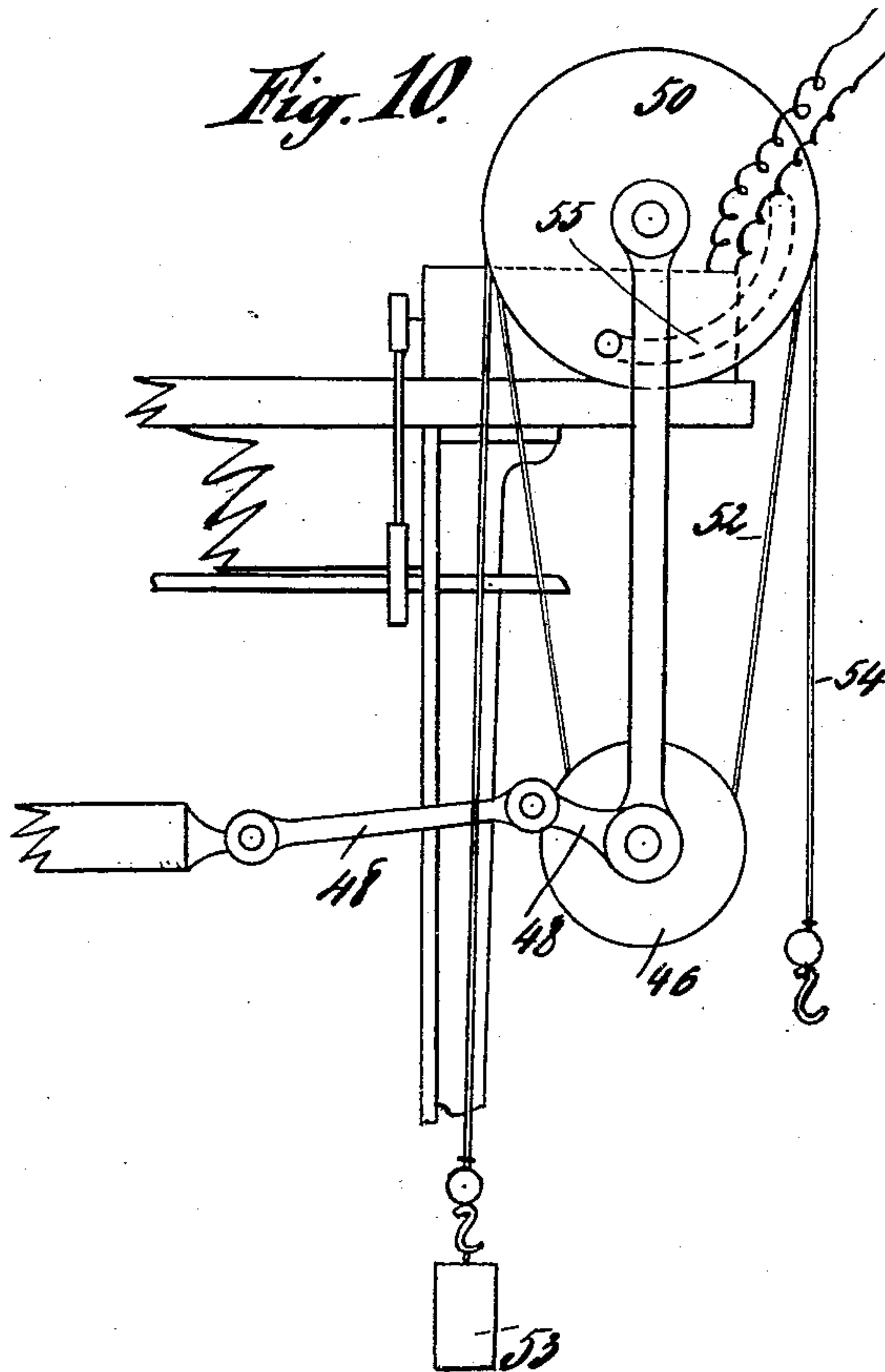
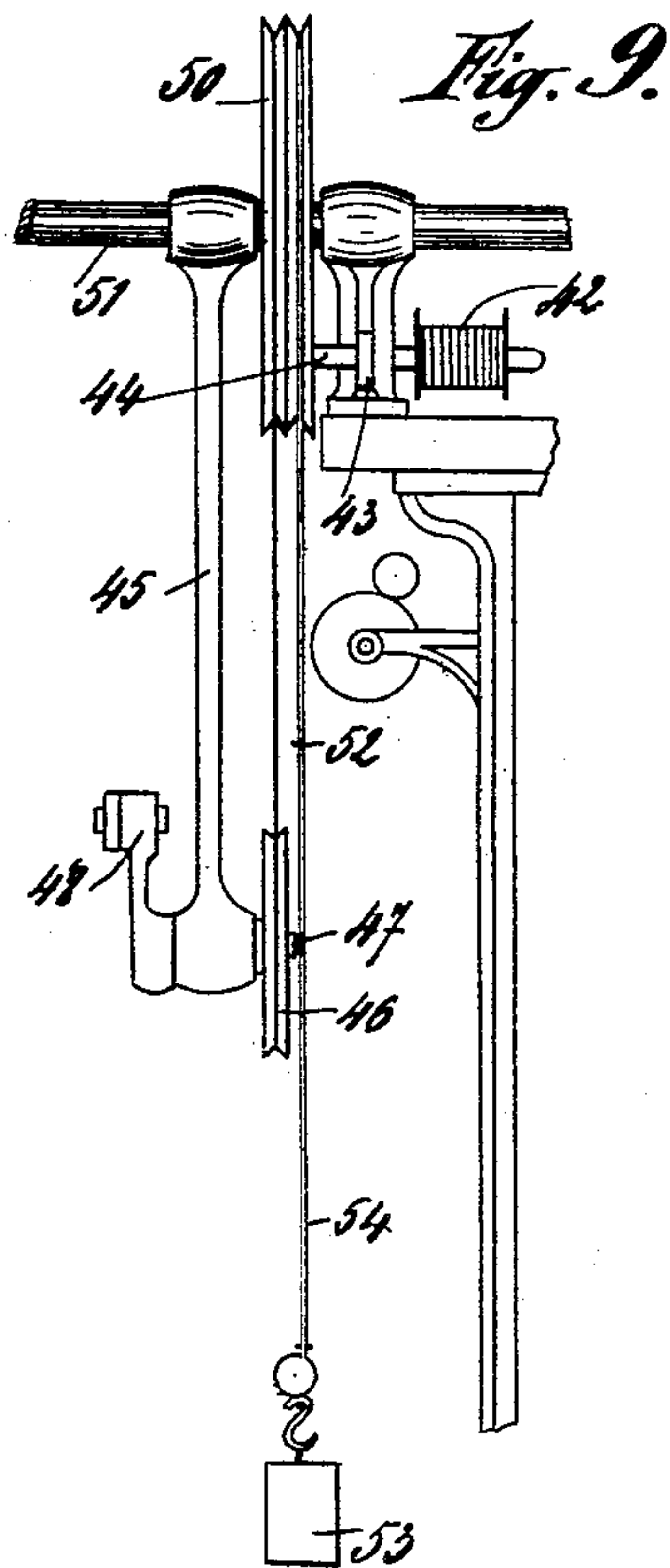
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

JEAN STOERK, OF BRUSSELS, GEORGES DUBOIS, OF TUBIZE, AND ARMAND DE BAUDRY D'ASSON, OF BRUSSELS, BELGIUM; SAID STOERK AND DUBOIS ASSIGNORS TO SAID ARMAND DE BAUDRY D'ASSON.

MACHINE FOR THE MANUFACTURE OF LUSTROUS YARNS.

SPECIFICATION forming part of Letters Patent No. 713,360, dated November 11, 1902.

Application filed July 15, 1902. Serial No. 115,667. (No model.)

To all whom it may concern:

Be it known that we, JEAN STOERK, chemist, a subject of the Emperor of Germany, residing at Brussels, GEORGES DUBOIS, engineer, a citizen of the French Republic, residing at Tubize, and ARMAND DE BAUDRY D'ASSON, manufacturer, a citizen of the French Republic, residing at Brussels, in the Kingdom of Belgium, have invented certain new and useful Improvements in Machines for the Manufacture of Lustrous Yarns, of which the following is a specification.

One of the most serious defects in the production of filaments or threads from viscous liquids particularly designed for the manufacture of lustrous yarns is the irregularity of the filament or thread. There are many causes of this irregularity; but they all may be summed up in the difference in thickness and the difference in number of the elementary filaments or threads of which the yarn is composed. These differences, which are so prejudicial to the production of a regular yarn, arise from three principal faults, which generally exist in all filament-producing machines, namely: First, absence of complete filtration effecting the filtration before the entrance of the material to be converted into filaments into the reservoirs and filament-producing tubes, wherein all kinds of impurities can form for various causes, as well as filtration through a small surface and at high pressure, which operation allows still more impurities to pass through the filtering material; second, absence of means for rapidly and conveniently replacing any capillary tube which may become damaged by a new tube, whence results an inequality in the size of the yarn consequent upon the absence of one or more elementary filaments which are lacking during the whole of the replacing operation; third, absence of automatic means for effecting the passage of the yarn from a full bobbin onto an empty bobbin and for regulating the quantity of yarn wound onto each bobbin in order to obviate variation in the diameter of the said bobbins, which is the cause of a corresponding variation in the size of the yarn when the delivery of the material con-

verted into filaments ought to remain constant.

The present invention has for its object to remedy these defects and to insure the production of regular yarn of uniform size.

It consists, chiefly, in effecting the production of filaments or threads from viscous liquids designed for the manufacture of lustrous yarns in a machine, the essential feature of which is a filter of special construction having a large surface and working at a low pressure and connected directly to a tube provided with special filament-forming cocks which replace the long capillary tubes hitherto in use and produce the elementary threads, the yarn thus produced being afterward wound in uniform quantity upon bobbins by means of a special counter automatically effecting the passage of the yarn from a full bobbin onto an empty bobbin, the whole operation being carried on so as to avoid the usual defect hereinbefore stated resulting from the separate filtration—the obstruction of the capillary tubes and the winding of unequal quantities of yarn onto the bobbins in conjunction with the winding of the yarn by hand from a full bobbin onto an empty bobbin.

The accompanying drawings show by way of example a machine constructed according to our invention.

Figure 1 is an elevation in perspective of a part of the complete machine. Fig. 2 is a sectional view, drawn to a larger scale, of the special filter forming part of this machine. Fig. 3 is a horizontal section of the said filter. Fig. 4 is a detail view of the lower end of a filtering-tube. Fig. 5 is a detail view of a filament-forming cock constituting a portion of the machine. Figs. 6, 7, and 8 are views of details of the said cock. Fig. 9 is a side elevation of the automatic yarn-winding mechanism, and Fig. 10 is a front elevation of the same.

As illustrated in Fig. 1, the machine comprises a filter 1, into which the viscous liquid is introduced through a tube 2. This filter 1 is directly connected by a tube 3 to the tube 4, provided with cocks 5 for producing the pri-

mary filaments 6, which being united in groups form the marketable yarns 7, which are wound upon bobbins 8, the quantity of yarn being controlled by an automatic arrangement 9.

5 The filter 1 (see Fig. 2) is constructed of a cylinder of cast-steel having very resistant sides and provided with flanges 10 at its two ends, the top part being provided with a removable cover 11, fixed by means of hinged
10 bolts 12. The tightness of the joint is insured, when the bolts are tightened by means of their nuts, by a leather washer 13, which is itself fixed on the flange of the cylinder by means of a steel ring 14, bolted into a depression made for this purpose in the flange 10.
15 The bottom of the filter is fixed and consists of a hemispherical disk 15 of cast-steel, over which is placed a plate 16. The bottom 15 and the said plate 16 are bolted together onto
20 the lower flange 10 of the cylinder 1. The tightness of the double joint formed by this connection is insured when the bolts are tightened by two india-rubber rings 17, located in two corresponding circular grooves. The plate
25 16 is provided with a certain number of conical holes 18—seven, for example—arranged as shown in Fig. 3. In these conical holes are fitted the lower ends of filtering-tubes 19. Each of these tubes is formed of a pipe of
30 drawn steel, for example, provided with holes 20, placed very closely together and which allow the filtering liquid to pass through. The upper end of each filtering-tube is closed by a screw-threaded plug 21, having a ring 22 on
35 its top, which serves to lift the tube whenever it is required to clean the filter. The lower end of each tube 19 is provided with a conical bolt 23, Fig. 4, having a hole therein and which allows of easily and quickly plac-
40 ing each tube in one of the conical apertures 18 of the plate 16. Each tube is also provided at its lower end with a leather washer 24 for the purpose of insuring tightness of the joint in the plate 16 for preventing any com-
45 munication between the upper or tube chamber of the filter and the lower chamber 25. Each filtering-tube before being placed in position in the filter is covered with a jacket 26, of felt or other suitable material, on which
50 the viscous liquid as it passes through to the interior leaves the impurities which it contains.

The liquid introduced into the filter through the short tube 2 fills the spaces between the
55 tubes, passes into the interior of the filtering-tubes 19 to the lower chamber 25, and without passing through any intermediate vessel flows directly into the tube 4, provided with the filament-producing cocks, which are used
60 instead of the capillary tubes hitherto employed. Each of these cocks, Fig. 5, comprises a cylindrical cap 28, which is fitted and fixed to the upper conical end 29, Fig. 6, of the cock by means of a bayonet-joint 30.
65 The upper part of the cylindrical cap is provided with a capillary hole, Fig. 7, 31, through which the filament of collodion (or other

similar material) designed to form a thread passes out. The conical portion 29 of the cock has formed thereon the two studs 32 of
70 the bayonet-joint and is provided at its upper part with a semicircular groove 33, in which is placed an india-rubber ring 34, serving to insure the tightness of the chamber 35 when, the cock being opened, the liquid is
75 forced therein under pressure. This ring forced downward by the pressure upon the inclined plane of the groove 33 is pressed into the conical space 36, Fig. 8, so that the greater the pressure of the liquid the more
80 completely will tightness be insured by the ring. The elementary filaments 6 thus issuing from the capillary holes 31 are united in the usual way to form the threads 7, which are wound onto the bobbins 8.
85

In order to automatically effect the passage of the thread from a full bobbin onto an empty bobbin when a given quantity of thread has been wound upon each bobbin, the machine is provided with a revolution-
90 counter 37, placed at the end of the top plate 38 of the machine. A band 39, passing over a pulley 40, Fig. 1, on the shaft carrying the thread-guide rollers 41 of the machine, actuates the counter 37, which serves to mo-
95 mentarily close the electric circuit of a battery in connection with the coil of an electromagnet 42, Fig. 9, each time the shaft carrying the guide-rollers has performed a num-
100 ber of revolutions corresponding to the winding onto the bobbin of a given length of thread. The current acting in the electromagnet 42 causes the attraction of an armature 43, on which is fixed a pin 44 for engag-
105 ing or disengaging the mechanism for effecting the passage of the thread from one bobbin onto another. A lever 45 carries at its lower end a grooved pulley 46, keyed upon a shaft 47, provided with a crank 48, which by its rotation, effected in the manner which will
110 be hereinafter explained, causes the displacement of the bar 41, carrying the thread-guides, and consequently the passage of the thread from one bobbin onto another. A second grooved pulley 50, turning loose upon a shaft
115 51, is connected to the pulley 46 by a cord 52, so that when the said pulley 50 rotates the pulley 46 rotates to a corresponding extent. The pulley 50 is, moreover, subjected to the action of a weight 53, acting through the medium of
120 a cord 54, and is kept from moving notwithstanding the action of the weight 53 by means of the pin 44 of the armature 43, which is normally engaged in a slot or groove 55 in the pulley 50.
125

From the foregoing description it will be understood that if when the revolution-counter 37 has registered a certain number of revolutions the said counter closes the circuit of the electromagnet 42. The latter acting upon
130 the armature 43 will disengage the pin 44 from the slot 55 in the pulley 50, which will consequently be free to turn under the action of the weight 53 and will cause a correspond-

ing partial rotation of the pulley 46, which through the medium of the crank 48 will displace the bar 41 of the thread-guide. The latter in moving will at the required moment
 5 cause the thread to pass from the full bobbin onto the adjacent empty bobbin. The oscillation of the pulley 50 being effected, the pin 44 of the armature 43 again fixes the pulley until the required quantity of thread has
 10 been wound onto the fresh bobbin, when the revolution-counter will cause a fresh disengagement. The reverse movement of the pulley 50 will then be caused by the removal of the counterweight 53 from one end to the
 15 other of the cord 54. An electric bell warns the attendant when the disengagement is about to take place.

As will be easily understood, in the machine above described none of the inconveniences mentioned are experienced. The filtration taking place in the thread-forming machine, the liquid thus cannot become altered or charged with fresh impurities between the various operations. Furthermore,
 25 owing to the special filament-forming cocks employed a special key is not required, as has hitherto been the case, for tightening or loosening nuts carrying capillary tubes, neither are there the objections so frequently
 30 resulting from too great or insufficient tightening of the shoulders of the capillary tubes the employment of which is completely dispensed with and an advantageous arrangement made use of instead which can be easily
 35 and rapidly replaced when required.

This machine completely remedies the defects before referred to resulting from the change by hand during the operation of the machine of the thread from the bobbins which
 40 have been wound with a given quantity of thread onto the empty bobbins, the attendant being no longer obliged to lift the elementary threads one by one and one after the other, which threads are liable to break
 45 during the said operation and which in this case had to be attached to the empty bobbin.

Having thus described our invention, what we claim is—

1. The combination of a filter, filament-forming
 50 ing cocks, a tube carrying said cocks and being connected directly to the filter, bobbins upon which the yarn produced by the cocks is wound in uniform quantity, and means for automatically effecting the passage of the
 55 yarn from a full bobbin to an empty bobbin, substantially as described.

2. The combination of a filter comprising a number of filtering-tubes, filament-forming
 60 cocks each comprising a cock and a cylindrical cap, the said cap being provided with a capillary hole, a tube connecting the said cocks directly to the filter, bobbins upon

which the yarn produced by the cocks is wound in uniform quantity, and means for automatically effecting the passage of the
 65 yarn from a full bobbin to an empty bobbin, substantially as described.

3. The combination of a filter comprising a cylinder, a removable cover, a hemispherical
 70 bottom, a plate placed between the said bottom and the cylinder and being provided with a number of conical holes, filtering-tubes fitting tightly in the holes of said plate, plugs closing the filtering-tubes at the upper end and jackets of filtering material covering the
 75 filtering-tubes; filament-forming cocks, a tube connecting the said cocks directly to the filter, bobbins upon which the yarn produced by the cocks is wound in uniform quantity and means for automatically effecting the pas-
 80 sage of the yarn from a full bobbin to an empty bobbin substantially as described.

4. The combination of a filter, filament-forming cocks, each cock having a conical portion
 85 cap provided with a capillary hole, means for holding the cap upon the cock and means to insure the tightness of the cap upon the cock, a tube connecting a number of said cocks, directly to the filter, bobbins upon which the
 90 yarn produced by the cocks is wound in uniform quantity and means for automatically effecting the passage of the yarn from a full bobbin to an empty bobbin substantially as described.

5. The combination of a filter, filament-form-
 95 ing cocks, a tube connecting the said cocks directly to the filter-bobbins upon which the yarn produced by the cocks is wound in uniform quantity, a shaft carrying thread-guide rollers, a revolution-counter actuated from
 100 said shaft, an electromagnet inserted in an electric circuit controlled by the revolution-counter, an armature for said electromagnet, a loose pulley mounted on a shaft, a weight acting on said loose pulley, a pin fixed on the
 105 armature of the electromagnet and holding normally said loose pulley and a gear between said loose pulley and the thread-guide-roller shaft in such a manner that when the loose pulley is released from the pin of the
 110 armature, the thread-guide-roller shaft is displaced through the rotation of said pulley so as to cause the thread to pass from a full bobbin on to an adjacent empty bobbin, substantially as described.
 115

In witness whereof we have hereunto set our hands in presence of two witnesses.

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