

E. KORSELT & A. THOMAS.
 PROCESS FOR MANUFACTURING YARNS AND FABRICS BY THE SPECIAL UTILIZATION
 OF WASHED FLAX WASTE.

APPLICATION FILED JAN. 30, 1905.

Patented Mar. 8, 1910.

6 SHEETS—SHEET 1.

951,251.

Fig. 1.

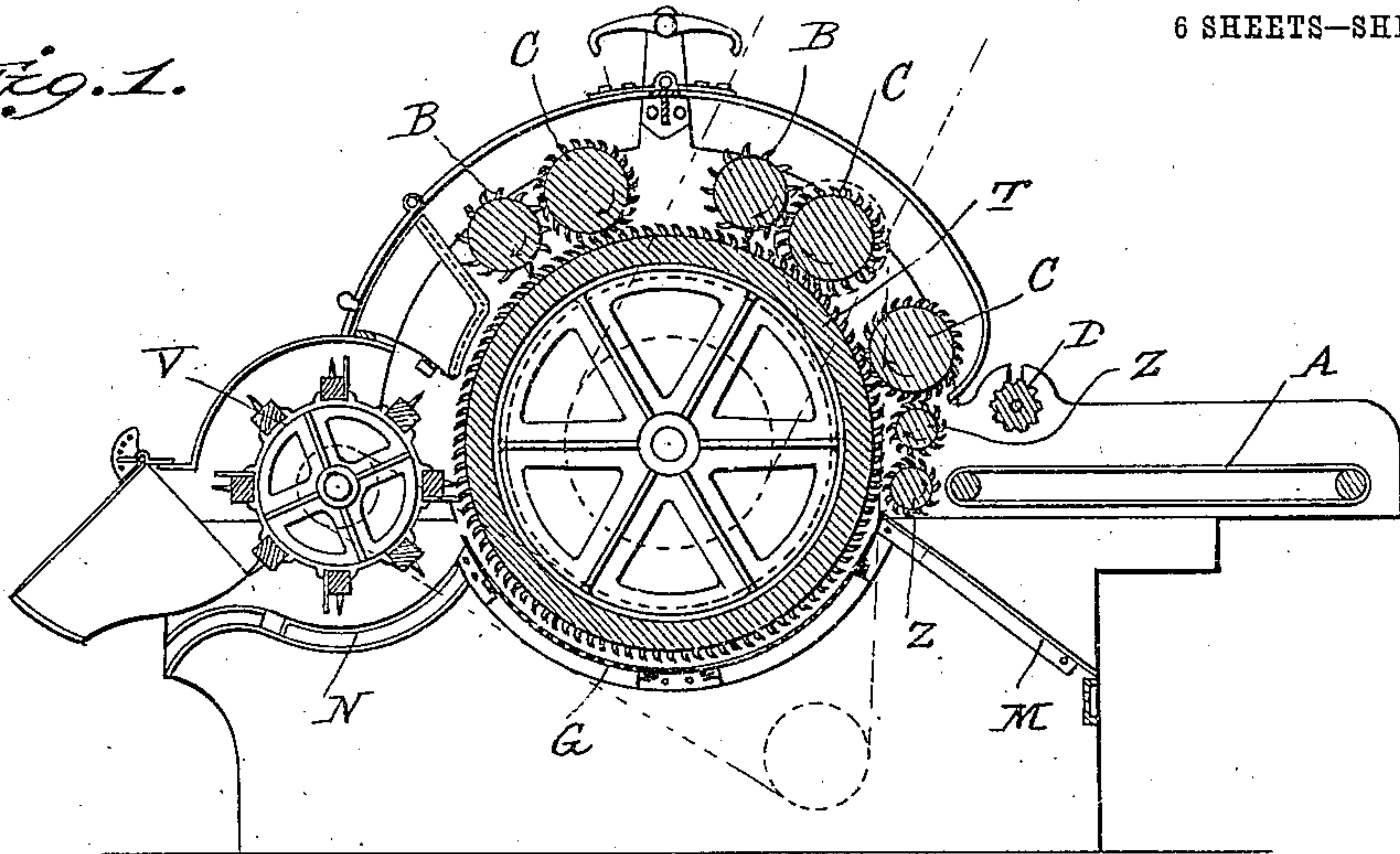


Fig. 2.

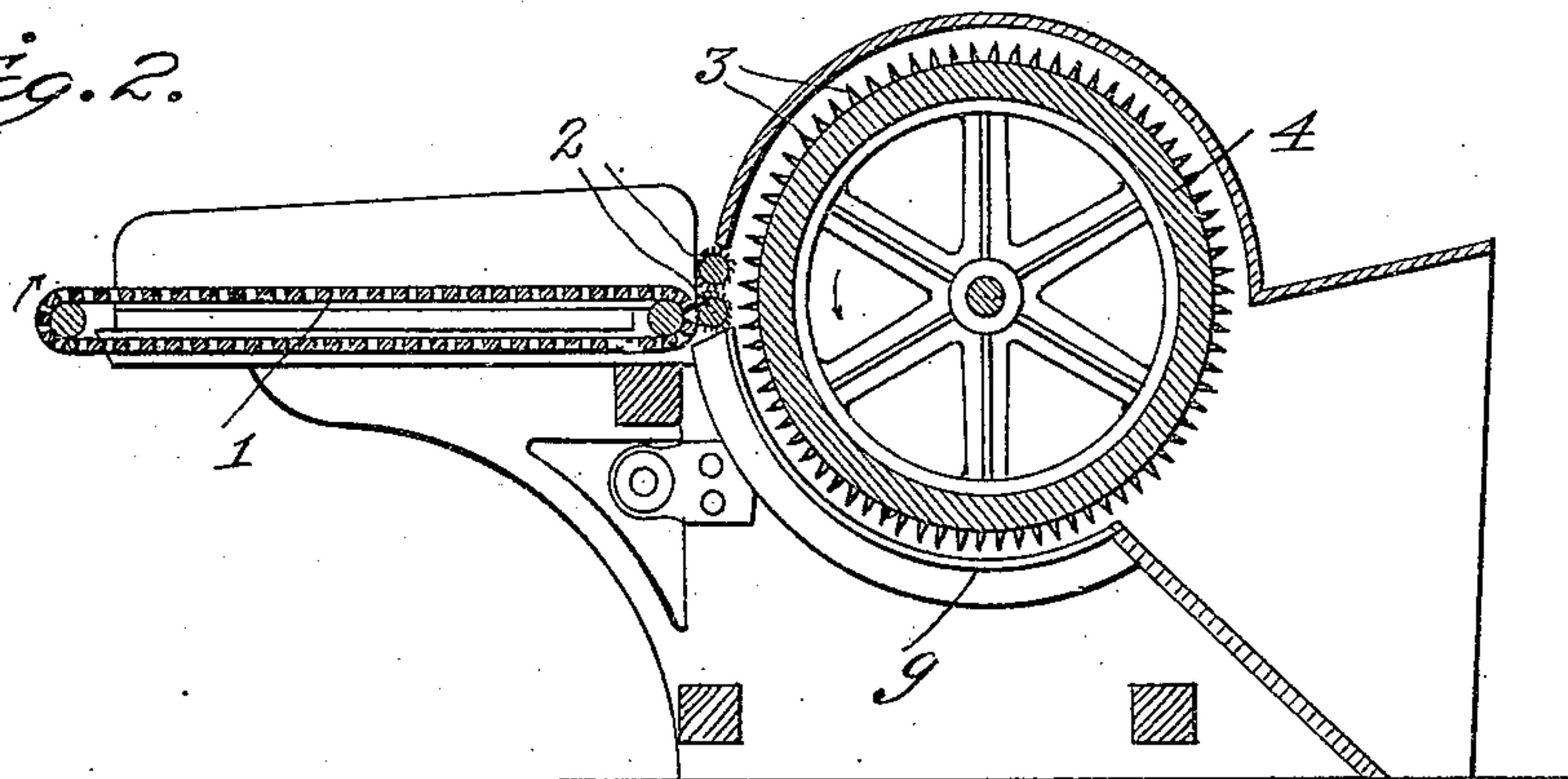
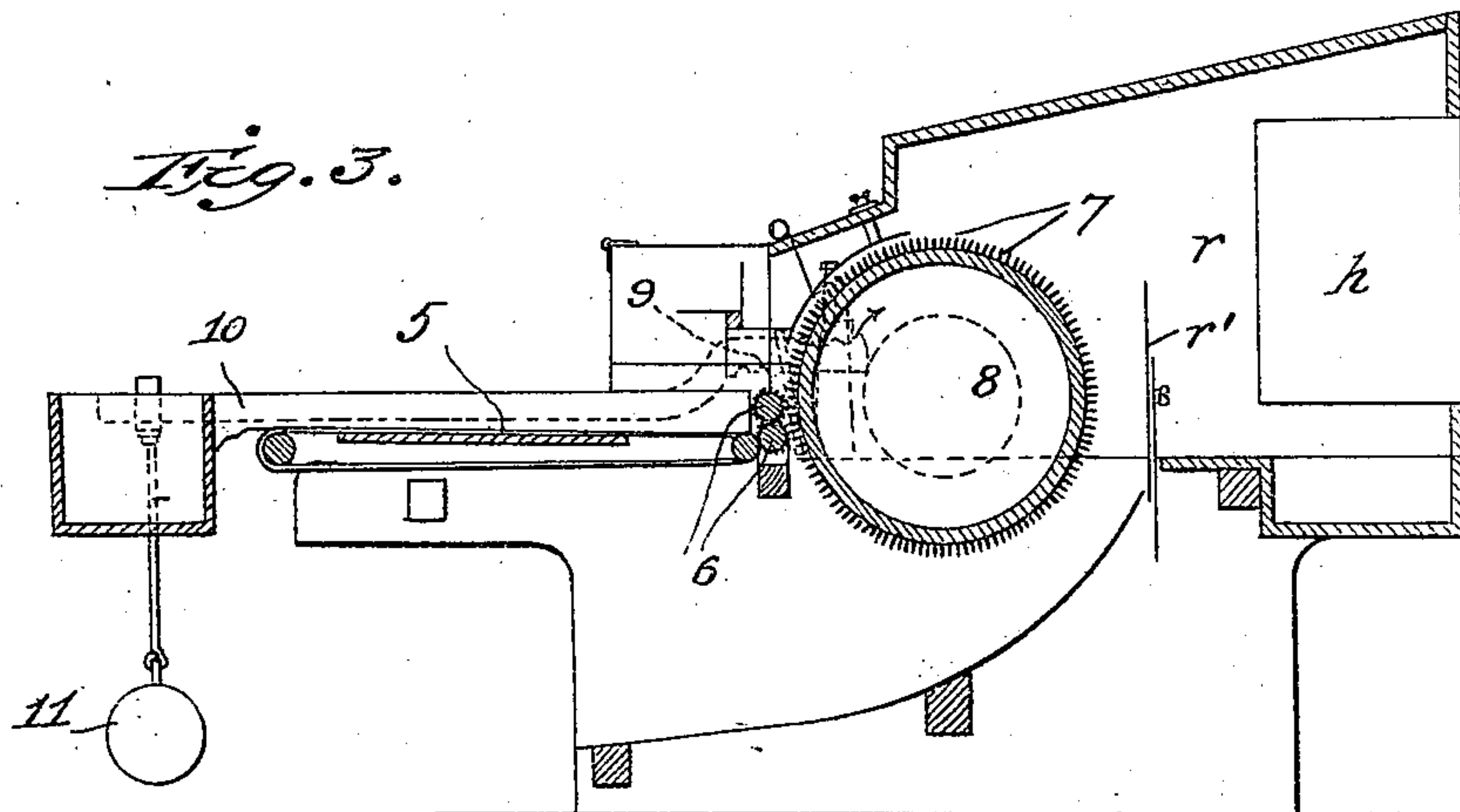


Fig. 3.



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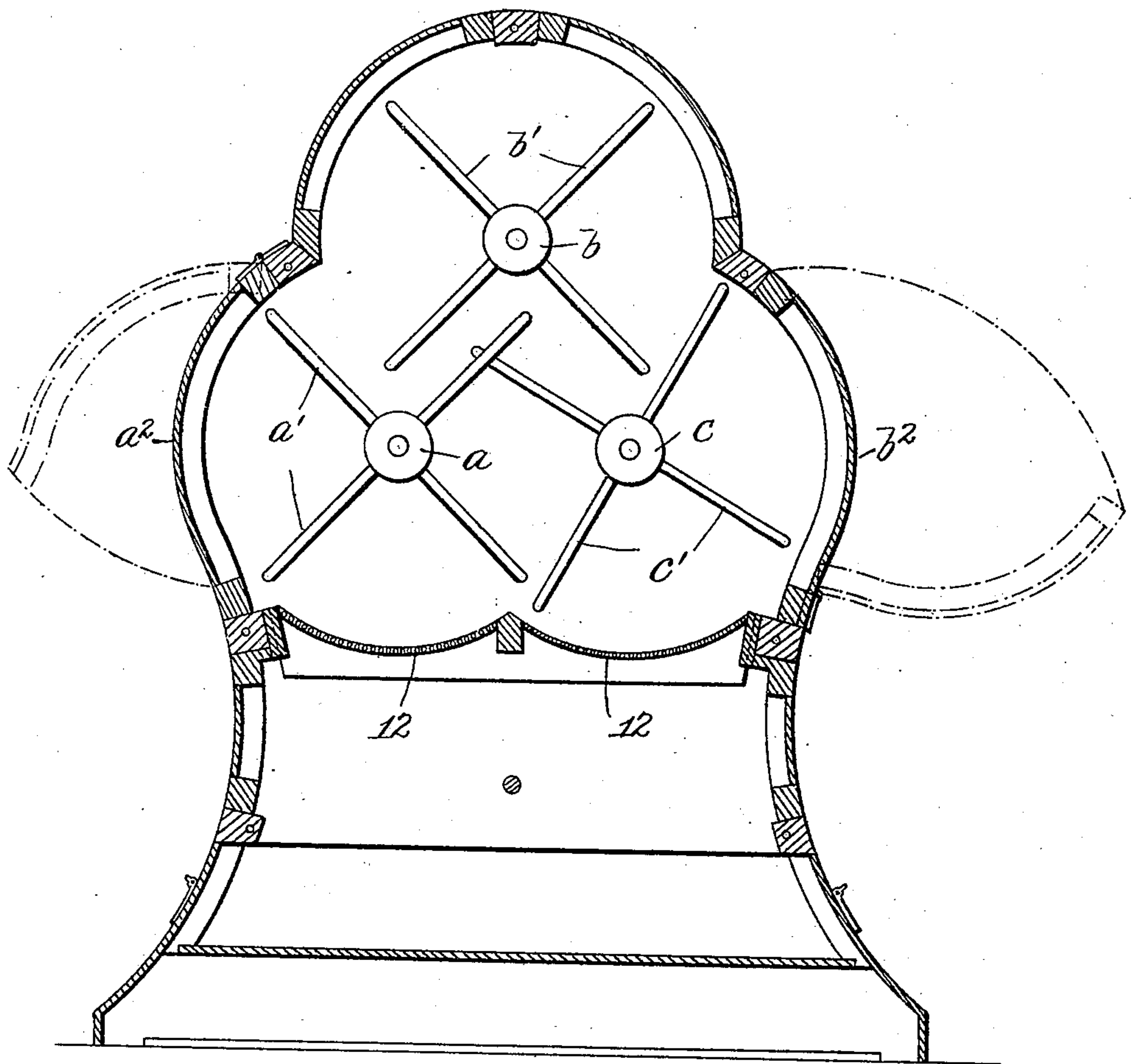
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6 SHEETS—SHEET 2.

Fig. 4.



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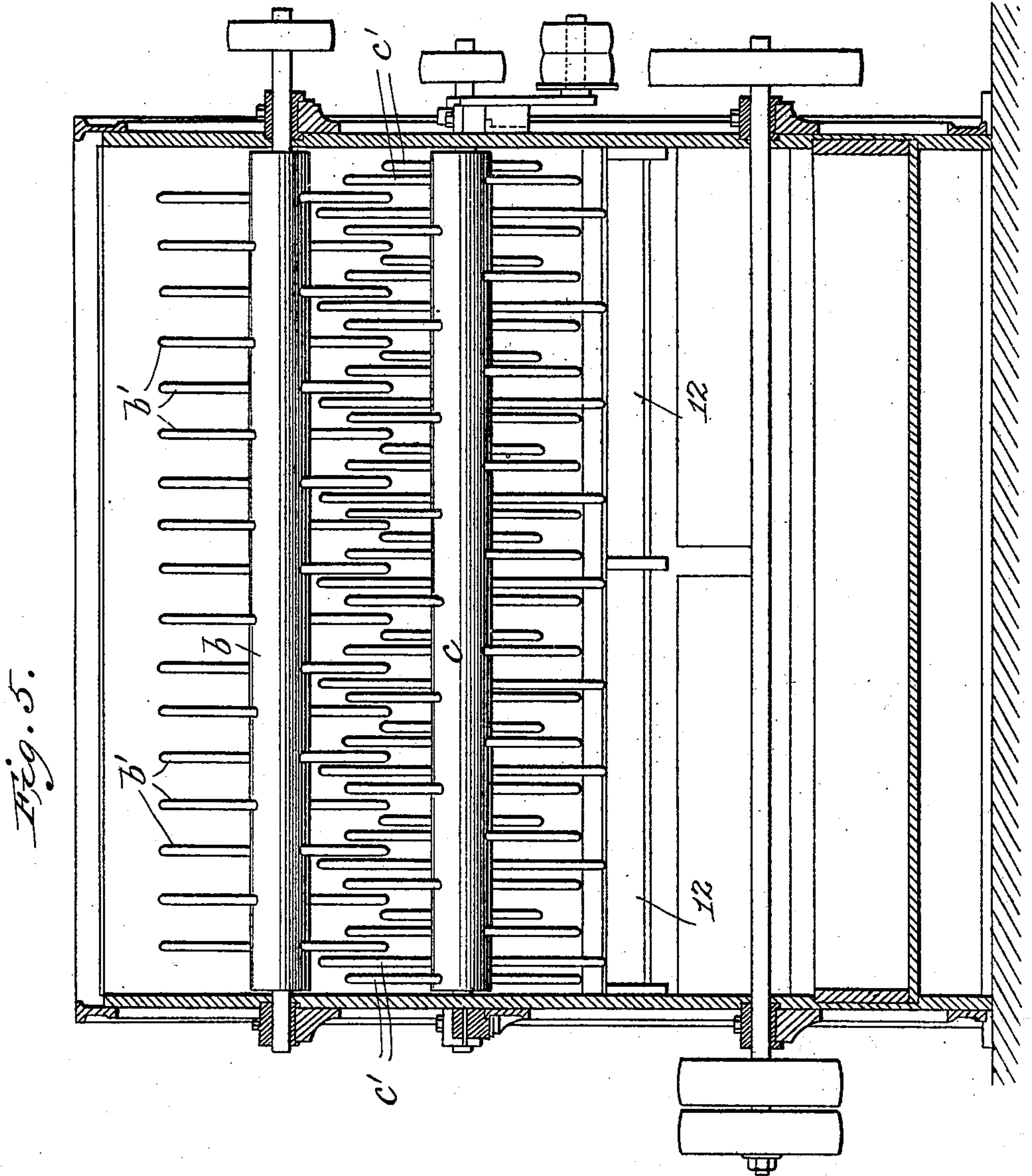
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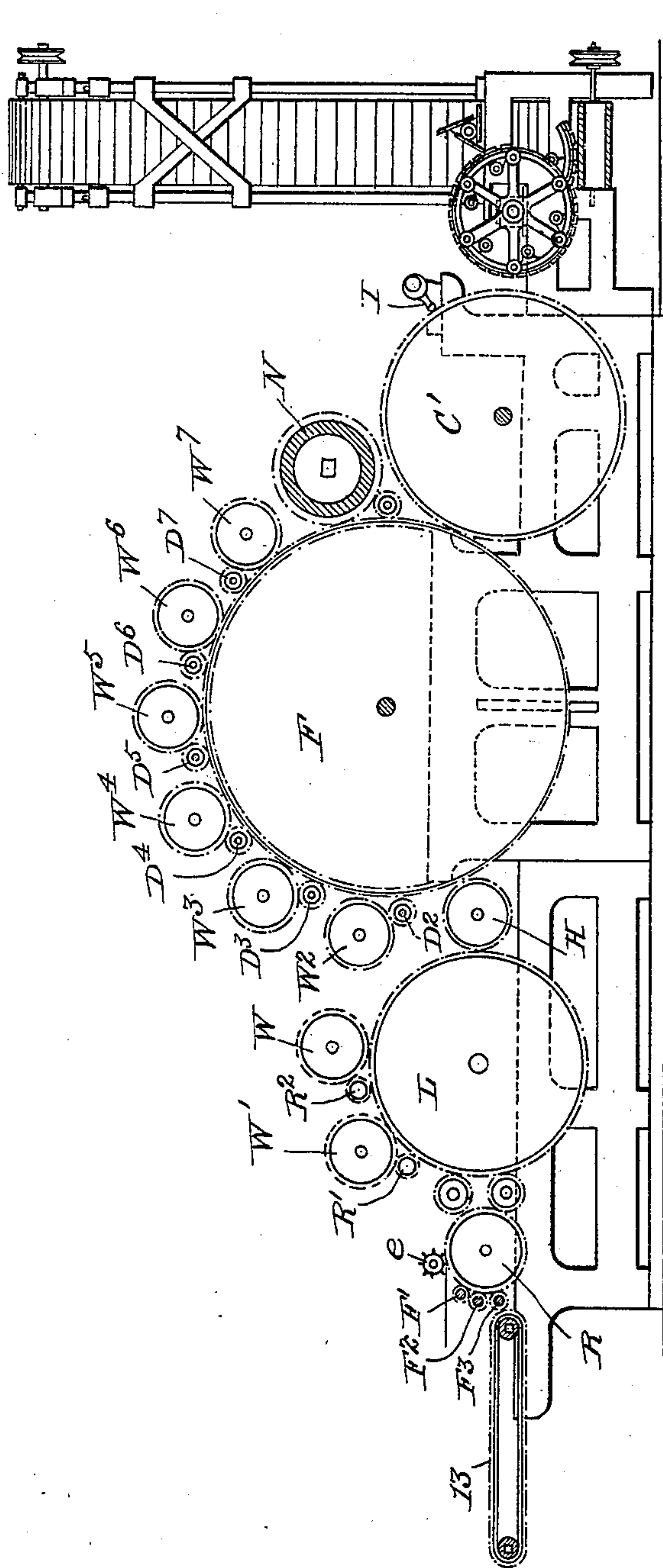
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Fig. 6.



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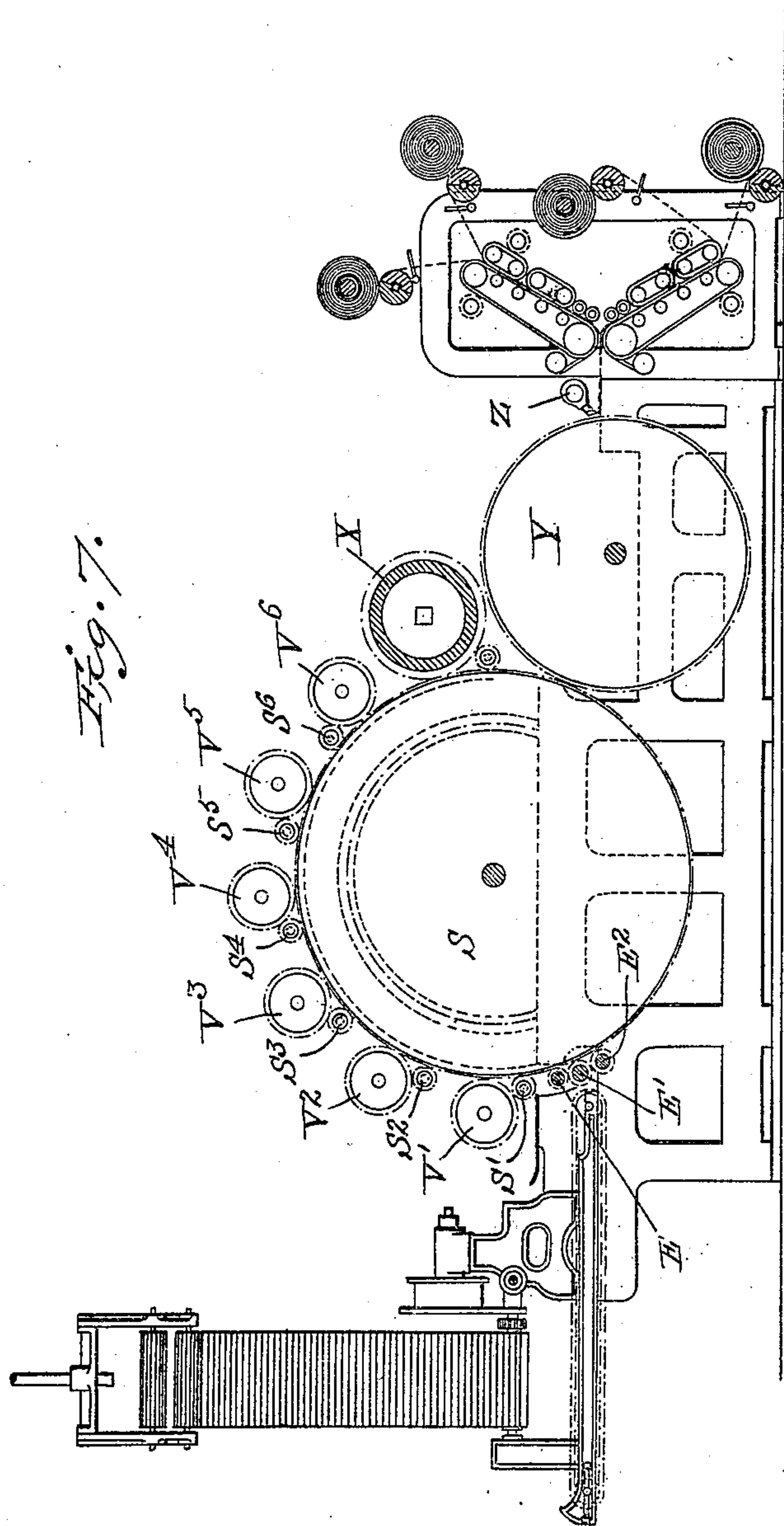
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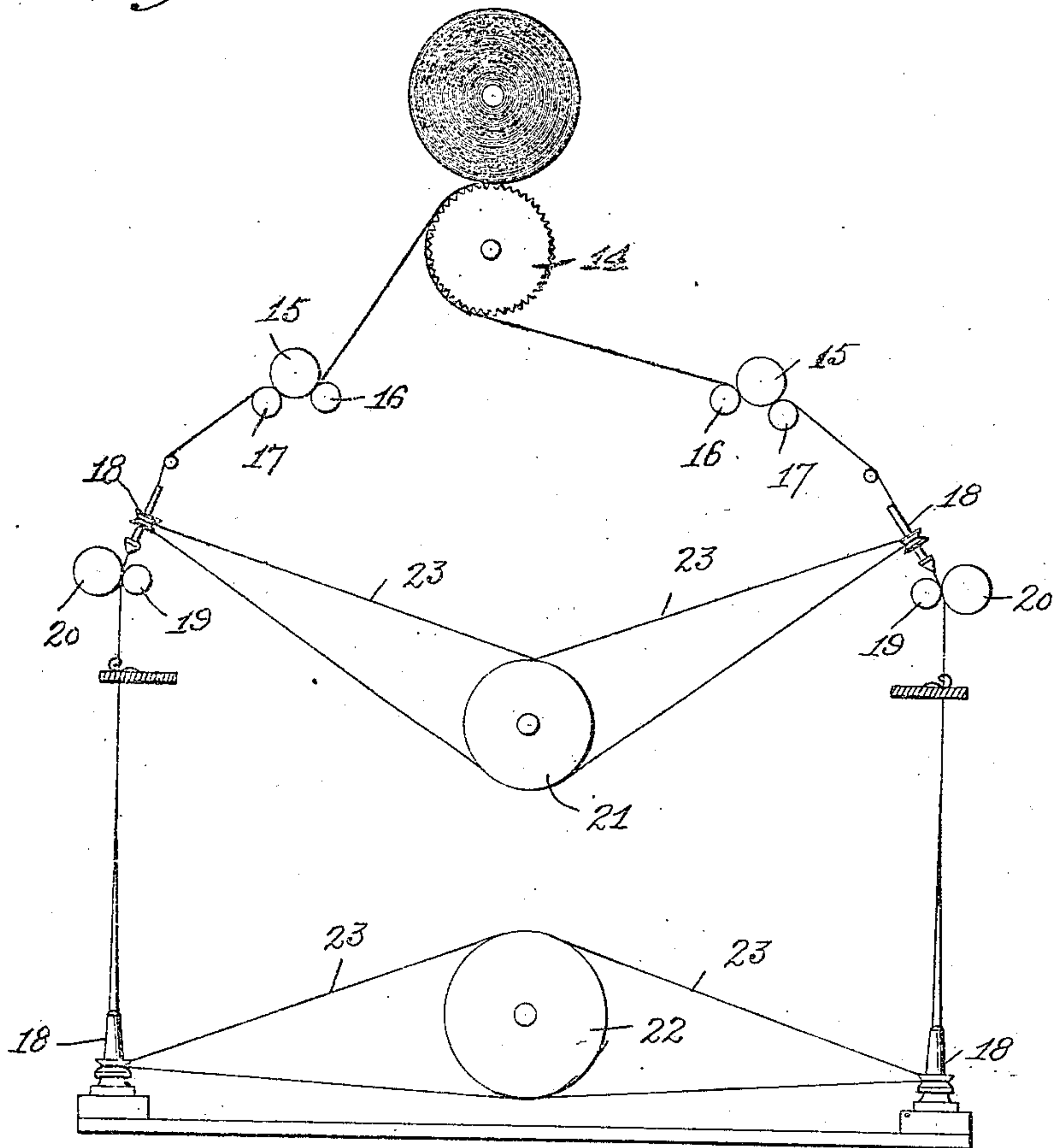


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 6 SHEETS—SHEET 6.

Fig. 8.



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UNITED STATES PATENT OFFICE.

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PROCESS FOR MANUFACTURING YARNS AND FABRICS BY THE SPECIAL UTILIZATION OF WASHED FLAX-WASTE.

951,251.

Specification of Letters Patent.

Patented Mar. 8, 1910.

Application filed January 30, 1905. Serial No. 243,598.

To all whom it may concern:

Be it known that we, EVALD KORSELT and AUGUSTE THOMAS, both subjects of the King of Belgium, and residents of Ghent, Belgium, have invented certain new and useful Processes for Manufacturing Yarns and Fabrics by the Special Utilization of Washed Flax-Waste, of which the following is a specification.

The present invention relates to a special utilization of washed flax waste falling off from the spinning frames, continuous or other, this flax waste being known commercially as "washed waste."

The invention consists first in treating this waste in a special manner hereinafter described, and secondly in spinning the material thus obtained upon machines spinning generally carded wool, which constitutes also a feature of this invention.

Until now the above named waste has been particularly used for the manufacture of thin papers, such as cigarette-paper etc. Owing to the improved deviling, oiling, spinning and mixing processes which constitute the feature of the present invention, it may be used for the manufacture of yarns and fabrics.

The washed flax waste is first dried either in the open air or by steam; when it is quite dry, it is passed through the devil or plucker in order to separate the fibers which adhere one to the other by reason of the washing operation, and to render them shorter; from the devil the waste is conveyed to the opening machine which is intended to arrange the fibers in such a manner that the fibers are more easily treated by the raveling machine the object of which is to give to all fibers the same length; the material is then oiled with the necessary quantity of oil for obtaining the regular spinning. After the oiling operation, the material is conveyed to the beater and then to the carding machines up to the continuous card and finally to the self-acting frame or to the fixed continuous frame according to whether warp yarn or weft yarn is to be obtained.

In the dividers the large and small rubbing sleeves may be provided with special contacting cleaning rollers which are furnished either with "shag" or with "cord" garniture. The addition of these rollers prevents the rubbing sleeve from being

soiled and allows a superior yarn to be obtained even when materials are treated which are very difficult to be spun.

The material prepared in the above stated manner is spun either in a pure state or mixed with a certain amount of cotton, wool or other fibers having an animal, vegetable or mineral origin according to the final products which are intended to be obtained. The oiling also varies according to the final result.

The above stated process allows the spinning of the finer numbers, which is one of the most important points of the question.

The invention consists of steps or treatment of material which will be more clearly described in connection with certain kind of apparatus and particularly pointed out in the appended claim.

In the drawings—Figure 1 is a sectional view of the teaser used during the carrying out of the invention. Fig. 2 is a similar view of an opener. Fig. 3 is a like view of a raveling or waste opener machine. Figs. 4 and 5 are transverse and longitudinal sectional views of a scutcher. Fig. 6 is a diagrammatic view of a carding machine. Fig. 7 is a diagrammatic view of the carding machine used after that shown in Fig. 6. Fig. 8 is a diagrammatic view of the spinning frame.

The method of treating the material is first by acting upon it by a teaser as represented in Fig. 1, which shows a big drum, feed rollers, cleaner, several pairs of workers and a fancy. All these are provided with bent steel pins, passing the one into the other, so that the material cannot leave the teaser without being opened and the material will not be torn because the rollers are driven slowly and there is a space between the pins, allowing the material to easily slip through them. The material is introduced by the continuous table A, then goes between the feed drums Z Z, where it is caught by the pins of drum T. This drum leads it slowly toward the workers C, where it is well divided and consequently well opened. There the material is taken by the straight pins B, which return it to the drum. This way the material passes several times between the pins directed in an opposite way, then being worked several times. Finally it is cleaned by fancy V, which throws it outside. The workers are covered

with a cover divided into two sections provided with hinges by which they can be raised at will. A pressing roller D prevents the workers' hands being caught by the feeding rollers during the operation of the machine. Under the drum T is fitted a grate G, through which fall the impurities. The grate is composed of rods, which can be moved aside to facilitate cleaning. A tray M is placed under the feeders to prevent the material from falling down. Behind the last sweeper, under fancy V, is a grated box N, which takes up the impurities.

The material coming from the teaser goes to the opener, shown in Fig. 2, which shortens the threads and fibers so as to facilitate their opening. This machine is principally composed of a big drum 4 covered with strong and straight steel pins 3. The material is introduced and spread over the traveling table 1, then passes between the feed rollers 2, 2, where it is taken up by the pins 3, 3 of the big drum 4, which by this way opens and shortens it still more and throws it outside. Under the drum is put grate *g* in order to evacuate the impurities. The grate is composed of rods, which can be drawn aside to facilitate cleaning.

From the opener above referred to the material passes to the waste opener, shown in Fig. 3, which serves to open still more and to shorten both threads and fibers. The material is introduced by the continuous table 5, then goes to the feed rollers 6, 6, where it is caught by the pins 7, 7 of the big drum 8, covered with straight steel pins and quite near the one to the other. By this way the material is torn, opened, and the fibers shortened. According to the quality and length of threads, the material may again be passed through the same machine and torn to pieces and properly prepared by being again thrown down on the feeding table in an entangled state, is engaged by the teeth of the drum of the willow mechanism, and consequently the material is pulled out or shortened, owing to the fact that the feeding rollers rotate at a lower speed than the drum and this pulling out or shortening effect depends upon the speed and number of teeth of the drum. It has been found by the foregoing operation or treatment, that the fibers which were not shortened enough are now the proper length. This shortening of the fiber or thread can also be accomplished by bringing the feed rollers closer to the drum, or adding a second or auxiliary set of feed rollers. The big drum turns, according to material, from 700 to 1,100 turns in a minute. The material thrown out by the drum is taken up by any suitable case or receptacle *r*, provided with draft hole *h*, which also enables one to observe the operation of the machine. Under the feed rollers is provided any suit-

able form of fan or ventilator, and in said casing *r* and just beyond the drum is provided an upright and adjustable partition *r'* which holds the material to the outside and thus prevents its return to the drum by the air currents formed by the machine.

In order to control the feeding of the material, the extremities of the axis of the feed rollers are provided with pressers 9 regulated by levers 10 and counterpoise 11. Under the drum is fixed a grate with rods, which can be moved aside to facilitate cleaning and to remove impurities. The material coming from the foregoing waste opener is first of all oiled. This being done, the oiled material is introduced into the mixing scutcher, which serves to obtain a homogeneous mixing. In order to obtain this result, if found necessary, the material can be passed several times through this machine. This scutcher has a special form of case (see Figs. 4 and 5), in which are disposed three drums *a*, *b* and *c* with rods *a'*, *b'* and *c'*. The breadth of the case differs according to production required from 1.60 to 2 meters wide. When the material is introduced the two hinged sides *a*² and *b*² of the case hermetically inclose the machine and the drums are driven. The rods of the drum are arranged in such a manner that they cross each other (see Fig. 5). Under the drums is fixed a grate 12 with rods to remove the impurities. The rods of the grate can be pulled out by drawing them aside in order to facilitate cleaning. The material coming from the scutcher is then passed into the first carding engine, as shown in Fig. 6. Usually this kind of spinning needs three carding engines.

In order to spare a second carding engine or intermediate carding engine, and principally because results have proved superior, we have put a breast with two workers and which consists of the following arrangement: A feeding table 13, leading the material to three feeders *F*¹, *F*², *F*³, thence to the taker in *R*, above which is a barring roller *e* with sides *W*, *W'* are two workers provided with the usual clearing rollers *R*¹, *R*². From the breast or drum *L* the material goes, with the help of a comb *H*, to the big drum *F*, which is provided with six workers *W*², *W*³, *W*⁴, *W*⁵, *W*⁶, *W*⁷, and their clearer rollers *D*², *D*³, *D*⁴, *D*⁵, *D*⁶, *D*⁷, respectively, to fancy *N*, to the big comb *C*¹. By means of a doffing comb *I*, the material is then detached from the big comb and the sheet obtained is by means of any suitable apparatus cut into smaller sheets and slivers and the same arranged without crossing of the fibers for properly feeding to the next carding engine. This operation can also be done in the usual manner and without automatic feeding by proceeding the ordinary way in making a sheet arranged by hand on

the feeding table of the next carding engine indicated in Fig. 7. This carding engine is also provided with a feeding table disposed so as to receive the sliver formed by the preceding carding engine, shown in Fig. 6. The sliver passes to the three feed rollers E, E', E², and reaches the big drum S provided also with six workers V¹, V², V³, V⁴, V⁵, V⁶, and to their respective clearer rollers S', S², S³, S⁴, S⁵, S⁶, respectively, to fancy X, to the big comb Y. By means of the doffing comb Z the sheet is detached from the big comb and the way out is effected by the steel band condenser and passes between the rubber leathers of intensive friction and forms, by leaving the rubber leathers one hundred and twenty good threads, divided on four rollers and two false threads. The yarn obtained by the last condenser carding engine passes to the spinning frame.

We are using self actors or ring spinning frames, which are generally used for carded wool. Of these two kinds of frames, we prefer the special ring spinning frame we are now describing to any other one and for the reasons that they give a higher production and a superior thread as to strength and evenness and cheaper and larger production. The surface drum produced by the condensing carding engine is placed on a roller driving surface drum 14, where the threads are divided on both sides of the frame. The thread passes between the rollers 15, 16 and 17 and then into spindle 18, from which they pass between the rollers 19 and 20. The drawing is produced by the rollers 15 and 20 turning quicker than rollers from which the yarn is fed. The spindle gives a previous twist to prevent breaking and the velocity of this spindle differs according to thickness of the thread and the velocity of the rollers depends on quality of material, etc. 21 and 22 are the pulleys for rotating the spindles 18, 18 by means of any suitable belts 23.

The number of turns required by the yarn during drawing must be very exact to prevent breaking, therefore it happens that, notwithstanding so many pulleys, it is difficult to get the necessary velocity. The fact as required the rollers 16 and 17 being displaced giving more or less twist, if they are more or less near or distant of rollers 19 and 20. The alternations of twist can be effected during the machine turning. An-

other advantage of this combination is that the drawing of all raw material proceeds with equal success. In fact it is certain that a short fiber will easily support a strong drawing operated on a small length of thread, whereas they will not stand the drawing on a great length of thread. The removing of the rollers allows to regulate at will the length of the thread to be drawn. It is therefore easy to spin the same material to finer sizes than with other spinning frames. These keep the same length of thread at the drawing, both good or bad raw material, short or long fibers. Leaving the rollers 19 and 20, the threads arrive at the heels of the traveler 24, which carries it by the regular around spindle A, which gives the twist.

The raw material which we use can only be spun by a method after long experiment and patience, and after a long time we have been able to obtain the fine sizes such as Nos. 18, 20, 22 and 25 line, which alone have a commercial value, the coarser sizes having no value whatever because they are too heavy and cannot in these coarse sizes compete with the cheaper jute yarns, hemp and tow yarns, even against cotton, cotton being light weight, give by equal weight far more length. We have therefore found a great difficulty to obtain these fine sizes with or without mixing with other textiles. The yarn made by our method is smooth and without the lumps and impurities of other flax and tow yarns, giving thus a nicer cloth.

Having now fully described our said invention, what we claim and desire to secure by Letters Patent is:—

The herein described treatment of washed flax waste which comprises drying the same, separating and shortening the fibers thereof, arranging the fibers of the material and reducing them substantially to the same length, oiling the material thus treated, beating said oiled material, carding the same and then spinning the material into yarn.

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

EVALD KORSELT.
AUGUSTE THOMAS.

Witnesses:

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