

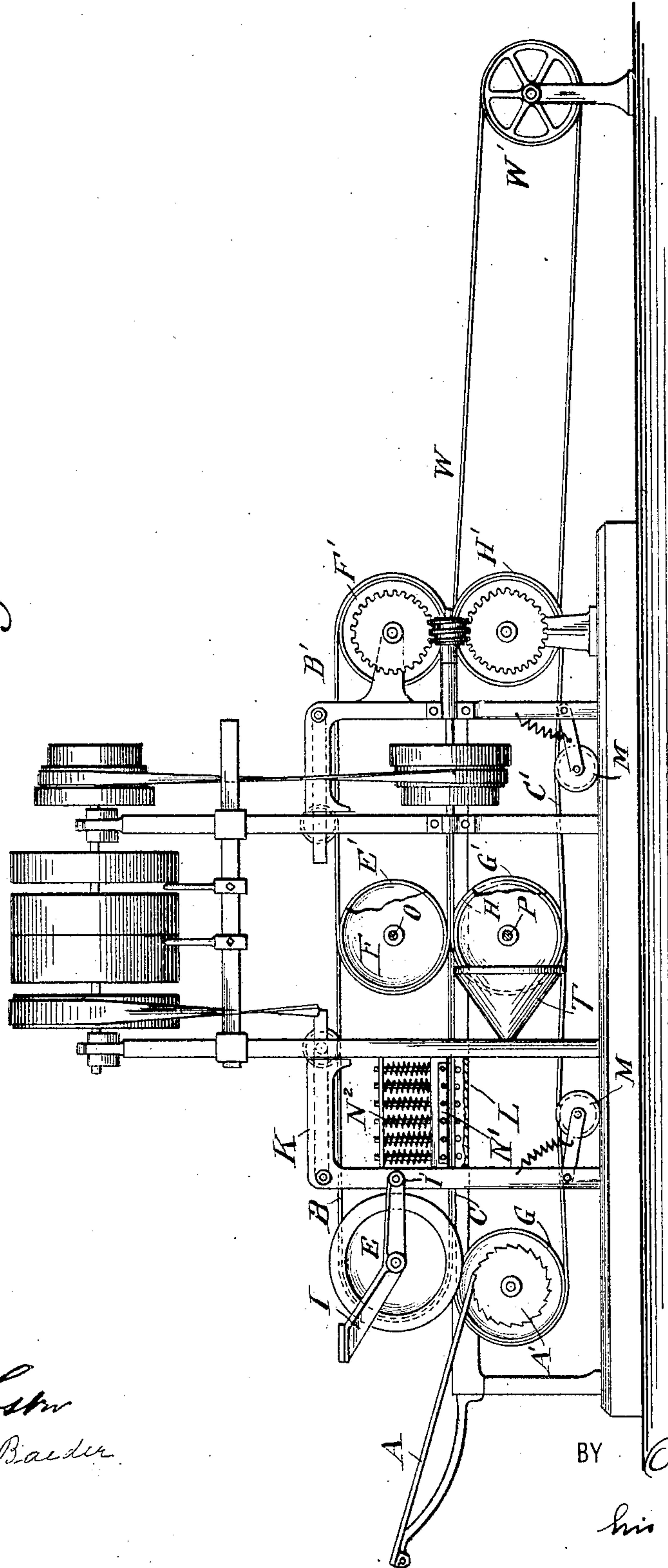
No. 805,441.

PATENTED NOV. 28, 1905.

H. J. BOEKEN.
FIBER CLEANING MACHINE.
APPLICATION FILED DEC. 20, 1904.

3 SHEETS—SHEET 1.

Fig. 1.



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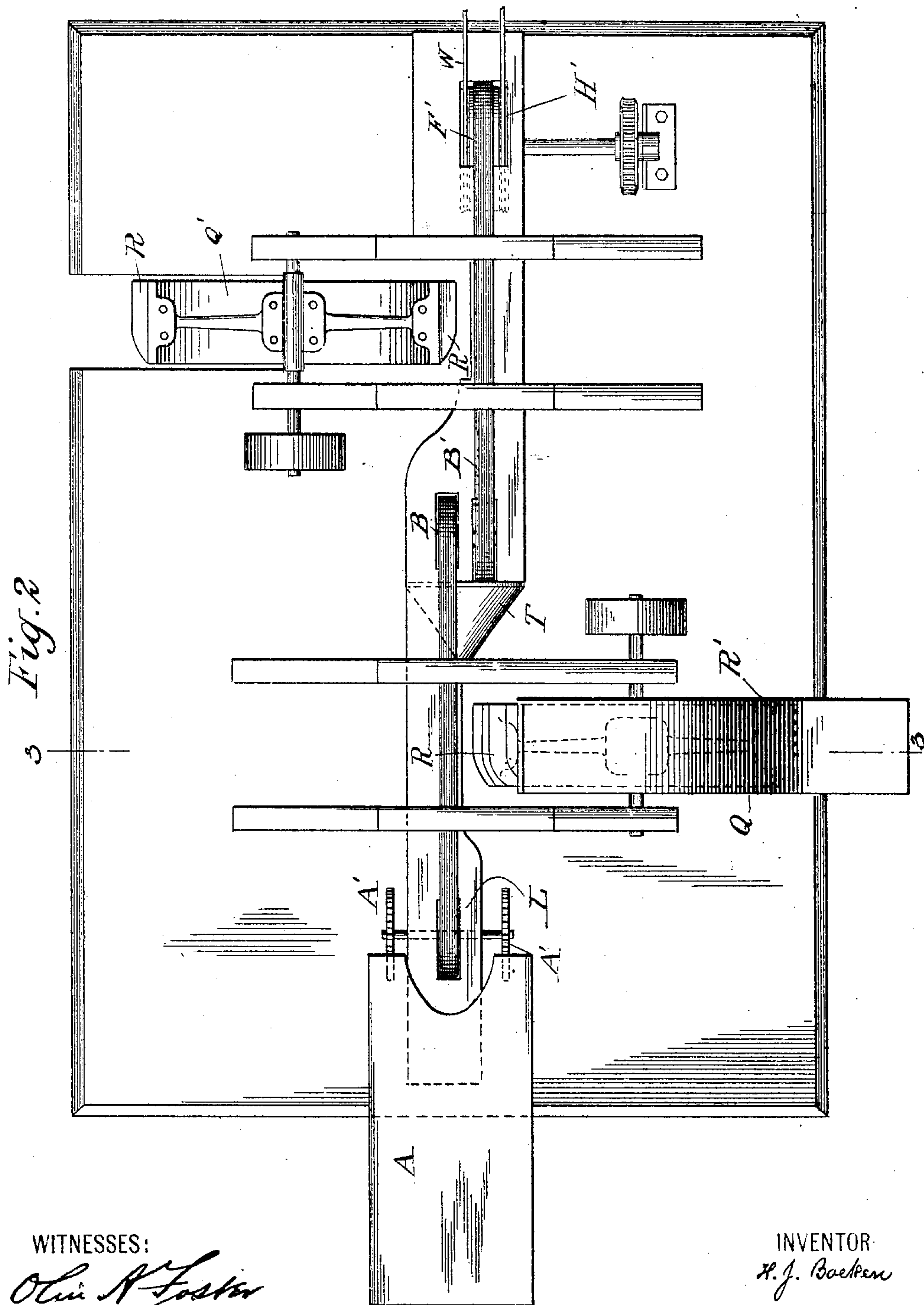
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3 SHEETS--SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 3,

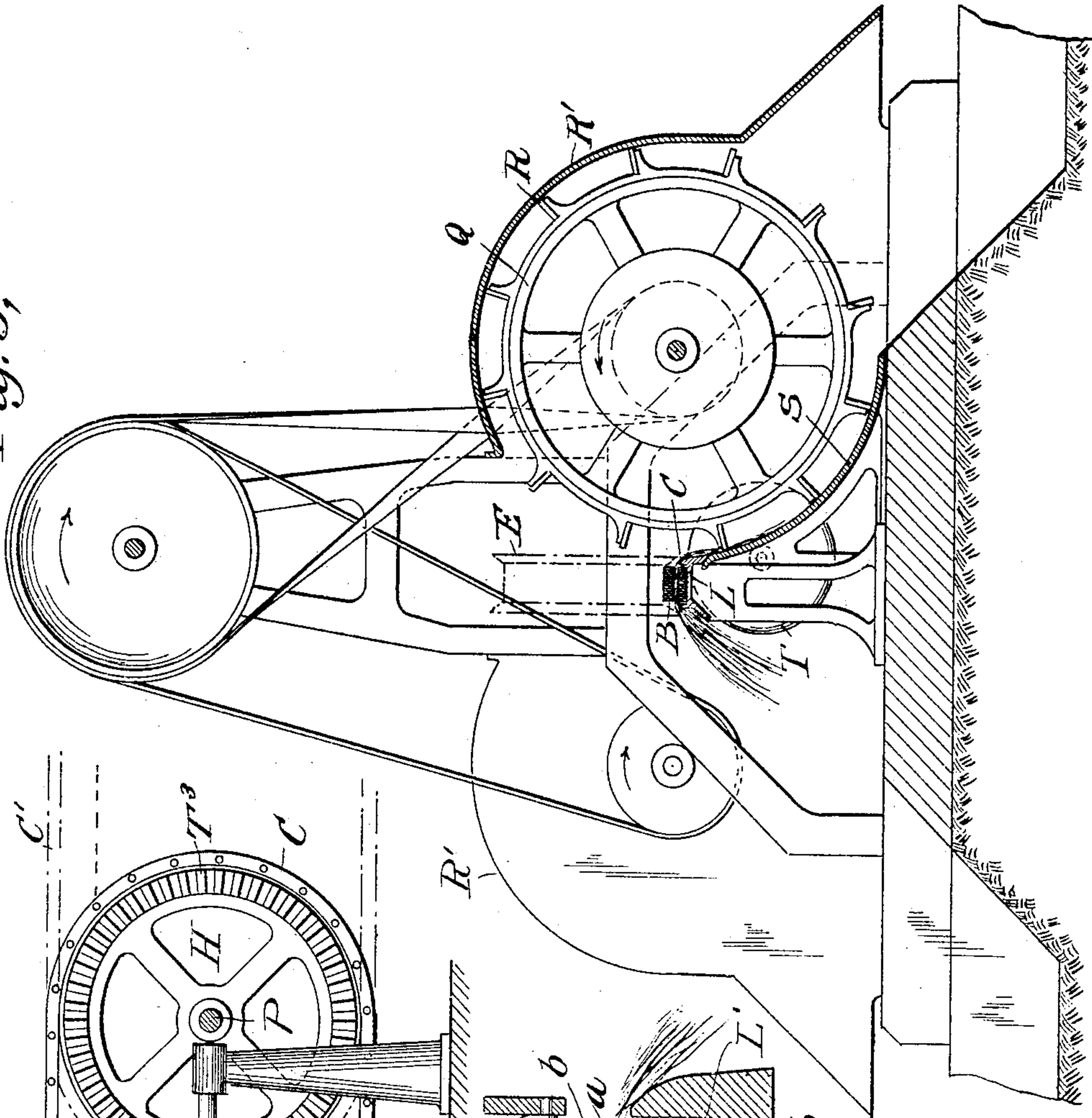


Fig. 4,

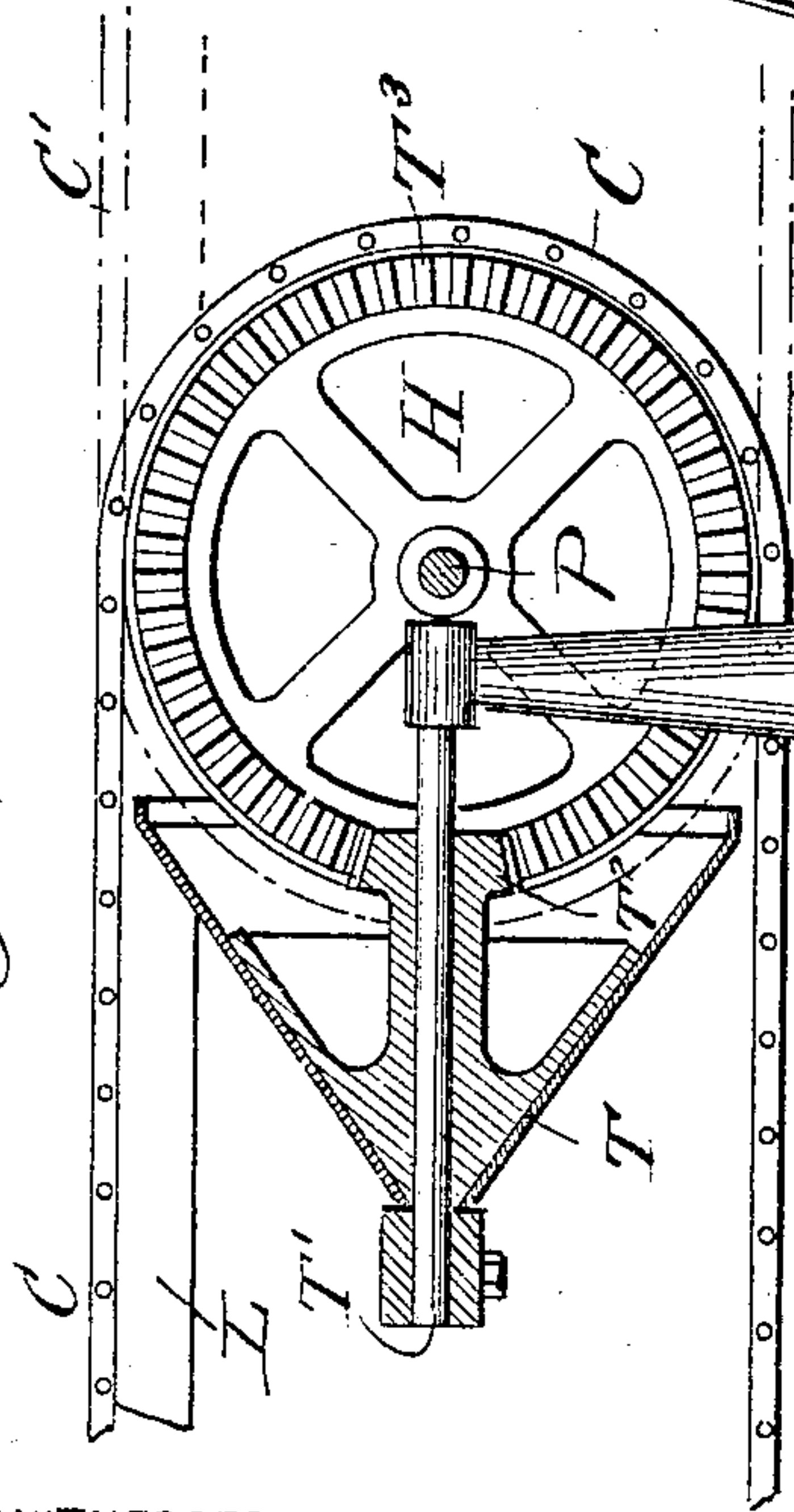


Fig. 5,

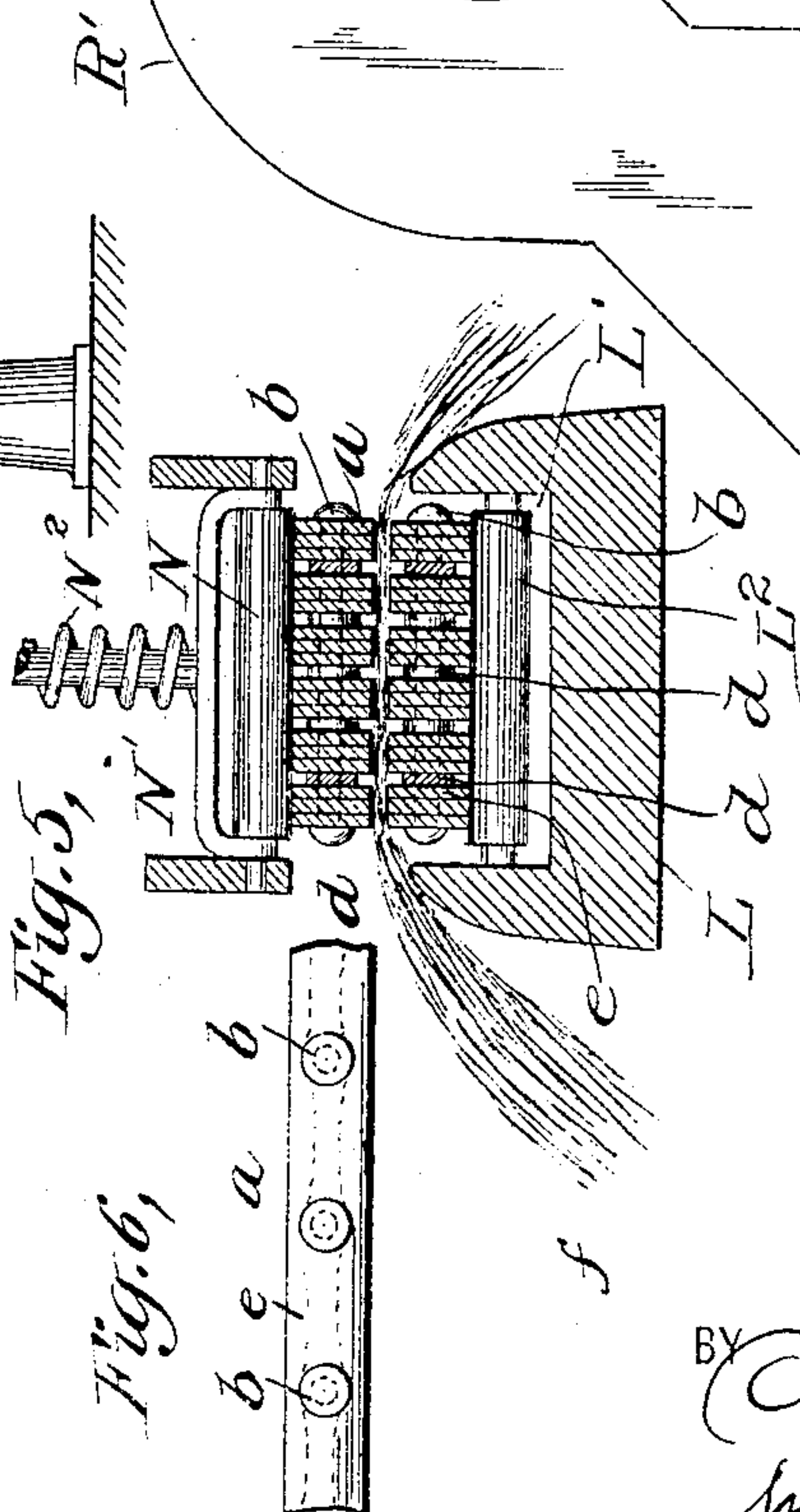


Fig. 6,



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UNITED STATES PATENT OFFICE.

HUBERT J. BOEKEN, OF DÜREN, GERMANY.

FIBER-CLEANING MACHINE.

No. 805,441.

Specification of Letters Patent.

Patented Nov. 28, 1905.

Application filed December 20, 1904. Serial No. 237,671.

To all whom it may concern:

Be it known that I, HUBERT J. BOEKEN, a citizen of Germany, residing at Düren, Germany, have invented certain new and useful Improvements in Fiber-Cleaning Machines, (for parts of which I have obtained Letters Patent in Germany, No. 155,865, of May 8, 1904,) of which the following is a specification.

This invention relates to improvements in that class of machines known as "fiber-cleaning" machines, and which are used for the purpose of removing the outer skin and flesh from the leaves of the tropical plants of the agave class and commonly known as "sisal," "henequin," &c., for the production of a clean fiber, which is commonly known as "sisal hemp" and is used in the manufacture of ropes, for spinning and weaving, and in the arts in general.

The object of my invention is to provide a new and improved machine of this kind which is simple in construction and design, strong and durable, cleans the fiber thoroughly and effectively in a very short time without entangling, tearing, or wasting the fiber, which machine automatically holds the leaves firmly and securely during the time they are being subjected to the cleaning-blades and automatically conveys them from the entrance to the exit end of the machine and from one set of holding and conveying belts to another set.

In the accompanying drawings, in which like letters of reference indicate like parts in all the figures, Figure 1 is a side elevation of my improved fiber-cleaning machine, partly broken away and partly in section, and the scraping-drums with their casings being removed. Fig. 2 is a plan view of the same, some of the parts being omitted. Fig. 3 is a vertical transverse sectional view on the line 3 3 of Fig. 2. Fig. 4 is a detail longitudinal sectional view through the conical transfer-ring-drum on an enlarged scale. Fig. 5 is a transverse sectional view through the two conveyer-belts on an enlarged scale. Fig. 6 is a side view of part of one of the belts.

The leaves which are to be cleaned or decorticated are placed transversely upon a feed-table A, which is pivotally mounted and rests with its free end upon rotating ratchet-wheels A', which give this feed-table a vibrating or shaking motion for readily delivering the leaves into the machine. This machine is constructed with two sets of endless feed-

belts arranged in pairs of two—that is, two coöperating belts in each set—namely, an upper endless feed-belt and a lower endless feed-belt in each set, each belt passing over two suitable pulleys. As shown, one set of the feed-belts consists of the upper endless belt B and the lower endless belt C, passing, respectively, over the pulleys E F and G H, and the other set of belts is composed of the upper belt B' and the lower endless belt C', passing over the pulleys E' and F', G' and H', respectively. Each belt is composed of a series of groups of leather straps *a* placed on edge, there being three, more or less, of said straps *a* in each group, and the groups are separated from each other a distance about equal to the thickness of one strap, more or less, and these several straps are united by means of rivets *b*, passed through them. For the purpose of holding the several groups of straps a proper distance apart leather washers *d* are placed on the rivets *b* and between the groups of straps, as shown in Fig. 5. For the purpose of preventing undue stretching of the belts a series of thin sheet-metal links *e* are placed against the inner straps of each outer group, and through the ends of these links the rivets *b* also pass. All these conveyer-belts are constructed in the like manner. The pulley E for the upper belt of the first series is mounted in a frame I, pivoted to the main frame K of the machine at I', so that the entrance end of the upper endless belt can yield more or less as the leaves are fed in between the upper and lower belt at the entrance end of the machine.

The upper strands of each lower belt C and C' rests in a recess or groove L' in the upper surface of a suitable saddle L, in the bottom of which groove L' a series of supporting-rollers L² are mounted, upon which the said upper strand rests. A spring-pressed idler M bears on the lower strand of each lower belt C C' for the purpose of holding said lower strand taut. A series of rollers N rest upon the upper surface of the lower strand of each upper belt B B', which rollers N are mounted in a suitable frame N', which frame is pressed downward by a series of springs N², so as to forcibly press the lower strands of the upper belts B B' upon the upper surface of the upper strands of the lower belts C C' or upon the leaves or fiber *f*, Fig. 5, between these two belts. This pressure is requisite for the purpose of holding the leaves firmly and securely during the time that they are

subjected to the beating or scraping action of the decorticating-blades, and this holding power of these belts is also increased by providing the belts with the open spaces between the several sets of straps *a*, as previously described. This saddle *L* extends from one end of the machine to the other, so as to form a support for the upper strand of the lower belt throughout the length of the machine and to give it solidity and strength. As appears clearly from the plan view, the two sets of belts are offset—that is to say, at their inner ends the belts overlap laterally—that is, one set of belts is at the side of the other, but the belts of the two sets are at the same elevation. The belt-pulleys *F* and *E'* of the upper series are both mounted on the common shaft *O*, and the pulleys *H* and *G'* of the lower belts of the two sets are both mounted on the shaft *P*, as is shown in Figs. 1 and 2. At the opposite sides of the machine the two scraping-drums *Q* and *Q'* are mounted on suitable shafts provided with suitable mechanism for rotating them, on which drums a series of scraping-blades *R* are mounted in the conventional manner, and these drums are surrounded each by a casing *R'*. Concentric with each drum a segmental support *S* is formed on the side of the saddle *L*, the space between the face of the curved support *S* and the circumference through the outer edges of the blades *R* being about equal to the thickness of the fiber in the leaf. One of these drums is on the right side of the machine and the other at the left side, and the one at the right-hand side of the machine is about midway of the length of the first set of endless belts, and the one on the left-hand side is about midway of the length of the second set of belts, as is shown in Fig. 2. At the inner end of the lower endless belt of the first set a conical drum *T* is mounted on a horizontal shaft *T'*, parallel with the lower endless belt. This drum is provided with a beveled pinion *T²*, engaging a cog-wheel *T³*, formed on the inner side of the pulley *H*, over which the lower endless belt *B* passes, whereby this conical drum *T* is rotated at a very great speed.

Endless cables *W* pass over pulleys on the shaft of the pulley *H'* and also over pulleys *W'* and serve for carrying off the clean fiber. As shown by dotted lines in Fig. 3 and full lines in Fig. 1, the pulley *E* is grooved circumferentially, and the annular flanges formed at the sides of this groove serve for bending down the leaves at the side edges of the upper strand of the lower belt of the first series.

The operation is as follows: The leaves are fed in between the first set of endless conveyers and holding-belts *B* and *C* in such a manner that they are grasped at or near their middle, so that about one-half of the

leaf hangs down from each side, as indicated in Fig. 5, and as the leaves are carried in the direction from the front to the rear of the machine the right-hand halves or ends of the leaves hanging down from between the belts are carried upon the support *S* at the right-hand side of the saddle *L* to be acted upon by the scraper-blades *R* of the right-hand scraping-drum *Q*, whereby the skin or covering of the leaves and the fleshy parts between the fibers are thoroughly scraped off, and this leaf is then conveyed by these belts to the ends of the conveying-belts *B* and *C* and must now be conveyed to the belts *B'* and *C'*, which, as said, are laterally offset from the belts *B* and *C*. For the purpose of lifting that end of the leaf which has been cleaned and which is now in a fibrous condition upon the overlapping end of the lower belt *C'*, so that these fibrous parts can be gripped between the belts *B'* and *C'*, the above-mentioned conical drum *T* has been provided. This drum rotates at great speed, and as the fibers come in contact with the surface of the same they are caused to rise and are gradually lifted into almost horizontal position, so that they can readily pass from the upper strand of the belt *C* upon the upper strand of the belt *C'*. As the belts *B'* and *C'* are to the right, looking at the machine from the front, it is evident that the gripping and conveying belts *B'* and *C'* will now grip the cleaned part of the leaf and the left-hand ends or halves of the leaves which have not yet been subjected to the action of the stripping-blades hang down at the left of the saddle. As the belts *B'* *C'* carry the leaves forward this uncleaned part of the leaf passes upon the left-hand support *S* and is subjected to the action of the blades *R* on the left-hand stripping-drum *Q'* and the remaining half of the leaf is now scraped and cleaned, so that the entire leaf is now in a fibrous condition, and this fiber as it leaves the two conveying-belts *C'* and *B'* at the pulleys *F'* and *H'* passes upon the cables *W*, which carry it off for drying, packing, baling, &c. The leaf is thus automatically fed into the machine, is automatically and firmly gripped and held between the two endless conveying and holding belts of the first series, and while so held by the conveying and holding belts of the first series one end or half of the leaf is cleaned and scraped, then the leaf, one-half of which has been thus scraped and cleaned, is automatically conveyed to a second set of belts, which now grip the cleaned or fibrous part of the leaf, and while the leaf is held by the second pair of belts the remaining half of the leaf is subjected to the action of another scraper-drum, and then the cleaned or decorticated leaf—that is, the fiber remaining—is automatically conveyed upon the conveying-belts, which convey it out of the machine.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a decorticating-machine, the combination with two pairs of conveyer-belts, of a conical drum located between the upper and lower strands of one belt for conveying the leaves from one pair of belts to the other, means for rotating this drum and means for scraping leaves held by the pairs of belts, substantially as set forth.

2. In a decorticating-machine, the combination with two sets of conveyer-belts side by side, which overlap laterally at their inner ends, of a cone-drum located between the upper and lower strands of one belt, at the delivery end of the same, the larger diameter of the cone-drum being near the delivery end of the belt and means for rotating said cone-drum, which cone-drum serves for transferring leaves from one pair of belts to the other, substantially as set forth.

3. In a decorticating-machine, the combination with two sets of endless conveyer-belts side by side, and which overlap at their inner ends, of a cone-drum located between the upper and lower strands of one belt, at the delivery end of the same, the larger diameter of the cone-drum being near the delivery end of the belt, which cone-drum serves for transferring leaves from one set of belts

to the other, and means for rotating said drum from the shaft on which the inner belt-pulley is mounted, substantially as set forth.

4. In a decorticating-machine, the combination with two sets of endless conveyer-belts, each set consisting of an upper and a lower belt, the inner ends of said belts overlapping laterally, a scraping-drum mounted at one side of one belt, and a scraping-drum mounted on the other side of the other belt, and a conical transfer-drum located between the upper and lower strand of one lower belt at the delivery end of the same, substantially as set forth.

5. In a decorticating-machine, a holding and conveyer belt composed of groups of leather straps on edge, which groups are separated a short distance from each other, rivets passed through the groups of straps on edge, washers between the groups and sheet-metal links incorporated in the outer groups of straps, through which metal links the rivets pass, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 9th day of December, 1904.

HUBERT J. BOEKEN.

Witnesses:

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SOPHIE M. BAIDEN.