

(No Model.)

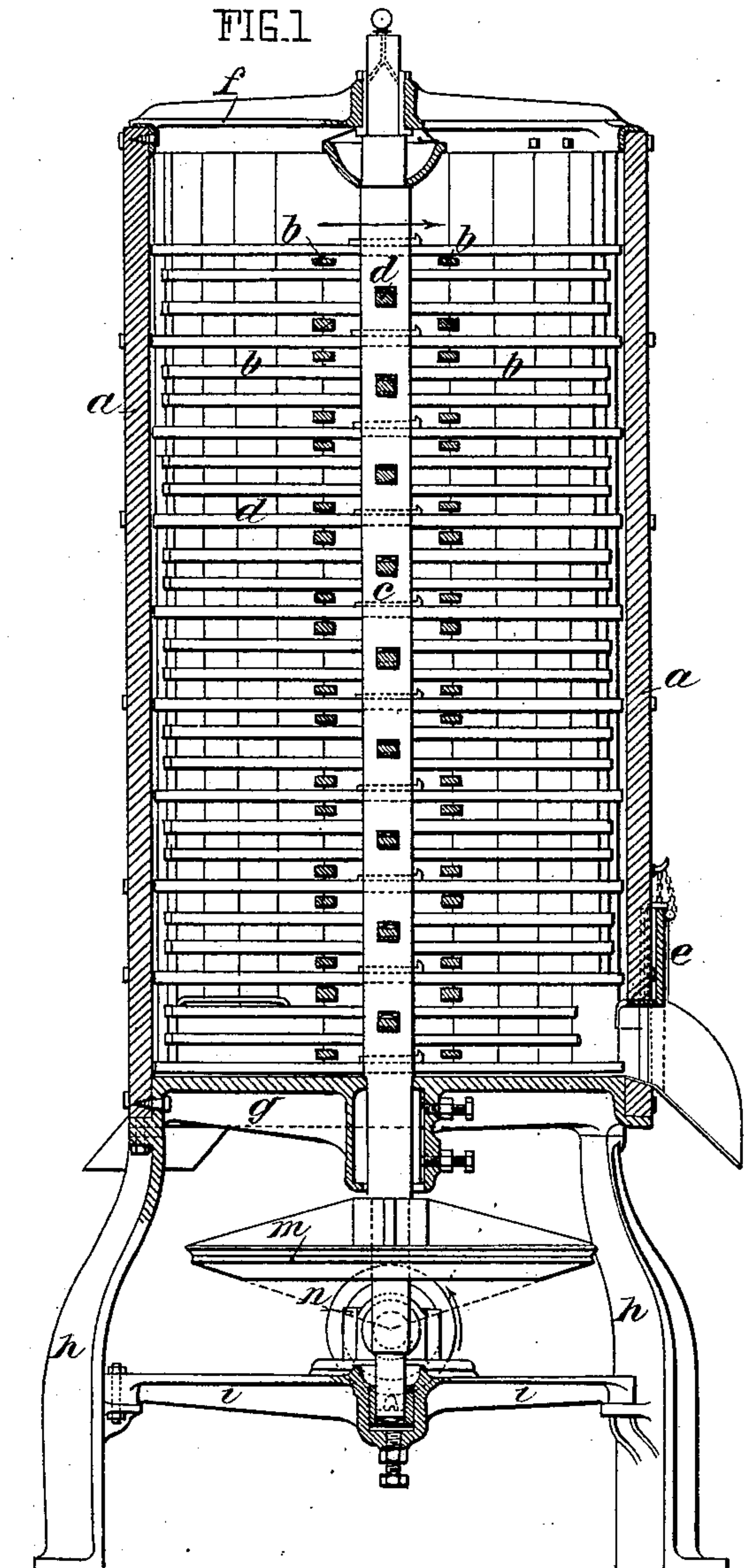
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L. VIGREUX.

APPARATUS FOR TRITURATING STRAW, &c., FOR CATTLE.

No. 454,094.

Patented June 16, 1891.



Witnesses,
R. C. Mitchell
L. M. Hachechleger

Inventor,
Léon Vigreux,
by Briesen & Knauth
his Attorneys.

(No Model.)

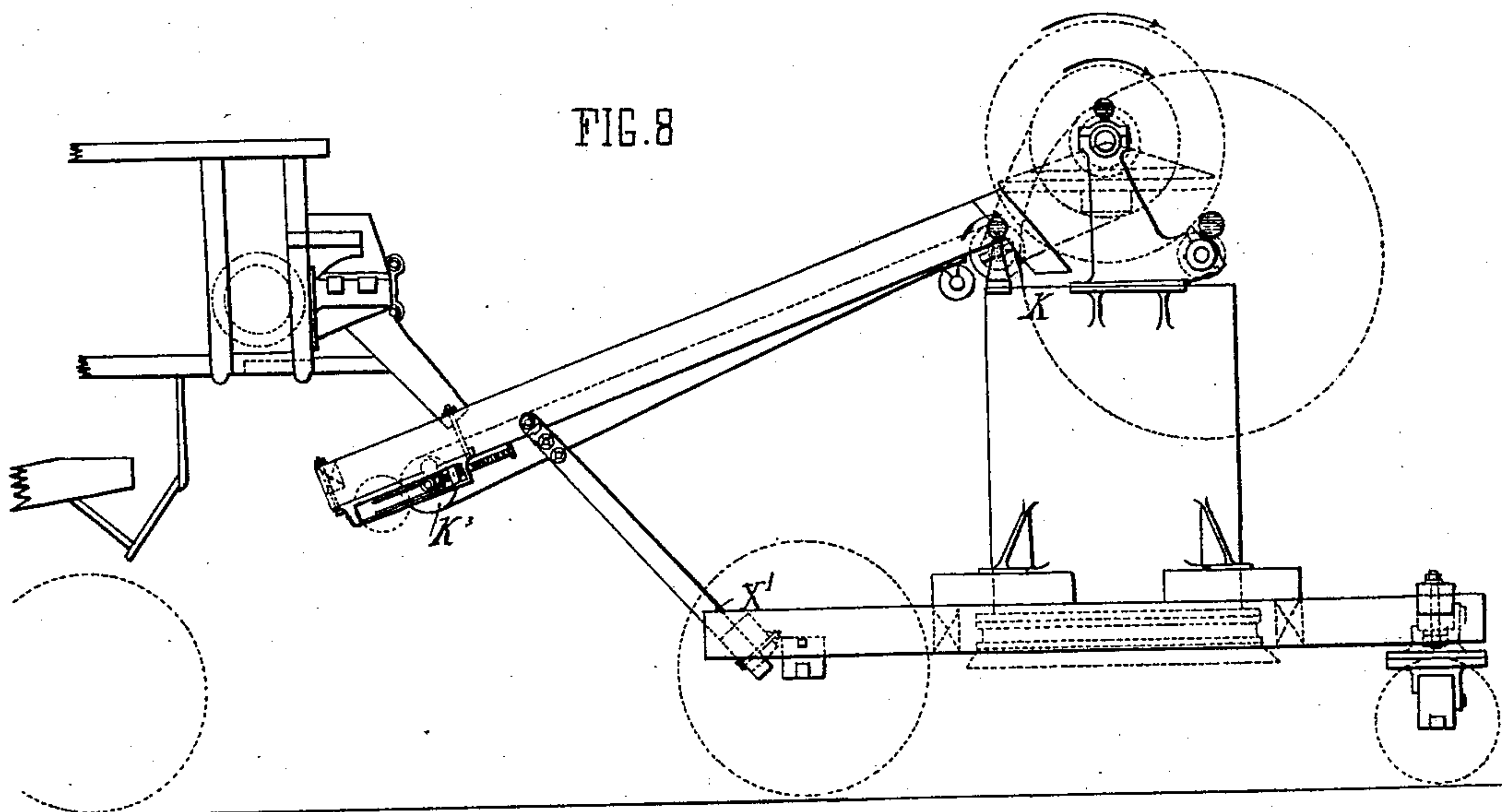
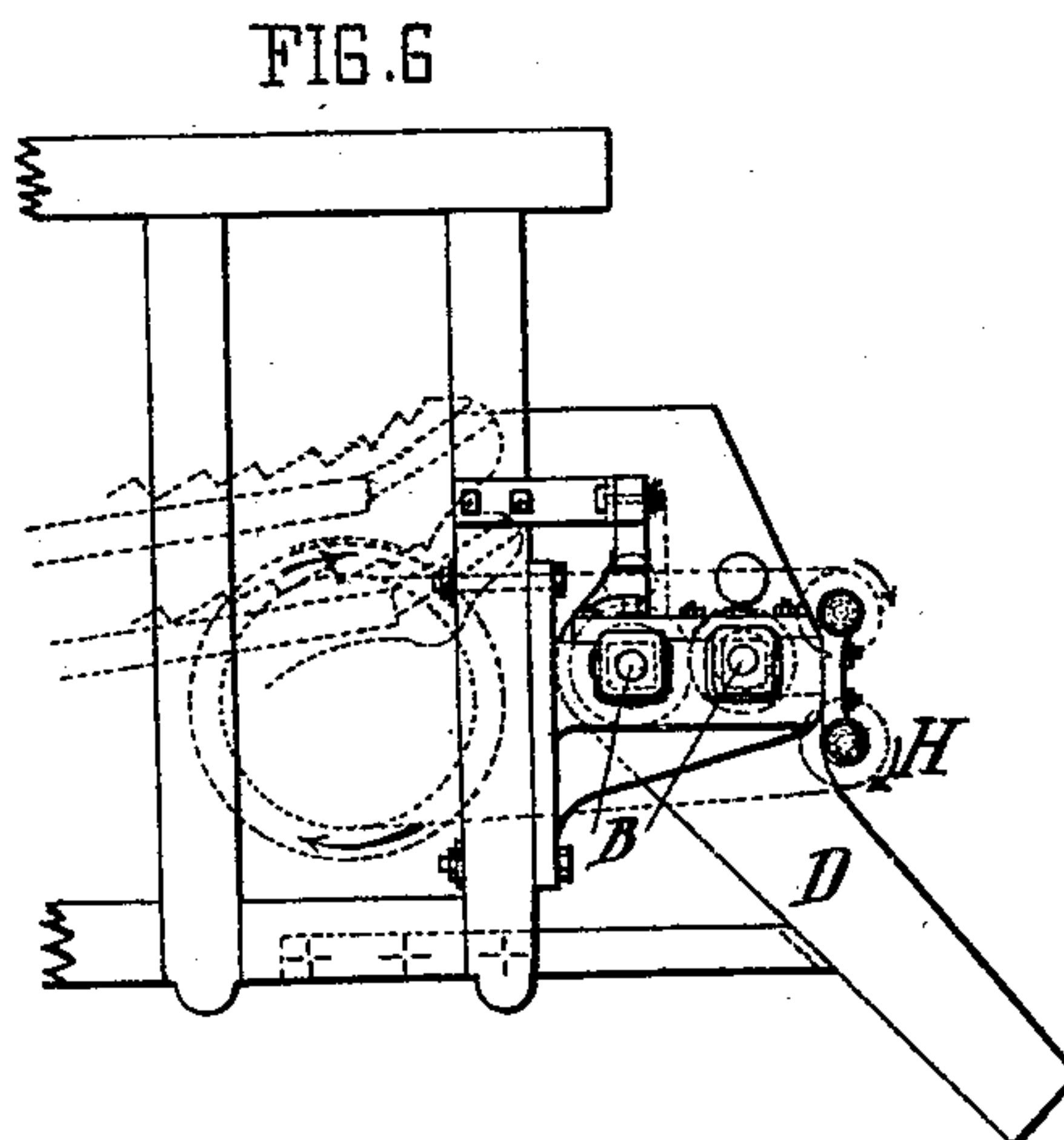
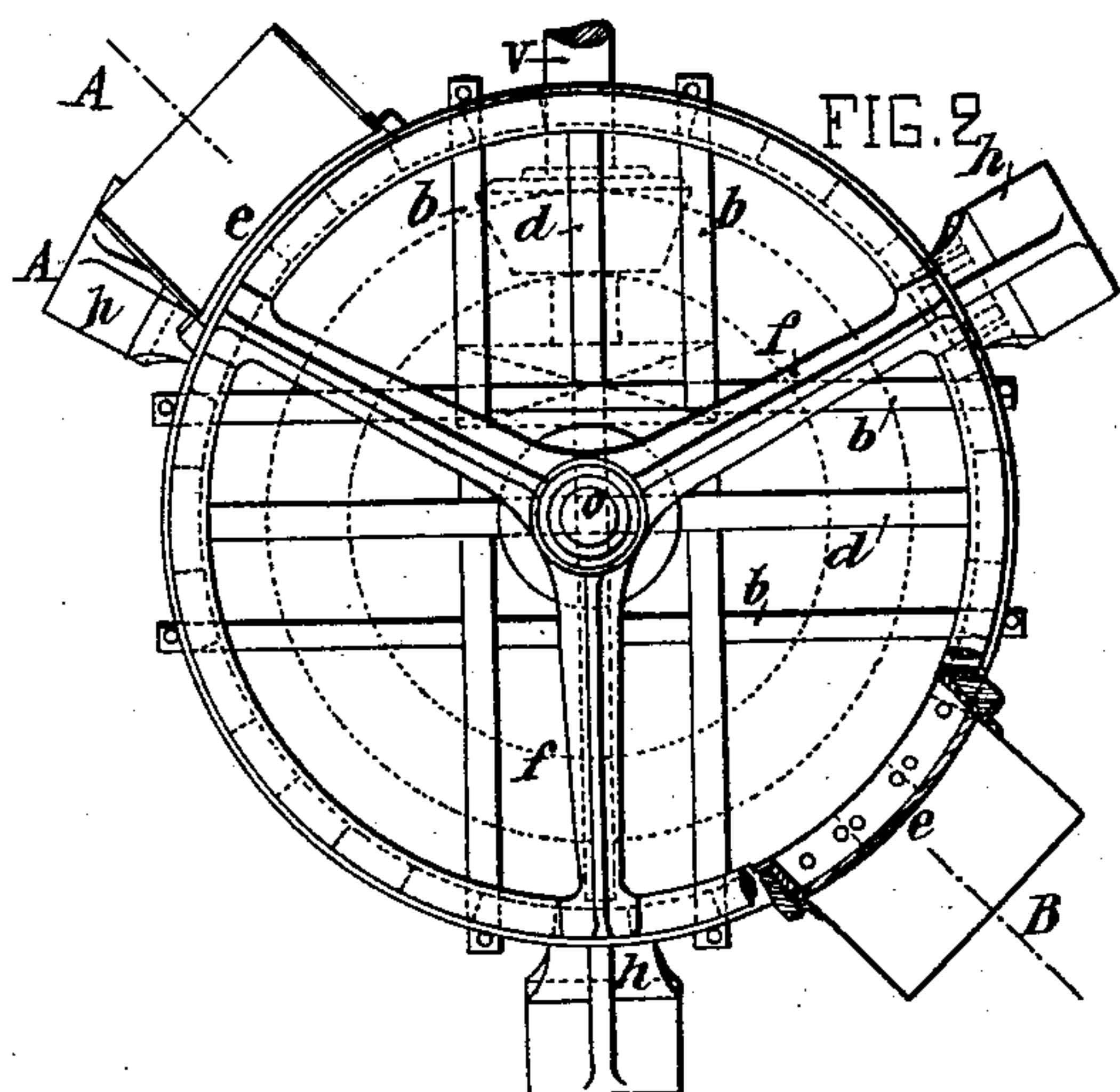
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(No Model.)

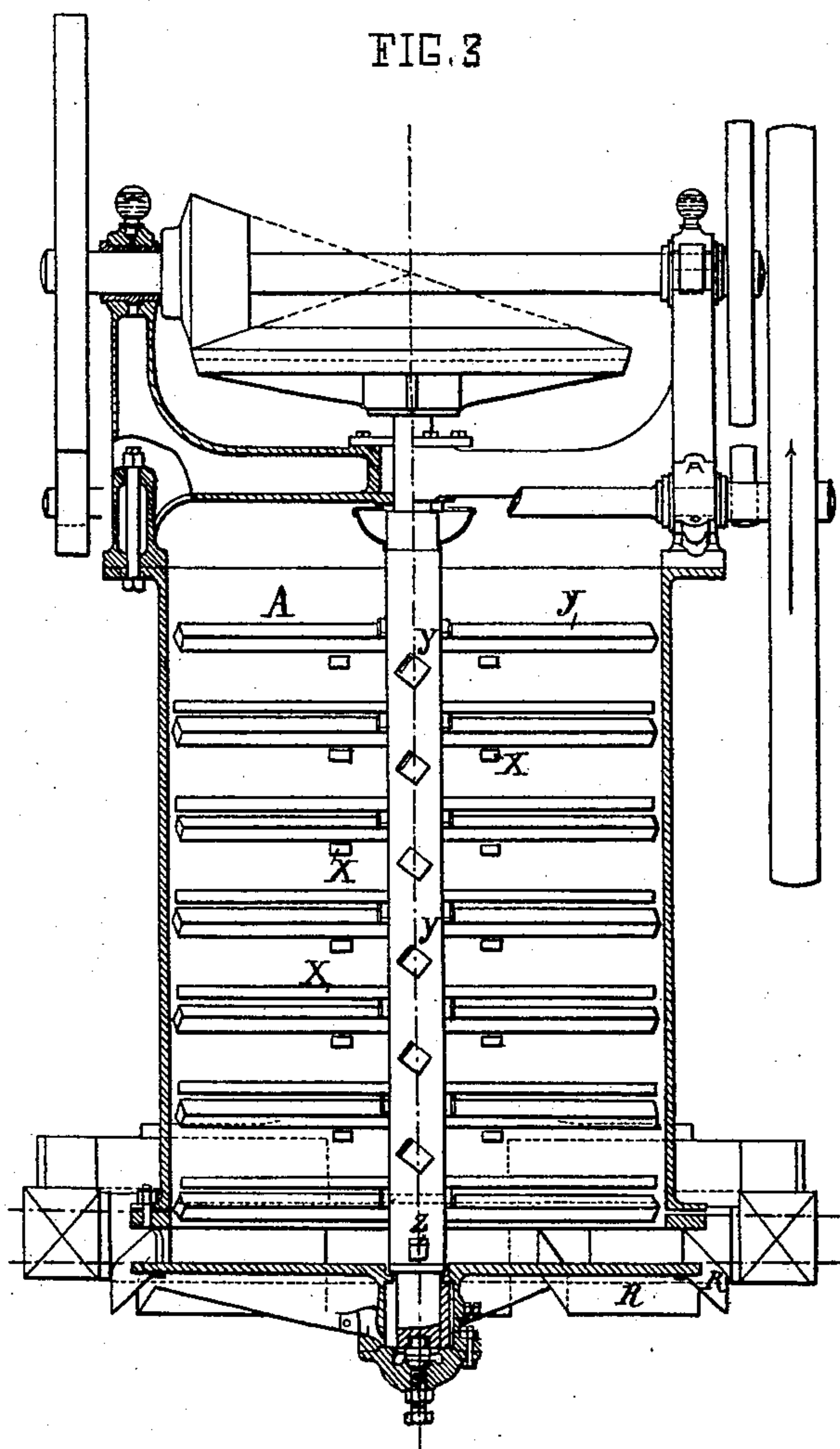
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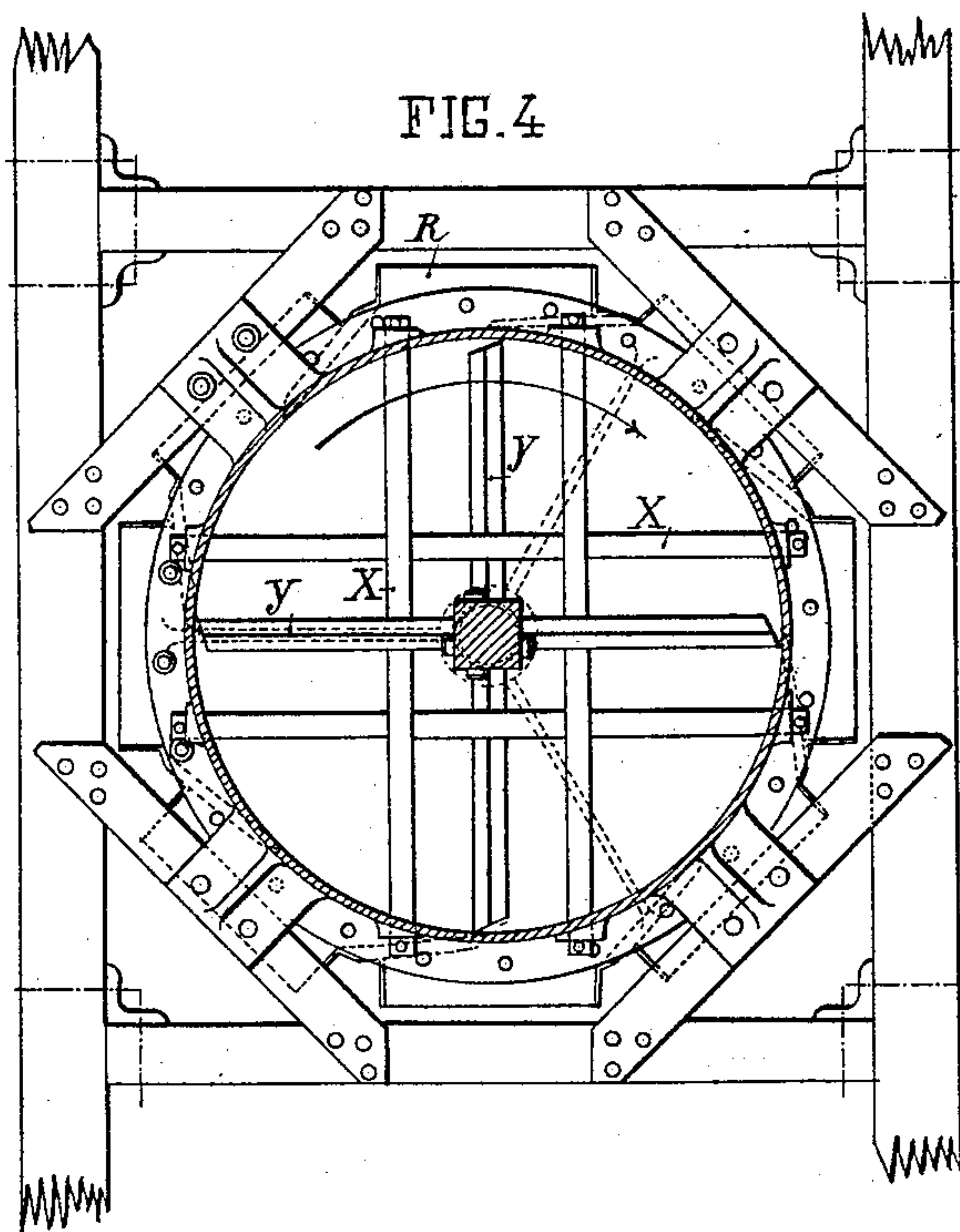
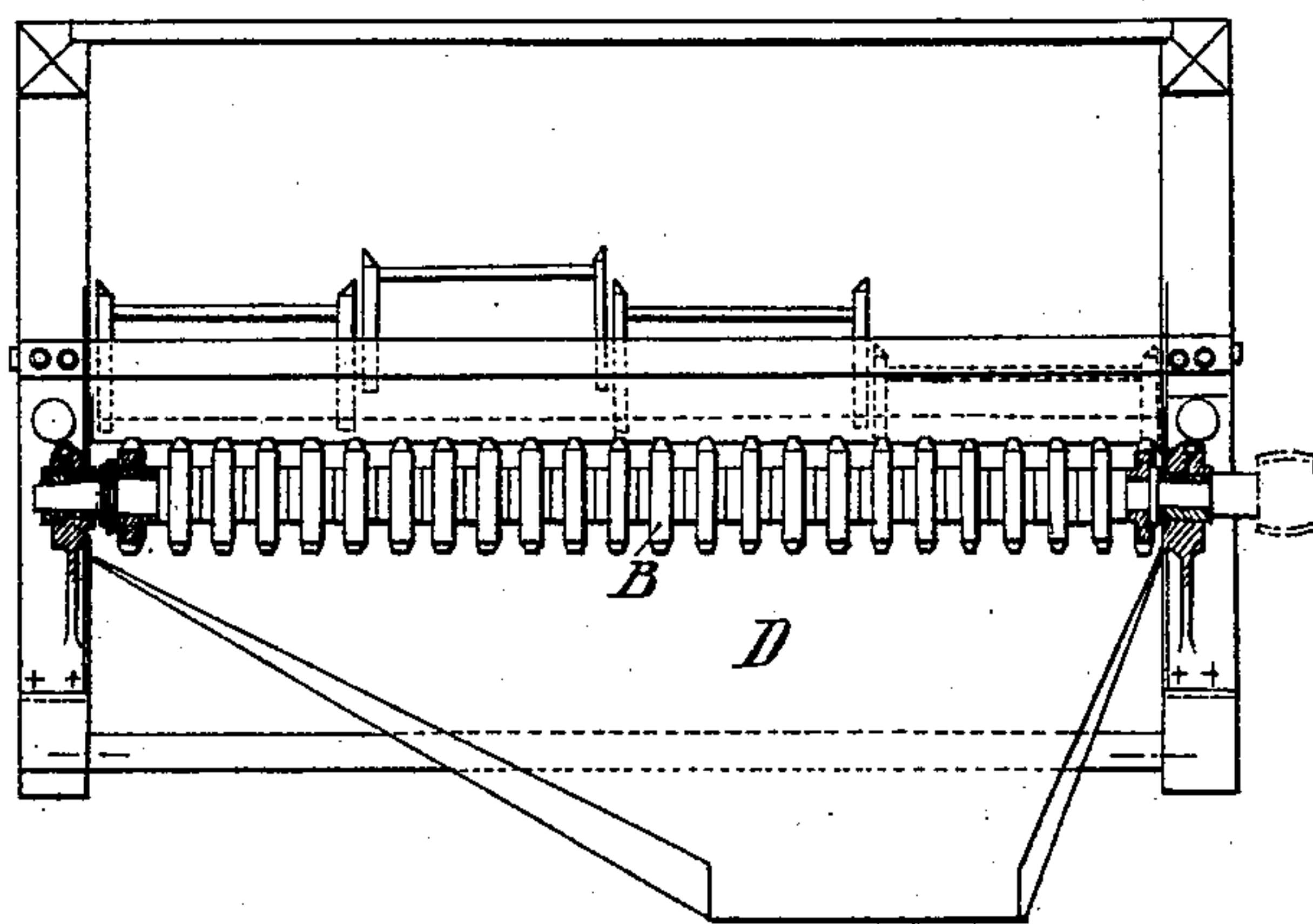


FIG. 5



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(No Model.)

5 Sheets—Sheet 5.

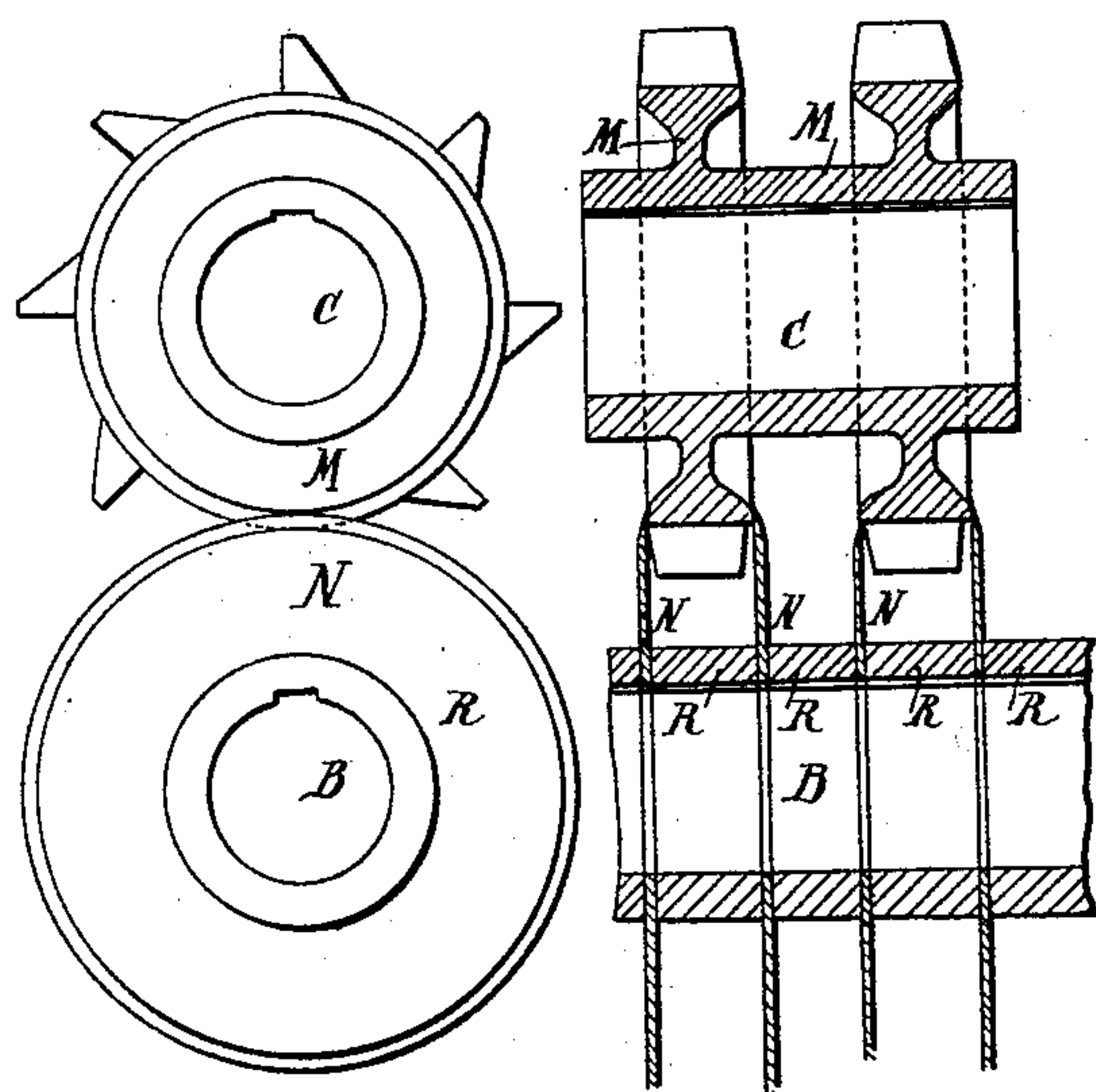
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FIG. 7



Witnesses.
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UNITED STATES PATENT OFFICE.

LÉON VIGREUX, OF PARIS, FRANCE.

APPARATUS FOR TRITURATING STRAW, &c., FOR CATTLE.

SPECIFICATION forming part of Letters Patent No. 454,094, dated June 16, 1891.

Application filed March 3, 1891. Serial No. 383,599. (No model.) Patented in France May 22, 1890, No. 205,827.

To all whom it may concern:

Be it known that I, LÉON VIGREUX, of the city of Paris, France, have invented Improved Apparatus for Triturating Straw and other Long Feed for Cattle, (for which I have obtained Letters Patent in France for fifteen years, dated May 22, 1890, No. 205,827,) of which the following is a full, clear, and exact description.

My invention relates to improved apparatus for tritulating straw or other long feed for cattle, with the object of softening it in order that it may be easily assimilated.

My apparatus (which may either be combined with or form an adjunct to a thrashing-machine or be used separately) is illustrated in the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a vertical section of the machine, taken on line A O B, Fig. 2, which is a part sectional plan of the same. The same letters of reference denote like parts in the two figures. Figs. 3 to 8 illustrate a modification, Fig. 3 being a sectional elevation and Fig. 4 a horizontal section of the machine. Fig. 5 is a part-sectional front elevation of the straw-cutter, and Fig. 6 an end elevation of the same with its driving-gear attached. Fig. 7 shows details of the knives and toothed disks, drawn to a larger scale. Fig. 8 shows the triturator, straw-cutter, and elevator combined with a thrashing-machine.

The same letters of reference denote like parts in Figs. 3 to 8.

Referring to Figs. 1 and 2, the tritulating-machine consists of a cylindrical vessel *a*, in which are fixed horizontal bars *b b* of iron or steel in four vertical rows, the bars of two of the rows crossing those of the other two rows at right angles and arranged in pairs, between which pass arms *d*, keyed on a vertical shaft *c*, mounted in a bearing in frame *f* and passing through the bottom *g* of said drum and turning in a foot-step bearing in a frame *i*, supported on standards *h*. The shaft *c* is driven by bevel-gear *m n* from a shaft *v*. The straw or other long feed after being cut or chopped up is supplied continuously to the vessel *a* by a screw-conveyer or any mechanical means, and is subjected to the action of the intermeshing fixed and revolving bars. It is discharged continuously at two opposite

outlets *e e*, provided with doors by which the outflow can be regulated. The speed of the shaft, the depth of material operated on, the area of the delivery-outlet, and the rate of feed would all vary according to the kind of material being operated on and the fineness and softness required. The fixed bars *b* may either be of rectangular form with sharp edges, as shown, or the edges on their working faces may be chamfered, while the revolving bars *d* may be of square section plane anglewise, so as to act by their edges only.

When the triturator is combined with a thrashing-machine, a straw-cutter having revolving knives is interposed to cut up the straw as it leaves the thrashing-machine before entering the triturator, by which it is ground and delivered in readiness for storing or for feeding purposes. Instead of employing a separate straw-cutter, the straw may be cut up in the triturator itself by substituting cutting-blades for some of the bars at the upper part of the vertical shaft *c*. The triturator may also be entirely independent of the thrashing-machine, and other alimentary substances—such as corn, roots, tubers, bulbous plants, &c., or saline matters—may be ground up with the fodder in the triturator.

Referring now to Figs. 3 to 8, which represent a modified arrangement in which one in every pair of fixed bars is omitted, so that each revolving bar instead of passing between two pairs of fixed bars, one pair at either side of the revolving shaft, passes under two fixed bars placed one on each side of the shaft; but in the case of large machines there would be two or three pairs in each horizontal row of fixed bars *X*, arranged parallel and at opposite sides of the shaft, upon which are keyed pairs of bars *y* at right angles to each other. The distance between the fixed and revolving bars is regulated by adjusting the foot-step bearing of the shaft by means of a screw, the said distance being but a few millimeters, according to the coarseness of the straw and the amount of trituration or grinding required.

To enable the machine to be carried upon a truck, the driving-gear is mounted above, as shown in Fig. 3, and the drum has eight outlets for the tritulated fodder around its base

provided with mouths, as represented in Fig. 4, discharging in the direction of rotation of the arms and tangentially to the inner circumference of the drum. The number of outlets may vary with the diameter of the drum, and the product is delivered regularly at successive opposite pairs of outlets by the lowermost revolving arm Z, which acts as a scraper and prevents choking.

Figs. 5, 6, and 7 show the continuously-acting straw-cutter before referred to as interposed between the triturator and the thrashing-machine when the two are employed in combination. It comprises two shafts B C, revolving in opposite directions, upon one of which are keyed toothed disks M, which seize the straw transversely to its length as it is delivered from the thrasher, the thickness of said disks varying with the length to which the straw is to be cut, which would be two, three or four centimeters, according to circumstances. Upon the second shaft are keyed steel knife-edged disks N, placed one on either side of and almost touching each of the toothed disks M and separated one from the other by distance-rings R, corresponding to the thickness of the disks M. The shafts are driven either by band or toothed gearing, and the cutting apparatus is placed beneath a hopper, into which the straw is delivered by the thrashing-machine, and there seized by the toothed disks and carried between them and the cutter-disks, whereby it is cut up into short lengths which fall onto a chute D, by which it is delivered either directly or by means of an elevator into the drum, according to the height of the latter relatively to that of the shaker of the thrashing-machine.

Fig. 8 represents the triturator and straw-cutter combined with a thrashing-machine. The bearings of the shafts of the straw-cutter, the hopper, and chute are all mounted at the delivery end of the thrashing-machine, the cut straw being delivered by the chute onto an elevator consisting of an endless web passing round rollers K K' and inclosed at the sides or altogether, so as to prevent the

straw being blown about. The bearings of the lower roller K' are adjustable by screws for regulating the tension of the web, and motion is imparted to the upper roller K by a band from the shaft by which the triturator-shaft is operated. The elevator is capable of pivoting upon the axis of the upper roller K and being supported at its lower end by an adjustable strut X', its angle of inclination can be regulated at will. The drum and elevator are shown as mounted upon a truck for the purposes of transport.

When the triturator and straw-cutter are not combined with a thrashing-machine, the straw-cutter would be mounted immediately above the triturator; or the straw may be cut up in an ordinary chaff-cutter and fed into the triturator-drum by an elevator or otherwise. The straw may also be simply cut up by the straw-cutter, which forms an efficient substitute for a chaff-cutter, and the triturator may be dispensed with.

I claim—

1. In a machine for grinding or triturating straw or other long feed for fodder, the combination of an outer cylinder having stationary cross-bars secured therein, with an inner central shaft having arms projecting therefrom, said arms being placed in close proximity with said stationary cross-bars, substantially as herein shown and described, for the purpose specified.

2. The combination of the herein-described continuously-acting straw-cutting device, consisting of the bladed rollers B C and hopper D, with the triturating or grinding mill composed of the cylinder *a*, stationary bars *b b*, shaft *c*, and arms *d d*, substantially as and for the purpose specified.

The foregoing specification of my improved apparatus for triturating straw and other long feed for cattle signed by me this 15th day of January, 1891.

LÉON VIGREUX.

Witnesses:

ROBT. M. HOOPER,
ALBERT MOREAU.