No. 869,653. PATENTED OCT. 29, 1907.

S. W. PUTNAM, 3D.

DRIVING DOG.

APPLICATION FILED MAR. 4, 1907.

3 SHEETS—SHEET 1.

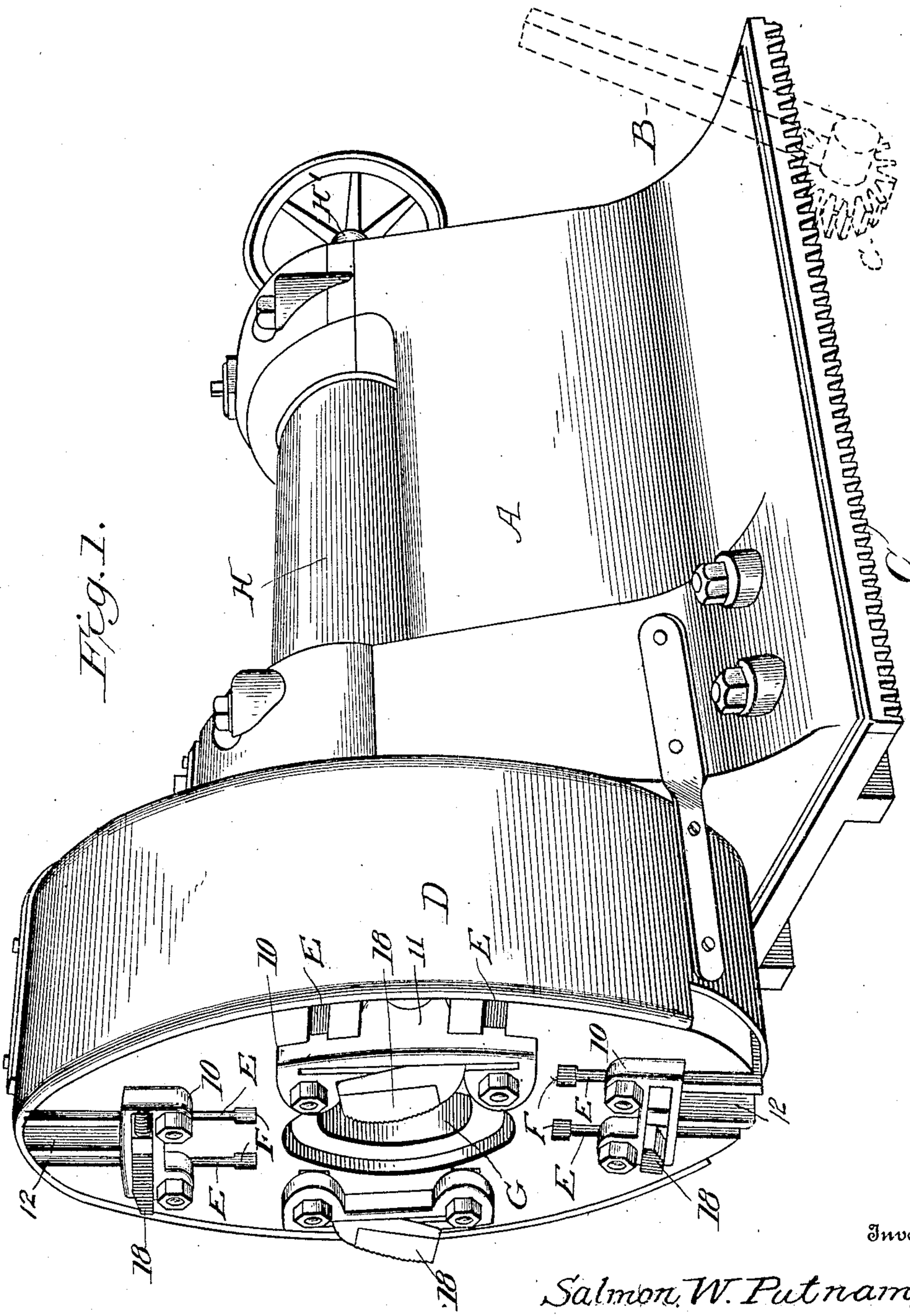

Fig. 1.

Witnesses

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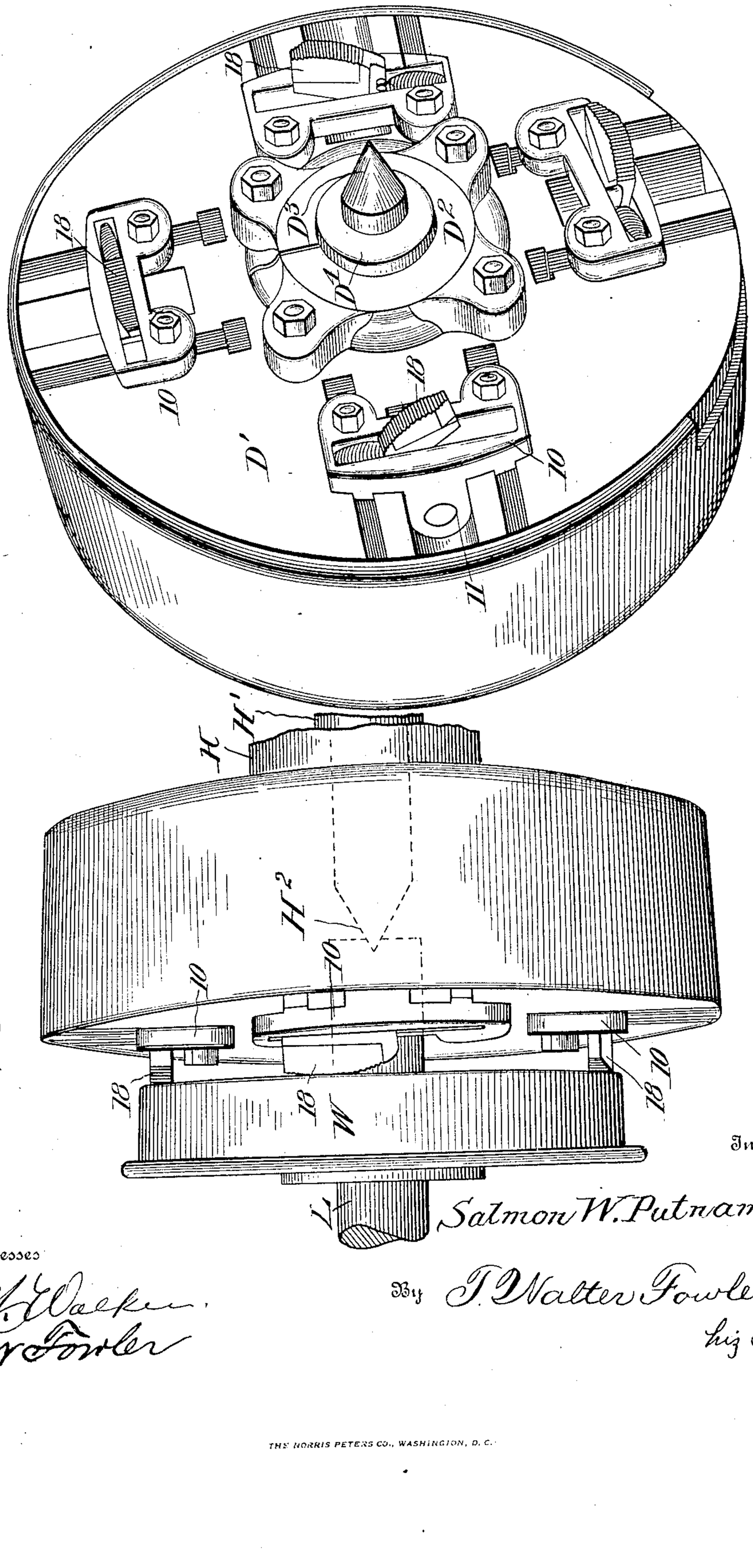

Fig. 3.

Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 6.

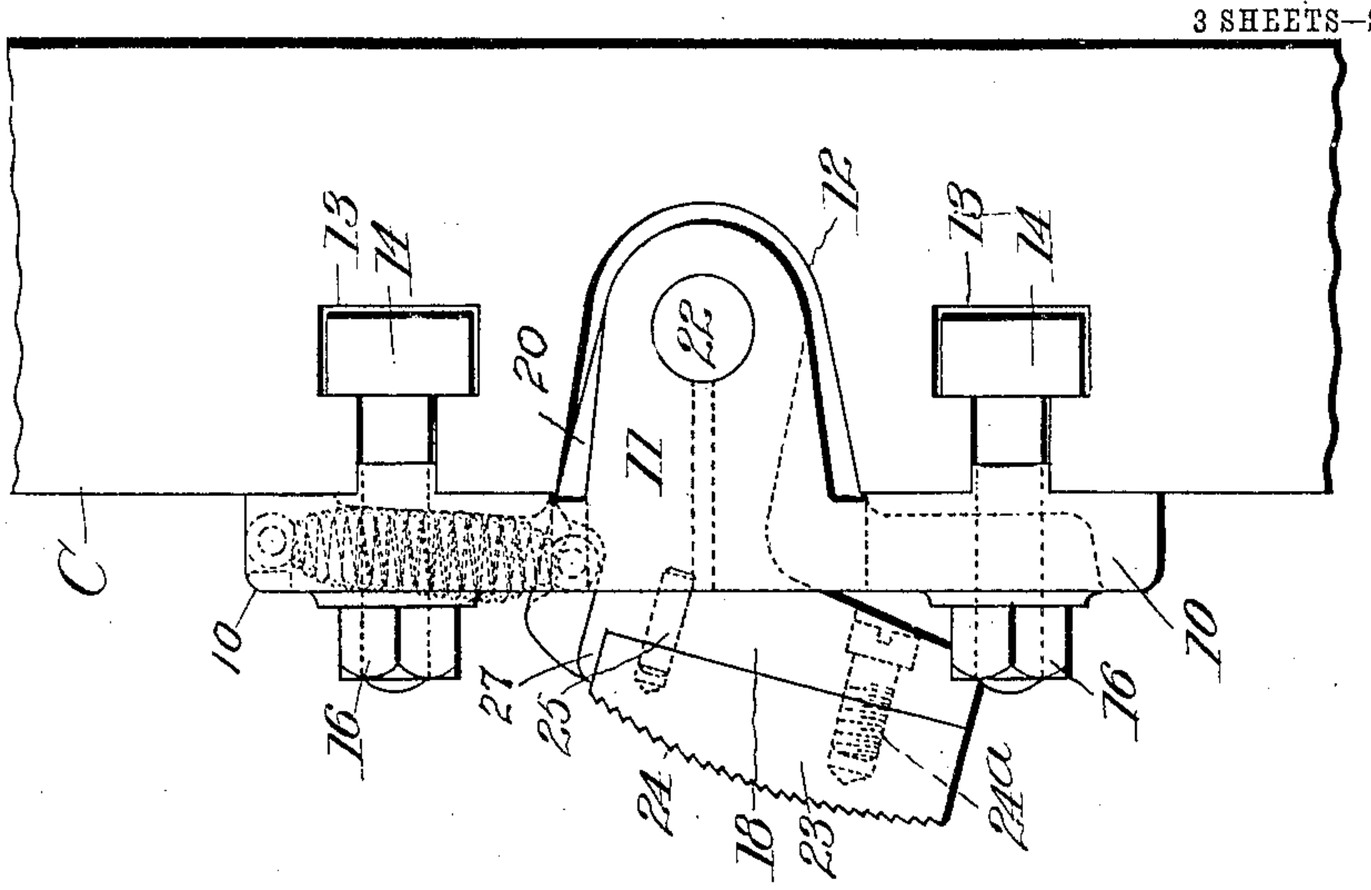


Fig. 5.

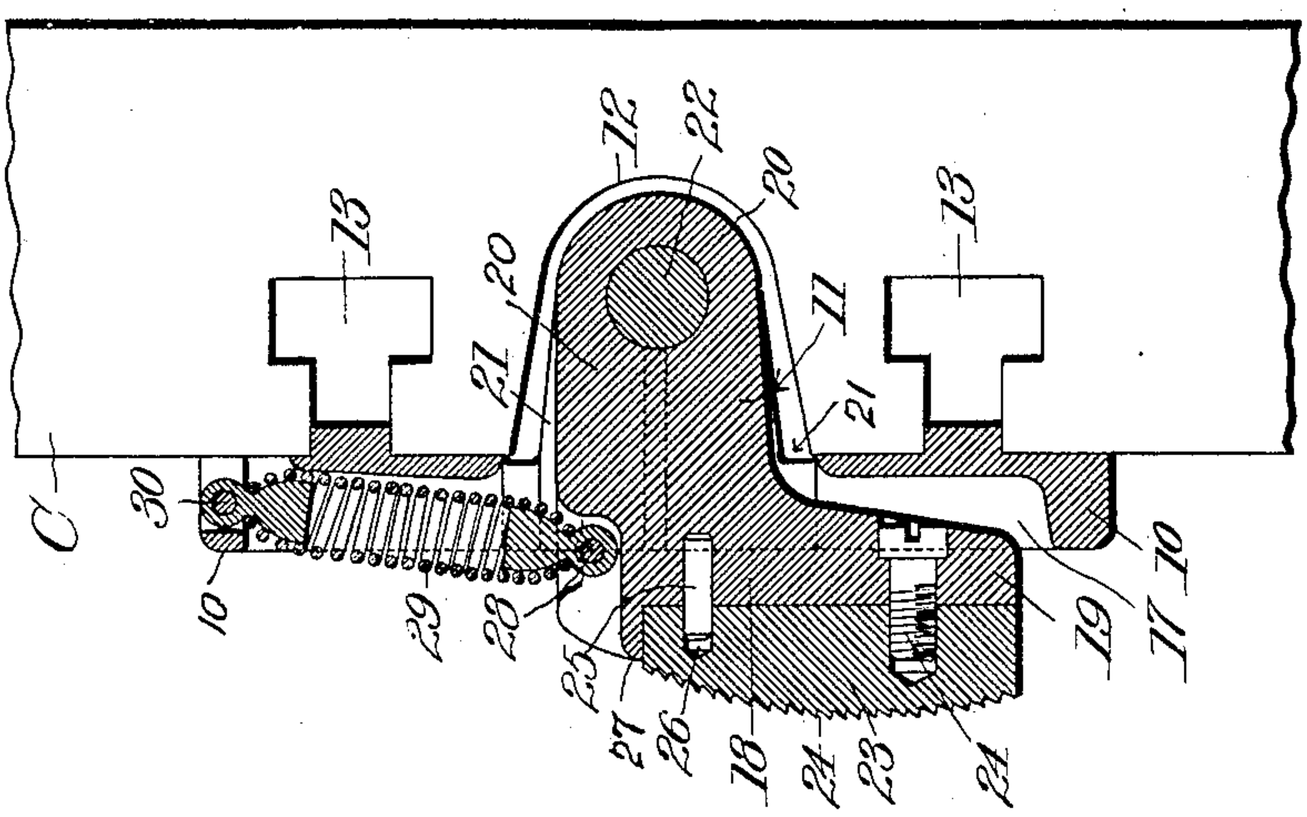
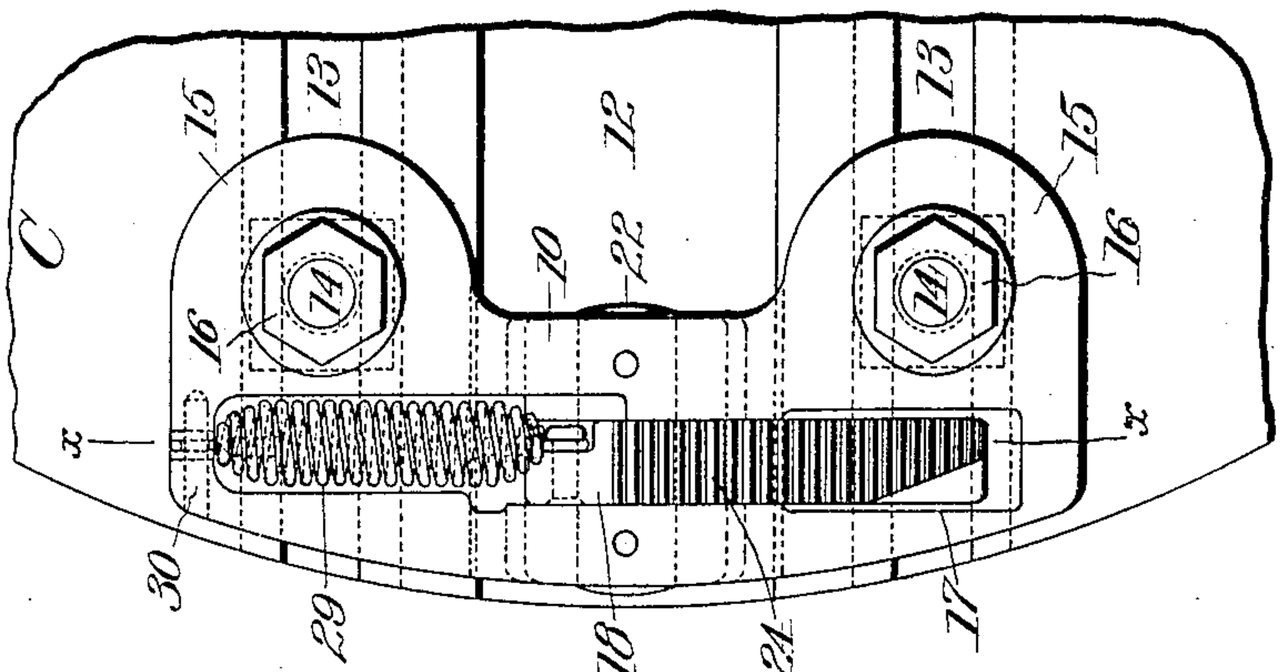


Fig. 4.



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UNITED STATES PATENT OFFICE.

SALMON W. PUTNAM, 3D, OF FITCHBURG, MASSACHUSETTS.

DRIVING-DOG.

No. 869,653. Specification of Letters Patent. Patented Oct. 29, 1907.

Application filed March 4, 1907. Serial No. 360,556.

To all whom it may concern:

Be it known that I, SALMON W. PUTNAM, 3d, a citizen of the United States, residing at Fitchburg, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Driving-Dogs, of which the following is a specification.

My invention relates to certain new and useful improvements in driving-dogs particularly designed for use in turning the steel tire of locomotive driving-wheels, coach-wheels, truck-wheels and all other wheels employing a steel or other tire, the turning being performed while the wheels are mounted upon their axles. Lathes of this type are well known, and it is usual in performing the turning operation to mount the axle, with its wheels, on the center of a double-head driving-wheel lathe, such lathes commonly presenting a face-plate contiguous to the outer face of each driving wheel when mounted upon the axle, as before mentioned. By suitable mechanism the two face-plates are driven in unison.

The object of my invention is to equip such a lathe as mentioned, or any other style of turning-lathe, or different kinds of face-plate or table work on both the usual form of so called engine lathe and boring or turning mills etc.; with a novel driving-dog which may be applied, with little or no modification, to form a positive and effective driver which is automatic, equalizing, and capable of adjusting itself automatically to the load.

With these and other objects in view, my invention consists of the parts, and the constructions, arrangements and combinations of parts which I will hereinafter describe and claim.

In the accompanying drawings forming part of this specification and in which similar reference characters indicate like parts in the several views:—Figure 1, represents the tail-stock portion of a steel-tire turning-lathe having a face-plate with driving-dogs constructed in accordance with my invention, Fig. 2, is substantially similar view showing a locomotive or car wheel in position and engaged by the driving-dogs, Fig. 3, shows a face plate of a lathe with an extension support and a projecting spindle, Fig. 4, is a face view of a fragment of the face-plate showing one of my improved driving-dogs, Fig. 5, is a sectional view of the driving-dog on the line *x*—*x* of Fig. 4, Fig. 6 is a side elevation showing the portion of the driving-dog when at rest.

While I have shown for illustrative purposes my invention associated with what is known as a steel-tire turning-lathe or a lathe designed for turning the tires of locomotive and car-wheels, I wish it understood that the invention is not restricted to this type of lathe, and that said lathe may represent generally any turning-lathe or any turning, boring or other machine, rotary or otherwise, whereon the dogs hereinafter mentioned may be used as an effective driver between the face-plate, or other rotatable member, and the work to be operated upon. The lathe herein shown will have the usual head-stock and tail-stock with face-plates between which the axle with its wheels will extend. For present purposes I deem it sufficient to show only the tail-stock-portion of the machine, the tail stock A being movable towards and from the work by means of a lever, B, and rack-and-pinion mechanism, shown generally at C.

The face-plate, D, is of usual or any appropriate and desired construction and is radially channeled or provided with slots, E, in which the driving-dogs are adjustably secured, said slots or channels being enlarged at the inner ends, as shown at F. In the center of the face-plate, Fig. 1, there is shown a hole G. This hole is, in practice, tapered. The object in making this hole tapering is as follows:—In turning steel-tired coach-wheels as the journals on the same are located outside of the wheels, much vibration would ensue should it be attempted to take cuts on the tire with the wheels on an axle suspended or held on the usual lathe centers. These outside journals are therefore usually provided with split taper bushings which serve to center the axle and grip it to some extent, also to allow the journals to project into the tapering hole and thereby bring the edges of the wheel W close to the face-plate, D, at the same time centering the whole and determining the point of maximum rigidity. As the tail-stock is provided with the rack-and-pinion mechanism C, or other means for moving it longitudinally along the bed, it is evident that the tail-stock—which in a measure resembles the opposing head-stock, not shown—may be drawn away from the head-stock, (or moved toward it as the case may be), thus providing the necessary means of putting in and taking out the aforementioned coach-wheels.

The spindle, H, is shown as being provided with the usual form of tail-stock-spindle H′ and center H² which latter is drawn back to clear the projecting journal of the axle, L, but which spindle H′ is run forward into the centers of the axle when the wheels are in position.

In Fig. 3 the face-plate D′ is shown provided with an extension support D², and a spindle D⁴ having a center D³ which is shown run out beyond the support. This arrangement is employed for turning wheels on axles known as truck-wheels and on which the journals are inside or between the wheel and axle and where the axle does not have the projecting journals which are on the axles of the coach-wheels before mentioned.

In each of the forms of lathes shown there is a face-plate provided with my improved driving-dog, the construction and operation of which I will now set forth.

A suitable forging or base member 10 is fitted against the face-plate and is provided with lugs or ears 11 on its inner side and which extend into suitable channels 12 made radially on the face-plate between and parallel

with the slots or channels E in which the dogs are adjustably mounted, said forging or base member being secured in place on the face-plate by means of bolts 14 having heads slidably fitting the slots or channels E, said bolts extending through suitable lugs 15 on the forging or base member and having their outer ends engaged by nuts 16, as shown.

The outer face of the base member or forging is slotted or channeled at 17 to admit the dog 18 which dog is of substantially right-angled formation in that it has two arms, one, 19, being substantially parallel with the face of the face-plate C and the other, 20, being substantially parallel with the axis of said face-plate and at right-angles to the companion arm 19 and extending inwardly through an opening 21 in the central part of the forging or base member, and between the parallel spaced ears or lugs 11 which project from the back of said forging or member, between which ears or lugs the inner end of the arm 20 of the dog is pivotally mounted by means of an appropriate pin 22.

The other arm, 19, is provided with a hardened steel or other shoe or jaw 23, whose outer face is curved and provided with teeth or serrations 24 adapted to embed themselves into the metal face of the tire, or part which they engage, and thereby obtain a powerful driving grip upon said tire, or other parts.

The shoe or jaw 23 is removable for repair purposes or to allow for the substitution of a new jaw for one that has become broken or damaged, or dull from use, by means of a bolt 24 passing through the arm 20 from the rear and into the back of the jaw, said bolt having its head countersunk in the rear surface of said arm. To assist the bolt in properly securing the jaw or shoe to the arm 20 of the dog, I provide the said arm with a drive-pin or stud 25, and I form the adjacent end of the jaw or shoe with a corresponding hole 26 to receive the projecting portion of said pin, as shown in Fig. 5. In addition to the forging the arm 20 of the dog is formed with a shoulder 27 against which the end of the shoe or jaw seats.

To assist the action of the dog and to render the same automatic and capable of adjusting itself automatically to the load, I attach to the dog by means of a pin 28, one end of a strong coiled spring 29, the opposite end of which I attach to the forging or base member 10 by suitable means as by the pin 30. By this means the driving dog is yieldingly mounted.

The position of the dogs when at rest is shown in Figs. 1 and 6. The act of putting wheels or axles into the lathe automatically and with absolutely no adjustments of the dogs, causes said dogs to change from the position of rest, in Figs. 1 and 6, to their working position, Figs. 2 and 5. It will be observed that there is considerable latitude between these two positions, namely, the position of rest and the working position, the design of the dogs being such that the wheels will be engaged and driven at any point between these two mentioned positions.

It will further be seen that the dog automatically adjusts itself to the load, or in other words to the resistance offered by the cutting tool. It will likewise be seen that in a face-plate equipped with a plurality of these dogs the action of the dogs is equalizing, or in other words the rim of the steel tired wheel is not sprung or forced away from the face plate more at one point than at the other. My dog, is, therefore, entirely automatic in its action, equalizing, and adjusts itself automatically to the load.

It is further possible with a lathe equipped with my improved dogs for turning steel tired wheels etc., to put the wheels into position either on the centers, or by taper bushings, and take them out and continue to repeat the cycle as it were, while the lathe is in constant operation and without stopping the same.

The method of putting a pair of coach or truck wheels into a lathe of the foregoing description is substantially as follows: The head-stock of the machine being bolted remains in its fixed position, while the tail-stock A is slid back along the bed in a direction away from head-stock. The wheels are then suspended between the face-plate, of the head-stock and the face-plate of the tail-stock by a crane or other elevating mechanism not shown. The face-plates are provided with a plurality of the described driving dogs, each dog being normally in a state of rest as in Fig. 1. According as to whether the wheels are what are known as coach or truck wheels they are, in practice, provided with split bushings which, in the case of "coach" wheels, engage hollow taper holes in the lathe spindle, and in the case of truck wheels, with central depressions to engage the lathe-centers extended. The crane or other elevating means places the wheels in such a position that the aforesaid mentioned split-bushings or axle centers come in line with the taper-hole, or lathe-centers extended according as the wheels are of the coach type or truck type. The tail stock A is then moved along the bed by rack-and-pinion C or other means in a direction toward head stock, and the act of so doing causes the high point of the serrated eccentric surface of the driving dog, 18, to engage the plane surface of the tire when the dog yields automatically in a line parallel with the axis of the work and until the point determined by the split-bushings engaging the taper spindle hole (in case of coach wheels) or the axle centers coming into contact with the lathe centers extended (in the case of truck wheels) is reached. The tail stock A is then clamped down to the bed of the machine by a suitable locking means. The wheels are now in a position ready to have cuts taken upon their tires as the act of putting the wheels into position as above described has caused each of the driving dogs to automatically recede from its position of rest to its working position, at which point it is capable of driving the work as described, equalizing entirely the strain, precluding the possibility of springing the tires more at one point than at another, and causing each dog to exert exactly the same amount of driving force. The operation described is automatically accomplished and by the act of putting the wheels into the lathe as before pointed out.

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

1. In a work driver, a rotary member, in combination with a dog pivoted thereto on an axis transverse to the axis of said member, said dog having a work-engaging face eccentric to its pivot, and means having a constant tendency to project said work-engaging face, substantially as described.

2. In a work-driver, a rotary member, in combination with a dog pivoted thereto on an axis transverse to the

axis of said member, said dog having a work-engaging face eccentric to its pivot, and having said pivot located interior to the plane of the outer face of said member, and means having a tendency to project said work-engaging face, substantially as described.

3. In a work driver, the combination with a rotary member, of a dog pivoted thereto on an axis transverse to the axis of said member, said dog having a work-engaging face eccentric to its pivot, and a spring connected to the dog and having a tendency to constantly project the work-engaging face thereof.

4. In machines of the character described, the combination of a rotatable face-plate, a work driving mechanism consisting of a forging or base member fitted to the face-plate, a dog carried by the forging and having two arms one disposed substantially at right-angles to the other, one of said arms being pivotally secured to the forging or base member and the other arm comprising a curved-face jaw member adapted to engage the work with a driving grip, and a spring for holding the jaw member yieldingly in opposition to the work, and allowing the dog to adjust itself automatically to the resistance offered by the cutting tool.

5. In machines of the character described the combination of a rotatable radially-channeled face-plate, a work-driving mechanism consisting of a forging or base member having spaced ears or lugs at its back fitting the channels of the face-plate, said forging or base-member having a recess through its central portion, a dog comprising two arms arranged one at right angles to the other, one of said arms extending into the recessed central portion of the forging and being pivotally mounted between the ears or lugs of the forging, and the other arm having a curved-face serrated jaw member adapted to engage the work with a driving grip, and a spring having one end connected to the dog and the other end connected to a fixed point, said spring permitting the dog to adjust itself automatically to the load.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

SALMON W. PUTNAM, 3D.

Witnesses:
EDWIN J. TILTON,
ALFRED C. ANDERSON.