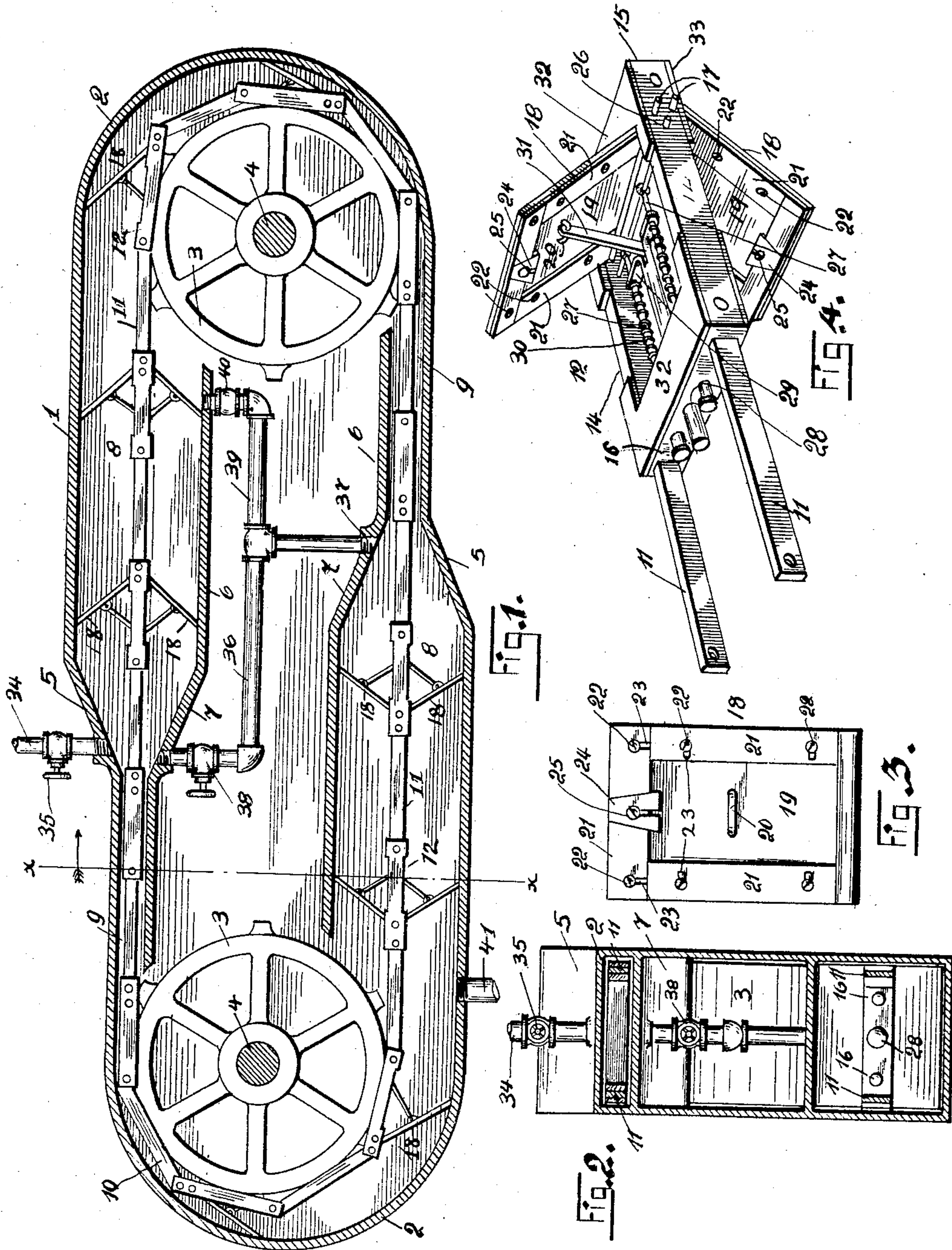


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J. M. MAXWELL.
ROTARY MOTOR.

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Witnesses:
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UNITED STATES PATENT OFFICE.

JAMES M. MAXWELL, OF PITTSBURG, PENNSYLVANIA.

ROTARY MOTOR.

SPECIFICATION forming part of Letters Patent No. 786,044, dated March 28, 1905.

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To all whom it may concern:

Be it known that I, JAMES M. MAXWELL, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Rotary Motors, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in rotary motors, and has for its object to provide a novel form of rotary motor which is adapted to be operated by steam.

15 A further object of my invention is to provide a motor wherein valves, pistons, and their connections which are commonly used in ordinary motors are entirely dispensed with, and in constructing my improved motor, wherein steam is to be utilized as a power, I have provided novel means whereby a portion of the exhaust-steam may be again used as a power medium for operating the motor.

25 Briefly described, my improved motor comprises a casing having mounted therein two sprocket-wheels, and over said wheels is adapted to travel a chain which carries a plurality of spring-actuated wings. These wings when passing through compartments within the casing are extended outwardly to receive the force of the supply of steam admitted to said compartments and be carried along by said steam until the same is exhausted, at which time another one of said compartments will be in operation to continually propel the chain, which will impart a rotary movement to the sprocket-wheels mounted within the casing, and from the shafts of said sprocket-wheels, which protrude without said casing, rotary movement may be transmitted to any desired point.

45 In this application I have simply illustrated one of the many constructions that may be employed when my improved motors are constructed, and I desire it to be understood that other mechanism from this shown and herein described may be employed.

In order that a better understanding may be had of my motor, reference will be had to

the accompanying drawings, forming a part 50 of this application, and wherein like numerals of reference will be used to indicate like parts throughout the several views, in which—

Figure 1 is a longitudinal sectional view of my motor. Fig. 2 is a vertical sectional view 55 taken on the line $x x$ of Fig. 1 looking in the direction of the arrow upon said figure. Fig. 3 is a detail view of one of the wings employed in connection with my improved motor. Fig. 4 is a detail perspective view of a section of 60 the chain as constructed in accordance with my invention.

The motor, as illustrated in Fig. 1 of the drawings, comprises an oblong casing 1, the one end of which is constructed out of alinement with the other end, and the ends of said casing are curved, as designated at 2 2, and in these curved ends of the casing are rotatably mounted sprocket-wheels 3 3, the shafts 4 4 of which extend without the casing. By 70 forming the one end of the casing out of alinement with the other end a portion of the top and bottom of said casing is inclined, as designated by reference-numerals 5 5, and within the casing I form partitions 6 6, which extend a short distance longitudinally of the length of said casing, and in forming these partitions a portion of each partition is formed out of alinement with the remainder of the partition, said construction providing inclined surfaces 7 7, the inclinations 7 of said partitions being adapted to correspond with the inclinations 5 of the top and bottom of said motor. It will be seen by referring to Fig. 1 that the peculiar construction of the casing and the 85 partitions provides compartments 8 8, which will be hereinafter termed "steam-compartments." The construction of the partitions 6 6 also provides similar compartments 9 9, the object of which will be hereinafter more 90 fully described. The sprocket-wheels 3 3 are eccentrically mounted within the casing, and over the said sprocket-wheels is adapted to pass a chain 10, which comprises a plurality of links 11 12. The links of the chain are alternately arranged. The links 11 comprise 95 straight bars, to which the links 12 are pivotally connected. The links 12 are of a par-

particular construction, whereby means is provided to propel the chain 10 and impart a rotary movement to the sprocket-wheels 3. Each link 12 consists of side frames 14 14 and end frames 15 15. In the side frames 14 14 are journaled rods 17, upon which are mounted wings 18 18. One of these wings is shown in Fig. 3 of the drawings, and it consists of a plate 19, which is provided with a central hook 20. Around the edges of the plates 19 are mounted a plurality of adjustable plates 21, which are held in position by screws 22, that pass through slots 23 of said plates. The adjustable plates upon the end of each wing 18 are adjustable by a slotted wedge-shaped plate 24, this plate being locked in a fixed position by a screw 25. The adjustable plates carried by the side of each wing are adjustable by the screws 22 22, and the object of these adjustable plates will be hereinafter more fully described. In the frames 14 14 is mounted a rod 26, and to this rod are connected the bars 27 27, which extend through the end plates 16 of the links; but prior to mounting these bars upon the rod 26 the T-shaped member 28 is mounted in the end 16 of the link, the outwardly-extending portions 29 of said member being engaged by the bars 27, and upon said bars between these outwardly-extending portions and the end 16 of the link are mounted spiral springs 30. To the member 29 are connected links 31, which are secured to the hooks 20 of each wing. The link also comprises top and bottom plates 32 33, these plates being sheared away to receive the wings 18 18. The springs 30 are employed to normally hold the wings 18 18 extended, this being accomplished through the medium of the member 28 and the links 31, which serve the function of toggle-levers.

Every alternate link of the chain 10 is identical in construction to that just described, and when the chain is mounted on sprocket-wheels 3 3 it is adapted to pass through compartments 9 to the steam-compartments 8, and when passing through said compartments 9 the wings 18 of the links 12 will be held in the closed position, as clearly illustrated in Fig. 1 of the drawings; but when they pass into the steam-compartments the size of these compartments will permit the wings 18 18 to extend outwardly, and when said link passes over one of the sprocket-wheels one of said wings 18 will be entirely closed, while the other will remain open until it has been gradually closed by the passage of said link around the sprocket-wheel and into one of the compartments 9.

The reference-numeral 34 indicates a steam-supply pipe which communicates with one end of one of the steam-compartments 8, this pipe being provided with a valve 35. The reference-numeral 36 indicates a pipe which

passes from the forward end of said steam-compartments 9 to the forward end 37 of the other steam-compartments, this pipe also being provided with a valve 38. The reference-numeral 39 indicates an exhaust-pipe which leads from the rear end of the first-named steam-compartment and communicates with pipe 36, this pipe being provided with a check-valve 40. The reference-numeral 41 indicates an exhaust-pipe which leads from the rear end of the steam-compartment 8 at the bottom of the casing.

Operation: When steam is admitted to the steam-compartments 8, located in the top of the casing 1, the same will strike the extended wings 18 and force the wings carried by the chain through said compartment until the same has reached the exhaust-pipe 39, when it will pass through said exhaust-pipe to the forward end 37 of the lower steam-compartment 8. When steam was first admitted to the upper steam-compartment 8, it was also permitted to pass through pipe 36 to the forward end of the lower steam-compartments and propel the chain passing through said compartments. By the construction of my improved motor and the employment of the upper and lower steam-compartments the chain is continually kept in motion, imparting a rotary movement to the sprocket-wheels 3.

It will be noted that various changes may be made in the details of construction without departing from the general spirit of my invention.

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

1. In a motor of the type set forth, the combination with a suitable supply of steam, of a casing, steam-compartments formed in said casing, sprocket-wheels mounted in said casing, a supply-pipe connecting said compartments, an exhaust-pipe from one compartment communicating with the other of said compartments, an exhaust-pipe for said last-named compartment, and means whereby when steam is admitted to said compartments said sprocket-wheels will be rotated.

2. A motor comprising a casing, an upper and lower steam-compartment formed in said casing, sprocket-wheels mounted in said casing, an endless chain carried by said sprocket-wheels and adapted to pass through said compartments, a plurality of spring-actuated wings carried by said chain, the exhaust of the upper compartment communicating with the supply of the lower compartment.

3. In a motor of the type set forth, the combination with a steam-supply, of a casing, an upper and a lower steam-compartment formed in said casing, sprocket-wheels mounted in said casing, an endless chain carried by said

5 sprocket-wheels, a plurality of spring-actuated wings carried by said chain, a supply-pipe leading from the upper compartment to the lower compartment, an exhaust-pipe leading from said upper compartment to said supply-pipe, and an exhaust-pipe for the lower compartment.

In testimony whereof I affix my signature in the presence of two witnesses.

JAMES M. MAXWELL.

Witnesses:

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