

C. J. MARTH.

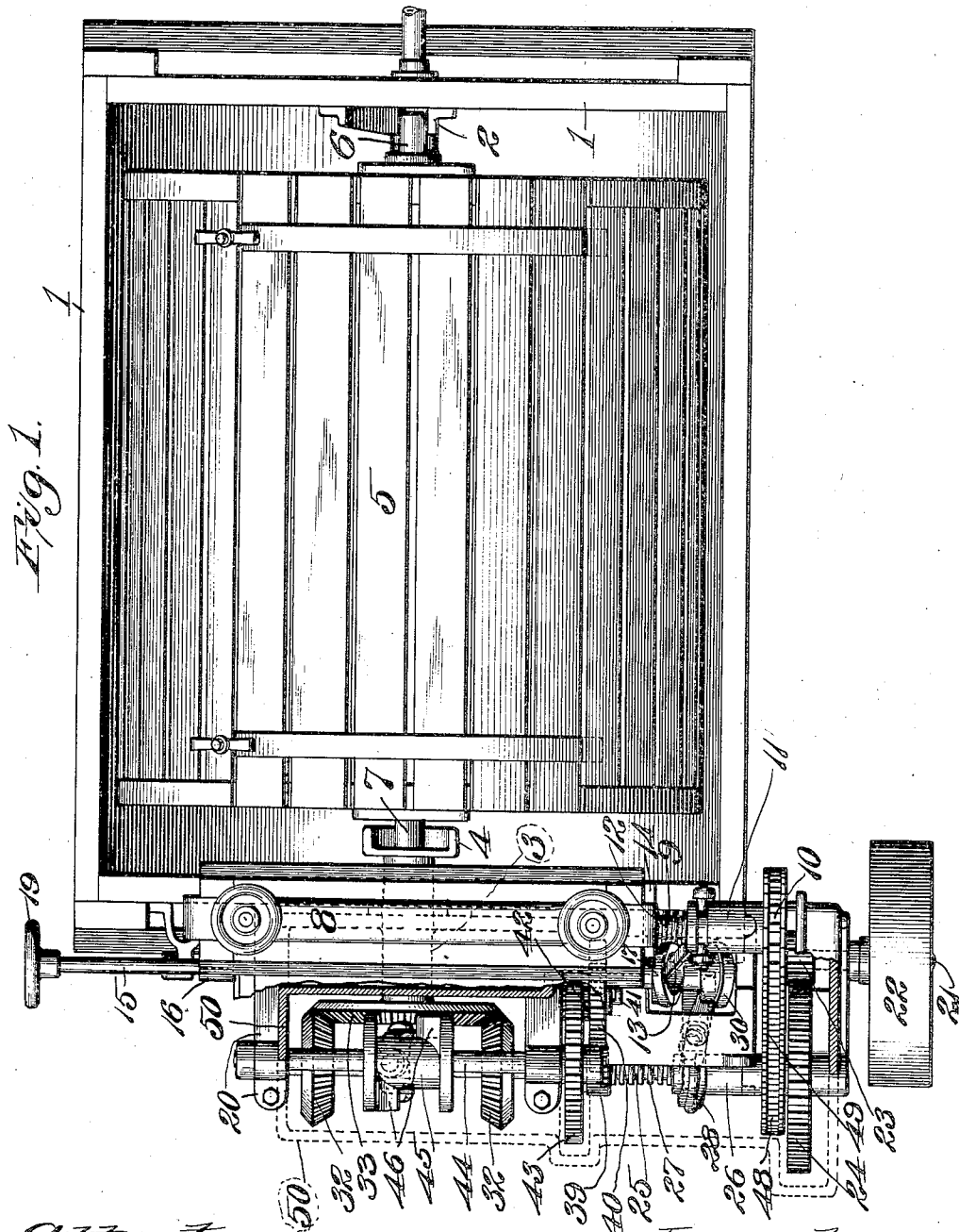
GEARING.

APPLICATION FILED DEC. 14, 1911.

1,042,580.

Patented Oct. 29, 1912.

3 SHEETS—SHEET 1.



Attest:
Wm. H. Scott.
George Barnett

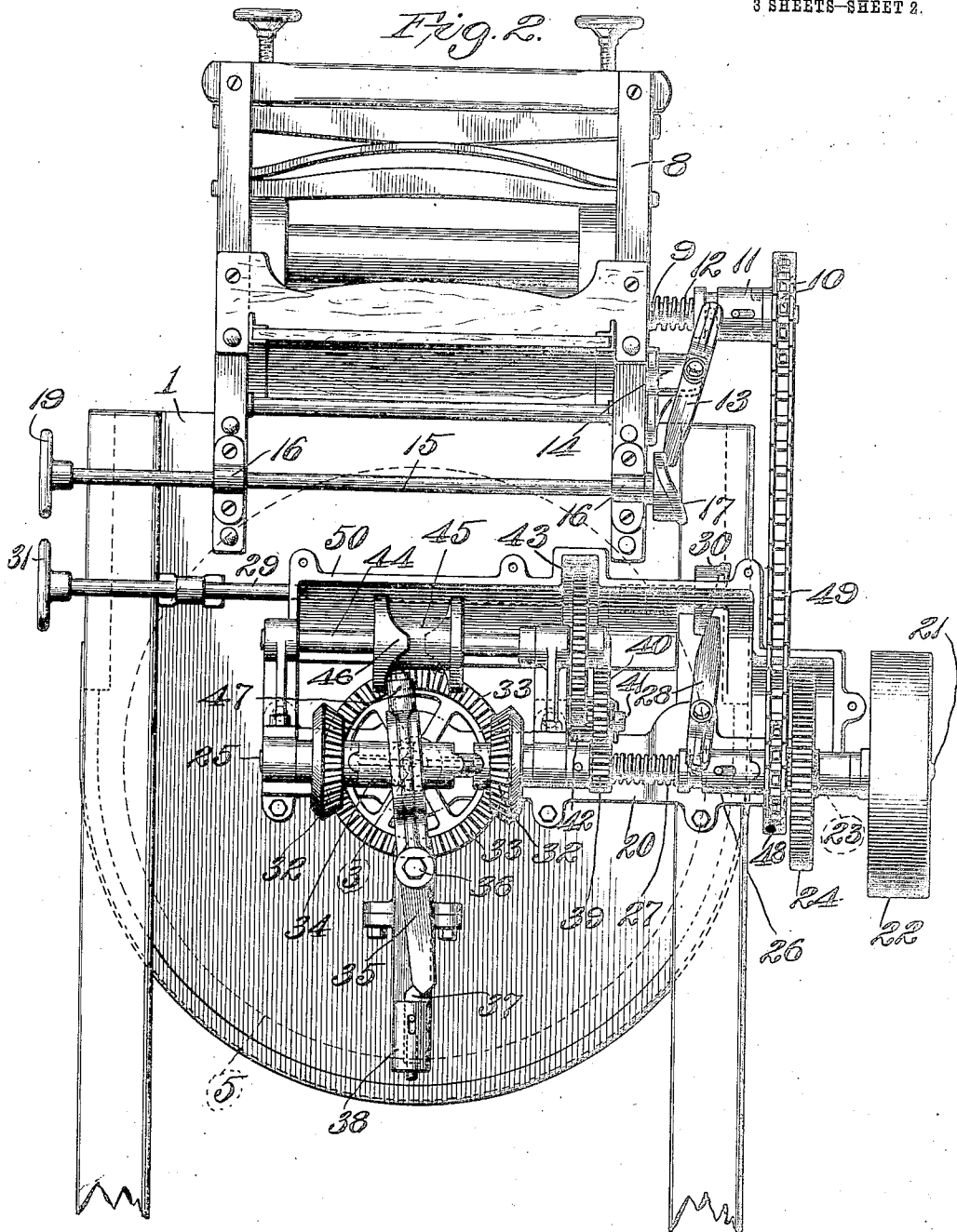
Inventor:
Charles J. Marth,
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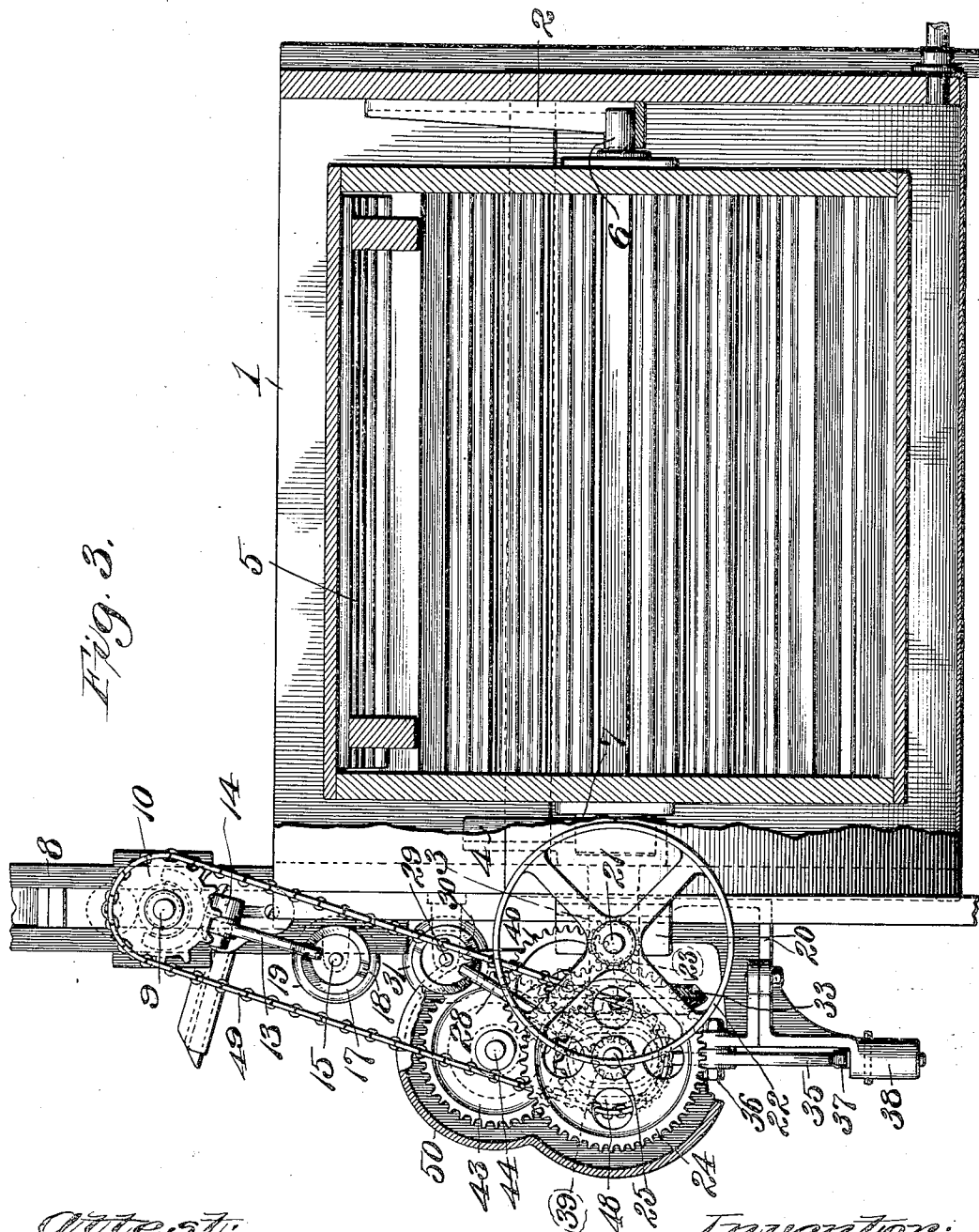
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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

CHARLES J. MARTH, OF ST. LOUIS, MISSOURI.

GEARING.

1,042,580.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed December 14, 1911. Serial No. 665,622.

To all whom it may concern:

Be it known that I, CHARLES J. MARTH, a citizen of the United States, residing at St. Louis, Missouri, have invented a new and useful Improvement in Gearing, of which the following is a specification.

This invention relates to gearing, and is especially adapted for use in washing machines and in washing machines and wringers combined, though it is useful in other combinations and for other purposes as well; and it consists of the novel construction, combination and arrangement of parts herein shown, described and claimed.

My present invention is particularly adapted for use in operating washing machines and other machines which require operation alternately in opposite directions.

In washing machines of a well-known type, there is a cylinder arranged to contain the articles to be washed; said cylinder being revolvably mounted in a receptacle arranged to contain the water. Superior results are obtained by rotating the cylinder alternately in opposite directions so as to cause the articles to rub against the inner surface of the cylinder while being agitated by movement through the water.

Since my invention is especially adapted for use in operating washing machines of the type referred to, I have illustrated one embodiment of my invention combined with such a machine.

An object of the invention is to produce an improved gearing in which there is a driving shaft arranged to be rotated constantly in either direction, and carrying two gears loosely mounted thereon and meshing with another gear controlling the driven mechanism, in combination with improved clutch mechanism, operating automatically, when the driving shaft is in operation to lock first one of said two gears and then the other on said driving shaft, thereby causing said driven mechanism to be operated alternately in opposite directions.

Other objects involve the use of the driving shaft to operate other mechanism, such, for instance, as a wringer, and convenient clutch devices for controlling the operation of said driving shaft and said wringer or other driven mechanism.

Other objects and purposes of the invention will appear from the following de-

scription, reference being made to the accompanying drawings, in which—

Figure 1 is a plan view of one embodiment of my invention applied to and combined with a washing machine and wringer. Fig. 2 is an end view of the washing machine and wringer showing the gearing in combination therewith. Fig. 3 is a side elevation of the gearing, the tub and cylinder of the washing machine being in section, and the cover or case of the gearing being also in section.

The washing machine of the type illustrated includes a receptacle 1 adapted and arranged to contain the water, and having attached to the inner side of one of the end walls thereof a bearing 2. The other end wall of the receptacle has a bearing in which a shaft 3 is journaled. A socket 4 is attached to the inner end of said shaft and is rotated with said shaft when the latter is driven by the gearing and driving mechanism. The cylinder 5, which is arranged to receive and contain the articles to be washed, has a trunnion 6 on one end to rest and revolve in the bearing 2, and on its opposite end said cylinder has a polygonal trunnion or projection 7 arranged to extend into and form locking engagement with the socket 4. Thus the cylinder 5 will be rotated with the shaft 3, and change in the direction of rotation of the shaft 3 will also change the direction of rotation of the cylinder.

In the type of washing machine shown, wringer mechanism 8 is supported by the receptacle 1. The shaft 9 of one of the wringer rolls extends beyond the frame of the wringer and has a sprocket wheel 10 loosely mounted thereon. A clutch member 11 is splined on the shaft 9 and constitutes means for locking the wheel 10 to said shaft, and is operable to release and permit said wheel to run idle when desired. A spring 12 encircles the shaft 9 between the clutch 11 and the frame of the wringer and actuates said clutch member toward the sprocket wheel. A lever 13 pivoted on a support 14 embraces the clutch member 11 between two arms of said lever, said arms extending into a groove in said clutch, and is operable to release the clutch in opposition to the spring 12. A rod 15 is supported in bearings 16 on the wringer frame and has on its inner end a cam 17. The cam 17 is close to the

lower end of the lever 13, so that when the rod 15 is turned the cam will operate the lever 13 to release the clutch 11. A notch 18 (Fig. 3) in the larger part of the cam receives and holds the lever when the latter is in position to hold the clutch member 11 disengaged from the wheel 10. A knob or hand wheel 19 is attached to the outer end of the rod 15 and constitutes means for manipulation of said rod to open and close the clutch.

A bearing casting 20 is secured to one end of the receptacle 1 and a short shaft 21 is revolubly supported thereby. The shaft 21 is the shaft for driving the remainder of the gearing, including the parts coöperating with the wringer, and is provided with a belt wheel or pulley 22 whereby said shaft may be driven. A small gear 23 (Fig. 1) is rigid on the shaft 21 and meshes with a relatively larger gear 24 which is loosely mounted on a shaft 25 journaled in bearings in the bearing casting 20. A clutch member 26 is slidably mounted on the shaft 25 and is operable to lock the wheel 24 to said shaft, or to release said wheel and permit the same to rotate freely and loosely on said shaft, as desired. A spring 27 which encircles the shaft 25 is effective to actuate the clutch to closed adjustment. A lever 28 pivoted on the bearing casting has arms entering a notch in the clutch member and is operable to open the clutch in opposition to the spring 27. A rod 29 has a cam 30 similar to the cam 17 for the purpose of operating the lever to open the clutch; said rod being provided with a hand wheel 31 for purposes of operation. Two gears 32 are loosely mounted on the shaft 25 and are in constant mesh with a relatively large gear 33 on the outer end of the shaft 3. A clutch member 34 is keyed on the shaft 25 between the gears 32 and is slidable from engagement with the hub of one of said gears to engagement with the other. A lever 35 pivoted at 36 has a yoke embracing and engaging the clutch member 34 and is operable to move said clutch member from one to the other of said gears 32. Assuming that the clutch 26 is closed, the shaft 25 will be rotated by power applied to the wheel or pulley 22. The gear 32 which is engaged by the clutch 34 will also be rotated and will drive the gear 33 and shaft 3, thereby rotating the cylinder 5. The lever 35 operates against a plunger or latch device 37 yieldingly carried in a support 38, and is effective to latch the lever and yieldingly hold the clutch 34 closed with either one of the gears 32, but will permit movement of said lever to move said clutch from one to the other of said gears.

A pinion 39 rigid on the shaft 25 meshes with a relatively larger gear 40 revolubly mounted on a supporting axle 41. A pin-

ion 42 rigid with the gear 40 meshes with a relatively larger gear 43 which is rigid on a shaft 44 journaled in bearings in the bearing casting 20 above the shaft 25, so that said shaft 44 will be driven whenever the shaft 25 is rotated. The shaft 44 carries a casting 45 having two disks integral therewith, and a cam 46 integral with the inner face of each disk. The upper end of the lever 35 extends between the disks which carry the cams 46, and has a roller 47 to roll against the faces of the disks. When the shaft 25 is rotated the shaft 44 will also be rotated, and the cams 46 will operate the lever 35 so as to engage the clutch 34 with the gears 32 alternately. The gears 32 being in mesh with the gear 33 on opposite sides of its axis will rotate the gear 33 in opposite directions. Thus, the shaft 25 being in constant rotation in one direction will automatically and alternately rotate the cylinder 5 first in one direction and then in the opposite direction, such alternate operation being maintained continuously. The upper end of the plunger or latch 37 is wedge-shaped, and the lower end of the lever 35 is similarly formed, so that the cams 46 will cause the lower end of the lever 35 to depress the said latch in moving from one adjustment to the other. The latch or plunger being spring-actuated will exert pressure against the lever 35 and actuate said lever the distance required to complete closing the clutch 34 after said lever is started by the cams 46. It will be observed that, in the embodiment shown, the cams 46 are arranged to operate the lever only part of the distance required to move the clutch 34 from one gear to the other; and that the cams merely serve to open the clutch, while the yielding latch or clutch closer 37 serves to complete the movement of the lever to close the clutch. Therefore, there is a direct coöperation between the clutch openers 46, and the clutch closer 37 in effecting the reciprocal rotation of the shaft 3 and the cylinder 5. Manipulation of the rod 29 to operate the lever 28 and open the clutch 26 stops and renders the gearing ineffective in so far as the operation of the shaft 3 and the clutch opening and closing devices are concerned.

The same power may be used for operating the wringer 8 either concurrently with or independently of the gearing for driving the shaft 3. A sprocket wheel 48 is rigid with the gear wheel 24 and rotates with said wheel. A chain 49 entrains the said sprocket 48 with the sprocket 10 so that by proper manipulation of the rod 15 to open or close the clutch 11, the wringer may be operated or maintained idle, as desired. Operation of the wringer is independent of any adjustment of the clutch 26, and is not affected by operation or inactivity of the

gearing and reversing mechanism which directly control the shaft 3.

The entire gearing mechanism may be shielded and incased in a housing 50 which is attached to and supported by the bearing casting 20. This prevents the clothing of the operator, and other articles, from becoming entangled in the gearing and is of material benefit where the gearing is employed on washing machines and other machines where there is opportunity for and danger of entanglement.

I have shown my improved gearing combined with a washing machine to which it is especially adapted, but it is obvious that it may be employed advantageously for operating any mechanism where reciprocating or rocking or oscillating movements are required. I do not confine myself to use of the invention in any particular embodiment or combination.

I am aware that there may be variations and alterations in the arrangement of the parts, to meet different requirements and conditions, without departure from the nature and spirit and scope of the invention. I do not restrict myself to specific features, but contemplate such changes and adaptations in arrangement and construction as will render the gearing most useful and serviceable for the purposes intended.

What I claim and desire to secure by Letters Patent is—

1. A gearing comprising a shaft, a gear wheel on said shaft, a second shaft, two gear wheels loosely mounted on said second shaft and in constant mesh with said first-named gear wheel on opposite sides of its axis, a clutch operable to lock said two gear wheels, one at a time, on said second shaft, means for rotating said second shaft, a third shaft parallel with said second shaft, means for driving said third shaft from said second shaft, and means operated by said third shaft to release said clutch, substantially as specified.

2. A gearing comprising a shaft, a gear wheel on said shaft, a second shaft, two gear wheels loosely mounted on said second shaft and in constant mesh with said first-named gear wheel on opposite sides of its axis, a clutch operable to lock said two gear wheels, one at a time, on said second shaft, means for rotating said second shaft, a third shaft parallel with said second shaft, means for rotating said third shaft from said second shaft, means operated by said third shaft to release said clutch, and means separate from said third shaft for holding said clutch in its different adjustments, substantially as specified.

3. A gearing comprising a shaft, a gear wheel on said shaft, a second shaft, two gear wheels loosely mounted on said second shaft and in constant mesh with said first-

named gear wheel on opposite sides of its axis, a clutch operable to lock said two gear wheels, one at a time, to said second shaft, a lever for moving said clutch from one to the other of said two gear wheels, a third shaft, means operated by said second shaft for rotating said third shaft, a device controlled by said third shaft for moving said lever, and means engaging with said lever to hold said clutch in engagement with said gear wheels, substantially as specified.

4. A gearing comprising a shaft, a gear wheel on said shaft, a second shaft, two gear wheels loosely mounted on said second shaft and in constant mesh with said first-named gear wheel on opposite sides of its axis, a clutch operable to lock said two gear wheels, one at a time, on said second shaft, a lever for moving said clutch from one to the other of said two gear wheels, a third shaft, gearing entraining said third shaft with said second shaft to rotate said third shaft, a device attached to said third shaft for moving said lever and thereby said clutch, a support, and means carried by said support to hold said lever and clutch in their different adjustments, substantially as specified.

5. A gearing comprising a shaft, a gear wheel on said shaft, two loosely mounted gear wheels in constant mesh with said first-named gear wheel on opposite sides of its axis, a shaft for rotating said two gears, a clutch adjustable to enable said second-named shaft to rotate said two gears one at a time, a lever for moving said clutch from one to the other of said two gear wheels, a cam-shaft, cams on said shaft, and means for operating said cam-shaft and thereby said cams effectively to cause said lever to move said clutch from one to the other of said two gear wheels, substantially as specified.

6. A gearing comprising a shaft, a gear wheel on said shaft, two loosely mounted gear wheels in constant mesh with said first-named gear wheel on opposite sides of its axis, a shaft for rotating said two gear wheels, a clutch adjustable to enable said second-named shaft to rotate said two gear wheels one at a time, a lever for moving said clutch from one to the other of said two gear wheels, a cam-shaft, cams on said cam-shaft, means for operating said cam-shaft and thereby said cams effectively to cause said lever to move said clutch from one to the other of said two gear wheels, and a latch device arranged yieldingly to hold said lever and clutch in different adjustments, substantially as specified.

7. A gearing comprising a shaft, a gear wheel on said shaft, a second shaft, two gear wheels loosely mounted on said second shaft and in constant mesh with said first-named gear wheel on opposite sides of its

axis, a clutch operable to lock said two gear wheels, one at a time, on said second shaft, a lever for moving said clutch from one to the other of said two gear wheels, a device for moving said lever, a third shaft operated by said second shaft for causing said device to move said lever to open the clutch, and a latch device or clutch closer cooperating with said lever, substantially as specified.

10 8. A gearing comprising a shaft, means for rotating said shaft, a pinion on said shaft, a second shaft, a gear wheel on said second shaft in constant mesh with said pinion, a clutch for locking said gear wheel on said second shaft, and means for operating said clutch to release said gear wheel, in combination with a third shaft separate from said two shafts, a gear wheel on said third shaft, two gear wheels loosely mounted on said second shaft in constant mesh with said last-named gear wheel, a lever and clutch device operable to lock said two gear wheels, respectively, to said second shaft, a fourth shaft, a gear wheel on said fourth shaft, a pinion on said second shaft, gearing entraining said last-named gear wheel with said pinion, and a cam attached to said fourth shaft for operating said lever and clutch device, substantially as specified.

30 9. A gearing comprising a shaft, means for rotating said shaft, a pinion on said shaft, a second shaft, a gear wheel on said second shaft in constant mesh with said pinion, and a clutch for locking said gear wheel on said second shaft, in combination with a third shaft, a gear wheel on said third shaft, two gears on said second shaft in constant mesh with said last-named gear wheel, a clutch device operable to lock said two gear wheels, respectively, to said second shaft, and a clutch operating device driven by said second shaft for shifting said clutch from one to the other of said two gear wheels, substantially as specified.

10. A gearing comprising a shaft, means for rotating said shaft, a pinion on said shaft, a second shaft, a gear wheel on said second shaft in constant mesh with said pinion, and a clutch for locking said gear wheel on said shaft, in combination with a third shaft, a gear wheel on said third shaft, two gears on said second shaft in constant mesh with said last-named gear wheel, a clutch device operable to lock said two gear wheels, respectively, to said second shaft, a clutch operating device driven by said second shaft for shifting said clutch from one to the other of said two gear wheels, and means for holding said clutch engaged with said two gear wheels, respectively, substantially as specified.

11. A gearing comprising a shaft, a gear wheel on said shaft, a second shaft, two gear wheels loosely mounted on said second shaft and in constant mesh with said first-named gear wheel on opposite sides of its axis, a clutch mounted on said second shaft between said two gear wheels, a support, a lever pivoted on said support and engaging with said clutch, a third shaft, a train of gears between said second shaft and said third shaft whereby said second shaft will rotate said third shaft, two disks rigid on said third shaft, a cam on each of said disks arranged to engage with one end of said lever and thereby move said clutch from one to the other of said two gear wheels, and means for holding said lever and clutch in engagement with said two gear wheels, respectively, substantially as specified.

In witness whereof, I have signed this specification in the presence of two subscribing witnesses.

CHARLES J. MARTH.

Witnesses:

F. W. ROSSKOPF,
L. C. KINGSLAND.