C. SCHENCK.

GEARING FOR REGISTERS.

APPLICATION FILED AUG. 26, 1913.

1,201,356.

Patented Oct. 17, 1916.

2 SHEETS—SHEET 1.

Fig. 2.

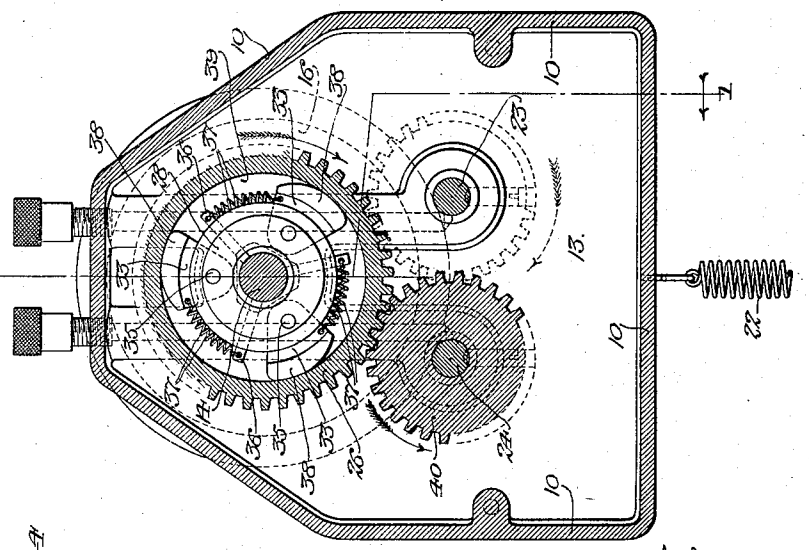

Fig. 3.

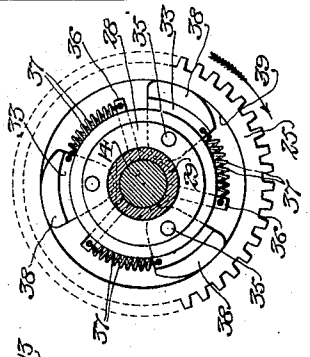

Fig. 1.

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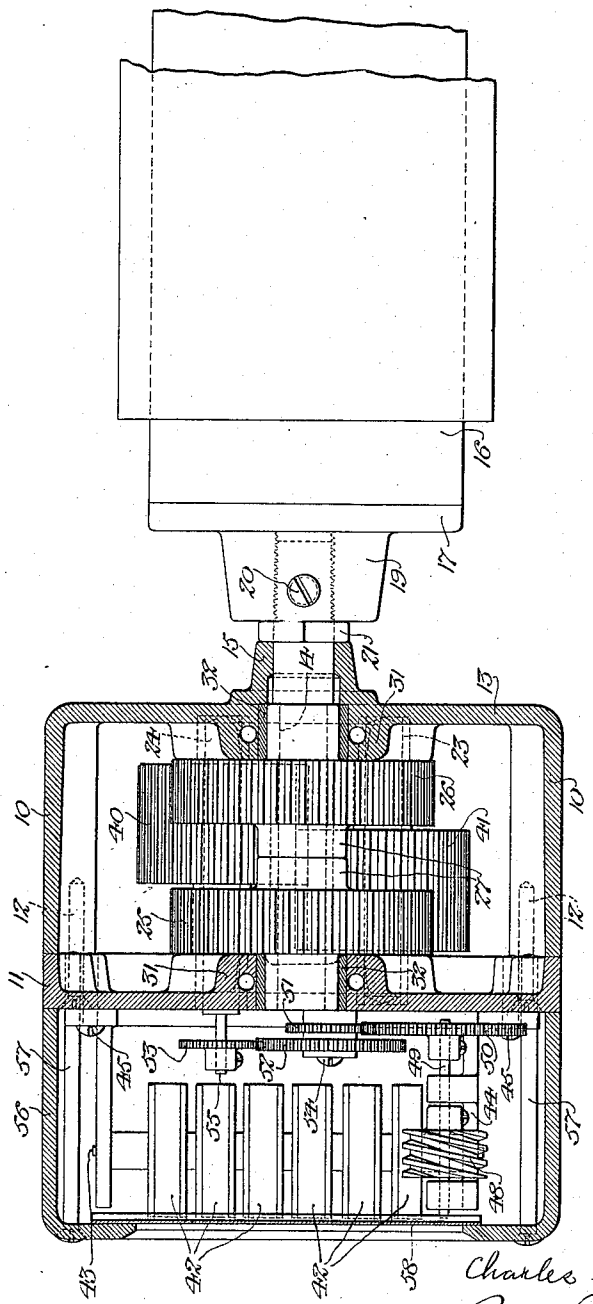
2 SHEETS—SHEET 2.

FIG. 4.



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UNITED STATES PATENT OFFICE.

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GEARING FOR REGISTERS.

1,201,356. Specification of Letters Patent. Patented Oct. 17, 1916.

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To all whom it may concern:

Be it known that I, CHARLES SCHENCK, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gearing for Registers, of which the following is a full, clear, and exact description.

The invention relates to gear mechanism for driving registers and the like and more particularly to means for driving a register from the operating mechanism of an elevator car, and the invention seeks to provide simple and effective mechanism for actuating the register from a drive shaft which rotates in opposite directions.

The invention consists in the features of improvement hereinafter set forth, illustrated in the preferred form in the accompanying drawings and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a vertical section of the improved register on a line 1—1 of Fig. 2. Fig. 2 is a vertical cross section on the line 2—2 of Fig. 1. Fig. 3 is a detail view of the part shown in section on the line 3—3 of Fig. 1. Fig. 4 is a horizontal section on the line 4—4 of Fig. 1.

The register-operating mechanism is inclosed in a box-like casing 10 having a contracted upper portion, as shown in Fig. 2. The casing is closed at one side by a flanged cap-plate 11 which is secured thereto by screws 12. The shafts of the register-operating mechanism are journaled in suitable bearings formed on the cap-plate 11 and on the opposite side wall 13 of the casing. A drive shaft 14 is journaled in the upper central portion of the casing and at one end projects outwardly through a boss 15 formed upon the outer face of the side wall 13. The projecting end of the drive shaft is adapted to be secured to the end of a shaft 16 which forms part of the elevator-hoisting mechanism. The drive shaft 14 of the register-operating mechanism is secured to the shaft 16 in axial alinement therewith, preferably by means of a suitable coupling or mounting plate 17 which is fastened to the end of the shaft 16 by screws 18. This plate is provided with a central boss 19 into which the outer end of the shaft 14 is threaded and within which the shaft 14 is fixed by a set-screw 20. For convenience in connecting and disconnecting the shaft 14 and the coupling, the shaft is preferably provided with a hexagonal flange 21 adapted to be engaged by a suitable spanner or wrench.

When the register drive shaft 14 is thus fixed to the end of one of the shafts of the elevator hoisting mechanism, it will rotate in opposite directions on the shaft 16 as the elevator car is raised and lowered. The drive shaft 14 also preferably serves as a support for the register casing and parts carried thereby. That is to say, the register is hung or suspended on the drive shaft 14 and, inasmuch as the drive shaft is journaled in the upper portion of the casing, the latter is held by gravity in vertical position. To prevent the register casing from swaying, a spring 22 may be connected to the lower central portion thereof and to a suitable fixed point, if desired.

Within the casing 10 and below and on the opposite sides of the drive shaft 14, are journaled two shafts 23 and 24. These shafts are parallel to the drive shafts 14 and a suitable counter is driven from one of them, while the other constitutes an intermediate shaft between the counter-actuating and drive shafts. Two loose gears are mounted either on the counter-actuated shaft or upon the drive shaft. Preferably, as shown, these loose gears 25 and 26 are mounted on the drive shaft 14 and are spaced some distance apart by the hub portions 27 thereof. These gears are adapted to be coupled to the drive gear by oppositely-acting clutches which are arranged to connect one or the other of the gears to the shaft in accordance with the direction of rotation thereof. As shown, the outer faces of the gears are counterbored and members or disks 28 are mounted on the shaft 14 within the gears 25 and 26. These clutch members or disks 28 are provided with hub portions 29 which are fixed to the shaft 14 by pins 30. The clutch members or disks 28 abut against the inner ends of hubs 31 formed upon the cap-plate 11 and the side wall 13 of the casing and preferably bushings 32 are inserted in the bosses 31 and about the hub portions 29 of the clutch disks.

The clutch disks are centrally and transversely recessed or slotted to receive a set of clutch dogs 33 (three in number in the form shown), which are eccentrically secured to the disk by pivot pins 35. Radial pins 36 are fixed to the disk in line with the clutch

dogs and are connected thereto by springs 37. The clutch dogs are provided with friction shoes 38 which are arranged to coöperate with an internal, cylindrical friction surface 39 formed upon the counterbored gears 25 and 26. The working faces of the shoes conform, in part, to the cylindrical friction surface 39, but at the end of each dog which is connected to one of the springs 37 the friction shoe 38 is cut away, as shown in Figs. 2 and 3. The cut away portions and springs of the clutches which coöperate with the gears 25 and 26 are oppositely arranged, as clearly shown in Figs. 2 and 3.

The counter-actuating shaft 24 and the intermediate shaft 23 are provided with two wide, overlapping gears 40 and 41 which intermesh with each other and mesh also, respectively, one with each of the loose gears. That is to say, the gear 40 on the shaft 24 meshes with the loose gear 26 and the gear 41 on the intermediate shaft 23 meshes with the loose gear 25. Inasmuch as the gears 40 and 41 are wider than the loose gears and overlap, they can mesh with each other.

When the drive shaft is rotated in one direction, for example that indicated by the arrows in Figs. 2 and 3, the clutch dogs which coöperate with the loose gear 26 act to connect this gear to the shaft and the counter-actuating shaft 24 is driven directly from the gear 26 through the medium of the gear 40. The gear 41 and the other loose gear 25 rotate idly in the opposite direction, the clutch dogs slipping over the friction surface of the gear 25. When the drive shaft 14 is rotated in the opposite direction, the gear 25 is fixed thereto by the clutch dog coöperating therewith and the counter-actuating shaft 24 is driven from the gear 25 through the medium of the idler gear 41 and gear 40 and the clutch dogs which coöperate with the gear 26 slip idly upon the friction surface. In this way, the counter-actuating shaft 24 is always driven in one direction in spite of the rotation in an opposite direction of the drive shaft 14.

The registering counter comprises a series of numbered wheels 42 which are mounted on a shaft 43. This shaft is journaled in a bracket 44 that is fixed to the outer face of the cap plate 11 by screws 45. The units wheel of the counter is driven by a worm wheel 46 mounted on one end of the shaft 43 and meshing with a worm 48 on a short shaft 49. This shaft is journaled on the bracket 44 and its inner end is provided with a gear 50 which is connected with the counter-actuating shaft 24 by a train of gears 51, 52 and 53. The gears 51 and 52 are fastened together and are mounted upon a stud or screw 54 on the face of the cap plate 15 and the gear 53 is fixed to a stud or pin 55 which projects from the end of the counter-actuating shaft 24. The gears 51, 52 and 53 may be readily changed so that the proper ratio may be provided between the counter-actuating shaft and the units wheel. The other counter wheels are driven from the units wheel in any suitable manner. The counter is inclosed in a casing section 56 which fits over the same and is fastened to the cap plate 11 by screws 57. The counter wheels are exposed through openings formed in a dial plate 58 which is provided at the outer face of the casing 56. The register is simple and compact and can be readily attached and supported from one end of one of the shafts which constitutes part of the elevator hoisting mechanism and the total travel of the car in opposite directions accurately registered. It is obvious that changes may be made in the details set forth without departure from the essentials of the invention as defined in the claims.

I claim as my invention:—

1. In a mechanism of the class described, the combination of a driving shaft adapted to rotate in opposite directions, a parallel actuating shaft, a pair of gears loose on one of said shafts, an idler gear meshing with one of said loose gears, a gear on the other of said shafts meshing with the other loose gear and with said idler gear, and oppositely acting clutches for connecting said loose gears to the shaft whereon they are mounted, substantially as described.

2. In mechanism of the class described, the combination of a driving shaft adapted to rotate in opposite directions, a parallel actuating shaft, a pair of gears loose on one of said shafts, an idler gear having its axis parallel to said shafts and meshing with one of said loose gears, a gear on the other of said shafts meshing with the other of said loose gears and with said idler gear, members fixed to the shaft whereon said loose gears are mounted, and oppositely acting friction clutch dogs for connecting said fixed members to said loose gears, substantially as described.

3. In mechanism of the class described, the combination of a drive shaft adapted to rotate in opposite directions, a pair of parallel actuating shafts, overlapping, intermeshing gears on said latter shafts, a pair of gears loosely mounted on said drive shaft and meshing respectively one with each of said overlapping gears, members fixed to said drive shaft, and oppositely-acting, spring-pressed, friction clutch-dogs pivoted on said members, said loose gears having friction faces coöperating with said dogs, whereby one or the other of said gears is connected to said drive shaft in accordance with the direction of rotation thereof, substantially as described.

4. In mechanism of the class described, the combination of a drive shaft adapted to ro-

tate in opposite directions, a pair of parallel actuating shafts, overlapping, intermeshing gears on said latter shafts, a pair of gears loosely mounted on said drive shaft and meshing respectively one with each of said overlapping gears, members fixed to said drive shaft within said loose gears, the latter having internal friction surfaces, and two sets of oppositely-acting, spring-pressed clutch-dogs eccentrically pivoted on said members and arranged to engage said friction surfaces to connect one or the other of said gears to said drive shaft, substantially as described.

5. In gearing for registers and the like, the combination of the drive shaft arranged to rotate in opposite directions, a pair of gears loosely mounted on said drive shaft and having internal friction surfaces, disks fixed to said shaft within said gears, automatically and reversely acting spring pressed friction dogs carried by said disks and coöperating with the internal friction surfaces of said gears to connect one or the other of said gears to said drive shaft in accordance with the direction of rotation of the latter, an actuating shaft, a connecting gear between said loose gears and said actuating shaft arranged to rotate the latter in the same direction, substantially as described.

6. In mechanism of the class described, the combination of a drive shaft adapted to rotate in opposite directions, a parallel actuating shaft, a parallel drive shaft, a parallel intermediate counter shaft, a pair of over-lapping, inter-meshing gears upon two of said shafts, a pair of gears loosely mounted on the other of said shafts and meshing respectively one with each of said over-lapping gears, and oppositely acting clutch devices for connecting one or the other of said loose gears to the shaft whereon it is mounted in accordance with the direction of rotation of said drive shaft, substantially as described.

7. In mechanism of the class described, the combination with a main drive shaft, of a supplemental drive shaft having means for securing the same in axial alinement to said main drive shaft, a casing hung on said supplemental drive shaft, and in the upper portion of which said latter shaft is journaled, an actuating shaft journaled in said casing, a pair of loose gears mounted on one of the shafts in said casing, gearing respectively connecting said loose gears to the other of said shafts, and oppositely acting clutches for connecting said loose gears to the shaft whereon they are mounted, substantially as described.

8. In mechanism of the class described, the combination of a main drive shaft, a supplemental drive shaft having means for securing the same in axial alinement to the end of a main drive shaft, a casing hung on said shaft and in the upper portion of which said shaft is journaled, an actuating shaft and an intermediate shaft journaled in said casing below and parallel to said drive shaft, a pair of loose gears on said drive shaft, two intermeshing gears mounted on said intermediate and said counter-actuating shafts and intermeshing respectively one with each of said loose gears, and oppositely acting clutches for connecting one or the other of said loose gears to said drive shaft in accordance with the direction of rotation thereof, substantially as described.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."