

C. F. SIEGRIST.
 REGISTERING MECHANISM.
 APPLICATION FILED JULY 15, 1912.

Patented Mar. 18, 1913.

1,056,460.

2 SHEETS-SHEET 1.

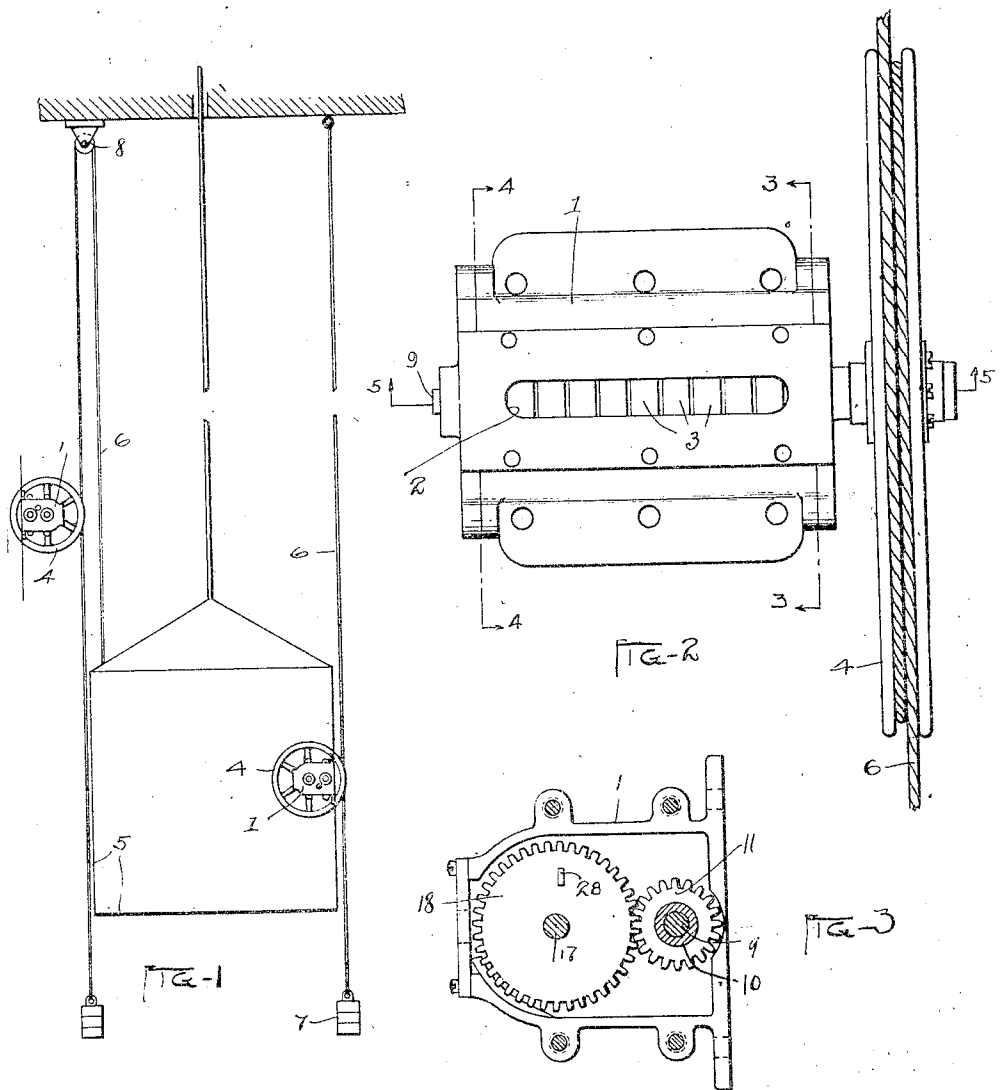
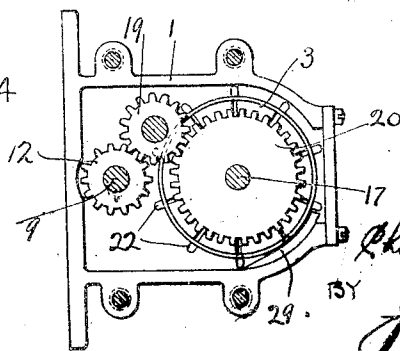


FIG 4



WITNESSES:

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2 SHEETS—SHEET 2.

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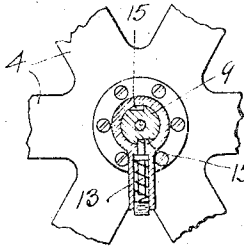
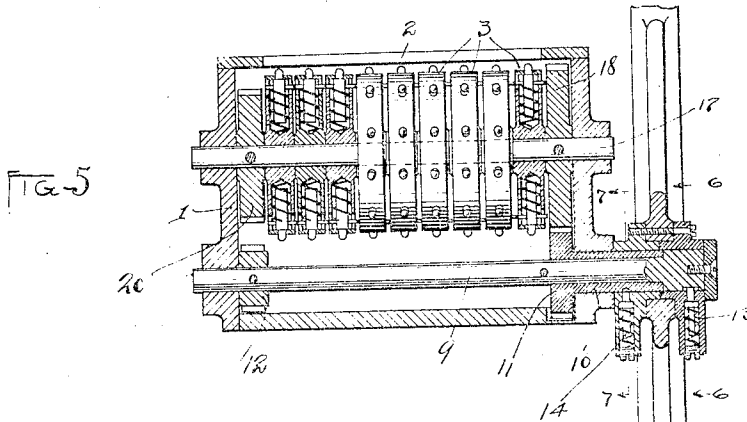


FIG-6

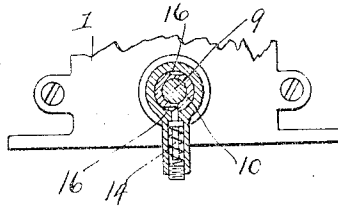


FIG-7

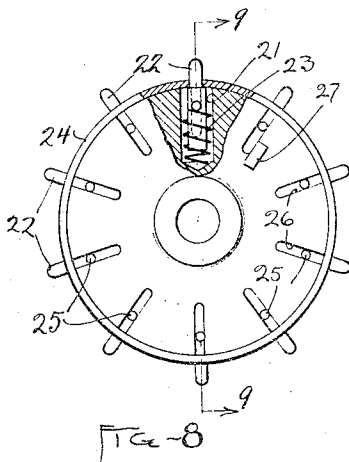


FIG-8

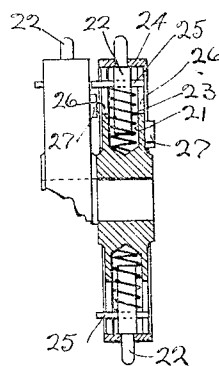


FIG-10

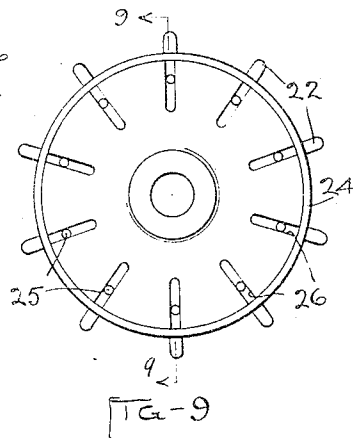


FIG-9

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REGISTERING MECHANISM.

1,056,460.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed July 15, 1912. Serial No. 709,308.

To all whom it may concern:

Be it known that I, CHARLES F. SIEGRIST, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Registering Mechanism, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The present invention, relating, as indicated, to registering mechanism, has more particular regard to the provision of a suitable apparatus for use in registering the actual distance traveled by elevators or lifts in buildings, or wherever a reciprocating movement of varying extent and limits as to starting and stopping points requires to be measured. It is a matter of no small importance in the use of such elevators, and especially in judging of the wearing qualities of the cables by means of which they are suspended, in the case of cable-suspended elevators, to know not merely the number of trips but the actual distance traveled in both directions, viz., up and down; for the trips are not all of the same length, and reversals in direction of travel, for short distances at least, frequently occur in the course of a trip.

The object of the present invention is to provide an extremely simple but effective mechanism for registering the total distance traveled in the case of an elevator cage or the like.

Another object is to provide a scheme of marking for the registering dials of the instrument which will permit the ready computation of the distance traveled in miles and fractions thereof.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—Figure 1 is a diagrammatic view illustrating an elevator carriage with my improved registering

mechanism shown in operative connection therewith, two separate mechanisms being shown diversely arranged, as will be hereinafter explained: Fig. 2 is a front elevational view of the mechanism on an enlarged scale: Figs. 3 and 4 are transverse sectional views of said mechanism taken on planes indicated by the lines 3—3 and 4—4, Fig. 2: Fig. 5 is a broken longitudinal sectional view taken on the line 5—5, Fig. 2: Figs. 6 and 7 are transverse sectional views of a detail taken on planes indicated by the lines 6—6 and 7—7, Fig. 5: Figs. 8 and 9 are elevational views of opposite sides of one of the registering disks; and Fig. 10 is a vertical axial section of one such disk.

The registering mechanism proper is housed in a suitable casing 1 having an elongated opening 2 on its one side, through which portions of the peripheries of the aligned registering or computing members 3 may be seen. The mechanism is designed to be actuated through a sheave or pulley 4 carried on a shaft in the casing, as will be presently more fully described, said pulley being in turn actuated in either of the two modes indicated in Fig. 1. As shown at the right in said figure, the casing is mounted on the elevator cage 5 so as to travel therewith, and a cord 6 or like cable is hung so as to depend alongside said cage, said cord being passed one or more times around the pulley and having a weight 7 attached to its lower end, so that as the cage is raised and lowered the pulley will be rotated in one or the other direction. In the other arrangement, illustrated at the left in said Fig. 1, the casing of the registering mechanism is relatively fixedly supported at any suitable point adjacent to the path of travel of the cage or at the top of the shaft as desired. The cord 6 which is passed around the pulley 4 as previously is then attached at its one end to the cage and is movably supported at an intermediate point by a pulley 8 located at the upper end of the path of travel of the cage, its free end being weighted as before.

The shaft upon which the pulley or sheave is mounted comprises, as shown in Fig. 5, an inner solid spindle 9 extending the entire length of the casing, and an outer tubular spindle 10 which merely extends a short distance within the casing and carries, integrally formed therewith a pinion 11, a corresponding pinion 12 being fixedly

mounted upon the opposite end of the inner spindle. On opposite sides of the hub of the pulley are provided spring-pressed plungers 13 and 14 arranged to engage notches 15 and 16 in the adjacent portions of the inner and outer spindles, respectively, as shown in Figs. 6 and 7. These plungers and notches constitute clutch means; the disposition of the notches being such that upon rotation of the pulley in one direction the inner shaft or spindle is rotated therewith, while upon rotation in the opposite direction the outer spindle is rotated; thus one or the other spindle will be rotated irrespective of the direction of travel of the cage which is the ultimate source of movement.

The registering or computing numbers 3, of which nine are shown, although the number is indeterminate, are loosely rotatable upon another shaft 17 disposed alongside and parallel with spindle 9, said shaft 17 being directly driven from the pinion 11 on the tubular spindle 10 by means of a gear 18 carried thereby, and indirectly driven from the pinion 12 on the farther end of the first spindle through an idler 19 and a gear 20 on the adjacent end of the shaft 17, see Figs. 3 and 4. Each of these computing members is of similar construction, consisting of a disk-like part having ten radially disposed apertures 21 in which are mounted plungers 22 normally urged outwardly by springs 23 into engagement with an annular retaining plate 24 that forms the periphery of each member, (Figs. 8, 9 and 10). This plate also bears the designations or numerals which indicate the distance traveled by the cage connected with the mechanism. Each plunger carries a transverse pin 25 that is guided in radial slots 26 in open communication with the apertures 21, said pins extending a short distance beyond corresponding faces of the successive disks, namely, those directed toward the right in Fig. 5. Each disk, furthermore, has, adjacent to one of the radial slots on the side of the disk beyond which the pins do not extend, a lug 27 which is so disposed as to be adapted to engage a pin on any plunger in the next adjacent disk, providing such plunger be pressed radially inward a sufficient distance; normally, however, the plungers are in their outermost position in which the pins are clear of such engagement. The gear 18 at the right hand side of the shaft in Fig. 5 is likewise provided with a lug 28 similarly disposed to those on the several disks, which lug is adapted to engage the plunger-pins 25 on the first of the series of disks, under the conditions just described.

Actuation of the plungers inwardly so as to bring the pins thereon into position to be engaged by the lugs on the adjacent disks is

obtained through the medium of a cam or incline 29 extending parallel with the common axis of the disks (Fig. 4). Such cam is of a width equal to the circumferential distance between three plungers, and save at its lower edge (which is beveled) it is curved to conform to the periphery of the disks. Accordingly, as shown in the figure just referred to, when one plunger has just passed beyond said cam the plunger once removed therefrom is just at the lower beveled edge thereof, while the intermediate plunger is half way between these two points and pressed inwardly into a position where the pin carried thereby will be engaged by the lug on the adjacent disk or gear as the case may be. The effect of such engagement will be to impart one-tenth of a rotation to the disk whose plunger pin is thus engaged, said pin thereupon escaping from engagement as the plunger moves beyond the upper, abrupt edge of the cam, while the pin on the next following plunger is disposed ready to be engaged when the lug on the actuating disk or gear comes around again.

By reason of the arrangement of gearing for connecting the actuating pulley with the respective ends of the shaft upon which the computing members are supported, it will be seen that said shaft is rotated in the same direction, no matter what the direction of rotation of the pulley may be, and such rotation results in the actuation of the successive disks by reason of the engagement of the lug on the gear with the plunger pins on the first disk, and the engagement of the lugs on said first and the succeeding disks with the plunger pins on the next adjacent disk.

While quite simple and compact, the foregoing mechanism is admirably suited to its purpose and can be readily installed in connection with any form of elevator cage.

Since the elevator service is conveniently registered in miles, I have adopted the following scheme of designations for the registering members, viz., on the first I mark the feet as follows:—0—5.28—10.56—15.84—21.12—26.4—31.68—36.96—42.24—47.52. The designations on the corresponding spaces of the next two disks will be the same as on the first, but multiplied by 10 and 100, respectively. The readings on the fourth disk then become miles, the designations on said disk being simply 0—1—2—3—4—5—6—7—8—9. Accordingly, the readings may be taken directly in miles and feet.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed providing the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In mechanism of the character described, the combination of a shaft; a series of registering members rotatably mounted thereon; means on said shaft adapted to actuate the first of said series of members, each member being adapted in turn to actuate the next succeeding member; two spindles, one within the other disposed parallel with said shaft; gearing connections between said shaft and spindles arranged and constructed to turn the shaft in the same direction when said spindles are rotated in opposite directions, respectively; a rotatable driving member; and clutch means adapted to operatively connect said driving member with said spindles, respectively, upon said member being rotated in opposite directions.

2. In mechanism of the character described, the combination of a shaft; a series of registering members rotatably mounted thereon; gears fixedly mounted on said shaft at opposite ends of said series of members, the gear adjacent to the first member being adapted to actuate the same and each member being adapted in turn to actuate the next succeeding member; two spindles, one within the other disposed parallel with said shaft; a pinion on each of said spindles, the pinion on the outer spindle directly meshing with the actuating gear on said shaft; an idler gear connecting the pinion on the inner spindle with the other gear on said shaft; a rotatable driving member; and clutch means adapted to operatively connect said driving member with said spindles, respectively, upon said member being rotated in opposite directions.

3. In mechanism of the character described, the combination of a shaft; a series of registering members rotatably mounted thereon, each of said members including a corresponding series of radially disposed plungers adapted to project beyond the periphery of the member, and means normally retaining said plungers in such projecting position, a plunger on one member being adapted to engage the next member to rotate the same when said plunger is pressed radially inward; and means adapted to thus press inwardly the successive plungers on each member as said member is rotated.

4. In mechanism of the character described, the combination of a shaft; a series of registering members rotatably mounted thereon, each of said members including a corresponding series of radially disposed plungers adapted to project beyond the periphery of the member; means normally re-

taining said plungers in such projecting position, a lug on correspondingly directed faces of said members, and pins on the plungers of each member, said pins projecting laterally from the faces of said members directed oppositely to those with the lugs and being respectively adapted to engage the latter when the plunger bearing the same is pressed radially inward; and means adapted to thus press inwardly the successive plungers in each member as said member is rotated.

5. In mechanism of the character described, the combination of a shaft; a series of registering members rotatably mounted thereon, each of said members including a corresponding series of radially disposed plungers adapted to project beyond the periphery of the member; means normally retaining said plungers in such projecting position, a lug on correspondingly directed faces of said members, and pins on the plungers of each member, said pins projecting laterally from the faces of said members directed oppositely to those with the lugs and being respectively adapted to engage the latter when the plunger bearing the same is pressed radially inward; and a cam disposed longitudinally of said series of members and adapted to engage the outer ends of successive plungers on each member and press the latter inwardly as said member is rotated.

6. In mechanism of the character described, the combination of a shaft; a series of registering members rotatably mounted thereon, each of said members including a corresponding series of radially disposed plungers adapted to project beyond the periphery of the member; means normally retaining said plungers in such projecting position, a lug on correspondingly directed faces of said members, and pins on the plungers of each member, said pins projecting laterally from the faces of said members directed oppositely to those with the lugs and being respectively adapted to engage the latter when the plunger bearing the same is pressed radially inward; and a cam disposed longitudinally of said series of members and adapted to engage the outer ends of successive plungers on each member and press the latter inwardly as said member is rotated, said cam having a width equal to the circumferential space between three plungers.

Signed by me this 12th day of July, 1912.
CHARLES F. SIEGRIST.

Attested by—
HORACE B. FAY,
D. T. DAVIES.