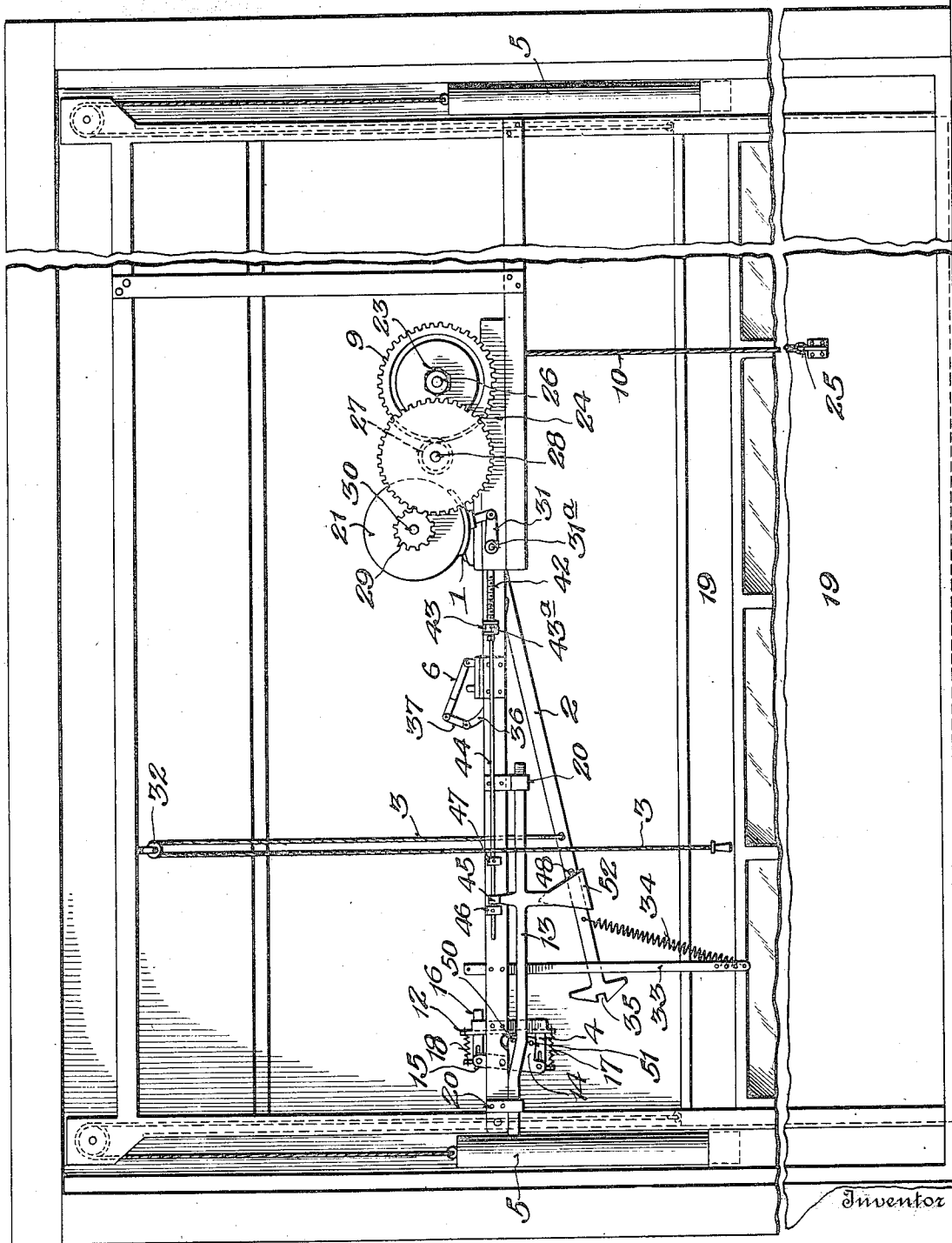


1,289,211.

Patented Dec. 31, 1918.
3 SHEETS—SHEET 1.



Witness

Chas. L. Grieshaber

Fig. 1.

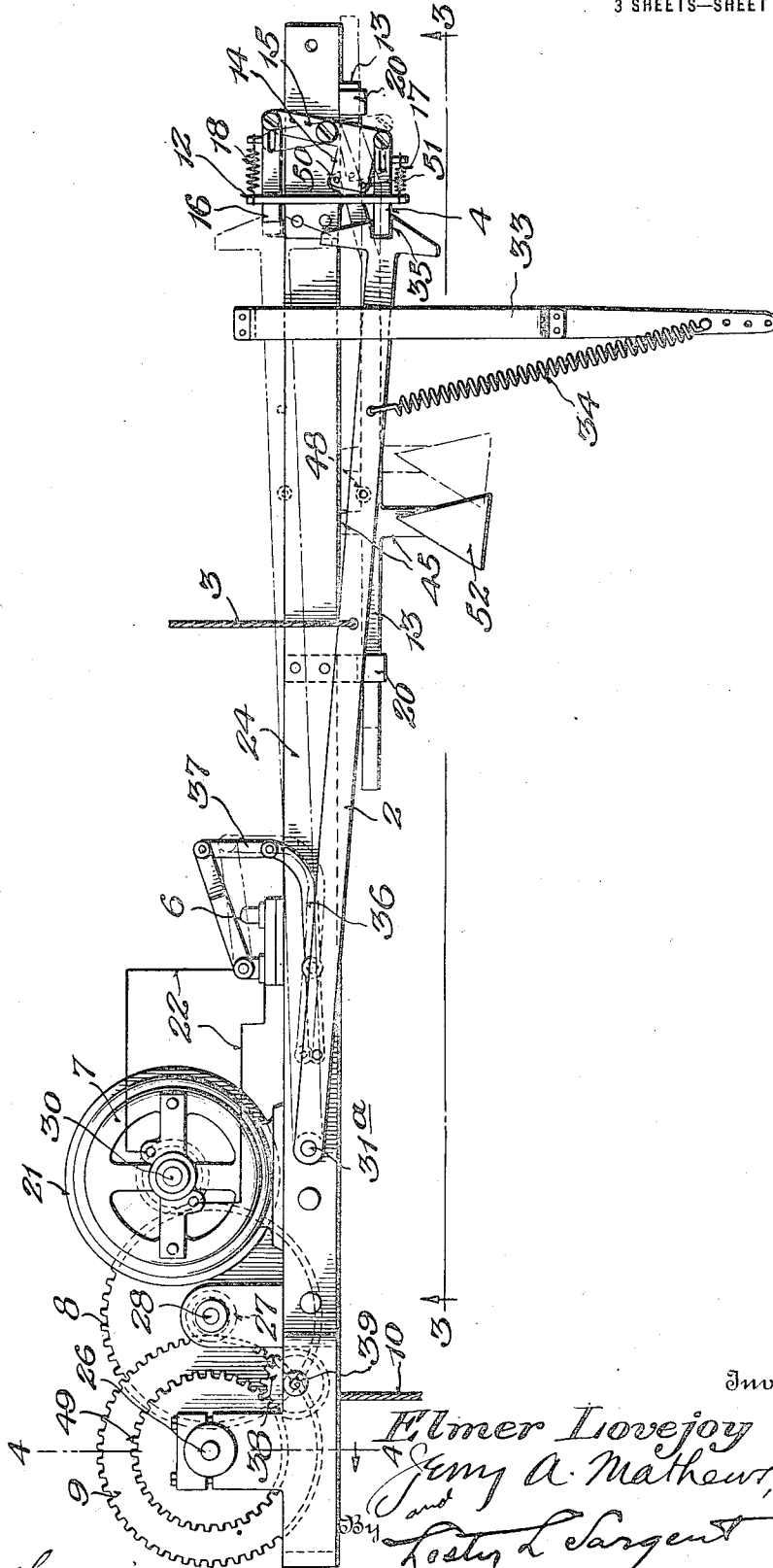
334

Elmer Lovejoy,
and Jerry A. Mathews,
Attorneys

1,289,211.

Patented Dec. 31, 1918.
3 SHEETS—SHEET 2.

Fig. 2.



Witness

Inventor

Chas. R. Grishauer

Elmer Lovejoy
J. A. Mathew,
and
Lester L. Sargent

Attorneys

E. LOVEJOY.

DOOR OPENER.

APPLICATION FILED AUG. 2, 1918.

Patented Dec. 31, 1918.

3 SHEETS—SHEET 3.

1,289,211.

Fig. 3.

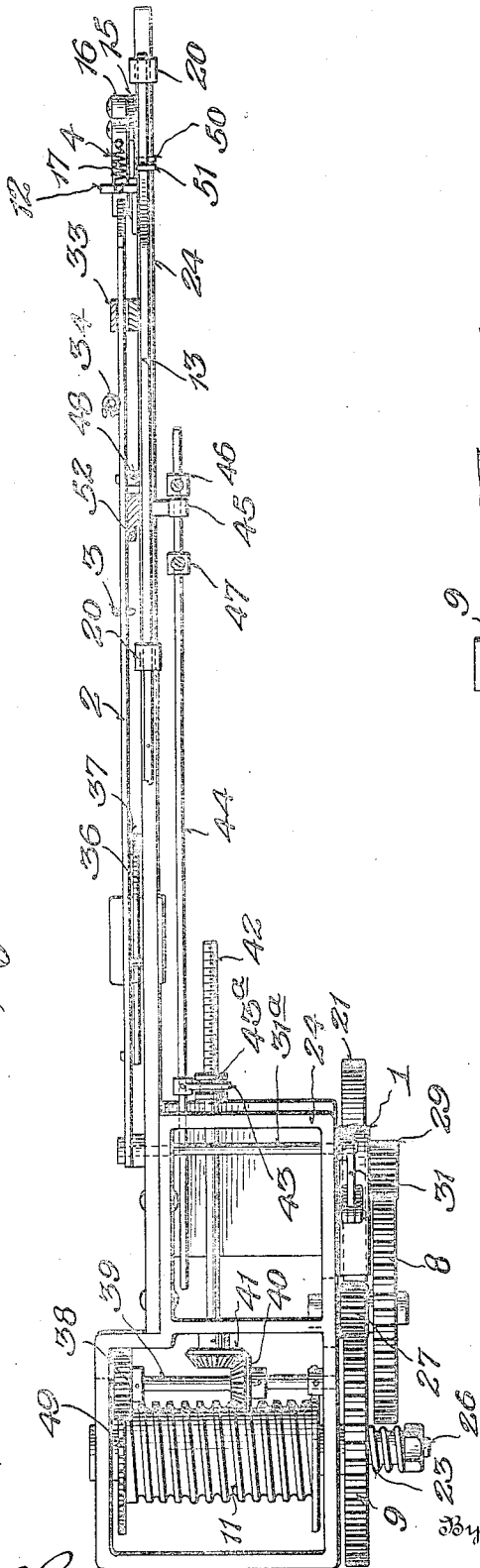
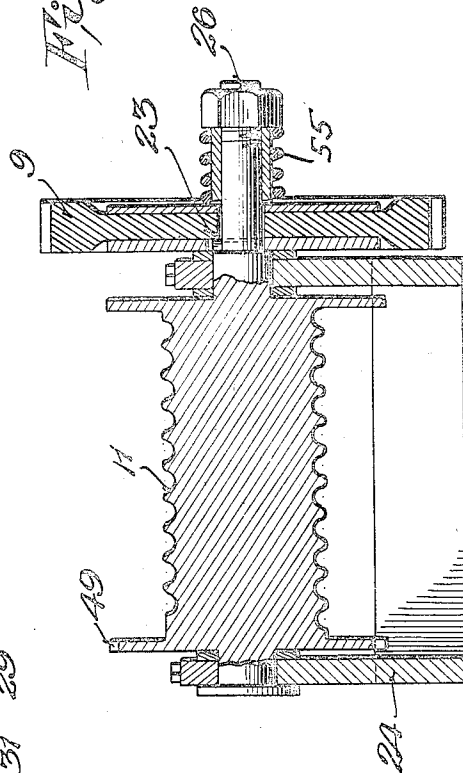


Fig. 4.



Witness

Chas. R. Gristauer

Inventor

Elmer Lovejoy,
Jesse A. Mathews,
and
Robert L. Sargent

Attorneys

UNITED STATES PATENT OFFICE.

ELMER LOVEJOY, OF LARAMIE, WYOMING.

DOOR-OPENER.

1,289,211.

Specification of Letters Patent.

Patented Dec. 31, 1918.

Application filed August 2, 1918. Serial No. 248,031.

To all whom it may concern:

Be it known that I, ELMER LOVEJOY, a citizen of the United States, residing at Laramie, in the county of Albany and State of Wyoming, have invented a new and useful Door-Opener, of which the following is a specification.

The object of my invention is to provide certain improvements for regulating and automatically controlling the operation of a power-operated door opener.

This is an improvement upon the invention patented to me March 26, 1918, Patent No. 1,260,561.

In the accompanying drawings illustrating my invention—

Figure 1 is a side elevation of my invention applied to a door, with the door moved to lowered position (the main portion of the door being broken away) and with the brake applied, and the electric switch open;

Fig. 2 is a side elevation from the reverse side of the apparatus, showing the arm 2 engaged by latch 4, the electric switch slightly open, and the apparatus in position in which pressure of the brake is released; the change of position of arm 2 and switch 6 when arm 2 is engaged by latch 16 being shown in dotted lines;

Fig. 3 is a bottom plan of the apparatus as viewed looking up on section line 3—3 of Fig. 2; and

Fig. 4 is a vertical section on line 4—4 of Fig. 2.

Like characters of reference designate like parts throughout the several views.

Referring to the accompanying drawings, I provide a suitable frame 24, on which is mounted an axle 26, carrying a suitable drum 11, to which one end of a suitable cable 10 is secured.

The other end of cable 10 is suitably secured by fastening device 25 to the top central portion of the door or gate. Mounted also on axle 26, I provide a relatively large gear 9, meshing with pinion 27. Pinion 27 is mounted on axle 28, which also carries gear 8. Gear 8 is a large gear which meshes with pinion 29. Pinion 29 is mounted on axle 30, and attached to axle 30 I also provide a brake drum 21. Axle 30 is connected to and driven by an electric motor 7.

As illustrated in Fig. 1, I provide a brake shoe 1, pivotally attached to crank 31, which in turn is secured to one end of shaft 31^a,

the other end of said shaft being secured to the end of and operated by T-arm 2, the movement of which causes the application or release of the brake.

I provide means for manually operating T-arm 2, consisting of a suitable cable 3 attached to the arm 2 and run over a suitable pulley 32, and thence down to a position where it may be readily operated by anyone who wishes to open or close the door. Pulley 32 may be mounted on either the inside or the outside of the door frame at any convenient height. To maintain T-arm 2 in proximity to frame 24 in position to be engaged by the latches to be described hereafter, I provide suitable spaced guide strips 33, one of which is extended downward as shown in Fig. 2, and to the end of which extension a spring 34 is attached, the other end of the spring being attached to member 2, to normally hold T-arm 2 in the position shown in Fig. 1, the door being in lowered position. T-arm 2 is provided with a slotted end portion 35, shaped to receive and be engaged by either latch 4 or latch 16, when the T-arm is operated.

I provide suitable spaced latches—an upper latch 16 and lower latch 4—which are pivotally attached to and operated by tilting link or lever 15, which has an extension or arm 14. Latches 16 and 4 are provided with springs 18 and 17, respectively, one end of each spring being secured to the adjacent latch and the other end of the spring secured to the latch guide piece 12.

Near the free end of arm 14, as shown in Fig. 1, I provide suitable spaced pins 50 and 51, engaging opposite sides of bent rod 13, which member operates lever 15. Bent rod 13 is disposed in spaced aligned relation to frame 24, and is supported by suitable guide members 20 attached to frame 24. Bent rod 13 is provided with a resetting arm 45 which has its upper end loosely engaged over a novel sliding rod 44. Sliding rod 44 is provided with spaced adjustable collars 46 and 47, which are adjustably secured to rod 44 and which at certain stages in the operation of the device contact with resetting arm 45 to operate that member, and through it the bent rod and latches. Resetting arm 45 is provided at its lower end with a triangular plate 52 which is operatively engaged by a stud 48 carried by the T-arm 2, as shown in Fig. 1.

The rear end of sliding rod 44 has attached to it a fixed bifurcated arm 43, which is in engagement with a grooved nut 43^a, which latter member is mounted on and operated by the threaded end of threaded shaft 42, as shown in Fig. 3. Shaft 42 carries a gear or beveled pinion 41 attached to its end and which meshes with pinion 40 which is mounted on shaft 39, which shaft extends transversely of frame 24, as shown in Fig. 3. Shaft 39 also carries a small gear 38 which meshes with a gear 49 attached to drum 11 and mounted on shaft 26.

Pivotaly attached to the T-arm 2, I provide a suitable switch lever 36 which is pivotally supported on frame 24 and which has its forward end operatively connected by link 37 with an electric switch 6 which is operated through its connection with T-arm 2. Electric switch 6 is suitably connected by insulated wires 22 with the electric motor 7 by which the door or gate is raised.

Gear 9 is provided with a suitable friction clutch 23, of similar construction to that shown in my prior patent or of simplified construction, as shown in Fig. 4, in which a spring 55 bears against member 9 to cause it to engage the clutch which acts as a safety device.

In Fig. 1, the door or gate 19 is shown in closed position, with the electric switch 6 open, and the brake 1 applied. The person desiring to open the door pulls on cable 3, which raises T-arm 2 from its lowermost position until its slotted end 35 is engaged by latch 16. As T-arm 2 is thus raised it operates crank shaft 31^a, crank 31 and brake shoe 1, releasing the brakeshoe from its engagement with brake drum 21, and at the same time closing the electric switch 6, which sets the motor in operation and through the gears that operatively connect the motor with the cable drum 9, causes the cable drum to wind the cable 10 and thus raise the door 19. I use no connection on the door other than cable 10 for hoisting and lowering the door. The adjustment as to stopping the door at any point is regulated by the hoisting drum.

The improved regulating mechanism operates as follows: When the cable drum 11 is revolved and winds cable 10 to raise the door, the shaft 42, shown in Fig. 3, is rotated by means of its operative connection with the drum 11, namely, through bevel pinions 41 and 40, shaft 39, gear 38, gear 49 and cable drum 11 mounted on shaft 26, on which shaft gear 49 is also mounted. As threaded shaft 42 is rotated in a right hand direction, member 43 is moved toward the cable drum, thereby drawing sliding rod 44 toward drum 11. The resetting arm 45 which is operatively attached to sliding rod 44 is engaged by adjustment collar 46 which

is moved toward the drum 11 with sliding rod 44. The movement of resetting arm 45 also moves bent rod 13 of which it is a part or to which it is affixed, and the movement of bent rod 13 tilts lever 15 (through the engagement of guide pins 50 and 51 with opposite sides of bent rod 13, as shown in Fig. 1) from the position shown in Fig. 1 to a reverse position, thus retracting latch 16.

When latch 16 is moved to retracted position by lever 15, the T-arm 2 is released from its engagement with latch 16 and drops to its lowermost position, operating the electric switch and brake as previously described.

The dropping of the T-arm 2 causes the resetting of latch 16, as stud 48 carried by T-arm 2 strikes the adjacent slanting edge of triangular member 52, operating it in a direction away from drum 1 and it in turn operating bent rod 13, which tilts lever 15 to a position to set latch 16 to the position shown in Fig. 1, ready to engage the T-arm when that member is again raised.

Door 19 is closed by gravity when the apparatus is in the position shown in solid lines in Fig. 2, the electric switch 6 being open and the brake 1 released from pressure against brake drum 21. As drum 11 is rotated to unwind cable 10 and lower the door, the shaft 42 is rotated through its connection with gears 41, 40, shaft 39, gears 38 and 49 to drum 11, and the threaded nut 43^a, bifurcated arm 43 and sliding rod 44 are driven in a direction away from drum 11 as shaft 42 turns in a left-hand direction. Collar 47, carried by sliding rod 44 is thus brought into contact with resetting arm 45, moving that member and bent rod 13 to which member 45 is secured in a direction away from drum 11, tilting lever 15 and operating the latches. The releasing of latch 4 from engagement with T-arm 2 results in the application of the brake and the stopping of further movement of the door.

As the action of lever 15 produced by bent rod 13 is slight, the resetting arm 45 and triangular plate 52 and stud 48 carried by arm 2 are introduced to force lever 15 further in the desired direction to insure the proper resetting of latches 4 and 16 to the proper position for the next operation of opening closing or braking the further movement of the door.

By the improvement above described the operative connection of the door opener with the door is reduced to the cable 10, other attachments to the door are eliminated and the possibility of the apparatus being injured through a vehicle striking the door is obviated.

What I claim is:

1. In a power operated door opener, the combination of a motor, a cable drum, a train of gears operatively connecting the

cable drum and motor, braking means, cable attached to the cable drum and to the door to be operated, a pivoted arm for setting the apparatus in and out of operation, means operatively connecting said pivoted arm with the before-mentioned braking means, an electrical motor control electrically connected with the motor and mechanically connected with the pivoted arm to control the operation of the motor and application of the braking means, spaced latched members arranged to be thrown into and out of engagement with the end of the pivoted arm to lock or release the pivoted arm at predetermined times, a slidable bent rod disposed above and parallel with the top of the door and with which the latch members are operatively connected, said bent rod being operatively related to the pivoted arm, and means operatively connecting the bent rod with the cable drum to positively control the operation of the bent rod.

2. In a device of the class described, the combination of a motor, a brake drum operatively connected to the motor, a cable drum, a train of gears operatively connecting the cable drum and the motor, a cable attached to the cable drum and having one end secured to the door to be operated, said cable constituting the only connection between said power operated device and the door, a brake shoe for the brake drum, means for applying the brake shoe to the brake drum, an electric switch connected to said means, means operatively connected with the cable drum for controlling the operation of the electric switch at predetermined times, means disposed above and free from the door for resetting latch control members at predetermined times, and the aforesaid latch control members.

3. In a device of the class described, the combination of a power operated door opener including a cable attached to the

door to be operated, a cable drum to which said cable is attached, power means for controlling the operation of the cable, means for setting the device into and out of operation said means including a latch controlled pivoted arm, and means for positively controlling the operation of the pivoted arm and of the latch controlling members, said means being disposed above and free from the door, the above-mentioned cable constituting the only connection between the door opener and the door.

4. In a device of the class described, the combination of a power operated door opener including a cable attached to the door to be operated, a cable drum to which said cable is attached, power means for controlling the operation of the cable, means for setting the device into and out of operation including a brake, and means for positively regulating the operation of the device including a train of gears and shafts operatively connected with the cable drum, a sliding rod operated by the aforesaid gears and shafts, said rod having no direct connection with the door, adjustable collars carried by the sliding rod, a second slidable member operated by the aforesaid slidable rod, latch members regulating the operation of the motor and brake, said latch members being operatively connected with the second slidable member, and means normally holding the apparatus in a predetermined position.

5. In combination with the apparatus described in claim 4, a triangle plate member carried by the second slidable member and arranged to be engaged by the means for setting the device into and out of operation when that member is operated to cause the positive resetting of the latch members under certain predetermined conditions, substantially as described.

ELMER LOVEJOY.