

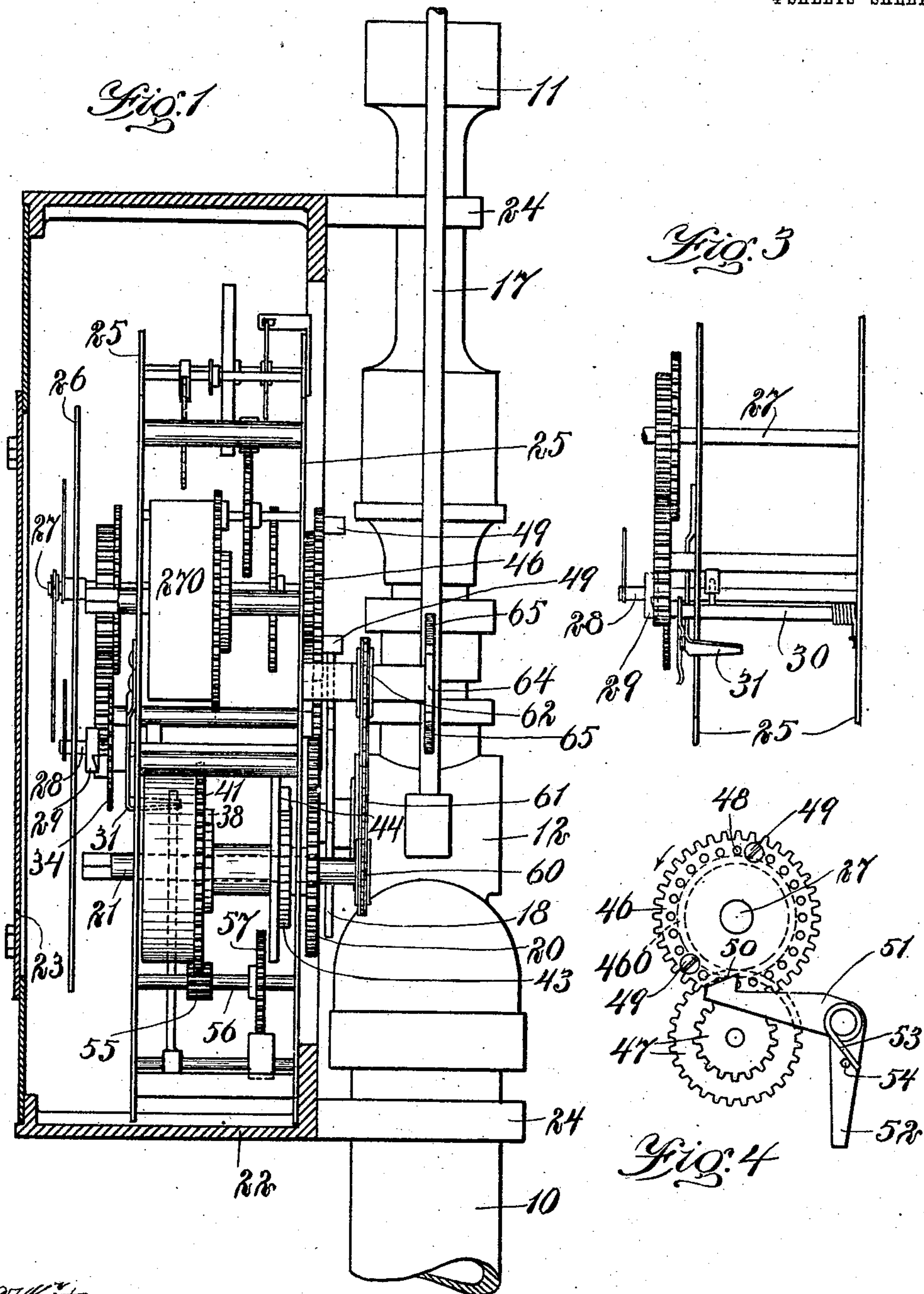
No. 849,889.

PATENTED APR. 9, 1907.

N. CORBEIL.
AUTOMATIC GAS LIGHTER AND EXTINGUISHER.

APPLICATION FILED AUG. 21, 1905.

4 SHEETS—SHEET 1.



Witnesses:
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Ed Batchelder

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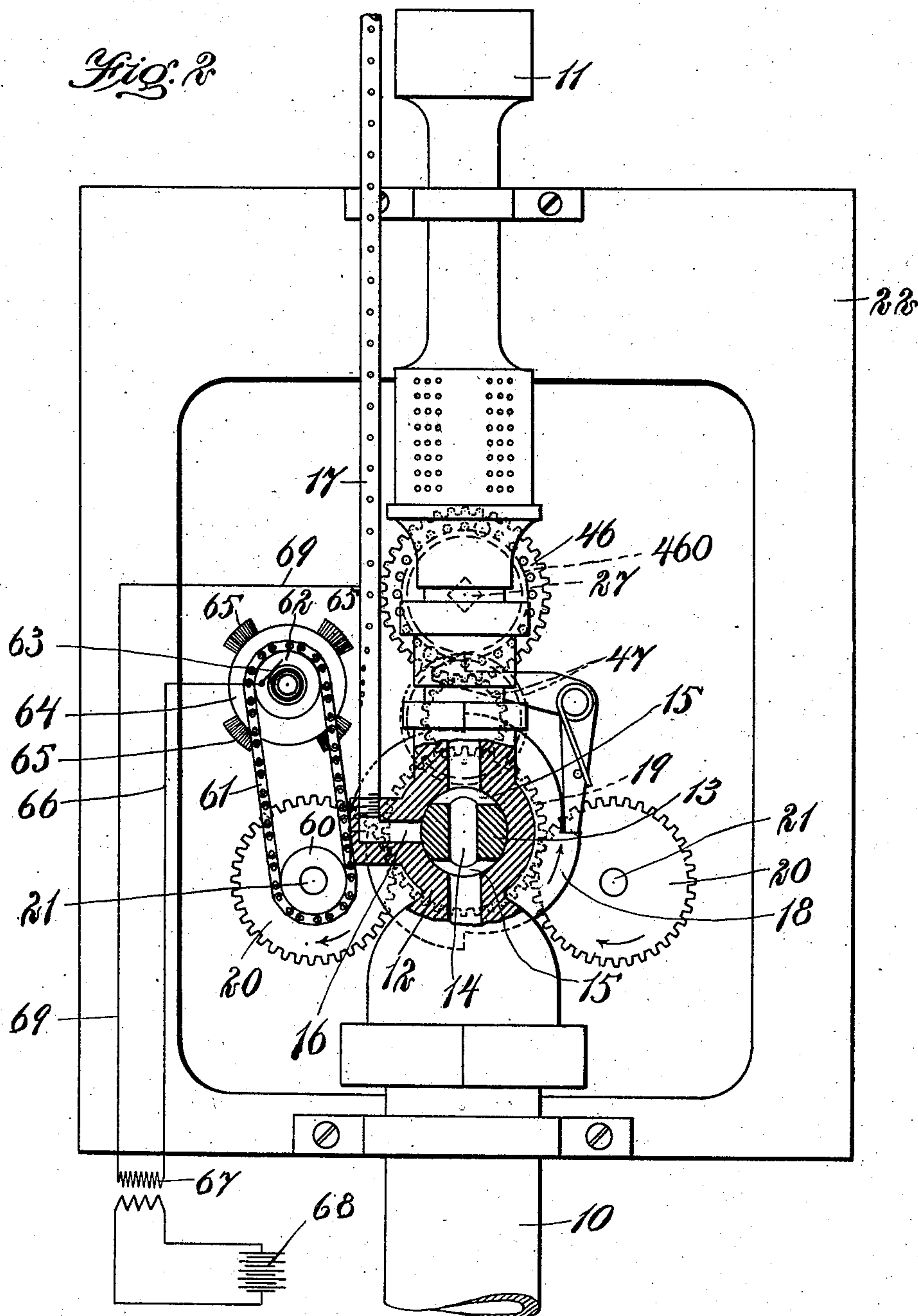
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4 SHEETS—SHEET 2.



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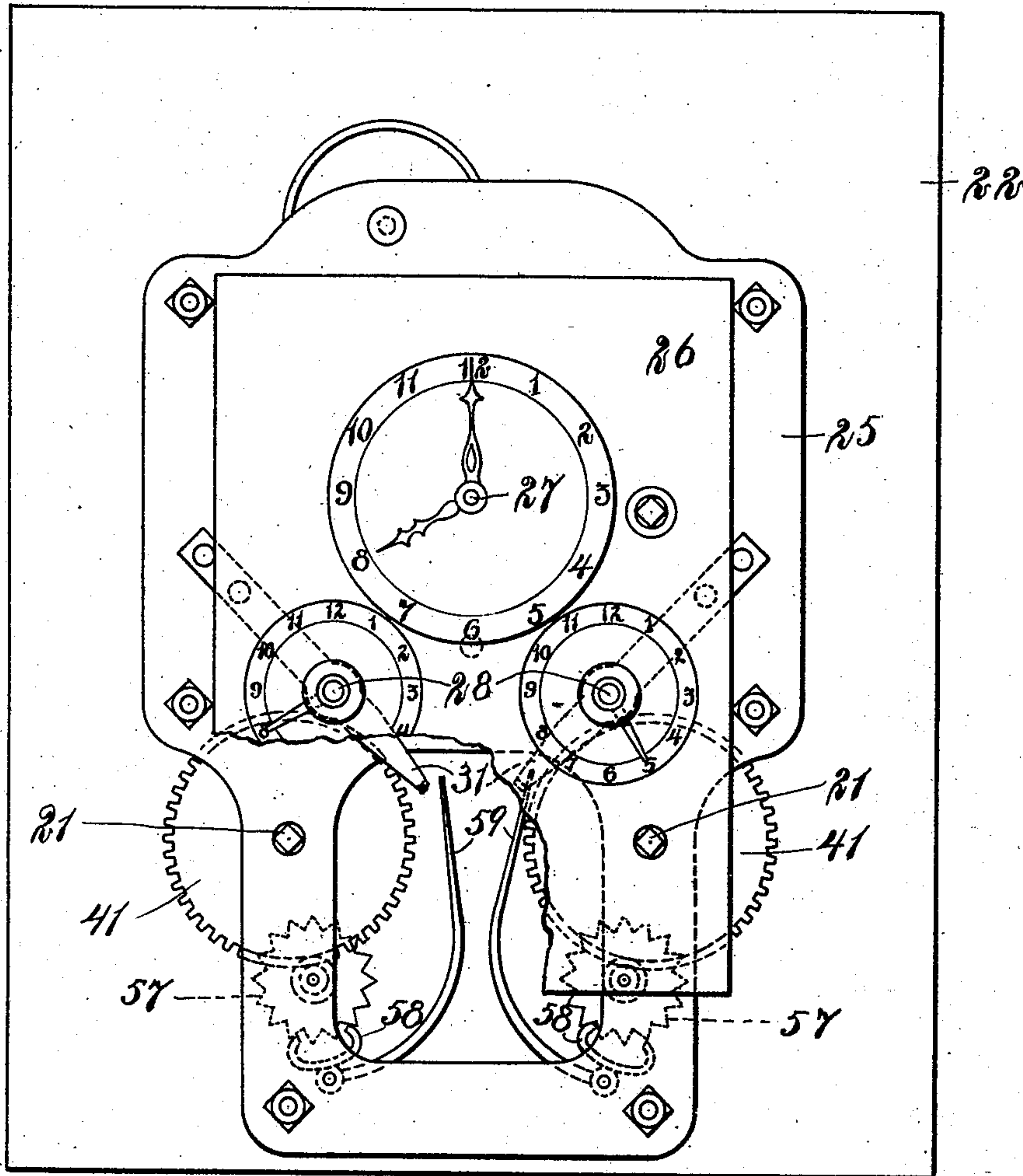
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4 SHEETS—SHEET 3.

Fig. 5



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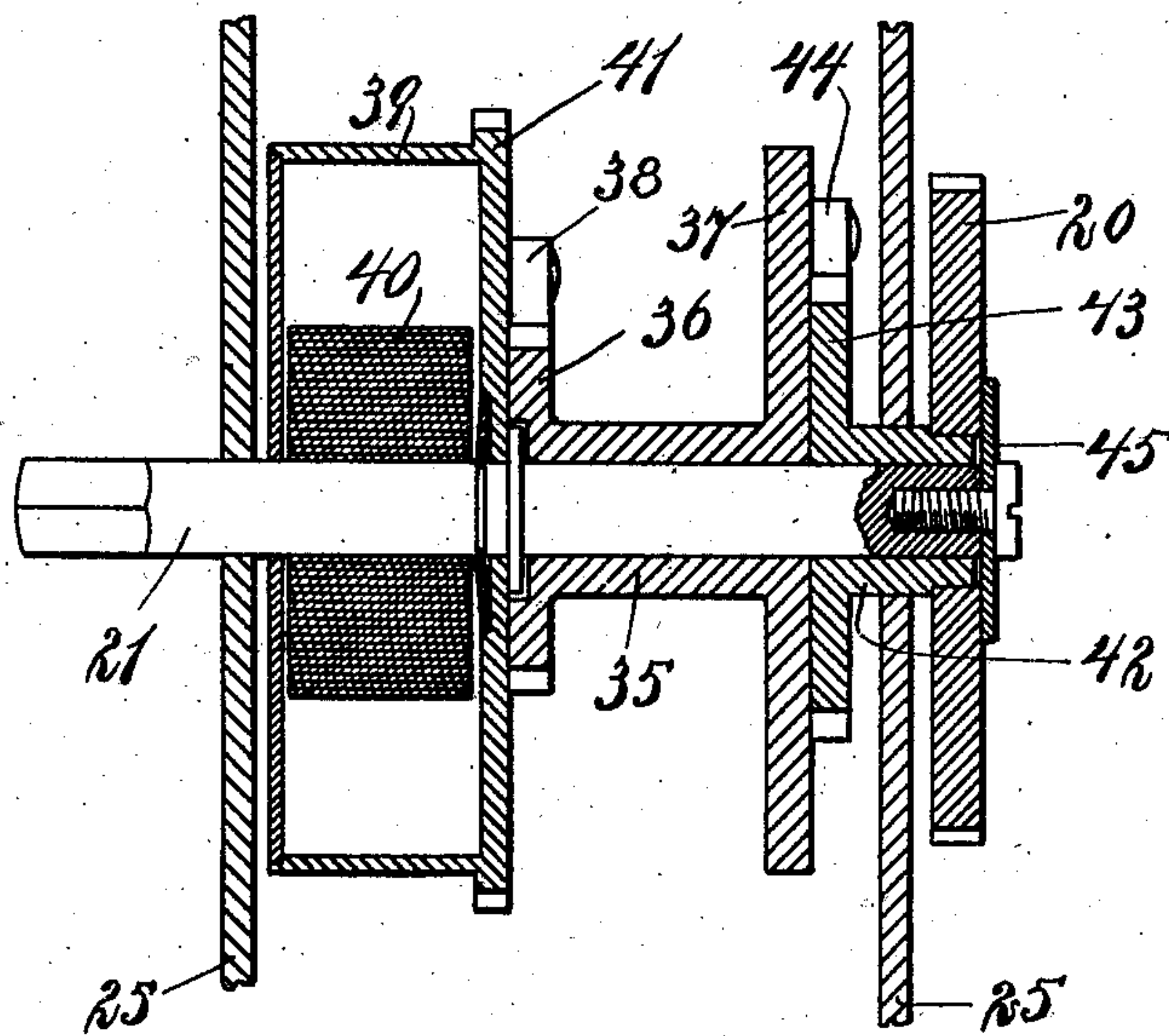
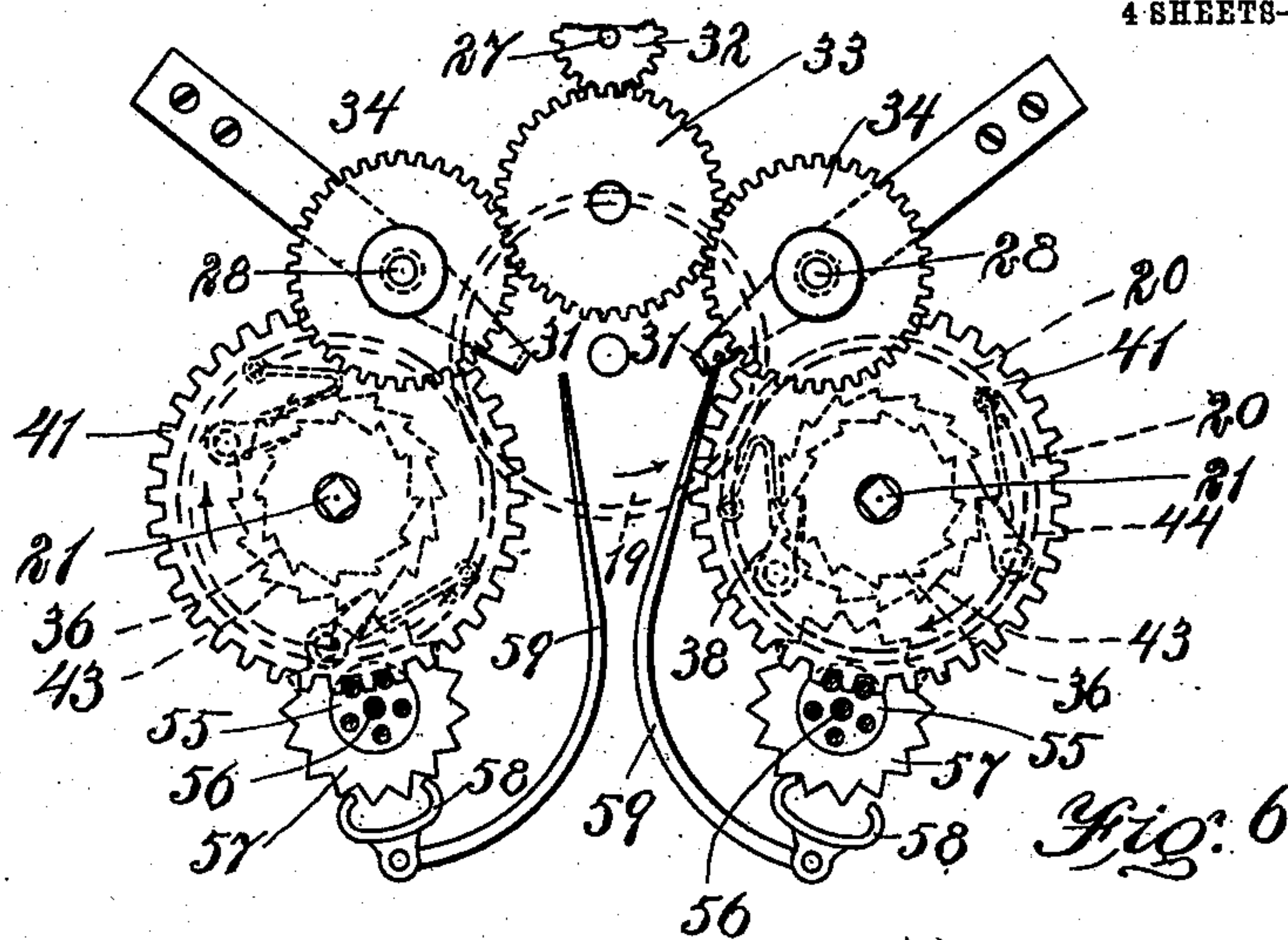


Fig. 7

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UNITED STATES PATENT OFFICE.

NAPOLEON CORBEIL, OF CHARLESTOWN, MASSACHUSETTS.

AUTOMATIC GAS LIGHTER AND EXTINGUISHER.

No. 849,889.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed August 21, 1905. Serial No. 274,978.

To all whom it may concern:

Be it known that I, NAPOLEON CORBEIL, of Charlestown, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Automatic Gas Lighters and Extinguishers, of which the following is a specification.

This invention relates to apparatus for automatically turning on gas to a burner, automatically lighting it, and then automatically extinguishing the light at a predetermined time.

The object of the invention is to provide an apparatus which will be absolutely automatic for any length of time, according to the power of the mainspring employed, (such as eight days,) to dispense entirely with the services of any person to light and extinguish the light, the particular object of the invention being to provide a practicable and reliable apparatus of this character designed for street-lamp purposes.

To these ends the invention consists in the construction and combination of the parts substantially as hereinafter described and claimed.

Of the accompanying drawings, Figure 1 is a side elevation of an apparatus embodying my invention, the casing being in section to show the interior mechanism. Fig. 2 is a rear elevation or looking from the right of Fig. 1. Fig. 3 is a detail side elevation of parts of the trip mechanism. Fig. 4 is a detail front elevation of parts of the valve lock and release devices. Fig. 5 is a front elevation, partly broken out, of the clock-dial and parts of the trip mechanism. Fig. 6 is a detail elevation of the trip mechanism and parts of the gear-trains. Fig. 7 is a detail longitudinal section of one of the twin spring-motors for actuating the gas-valve.

Similar reference characters indicate the same or similar parts throughout the several views.

An ordinary gas-supply pipe is indicated at 10, and connected therewith is any suitable burner, the base of which is indicated at 11. Within a casing 12 is a rotary plug-valve 13, provided with a through-port 14 and the sides of said valve being recessed, as at 15, so as to communicate at times with a side port 16, formed in the valve-casing. Connected with said port 16 is a perforated tube or pilot-burner 17. Obviously when the valve is turning from a closed position to an open position a small amount of gas will

be allowed to escape through one of the recesses 15 and port 16 and the perforated tube 17, the communication with said port and tube being, however, closed when the valve is wide open in the position shown in Fig. 2.

Connected with the valve 13 so as to rotate therewith is a disk 18 and a gear 19, the disk 18 being provided with four shoulders adapted to cooperate with a stop-arm 52, hereinafter described, to hold the valve in either open or closed position, it being understood that the tendency of the valve when free to move at all is to rotate in the direction of the arrow shown in Fig. 2.

Meshing with the gear 19 are two gears 20, each gear 20 being mounted on a shaft 21. As the two mechanisms connected with the two shafts 21 are identical, except for the igniting mechanism actuated by one of them, a description of one mechanism will suffice for both. Before describing said mechanism, however, the structure of some of the other parts of the apparatus will be referred to.

A suitable casing for the apparatus is indicated at 22, said casing having, preferably, a front panel 23, of glass. Said casing is connected with the gas-supply pipe and the burner-base by a suitable strap connection 24. Within the casing is secured the mechanism which is supported by the frame or plates 25, suitably spaced by pillars, as usual in clock-movements. A dial-plate 26 is provided with the characters representing an ordinary eight-day-clock dial and with two alarm-clock dials. The hour-hand arbor of an ordinary eight-day-clock mechanism is represented at 27, the mainspring of said clock mechanism being indicated at 270. The parts of the mechanism illustrated in Fig. 1 above the mainspring are those of an ordinary clock-train and will not need detailed description herein.

Two setting-hand arbors 28 are shown, these being similar to those employed in ordinary alarm-clock mechanisms, each arbor 28 having a tripping-cam 29 of a well-known type or form. The spring-pressed rod 30, which engages the tripping-cam 29, is provided with a tripping-point 31, which is shifted in and out or in the direction in which its tip extends when actuated by or permitted to move by the tripping-cam 29.

A pinion 32 on the hour-hand arbor 27 meshes with an idler-pinion 33, the latter meshing with pinions 34 on the setting-hand arbors 28. The pinions 32, 33, and 34 are so

proportioned that the pinions 33 and 34 are rotated only once in twenty-four hours, and therefore each tripping-cam 29 performs its function but once in twenty-four hours. It is to be understood, of course, that the connection between each tripping-cam and the pinion 34 of its shaft is a frictional one, as is usual in alarm-clock mechanisms, so that there can be an adjustment of the time for the operation of each tripping-cam.

As best indicated in Fig. 7, each shaft 21 is provided with a sleeve 35, fixed thereon, so as to rotate therewith, said sleeve having a ratchet 36 and a disk 37. A pawl 38, engaging the ratchet 36, is carried by the drum 39, containing the spring 40, said drum being toothed to form a gear or pinion 41. Loose on the inner end of the shaft 21 is a sleeve 42, having a ratchet 43, which is engaged by a pawl 44, that is carried by the disk 37. Each gear 20 is secured to its respective shaft 21 by means of a spring-washer 45.

The hour-hand arbor 27 carries a loose pinion 46 and a fast pinion 460. (See dotted lines in Fig. 4.) These two pinions mesh with a compound pinion 47, mounted to rotate freely on a stud, these pinions being of an ordinary type where a multiplication of speed is desired. Said pinions are so proportioned that while the arbor 27 and its fast pinion 460 rotate once in twelve hours the loose pinion 47 is rotated once in twenty-four hours through the medium of the compound pinion 47. The pinion 46 is provided with a series of holes 48, there being twenty-four holes in the series to correspond with the total number of hours in a complete day. Two pins 49 are set in two of the holes 48 to correspond with the hours at which gas is to be turned on and turned off. The said pins 49 in turn act upon the cam-shaped end 50 of the elbow-lever 51, the stop end or arm 52 thereof moving to and from position to engage one of the four shoulders of the disk 18, which is mounted to rotate with the gas-valve. A spring 53, coiled about the axis of the elbow-lever and bearing against a pin 54 and connected with a suitable part of the frame of the mechanism, tends to normally hold the elbow-lever in the position indicated in Figs. 2 and 4; but the cam end 50 of the elbow-lever is so shaped that a pin 49 will slip off from the top of the cam very quickly after having moved the stop end 52 out of engagement with a shoulder of the disk 18. During the short time that the stop end 52 clears said shoulder the valve and the disk 18 will move far enough so that when said pin 49 slips off from the tip of the cam 50 the stop end 52 of the lever will return in position to engage the next shoulder of the disk 18 and prevent the valve from making more than one-quarter of a revolution, so as to either close the valve from an open position or open it from a closed position.

Referring particularly to Fig. 6, 55 indicates a pinion mounted on a shaft 56, which also carries an escapement-wheel 57. Coöperating with said escapement-wheel is an escapement 58, having an arm 59, adapted to engage and be detained by the trip-point 31. It is to be understood at this point that there are two of these mechanisms.

When either one of the tripping-cams 29 of what may be termed an "alarm mechanism" reaches a position to cause the shifting of its trip-point 31 in the direction hereinbefore described, the arm 59 of that pair of the twin mechanisms is released, and the escapement permits of the somewhat-retarded rotation of the pinion 41 under the influence of the spring 40. Through the pawl 38 and ratchet 36, sleeve 35, disk 37, pawl 44, ratchet 43, sleeve 42, gear 20, and gear 19, Fig. 2, the valve 13 is moved one-quarter of a revolution, it being understood that at the same time the stop-arm 52 of the elbow-lever 51 has been shifted so as to move out of the path of the shoulder of the disk 18 that has been engaged thereby. This movement of the valve continues until the next shoulder of the disk 18 engages the stop-arm 52, and the valve remains in the position to which it is moved until the other of the twin mechanisms is operated in a manner similar to that just described to give the gas-valve another quarter-rotation. This engagement of a shoulder of the disk 18 with the stop-arm 52 stops further operation of that motor, and as the clock-movement actuated by the spring 270 continues to operate the cam 29, which has released the trip-point 31, causes the return of the rod 30 in the usual manner of alarm mechanism, so that the vibrations of that particular escapement-arm 59 is stopped, no matter which side of the point 31 is engaged by the arm 59. This motor will not again act until the proper pin 49 actuates the lever 51; but the other motor and the other pin 49 may act in the same manner at the time determined for their operation, the pawl-and-ratchet mechanism 44 43 permitting the continuous successive operations of the two motors one after the other until the power of the springs is exhausted. Said springs will be, of course, rewound in the ordinary manner when occasion requires.

When the valve 13 is in a position to close the vertical passage-way for gas, there is of course no supply of gas leading into the valve-casing, and therefore the fact that the port 14 would be in communication with the port 16 makes no difference; but when the valve is moving from a closed position to the open position (shown in Fig. 2) one of the recesses 15 of the port permits a small quantity of gas to escape through the port 16 and into the perforated tube 17 and is ignited there by means that will now be described. Of course the ignited gas from the tube 17 will ignite

the gas at the burner, to which said tube leads. A pulley 60 is mounted on one of the shafts 21 and is connected by a belt or chain 61 with a pulley 62 on an insulated counter-shaft 63. Said shaft is provided with a disk 64, having four brush-contacts 65, adapted to wipe over the surface of the tube 17. Of course said disk 64 makes one-quarter of a revolution, as will be readily understood from the proportions of the gearing shown in Fig. 2. A wire 66 leads from the counter-shaft 63 to a suitable induction-coil 67, which is excited by a suitable battery or generator 68. Another wire 69 connects the induction-coil 67 with the tube 17. Therefore when the disk 64 makes one-quarter of a revolution it completes the circuit from a brush 65 to the tube 17, so as to produce sufficient sparking to ignite the gas supplied by means of the tube 17.

Each of the twin mechanisms carried by and adjacent to a shaft 21 constitutes a motor, the spring 40 furnishing the power, and these two motors alternately actuate the valve, while the clock mechanism serves to control the operation of said motors at such times as may be predetermined by the setting of the arbors 28 in a manner similar to the method of setting ordinary alarm-clocks.

Having now described my invention, I claim—

1. An automatic gas lighter and extinguisher, comprising in its construction a burner, a gas-supply pipe having a valve, a pair of motors for alternately actuating the valve, a clock mechanism for controlling the operation of said motors, and means whereby said motors may continuously succeed each other in their alternate actuation of the valve.

2. An automatic gas lighter and extinguisher, comprising in its construction a burner, a gas-supply pipe having a valve, a pair of spring-motors for alternately actuating the valve, a clock mechanism including variable tripping devices for controlling the operation of said motors, and means whereby said motors may continuously succeed each other in their alternate actuation of the valve.

3. An automatic gas lighter and extinguisher, comprising in its construction a burner, a gas-supply pipe having a valve, a pair of spring-motors for alternately actuating the valves, a clock mechanism including variable tripping devices for controlling the operation of said motors, a pilot-burner leading from the valve-casing and having means whereby the gas supplied by said pilot-burner will be automatically ignited when the valve is shifted, and means whereby said motors may continuously succeed each other in their alternate actuation of the valve.

4. An automatic gas lighter and extin-

guisher, comprising in its construction a burner, a gas-supply pipe having a rotary valve, means for operating said valve step by step, a pair of motors for alternately actuating the valve, a clock mechanism for controlling the operation of said motors, and means whereby said motors may continuously succeed each other in their alternate actuation of the valve.

5. An automatic gas lighter and extinguisher, comprising in its construction a burner, a gas-supply pipe having a valve, a pair of spring-motors for alternately actuating the valve, means, including trip-cams for controlling the operation of said motors, and a clock mechanism for actuating said cams.

6. In a gas lighting and extinguishing apparatus, the combination with a gas-supply pipe and a rotary valve for controlling the flow of gas, of a disk connected to rotate with said valve and having four shoulders, twin motors for actuating said disk and valve, a clock mechanism, adjustable devices for permitting said clock mechanism to alternately release the motors, and a stop controlled by said clock mechanism to release said shouldered disk.

7. In a gas lighting and extinguishing apparatus, the combination with a clock mechanism including an hour-hand arbor and two setting-hand arbors, of tripping-cams carried by the latter, a pair of twin spring-motors having escapement devices adapted to be released by said tripping-cams, a burner, a gas-supply pipe having a valve, and means whereby said valve may be actuated by either of said motors.

8. In a gas lighting and extinguishing apparatus, the combination with a clock mechanism, of a disk operated by the hour-hand arbor of said mechanism, adjustable stops carried by said disk, a gas-supply pipe having a valve, means for actuating said valve, and a stop to limit the movement of the valve, said stop being adapted to be actuated by either of the stops of said disk.

9. In a gas lighting and extinguishing apparatus, the combination with a gas-supply pipe, a burner and valve, of a clock mechanism, means controlled by said clock mechanism for actuating said valve, a pilot-burner having connections whereby it will be supplied with gas intermittently, and an electrical device for igniting the gas supplied by the pilot-burner, connections being provided for controlling the operation of the electrical igniter by the movements of the gas-supply valve.

In testimony whereof I have affixed my signature in presence of two witnesses.

NAPOLEON CORBEIL.

Witnesses:

THOS. J. KEATING,
HENRY FIELD.