

J. H. HART.
SIGN DISPLAYING MECHANISM.
APPLICATION FILED JAN. 20, 1908.

907,793.

Patented Dec. 29, 1908.

4 SHEETS—SHEET 1.

Fig. 1.

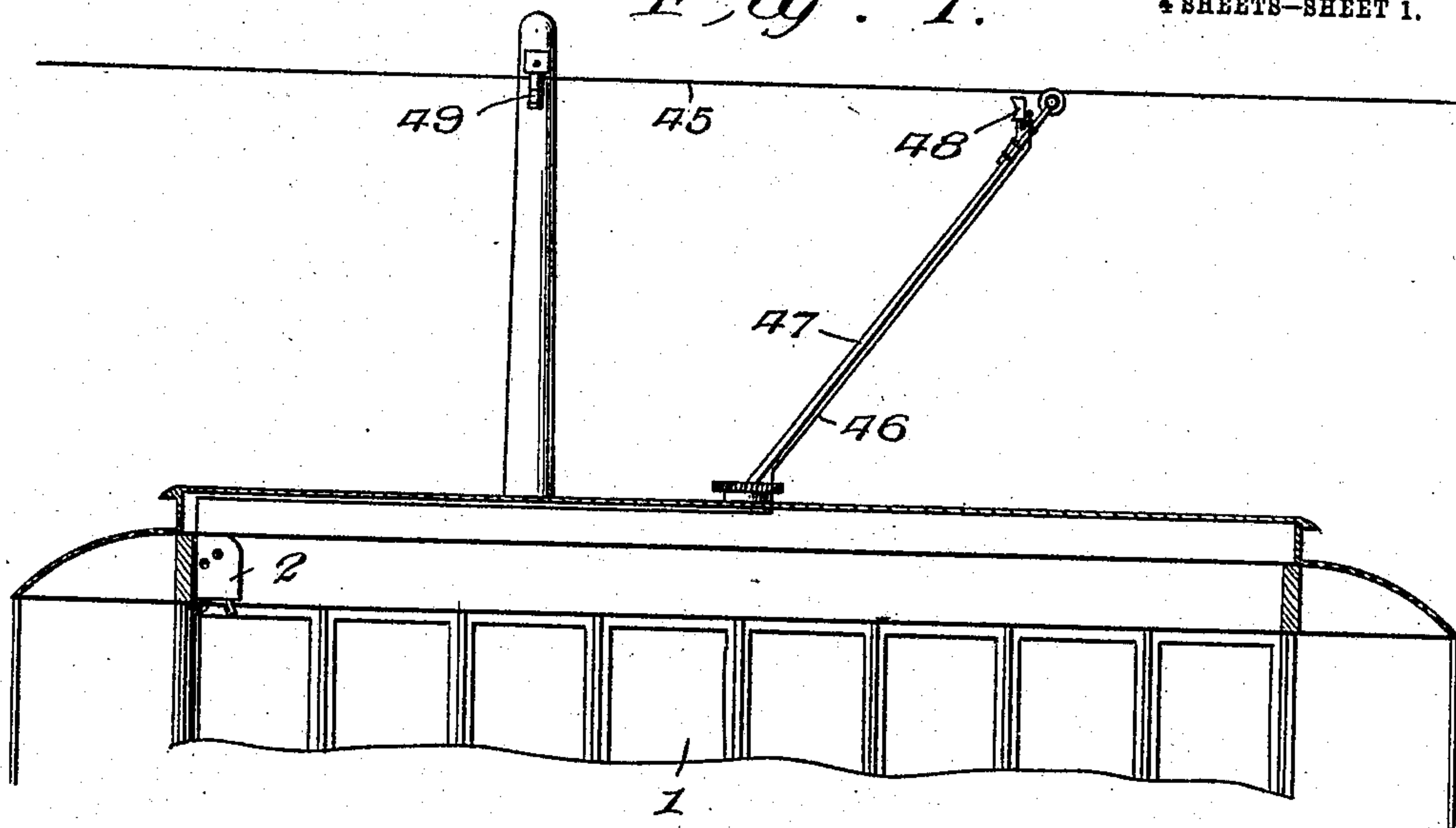
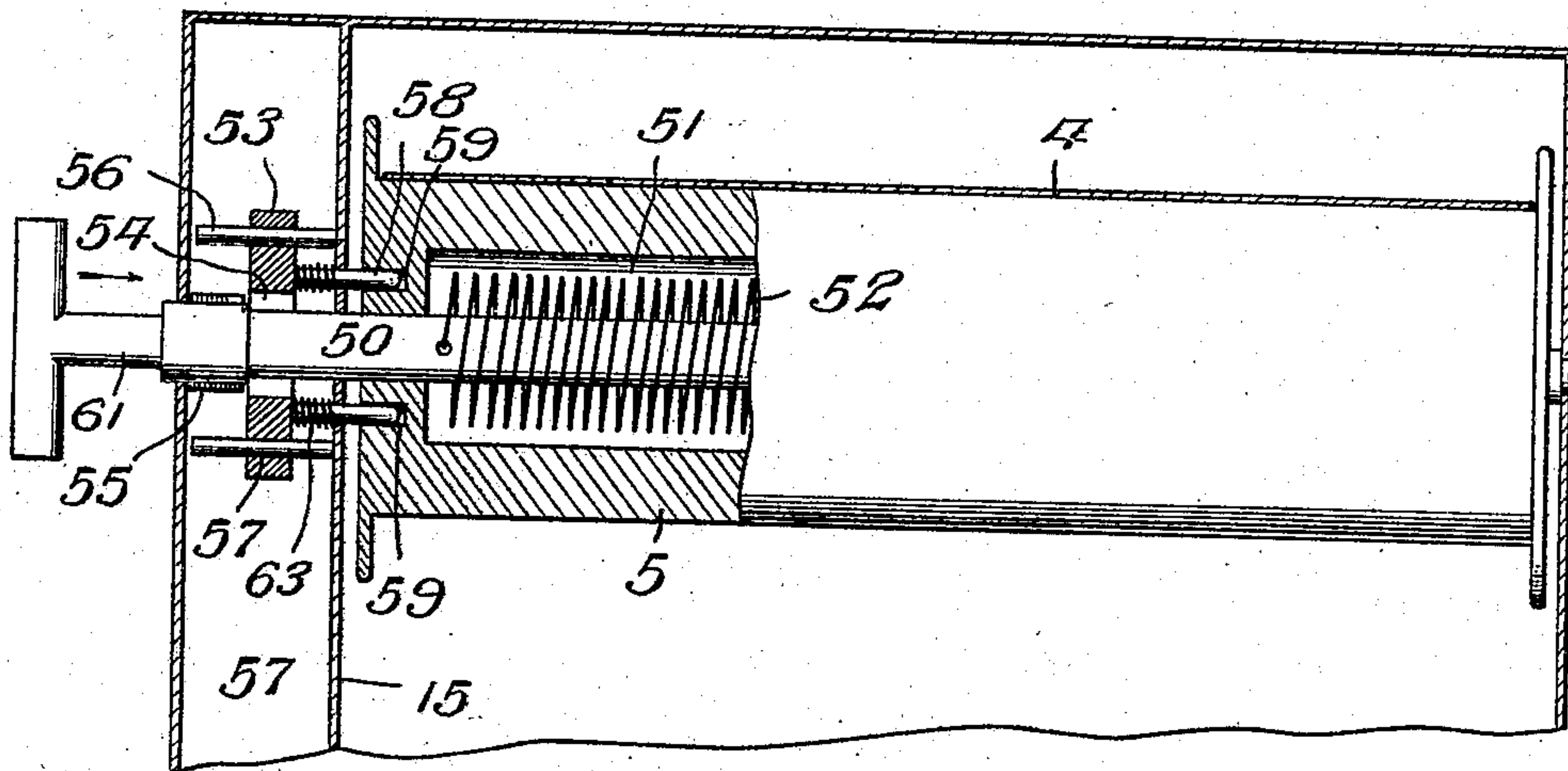


Fig. 4.



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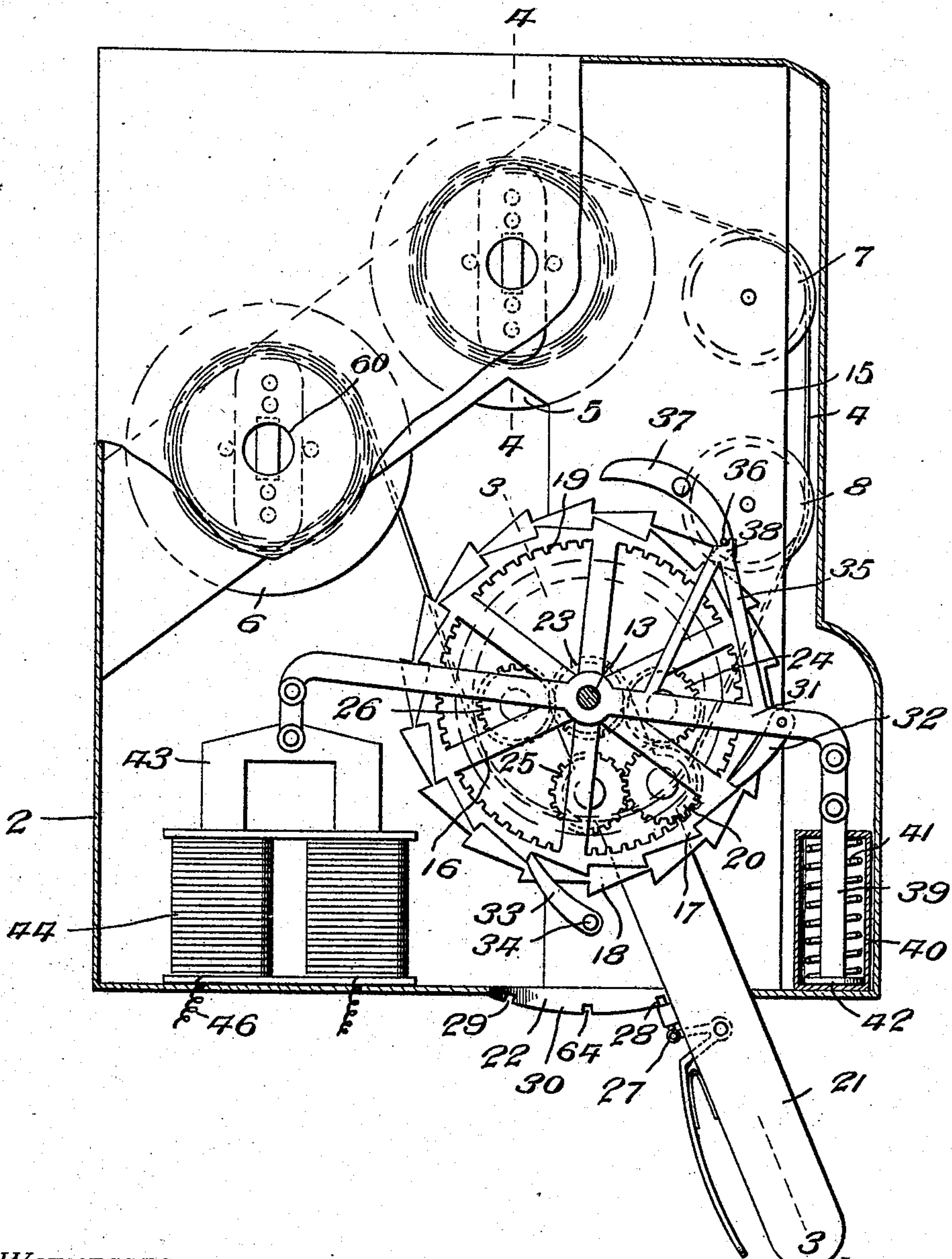
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3.

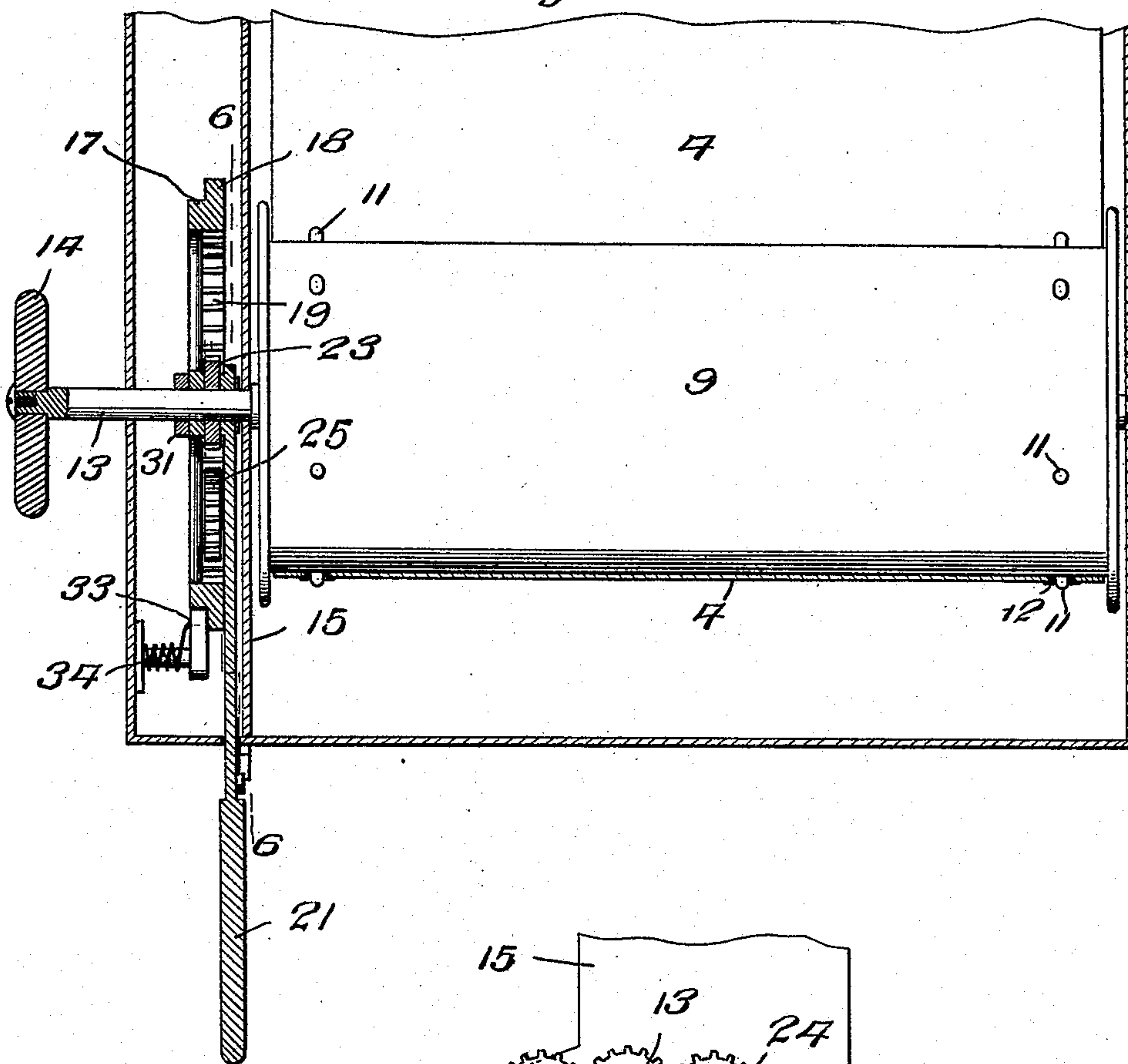
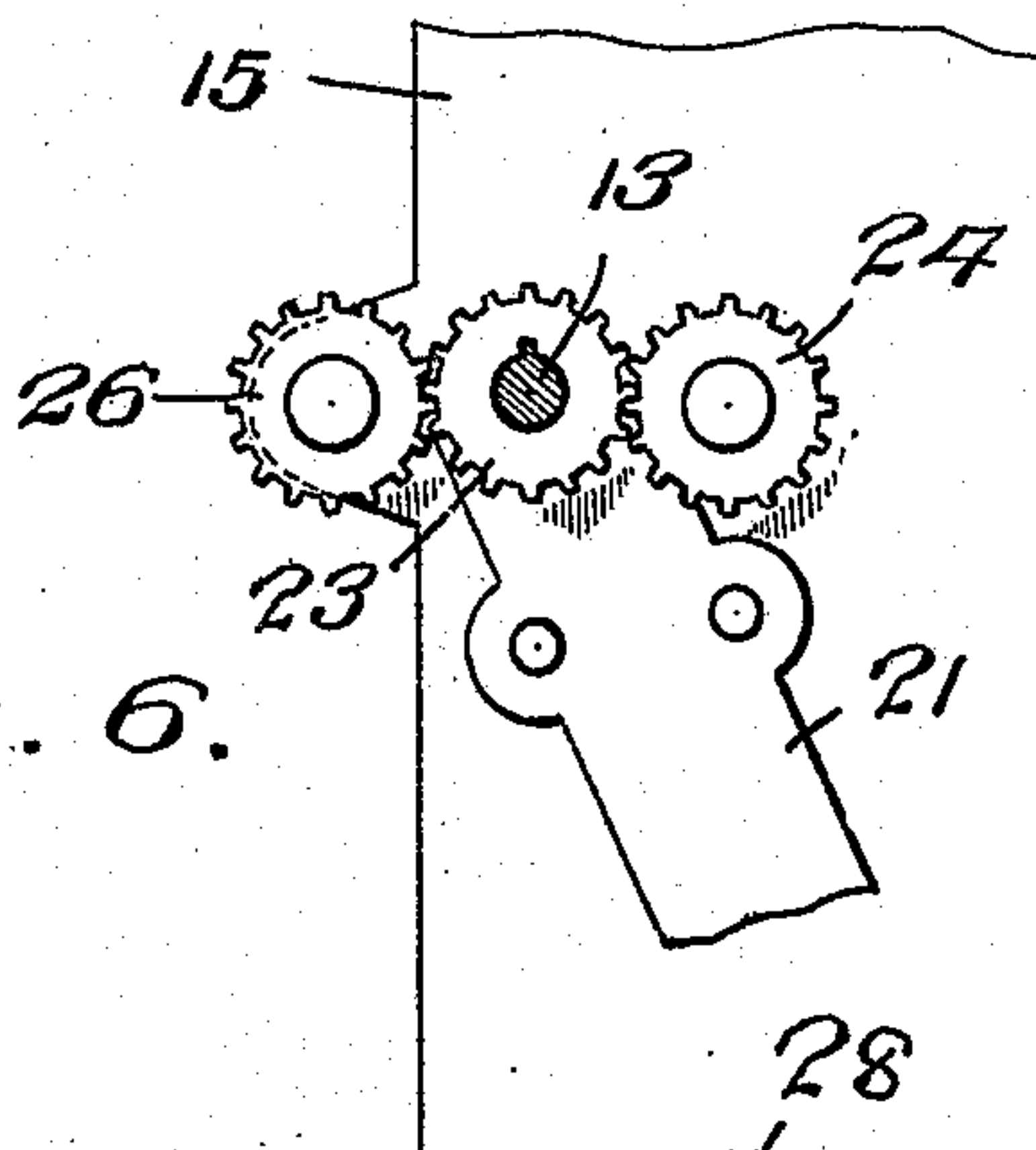


Fig. 6.



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JOHN HARRY HART, OF MEMPHIS, TENNESSEE.

SIGN-DISPLAYING MECHANISM.

No. 907,793.

Specification of Letters Patent.

Patented Dec. 29, 1908.

Application filed January 20, 1908. Serial No. 411,757.

To all whom it may concern:

Be it known that I, JOHN HARRY HART, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Sign-Displaying Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to new and useful improvements in sign-displaying mechanism for any public or other conveyance where electricity is used for power illumination or any other purpose and more particularly to that class adapted to be used in connection with the electrically operated street cars for indicating the approach of a car to a street and my object is to provide a belt having the names of streets thereon and successively bring the names before an opening to display the same.

A further object is to provide means for intermittently moving the belt lengthwise to bring the names before the opening.

A still further object is to provide a reversing and stopping mechanism whereby the belt may be moved in either direction coincident to the travel of the car and a still further object is to provide a means for holding the belt under tension.

Other objects and advantages will be hereinafter referred to and more particularly pointed out in the claims.

In the accompanying drawings which are made a part of this application Figure 1 is a sectional view through a car body showing my improved displaying mechanism located in one end thereof and means for electrically connecting the same with the feed wire for the trolley. Fig. 2 is an end elevation of the displaying mechanism showing a portion of the outer casing broken away and parts of the device in section. Fig. 3 is a sectional view as seen on line 3—3, Fig. 2 parts of the operating mechanism being omitted. Fig. 4 is a sectional view as seen on line 4—4, Fig. 2. Fig. 5 is a front elevation of the displaying device showing portions of the casing broken away. Fig. 6 is a detail, sectional view as seen on line 6—6, Fig. 3, and Fig. 7 is a perspective view of a key employed for winding parts of the device.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 indicates the body of a car, at one end of which is secured my improved form of displaying device, which consists of a casing 2 in the forward face of which is provided an opening 3, through which is adapted to be successively exposed, suitable indicating characters carried by belt 4, said belt being wound at its opposite ends on spools 5 and 6, respectively, while the belt in its passage between the spools is directed over guide rollers 7 and 8 above and below the edges of the opening 3, respectively, while below said guide rollers is a drum 9, around which the belt passes and by which means the belt is moved longitudinally, the peripheral surface of said drum being provided adjacent its ends with studs 11, which enter eyes 12 in the belt and cause said belt to travel longitudinally when the drum is rotated.

The drum is supported on a shaft 13, which finds bearing in the casing 2, one end of the shaft extending beyond the wall of the casing and having thereon a hand-wheel 14, whereby said drum may be manually operated when desired.

Loosely mounted upon the shaft 13 and between one wall of the casing and a frame 15 in the casing is a gear 16, which gear is provided on its peripheral edge with tiers of oppositely disposed ratchet teeth 17 and 18, while between said ratchet teeth and the hub of the gear, are provided cog teeth 19, with which is adapted to engage a cog 20, which cog is rotatably mounted on a lever 21, the upper end of the lever being pivotally mounted on shaft 13, while the lower end thereof is extended through a slot 22 in the lower wall of the casing 2.

Fixed to the shaft 13, is a driving cog, 23, between which and the cog 20, is an idler 24 and by means of which motion is imparted to the driving cog to move the belt in one direction, said idler being pivotally mounted on the frame 15.

When it is desired to drive the belt in the opposite direction, the lever 21 is swung rearwardly or to the opposite end of the slot from the position shown in Fig. 2, which will result in engaging an auxiliary cog 25, carried by the lever 21 and meshing with the cog 23, with an idler 26 on the opposite side of the driving cog 23 from that occupied by the

idler 24 and, as the gear 16 rotates in the same direction at all times, the rotation of the drum will be reversed when the lever is swung to opposite ends of the slot 22.

5 The lever 21 is held in its adjusted position by means of a spring-operated latch 27, engaging with notches 28 and 29 at opposite ends of a curved plate 30, said plate being adjacent one edge of the slot 22 and depending therefrom, the notches 28 and 29 being so located as to bring the cogs 20 and 25 in engagement, respectively, with the idlers 24 and 26 when the latch is in engagement with said notches.

15 The gear 16 is rotated through the medium of a walking beam 31, said beam being pivotally mounted upon the shaft 13 and provided with a depending pawl 32, which is adapted to successively engage the ratchet teeth 17 on the periphery of the gear 16, said gear 16 being held against reverse movement by means of a pawl 33, one end of which is pivotally secured to a stub shaft 34, while the opposite end thereof is in the path of and adapted to successively engage the ratchet teeth 17.

Extending upwardly from the walking beam 31, is a bracket 35, the upper end of which is adapted to engage a pin 36, carried by one end of a latch 37, one end of the latch being provided with a depending extension 38, as shown by dotted lines in Fig. 2, which extension is adapted to engage the ratchet teeth 18 on the peripheral edge of the gear 16, when that end of the walking beam carrying the bracket 35 is in its lowered position, while the opposite end of the latch 37 is adapted to engage the ratchet teeth 18 when the walking beam is swung in the opposite direction, said latch 37 being employed for limiting the rotation of the gear 16.

The latch 37 is caused to follow the arm 35 in its downward movement by making that end of the latch containing the extension 38, heavier than that portion of the latch beyond its pivot point, in which event that end of the latch containing the extension 38 will descend by gravity.

That end of the walking beam having the bracket thereon, has pivotally secured thereto a plunger 39, which plunger extends longitudinally through a housing 40, which housing is secured to the lower wall of the casing 2 in any preferred manner and in said housing is located a spring 41, which surrounds the plunger 39 and between the upper end of the housing and a disk 42 on the lower end of the plunger, whereby, when the opposite end of the walking beam is lowered, the spring 41 will be compressed, the tension of said spring being sufficient to again lower the plunger when the opposite end of the walking beam is released.

Secured to the opposite end of the walking beam 31 from that occupied by the plunger

39 is an armature 43, which armature is suspended above magnets 44 and is adapted to be attracted by said magnets when the magnets are energized, this operation rocking the walking beam on the shaft 13 and elevating the opposite end of the walking beam and moving the pawl 32 into engagement with the next succeeding ratchet tooth 17.

The magnets 44 are electrically energized by tapping the usual form of feed or trolley wire 45, the current so obtained being communicated to the magnets 44 through wires 46, said wires extending along the trolley pole 47 and into engagement with a contact point 48, which contact point is adapted to engage a tapping lever 49 carried by the feed wire 45 and, by properly locating the tapping lever, the characters on the belt 4 will be disposed below the openings 3 at the proper interval to indicate each street crossing.

In order to hold the belt 4 taut at all times, I provide a tensioning device for the spools 5 and 6, said spools being mounted upon shafts 50, which extend longitudinally through the ends of the spools and through circular cavities 51 that portion of the shafts in the cavities being surrounded by tension springs 52, one end of the springs being secured to the shafts, while the opposite ends thereof are secured to the spools in any preferred manner (not shown) and by giving said springs the proper tension and arranging them to exert tension reversely to the rotation of the spools, the belt will be held under tension at all times.

The means for holding the spring 52 under tension, consists of a plate 53, which plate is adapted to surround the shafts 50, the openings in the plates adapted to receive the shafts, being provided with notches 54 to receive wings 55 on the outer end of the said shafts, the plate being held against rotation between the wall of the casing and the frame 15 by means of studs 56 carried by the frame 15 extending through openings 57 in the ends of the plates, the studs being of sufficient length to permit the plate to be moved inwardly a sufficient distance to release the wings 55 and allow the shafts 50 to be rotated.

When the tension of the springs 52 is to be increased or decreased, the spools 5 and 6 must be held rigid and to accomplish this result, stems 58 are secured to the inner face of the plates 53 and are of sufficient length to extend through the frame 15 and engage sockets 59 in the ends of the spools 5 and 6, thereby holding the spools in a fixed position while the shafts 50 are being rotated.

The end wall of the casing 2 is provided with openings 60, through which is to be introduced a key 61, the inner end of the key having a channel 62 therein, which is adapted to receive the winged ends of the shafts

50, that end of the key containing the channel, being of sufficient diameter to engage the face of the plates 53 and move the same inwardly as the key is entered through the openings 60, so that when the stems 58 have moved inwardly a sufficient distance to engage the sockets 59, the wings 55 will be free from the notches in the plates, when the key may be turned to rotate the shafts and increase or decrease the tension of the springs 52.

After the springs 52 have been placed at the proper tension, the key is gradually removed from the end of the shafts and simultaneously with the removal of the key, the plate 53 will be moved outwardly and the wings seated in the notches 54 by disposing springs 63 around the stems 58 between the plates 53 and frames 15, said springs being employed for automatically moving the plates outwardly and disposing the notches over the wings.

In practice the tapping lever 49 is placed at any suitable point between the street crossings, so that the name of the street towards which the car is moving, will be moved in position to be exposed through the opening 3 before the car has reached the crossing.

In automatically moving the belt endwise to bring the name of the next succeeding street in front of the opening 3, the magnets 44 are energized when the contact point 48 engages the tapping lever 49, whereupon the armature will be attracted by the magnets and walking beam 31 is rocked upon the shaft 13, thus lowering the ends of the beam to which the armature is secured and elevating the opposite end thereof until the pawl 32 has moved into engagement with the next succeeding ratchet tooth 17 and simultaneously with the rocking of the beam, the extension 38 on the latch 37, will be elevated and the opposite end of the latch moved into the path of the teeth 18, the pawl 33 and latch 37 holding the gear 16 against reverse rotation.

As soon as the contact point 48 is released from the tapping device 49, the magnets 44 become deenergized and the armature released, whereupon the springs 41 will rock the walking beam in the opposite direction and rotate the gear 16 the distance of the stroke of the walking beam, the rotation of the gear 16 imparting motion to the cog 20, idler 24 and driving cog 23, thereby rotating the drum 9 and moving the belt 1 longitudinally and, as shown in Fig. 2 of the drawings, the belt is being unwound from the spool 5 and wound onto the spool 6.

When the car has reached the end of the line the lever 21 is swung rearwardly and the latch 27 engaged with the notch 29, thereby removing the cog 20 from engagement with the idler 24 and moving the auxiliary cog 25 into engagement with the idler 26, so that

when the gear 16 is again rotated the belt 4 will be unwound from the spool 6 and rewound onto the spool 5.

If, for any reason, it is desired to manually rotate the drum 9 to shift the belt on the spools, I provide a notch 64 at the longitudinal center of the curved plate 30 and, when latch 27 is engaged with the notch 64, the cog 20 and auxiliary cog 25 will be out of engagement with the idlers 24 and 26 when the drum 9 may be readily rotated by grasping the hand wheel 14 on the extended end of the shaft 13 and the drum rotated until the belt is shifted to the required position.

The springs 52 are so arranged that when the belt is moving in one direction, the tension of the spring in the spools from which the belt is being unwound, will be gradually increased while the tension of the spring in the spool upon which the belt is being wound, will be decreased, the key 61 being employed only for setting the tension of the springs, whereby said springs will always exert some tension on the belt and as the tension of the springs becomes weakened by use, additional tension is imparted thereto by rotating the shafts to which the springs are secured with the key 61.

It will be seen that I have provided a very cheap and economical form of sign-displaying mechanism and one that will be positive in its operation and it will further be seen that by providing the lever 21 and mounting thereon the cogs 20 and 25, the mechanism may be readily reversed to shift the belt in the opposite direction when desired, or that said cogs may be entirely disconnected and the belt shifted manually.

What I claim is:

1. In a displaying mechanism of the class described, the combination with a pair of rotatably mounted spools a belt adapted to be wound onto said spools and eyes in said belt, of a drum, studs on said drum adapted to engage said eyes and move the belt longitudinally when the drum is rotated, a supporting shaft for the drum, a gear rotatably mounted on said shaft, a plurality of cogs interposed between the gear and shaft to rotate the drum when the gear is rotated, a walking beam on said shaft, means on the walking beam to engage and rotate the gear and means to intermittently rock said walking beam and rotate the drum.

2. The herein described displaying mechanism comprising the combination with a belt and spools for said belt of a drum, around which said belt extends, means on the drum to engage and move the belt when the drum is rotated, a shaft for said drum, a gear rotatably mounted on the shaft, a driving cog on said shaft, a plurality of cogs between said gear and driving cog adapted to rotate the drum when the gear is rotated, means to shift a portion of the interposed

cogs, whereby the rotation of the drum will be reversed and additional means to automatically rotate the gear.

3. In a displaying mechanism of the class described, the combination with a drum, a shaft for said drum and a belt extending around said drum; of a gear rotatably mounted on said shaft, means to intermittently rotate said gear, a driving cog fixed to said shaft, a pair of idlers meshing with said driving cog, a cog adapted to mesh with said gear and one of said idlers to rotate the drum in one direction, an auxiliary cog meshing with the last mentioned cog and adapted to mesh with the opposite idler and means to shift the auxiliary cog and the gear-engaging cog, whereby the rotation of the drum will be reversed.

4. In a displaying mechanism of the class described, the combination with a belt, a drum around which said belt extends and means to intermittently rotate said drum and move the belt longitudinally; of spools adapted to receive said belt, said spools having cavities, shafts for said spools, tension springs in said cavities and surrounding said shafts, means whereby the tension of said springs may be increased or decreased, means to hold said shafts against casual rotation and additional means to hold the spools in a fixed position when desired.

5. In a displaying device of the class described, the combination with a belt and means to move the same longitudinally; of spools adapted to receive the ends of the belt and wind the same thereon, said spools having cavities, shafts extending through said cavities, tension springs in said cavities secured at one end to the shafts and at the opposite ends to the spools, a plate surrounding one end of each of said shafts, each of said plates having notches therein, means at the end of the shaft to engage said notches and hold the shaft against casual rotation, means on said plate, adapted to engage the ends of the spools and hold the spools in a fixed position and additional means adapted to move the plate laterally and engage the end of the shaft, whereby motion may be imparted to said shaft and the tension of the spring increased or decreased.

6. In a displaying device of the class described, the combination with a belt and means to move the same longitudinally; of spools for said belt, shafts extending through said spools, tension springs between said shafts and spools adapted to hold said belt taut, plates at one end of said shafts, said plates having notches, wings on said shafts adapted to enter said notches, means to hold the plates against rotation, stems on said plates adapted to be moved into engagement

with the spools and hold said spools in a fixed position while the shafts are rotated, means to move said plates laterally and the stems into engagement with the spools and additional means to return said plates to their initial positions and move the notches therein into engagement with the wings.

7. In a displaying mechanism of the class described, the combination with a drum, a belt adapted to pass around said drum and be operated thereby and a supporting shaft for said drum; of a gear rotatably mounted on said shaft, a plurality of cogs interposed between said gear and shaft to rotate said shaft when the gear is operated, a walking beam pivotally mounted on said shaft, means on said walking beam to operate said gear, magnets at one end of said walking beam, means to energize said magnets, whereby the end of the beam above the magnets will be attracted and the beam rocked and means at the opposite end of the beam to rock the beam in the opposite direction when the magnets are deenergized.

8. In a displaying mechanism of the class described, the combination with a drum, a supporting shaft for said drum, a gear rotatably mounted on said shaft and means to intermittently rotate said gear; of a lever pivotally secured at one end to said shaft, a pair of intermeshing cogs carried by said lever, one of said cogs being adapted to mesh with the gear, a driving cog on the shaft and idlers meshing with said driving cog and adapted to be engaged by one or the other of the intermeshing cogs on said lever, whereby the drum will be rotated in opposite directions.

9. In a displaying device of the class described, the combination with a drum and a supporting shaft therefor; of a gear rotatably mounted on said shaft, means to rotate said gear, a driving cog fixed to said shaft, idlers meshing with said driving cog and at opposite sides thereof, a lever pivoted to said shaft, a cog carried by said lever adapted to mesh with the gear and one of the idlers, an auxiliary cog meshing with the last mentioned cog and adapted to be engaged with the opposite idler and means to hold the lever in various positions, whereby one or the other of the cogs carried by the lever will be held in engagement with their respective idler or both entirely out of engagement with the idlers.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN HARRY HART.

Witnesses:

J. L. WOODS.

PATTI CHAMBERLIN.