No. 864,038. PATENTED AUG. 20, 1907.

# C. SIMON.

## BELL RINGING MOTOR.

APPLICATION FILED MAY 29, 1906.

3 SHEETS—SHEET 1.

Fig. 1.

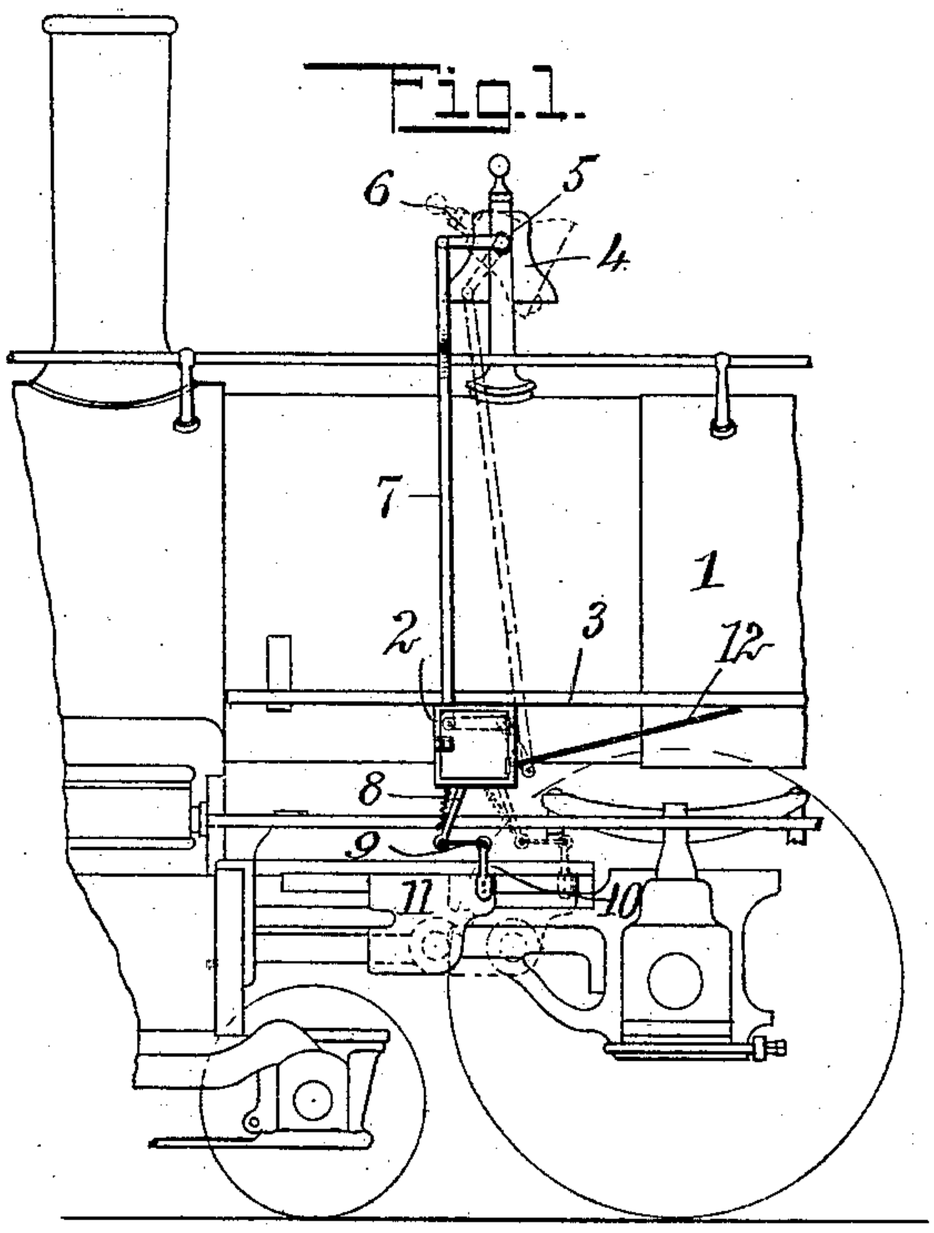



Fig. 2.

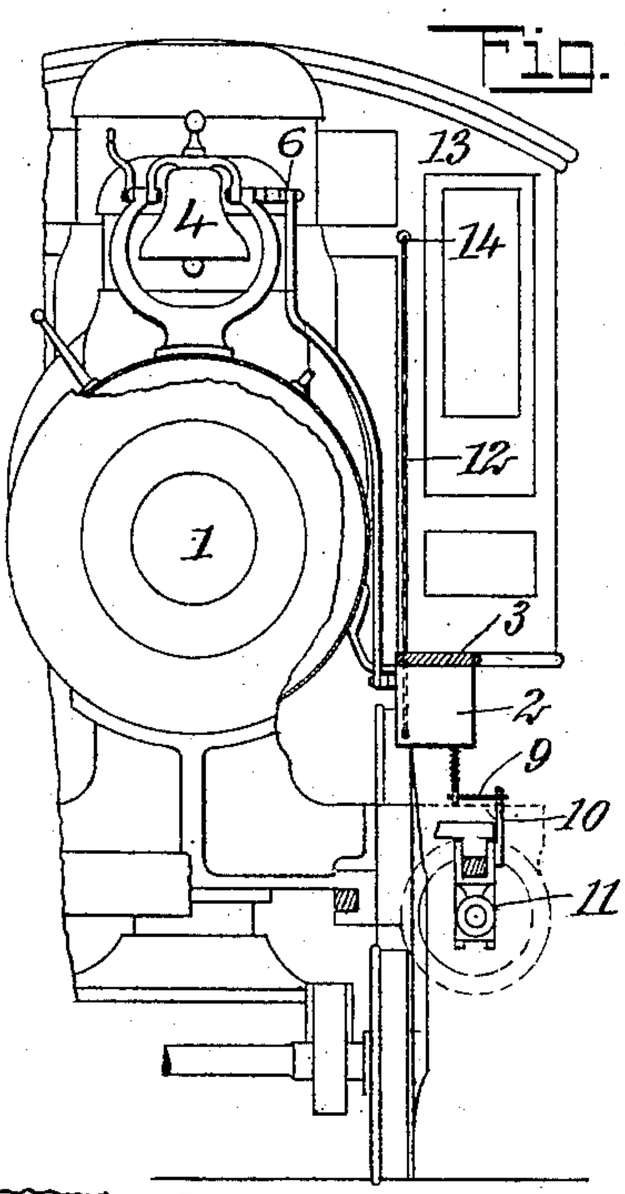
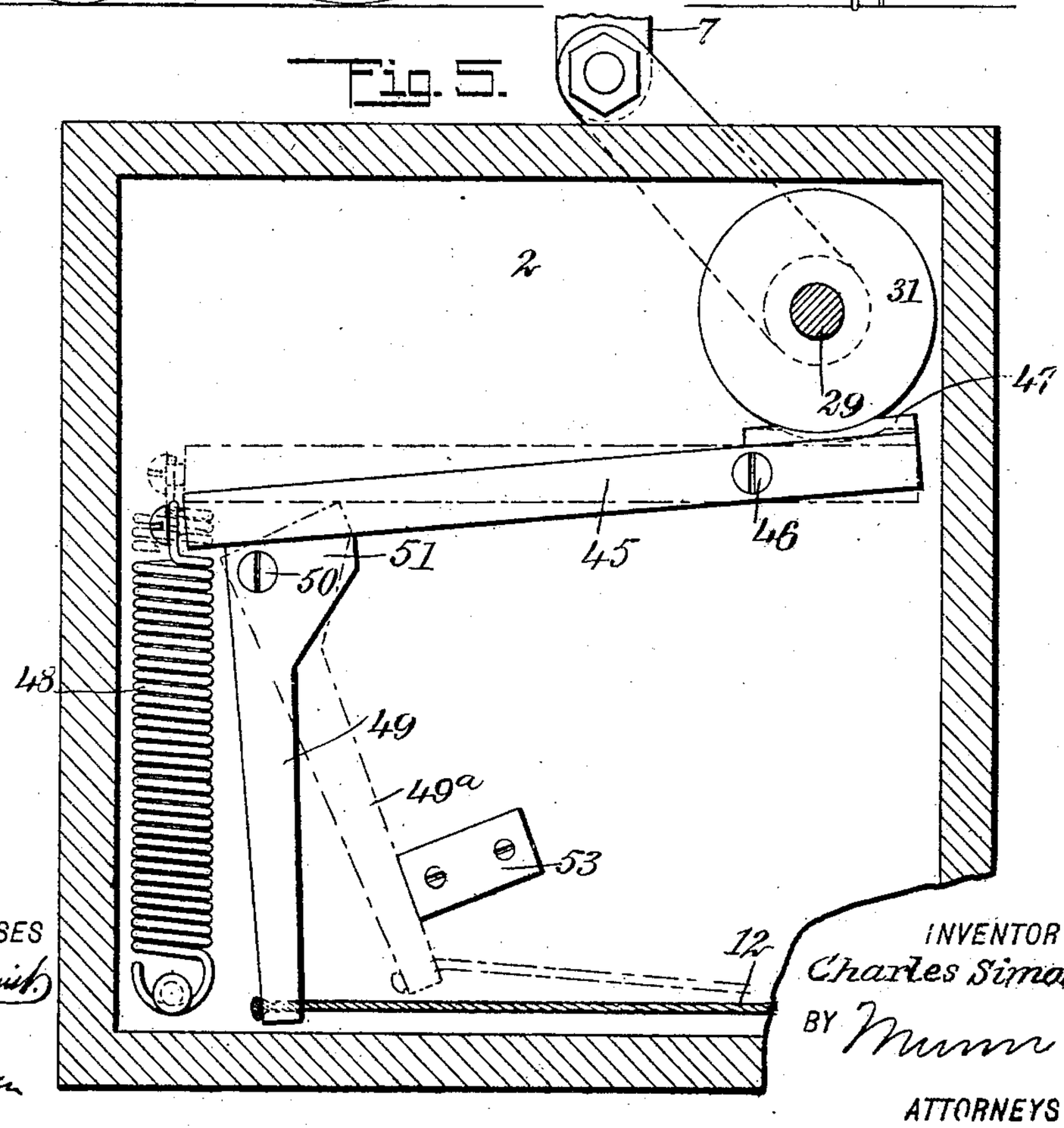



Fig. 5.

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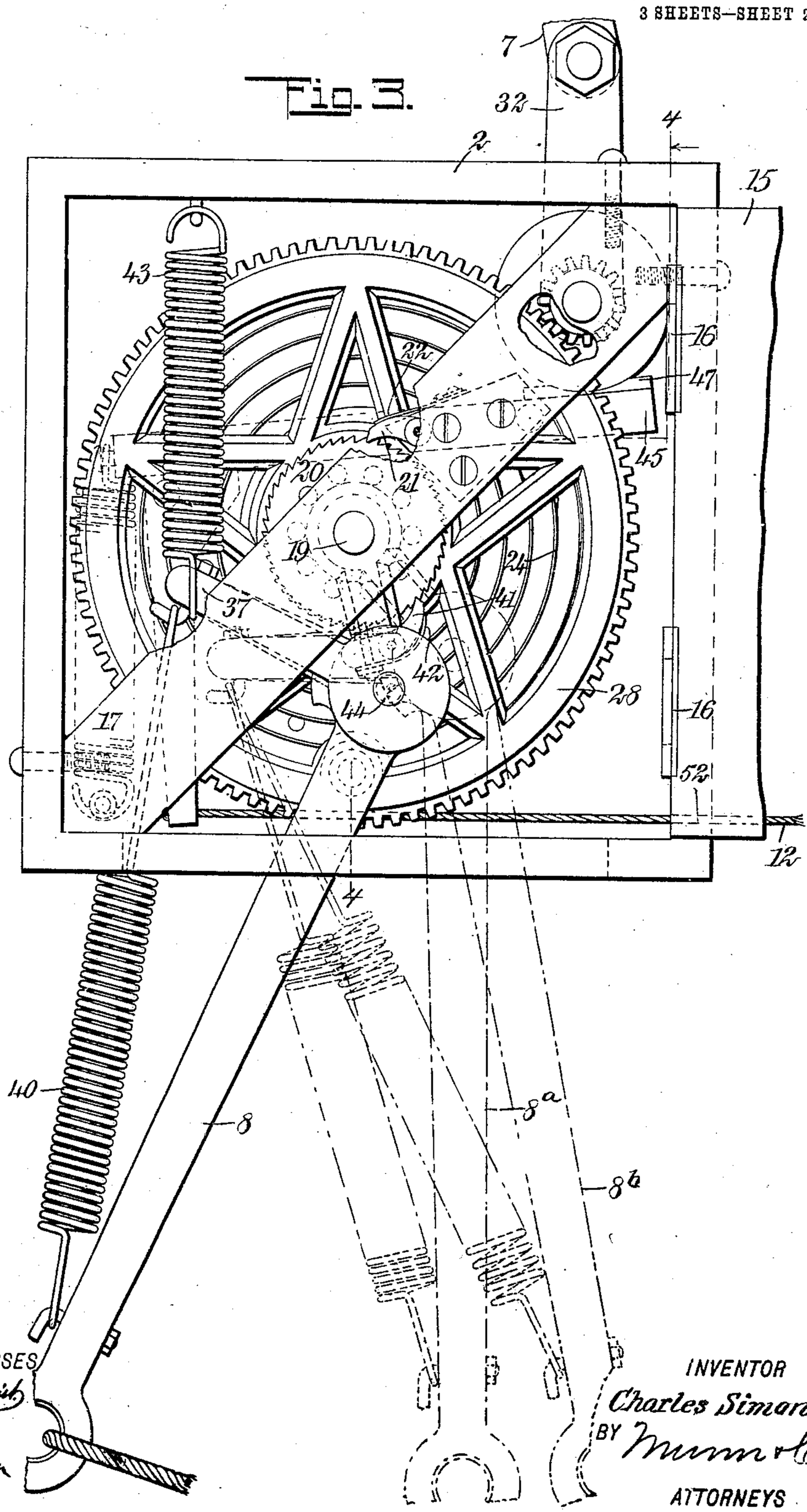
3 SHEETS—SHEET 2.

Fig. 3.

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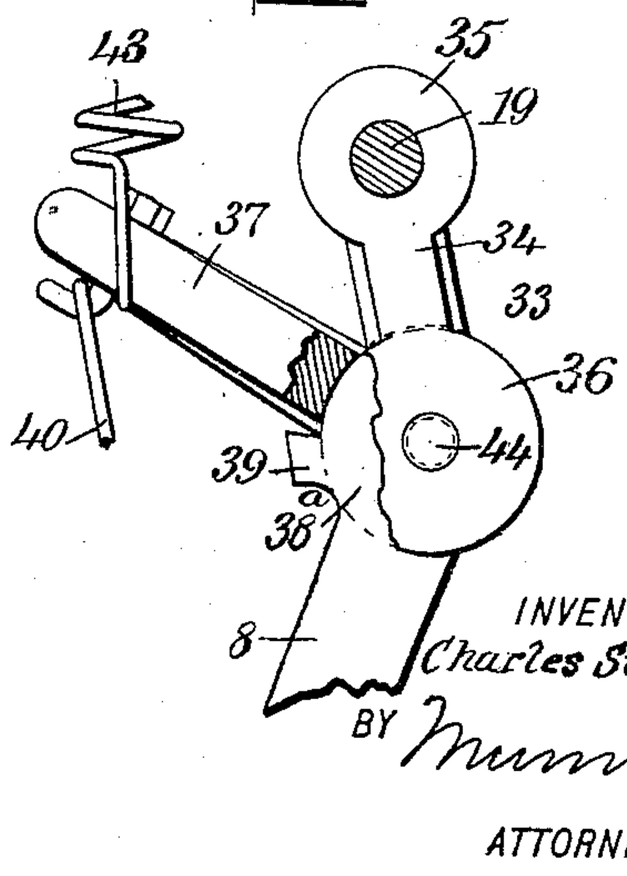
3 SHEETS—SHEET 3.

Fig. 4.




Fig. 6.

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# UNITED STATES PATENT OFFICE.

CHARLES SIMON, OF AVILLA, INDIANA.

## BELL-RINGING MOTOR.

No. 864,038. Specification of Letters Patent. Patented Aug. 20, 1907.

Application filed May 29, 1906. Serial No. 319,275.

*To all whom it may concern:*

Be it known that I, CHARLES SIMON, a citizen of the United States, and a resident of Avilla, in the county of Noble and State of Indiana, have invented a new and Improved Bell-Ringing Motor, of which the following is a full, clear, and exact description.

This invention relates to a device for automatically ringing a bell.

The invention is expected to be useful in many connections, but has its greatest utility when used as an attachment for ringing a locomotive bell.

The object of the invention is to produce a device of this class which is simple in construction and which will be operated from a moving part of the machinery of the locomotive.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the forward portion of a locomotive, illustrating the manner of attaching the device; Fig. 2 is a front elevation of the locomotive, certain parts being shown in cross section and further illustrating the manner of attaching the device; Fig. 3 is an elevation of the device, representing the cover of the case in an open position, certain parts being broken away to disclose the details of the construction more completely; Fig. 4 is a vertical cross section on the line 4—4 of Fig. 3, through the case of the device and a portion of the mechanism thereof; Fig. 5 is a vertical section through the case of the device and taken in a plane at right angles to that in which Fig. 4 is taken; this view is intended to illustrate especially a brake device for the motor, and Fig. 6 is a side elevation showing a portion of the mechanism for winding the motor spring from a moving part of the locomotive machinery.

Referring more particularly to the parts, and especially to Figs. 1 and 2, 1 represents a locomotive provided with my bell-ringing device. This device comprises a case 2 which contains mechanism to be described hereinafter, and this case is preferably attached at one side of the engine beneath the foot-board 3 thereof as shown. The bell 4, which is mounted upon the horizontal axis of rotation at the point 5, is provided with a rigid arm 6, which arm connects with a link 7 which extends downwardly to the mechanism within the case 2, so that motion may be transmitted to the bell. From the interior of the case 2 a main or winding lever 8 projects, and this lever is connected by a cord 9 with a post 10 carried by the crosshead 11 of the locomotive. By an arrangement to be described hereinafter, when the crosshead 11 reciprocates the lever 8 is reciprocated, and in this way the movement of the machinery is utilized to wind a spring which will ring the bell. The operation of the mechanism within the case 2 is completely controlled by the cord 12 which extends from the case into the interior of the cab 13 of the locomotive, passing through guide openings 14 in the forward wall thereof, as indicated in Fig. 2.

The construction of the mechanism within the case will now be described, reference being had especially to Figs. 3 to 6 inclusive: The case 2 preferably consists substantially of a rectangular or square box as shown, having a cover 15 adapted to open outwardly upon hinges 16 as shown. In the forward portion of the box, a diagonally disposed frame bar 17 is provided, and in this frame bar and in the rear wall 18 of the case a main shaft 19 is rotatably mounted. This shaft 19 carries loosely a ratchet wheel 20, the teeth whereof are engaged by a detent pawl 21, which is maintained against the teeth by a spring 22 as shown. The said pawl is pivotally mounted on the inner face of the said diagonal bar 17. Loosely mounted on the main shaft 19 I provide a spring barrel 23 within which there is arranged a coiled or spiral spring 24, the inner end of this spring being rigidly attached to the shaft as shown in Fig. 4. The outer end of this spring is attached to the spring barrel on a suitable bolt 25, as indicated in Fig. 4. The aforesaid ratchet wheel 20 is rigidly secured to this spring barrel by suitable fastening devices, such as the screw 26. On the side opposite the ratchet wheel 20 the spring barrel 23 is formed with a hub 27; on the shaft 19 is rigidly mounted a main gear wheel 28. In the upper portion of the case there is mounted, rotatably, an auxiliary shaft 29 which carries a rigid pinion 30, and this pinion meshes with the gear wheel 28 as shown. Adjacent to the pinion 30 the shaft 29 is provided with a rigid brake wheel 31. The shaft 29 extends through the rear wall 18 of the case and is provided with a crank 32.

From the construction described it should be understood that if the spring 24 is wound up by turning the spring barrel 23, it will exert a rotative force on the shaft 29, which will be imparted through the gear wheel 28 to the pinion 30; in this way the crank 32 will be rotated. This crank is pivotally attached to the aforesaid link 7, so that when the crank 32 rotates as suggested, the arm 6 of the bell 4 will be rocked to and fro in such a manner as to ring the bell.

The cord 9 and the main lever 8 afford means for winding the spring 24 from the cross-head, by means of mechanism which will now be described: Referring especially to Figs. 3, 4 and 6, I provide, loosely mounted on the shaft 19, a pawl carrier 33; this pawl carrier comprises an arm 34 having an eye 35 received on the shaft 19, and the outer extremity of this arm is formed into a substantially circular hub 36, from which a second arm 37 projects upwardly in an inclined position as shown. As indicated in Fig. 4, the hub 36 is bifurcated, pre-

senting two ears 38 between which the inner extremity of the aforesaid main lever 8 is pivoted. In order to form this connection, the inner extremity of the main lever 8 is preferably formed with a substantially circular head 38ª which conforms in outline to the shape and dimensions of the hub 36. This head 38ª is provided with a laterally projecting tooth or shoulder 39 which is normally in engagement with the side face of the arm 37 of the pawl carrier, being retained in this normal relation by means of a helical spring 40 arranged as shown in Fig. 3. The lower extremity of this spring is attached to the lever 8 near the outer extremity thereof, while the upper extremity of the spring is attached to the under side of the arm 37. On the inner side of the pawl carrier 33 a pawl 41 is arranged, which pawl engages with the teeth of the ratchet wheel 20, being manitained thereagainst by a small spring 42, as indicated. The pawl carrier 33 is normally held in the position in which it is shown in Fig. 3 by means of a coiled or helical spring 43, the lower extremity whereof attaches to the under side of the arm 37, the upper extremity of the spring being attached to the case 2 as shown.

From the construction just described, it should be undertsood that if the cord 9 is pulled by a rearward movement of the cross-head 11, the main lever 8 will be moved rearwardly. Under normal conditions, in winding the spring, the tension in the cord 9 will not be sufficient to extend the spring 40, from which it follows that the pawl carrier 33 will move bodily with the lever 8, rotation taking place on the shaft 19 as an axis; the movement of the lever 8 will evidently be toward the right, so that the pawl 41 in engagement with the ratchet wheel 20 will afford means for rotating the ratchet wheel in a left-hand direction. When the return movement of the cross-head 11 takes place, the spring 43 will operate to return the pawl carrier to its normal position. In this way, as the cross-head 11 reciprocates, the pawl carrier will be rocked to and fro and the ratchet wheel will be advanced by an intermittent movement. The ratchet wheel will be held against a retrogressive movement by means of the detent pawl 21 described above. In this way, the spring 24 may be wound. When the spring is being wound in the manner described, the main lever 8 will move rearwardly so as to occupy substantially the position in which it is indicated in the dotted outline 8ª. When the spring has become wound, the force necessary to increase its tension will become so great that it cannot be transmitted through the spring 40 to the pawl carrier. At this juncture, the rocking movement of the main lever 8 will take place on a pin 44 which connects the lever 8 with the pawl carrier. Assuming that the spring becomes wound up when the lever 8 is in the position 8ª, then the lever will move rearwardly under the tension of the cord 9, so as to occupy some such position as the position 8ᵇ indicated in dotted lines in Fig. 3. When the cross-head moves forwardly, of course the spring 40 will return the main lever to its normal position with the shoulder or tooth 39 in engagement with the arm 37 of the pawl carrier.

I provide an arrangement for controlling the operation of the motor by means of the cord 12 described above, which cord runs to the interior of the cab of the locomotive to a point where it will be in convenient reach by the engineer or fireman. Referring especially to Fig. 5, I provide, within the case 2, a brake lever 45 which is pivotally attached to the case at the point 46 and provided with a brake shoe 47 which lies adjacent to the face of the brake wheel 31 described above. A spring 48, which is attached to the long arm of the brake lever, normally tends to hold the shoe 47 in engagement with the brake wheel. A trip lever 49 is mounted in the case pivotally at 50, and the upper extremity of this lever is formed with a toe 51, which toe engages th eunder side of the brake lever 45 as shown. To the lower extremity of this trip lever 49, the cord 12 attaches as shown, the said cord being suitably guided through an opening 52 formed in the side wall of the case as indicated in Fig. 3. When the cord 12 is pulled upon, the lever 49 may be moved over into the position 49ª indicated by the dotted lines in Fig. 5. The toe 51 is then projected upwardly, which has the effect of depressing the brake shoe 47. In this way the frictional resistance at the brake shoe, which normally prevents the spring from unwinding, is relieved, so that the spring will operate to rotate the crank 32 and ring the bell. In order to limit the rearward movement of the trip lever 49, I provide the case 2 with a block or stop 53, as indicated in Fig. 5.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a motor of the class described, in combination, a spring, a ratchet wheel affording means for winding said spring, a pawl carrier having a pawl coöperating with said ratchet wheel for winding said spring, a lever pivotally mounted on said pawl carrier, a spring connecting said lever with said pawl carrier and through which said pawl carrier is actuated, and means for connecting said lever to a moving piece.

2. In a motor of the class described, in combination, a spring, a ratchet wheel, a pawl carrier having a pawl affording means for winding said spring through said ratchet wheel, a lever pivotally mounted on said pawl carrier and adapted to connect with a moving part of the locomotive, an extensible member connecting said lever with said pawl carrier and affording means for transmitting a force thereto to advance said pawl carrier, and means for returning said pawl carrier.

3. In a motor of the class described, in combination, a ratchet wheel, a detent pawl therefor, a pawl carrier having a pawl affording means for winding said ratchet wheel. a spring adapted to be wound by said ratchet wheel, a lever pivotally attached to said pawl carrier and adapted to connect with a moving part of the locomotive, and a spring connecting said lever with said pawl carrier through which the force may be imparted from said lever to said pawl carrier.

4. In a motor of the class described, in combination, a main shaft, a spring barrel mounted thereupon, a spring disposed within said spring barrel and having its ends connected respectively with said shaft and said spring barrel, a ratchet wheel rigid with said spring barrel, a pawl carrier having a pawl engaging said ratchet wheel and affording means for winding said spring, a main lever pivotally attached to said pawl carrier and adapted to connect with a moving part of the locomotive, a second spring connecting said main lever with said pawl carrier and through which said pawl carrier is actuated, and a third spring connected with said pawl carrier and affording means for returning the same.

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

CHARLES SIMON.

Witnesses:
THOMAS L. GRAVES,
JAMES GRAVES.