2 Sheets—Sheet 1.

J. HARRISON.

Ringing Bells.

No. 29,784.

Patented Aug. 28, 1860.

Fig. 5,

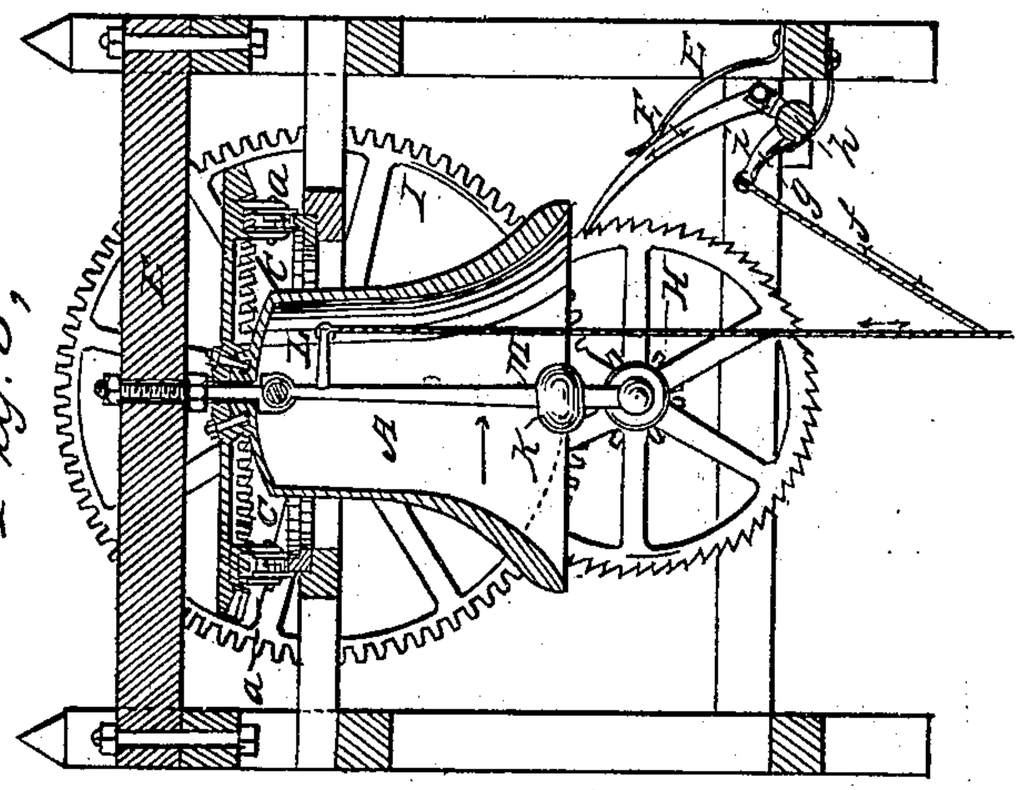


Fig. 4,

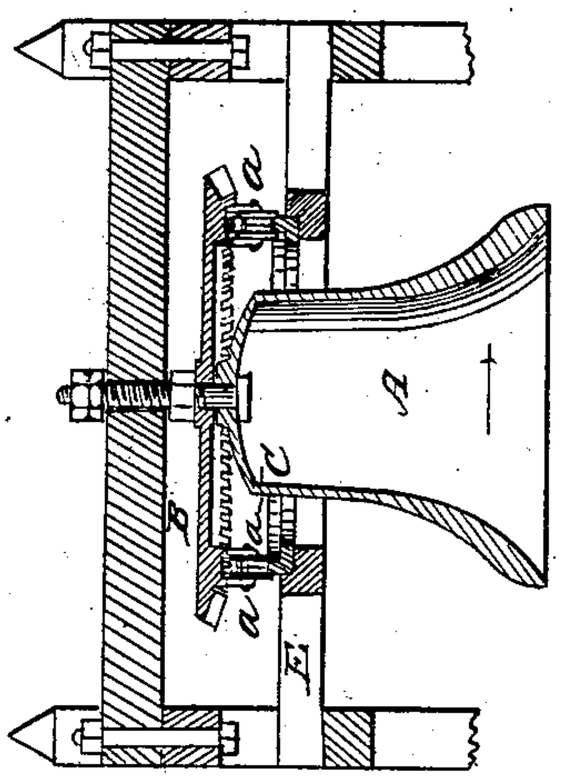


Fig. 2,

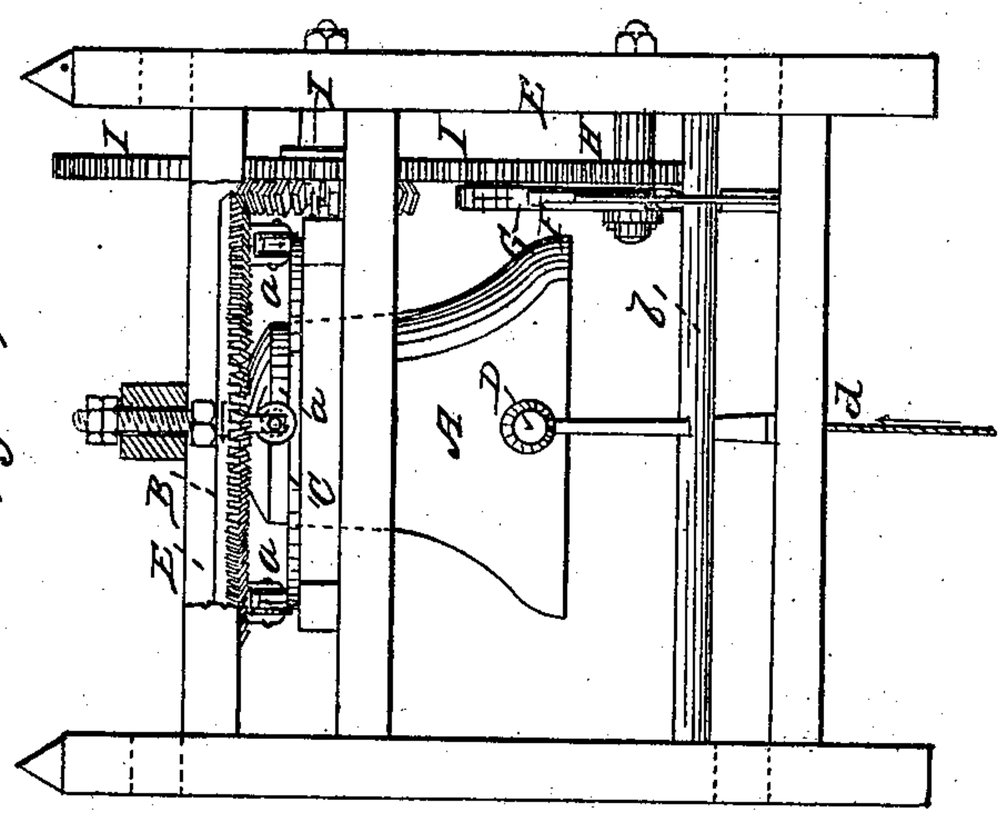


Fig. 3,

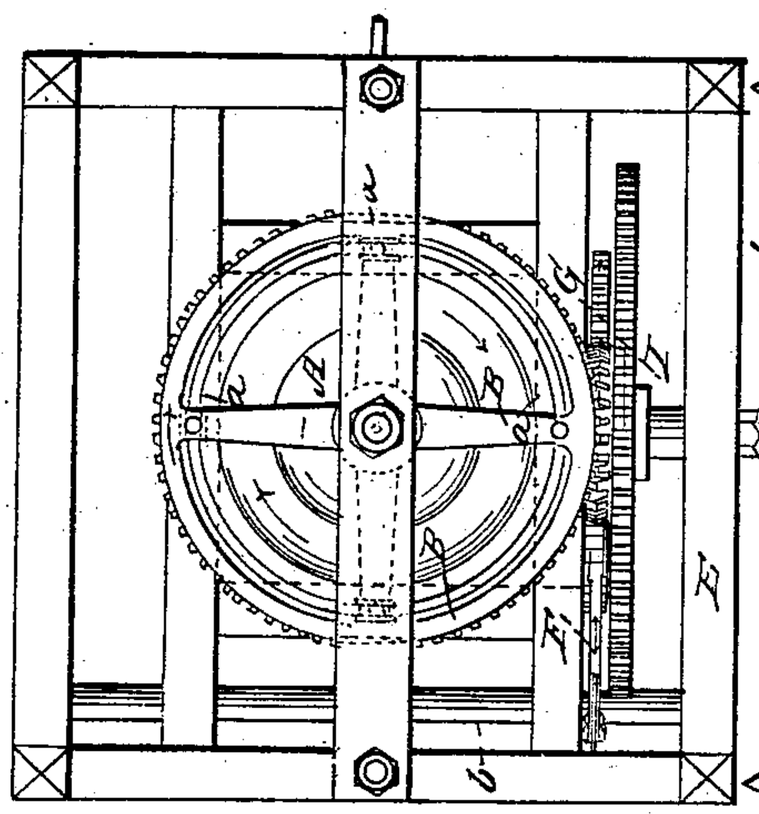
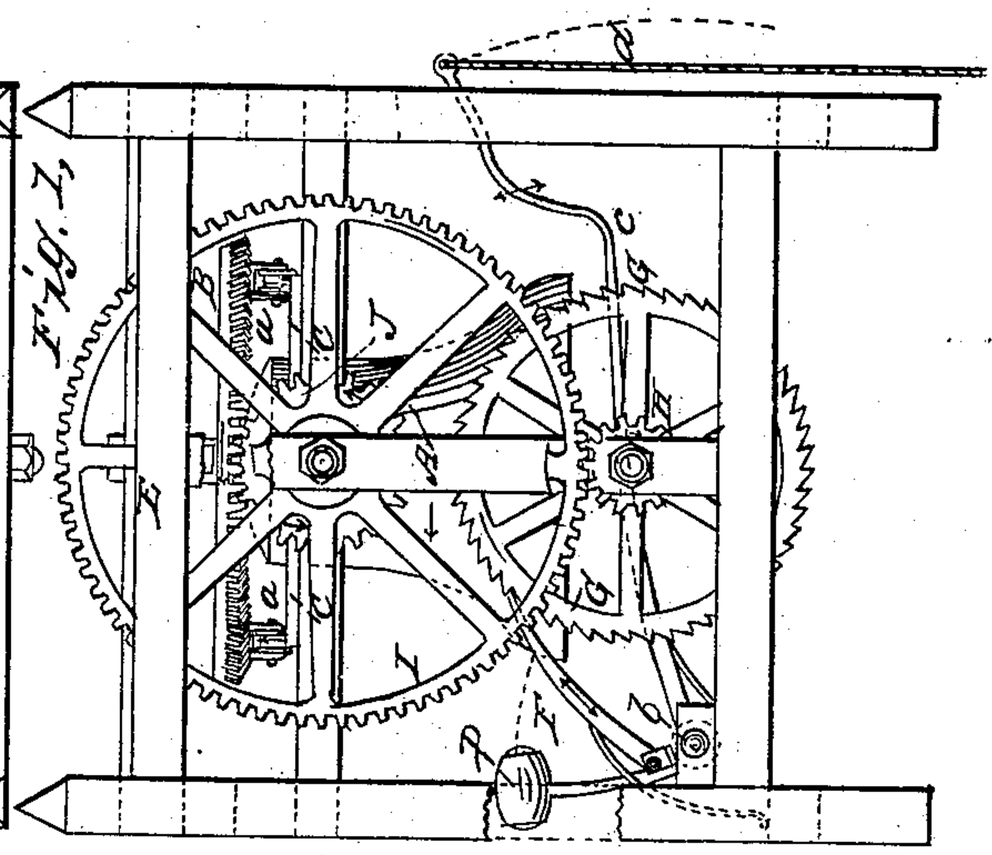


Fig. 1,



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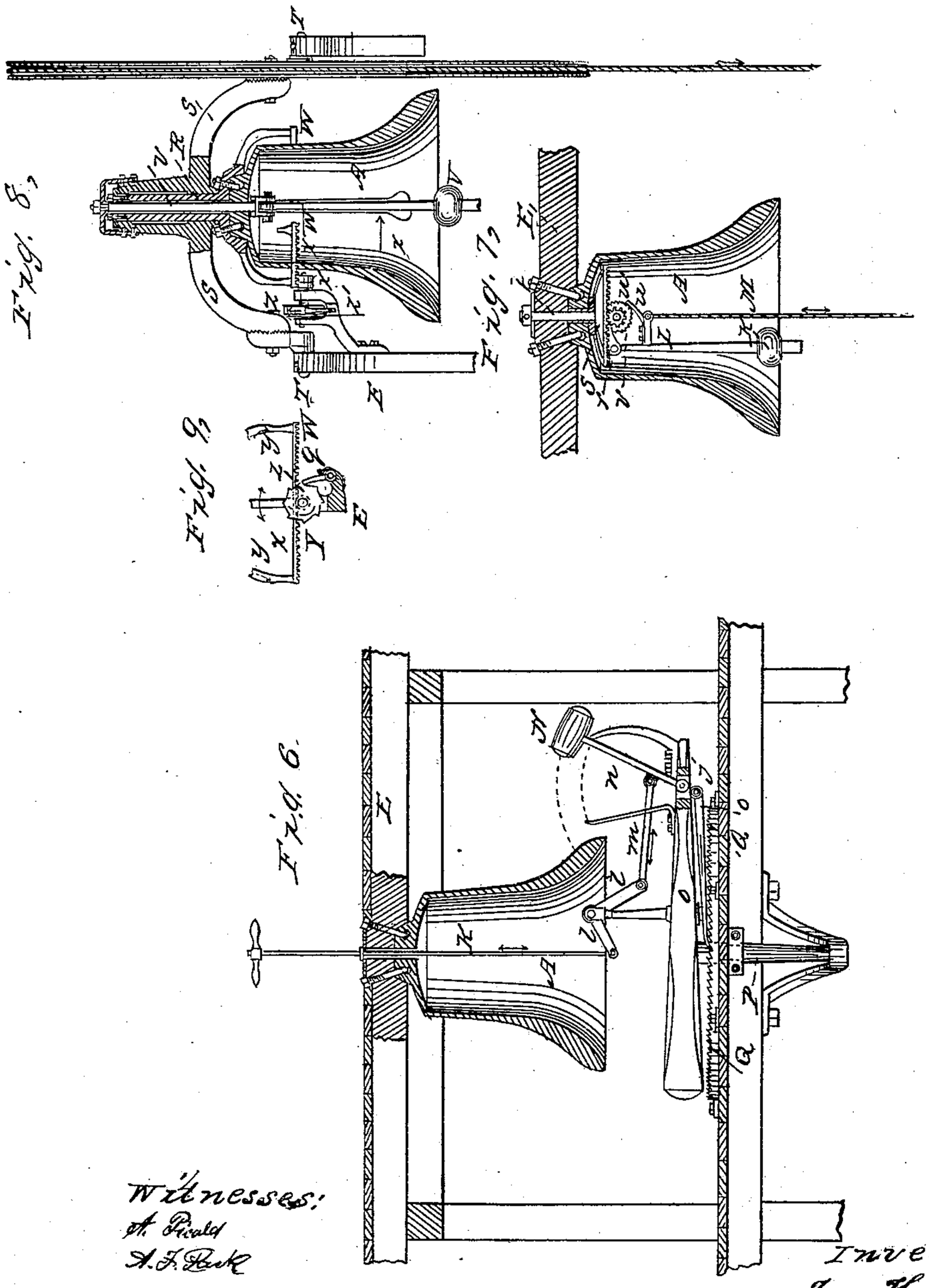
J. HARRISON.

Ringing Bells.

No. 29,784.

2 Sheets—Sheet 2.

Patented Aug. 28, 1860



Witnesses:
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A. F. Pickel

Inventor:
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UNITED STATES PATENT OFFICE.

JAMES HARRISON, OF TROY, NEW YORK.

APPARATUS FOR RINGING BELLS.

Specification of Letters Patent No. 29,784, dated August 28, 1860.

To all whom it may concern:

Be it known that I, JAMES HARRISON, of the city of Troy, in the county of Rensselaer and State of New York, have invented a new and useful Improvement in Ringing or Sounding Bells; and I do hereby declare that the following contains a full and exact description thereof, reference being had to the annexed two sheets of drawings, making a part of this specification, and in which the same letters of reference indicate like parts in all the drawings, and the arrows therein show the directions in which the parts move.

When a church, fire-alarm or other similar kind of bell is uninterruptedly and powerfully rung for many minutes together with the heavy clapper or hammer constantly striking in the same place or in two opposite places on the bell, as is often the case in sounding such bells, the part of the bell where the clapper or hammer thus incessantly strikes is then not infrequently temporarily heated and weakened by the unintermitted hammering thereon, so as to be quite liable to fracture at such times.

To obviate that defect and at the same time and by the same means equalize the hammering upon and the consequent wear of all parts of the sound-bow or circumference of the bell, simply by the act of ringing or sounding the bell, is the object of my improvement. And the characteristic or principle of my invention or improvement is the causing of the successive blows of the hammer or clapper of a bell to strike in a series of different places upon and along or around the sound-bow or circumference of the bell, by making the bell-ringing mechanism turn or revolve the bell or its clapper or hammer in or by the operation of sounding the bell and by means of some mechanical device or devices, the particular mechanism hereinafter described for communicating the requisite rotary motion to the bell or its hammer or clapper from the bell-ringing mechanism not being of the essence of the invention, but incidental and subsidiary thereto, and capable of many modifications without affecting the nature of my invention or improvement.

In order to enable persons skilled in hanging and ringing church, fire-alarm, and similar bells, to apply my improvement thereto, reference is here made to the annexed drawings, in Sheet I of which Figure 1 is a side elevation, Fig. 2 a back elevation, Fig. 3 a plan, and Fig. 4 a partial central vertical section, all of a bell, A, which is suspended on a wheel, B, supported by rollers, *a*, *a*, *a*, *a*, on a circular track, C, concentric with the bell, so that the latter can be revolved about its axis, on the track as a support; the bell being rung by being struck upon its outside by a hammer, D, fast on a rock-shaft, *b*, in a stationary frame E, and operated by an arm *c* and a cord or rod *d*. And in this case the bell is slowly revolved on the track C, with a step by step motion, at and by each stroke of the hammer D, (so as to present a different part of the bell to the hammer at each blow,) by means of a driving-pawl, F, worked by the hammer-shaft, *b*, and turning a ratchet wheel G, fastened to a pinion, H, which turns a wheel, I, which is fast to and turns a bevel pinion, J, which turns the wheel B which is fastened to the bell.

Fig. 5, on Sheet I of the annexed drawings, is a central sectional elevation of a fire-alarm bell, A, secured to a wheel B, supported by rollers, *a*, *a*, on a circular track C, so that the bell can be turned horizontally around its axis, on that track; the bell being sounded by being struck on its inner surface by a clapper, K, pivoted at the upper part of the interior of the bell to a bolt, *e*, passing loosely through the top of the bell and fastened to the frame E, so that the clapper will not turn around in the bell. In this case the clapper is struck against the bell by the use of an arm, L, fast upon and extended laterally from the shank of the clapper, and a rope or rod, M, attached to that arm and extended downward out of the bell; and the bell is turned a step in its movement around its axis at and by each stroke of the clapper, K, so as to present a different part of the circumference of the bell to each blow of the clapper, by means of a cord, *f*, which connects the clapper-rope, M, with an arm, *g*, fast on a rock-shaft, *h*, which, by an arm, *i*, works a driving-pawl, F, so that at each downward movement of the rope M, the pawl turns a ratchet wheel, G, a step, which wheel, by means of intermediate gearing, turns the wheel B and thereby the bell.

Fig. 6, on Sheet II of the annexed drawings, represents a fire-alarm bell, A, which is fastened to a frame E, and is rung or sounded by being struck on its outside by a hammer, N, pivoted at *j*, upon an arm, O, fast on a spindle, P, which is arranged in

line with the axis of the bell, so that the hammer can be revolved around the bell, the hammer N being struck against the bell by the use of a rod, *k*, sliding through a hole in the top of the bell, and jointed to an elbow lever, *l*, which is pivoted to a link, *m*, jointed to the shank, *n*, of the hammer. In this case the hammer is made to take a step in its course around the bell, at and by each operation of striking the bell, so that the hammer will successively strike on all parts of the sound-bow of the bell alike, by means of a driving-pawl, *o*, pivoted to the shank of the hammer and arranged so as to engage with the ratchet-teeth of a stationary ring, Q, as the hammer recedes from the bell.

Fig. 7, on Sheet II, of the annexed drawings is a central sectional elevation of a chime or fire-alarm bell, A, which is fastened to a frame, E, and is rung by striking its inner side with a clapper K, pivoted at *r* to a clevis, *s*, fast on a spindle, *t*, fitted to turn in a socket through the middle of the top of the bell, so that the clapper can be turned around thereon, the clapper being struck against the bell by pulling down on a cord or rod M, attached to the end of an arm, L, projecting laterally from the clapper-shank. In this case the clapper is made to move a step in its revolution within the bell at and by reason of each stroke of the clapper (so that the clapper in its revolutions will strike equally upon all parts of the circumference of the bell) by means of a spring-dog, *u*, carried by the clapper and engaging with and turning a ratchet-wheel *v*, which is fast on a shaft which has its bearings in the clapper-clevis *s* and which has, fastened to it, a pinion, *w*, which engages with the teeth of a stationary ring, *x*, (on the bell,) along which the pinion is made to roll or travel slowly and thus turn the clapper around. It is obvious that if the clevis, *s*, was held stationary, and the bell free to turn on its axis, the bell would then be turned around the clapper by this same apparatus, and that if both, the clapper and the bell, were free to revolve, the clapper, or the bell, or both the clapper and the bell, would be turned around in such a case, according to the relative ease with which the bell and the clapper could be revolved.

Fig. 8, on sheet II of the annexed drawings, is a central sectional elevation of a church, factory, or locomotive bell, A, provided with a spindle-shank, R, in the line of its axis, which spindle, R, is fitted to turn in a yoke, S, which is mounted to revolve and carry the bell, on a horizontal axis or journals, T, T, the spindle U of the clapper, V, being held stationary in the yoke at *p*, and the bell being rung by the falling and striking of the clapper against the opposite sides of the bell as the yoke and bell are swung back and forth on the journals, T, T, in the usual manner.

Fig. 9 is a sectional elevation at the line *z*, *z'* in Fig. 8. In this case the bell is made to turn a step in its revolution around the clapper by each double swing of the bell by means of a toothed wheel, W, surrounding the bell, and fast to its shank, and engaged with a pinion, X, fast on a shaft, Y, which is arranged in line with the journals T T of the yoke, and which has fastened upon it a ratchet wheel, Z, furnished with a dog or pawl, *q*, hung on the frame E, so that when the yoke, wheel W, and bell, are swung in the direction indicated by the arrow *y*, Fig. 9, the ratchet and pinion will be turned by the wheel in the same direction; but when the bell, wheel, and yoke, are swung in the opposite direction indicated by the arrow *y'*, Fig. 9, the ratchet wheel, and pinion X, will be held fast by the dog *q*, so that the wheel, W, and bell will be turned a step around the clapper in the direction pointed by the arrow *x'*, so that the successive blows of the clapper against the two opposite sides of the bell will strike in different places thereon.

It is obvious that my improvement is also applicable to a bell which is rung by being struck upon its inside by a hammer mounted on a support separate from the bell; and to a bell which is sounded by being hit upon its outside by a hammer supported by the shank of the bell; and to a bell having two or more clappers or hammers; and to a bell which is rung or sounded in any similar manner to the modes represented in the annexed drawings, whether the ringing mechanism is actuated by manual, steam, water or other suitable power or force. And for communicating the requisite rotary motion to the bell or its hammer or clapper from the bell-ringing mechanism to make the clapper or hammer strike successively in a series of places upon and along or around the bell substantially as herein described, various devices differing from but equivalents for those represented in the annexed drawings for that purpose may be employed without affecting the distinguishing character of my invention, a bell which has my improvement applied to it being distinguishable from all others by the fact that while a bell having my improvements is being rung or sounded, the bell-ringing mechanism then so turns the bell or its hammer or clapper in or by the act of sounding the bell and by means of any device substantially such as or equivalent for any of the various contrivances shown in the annexed drawings or hereinbefore described for that purpose, as to thereby make the successive blows of the clapper or hammer strike in a series of different places upon and along or around the sound-bow or circumference of the bell.

I am well aware that it is not new to so

mount a bell that it may at any time be turned around its clapper or hammer or so as to make the hammer or clapper strike in a different place on the bell. That I do not claim. And I do not broadly claim so turning a bell or its hammer or clapper while the bell is being sounded, as to thereby make the successive blows of the clapper or hammer strike in a series of different places upon and along or around the bell, although I am not aware that that was ever done before it was done by me.

What I claim as my invention or improvement and desire to secure by Letters Patent is—

Distributing the blows of the hammer or clapper of a bell along or around the sound-bow or circumference of the bell, substantially as herein described, by turning the bell or its clapper or hammer by the action of the bell-ringing mechanism in sounding the bell, substantially as herein described.

JAMES HARRISON.

Witnesses:

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A. F. PARK.