(Model.) 2 Sheets—Sheet 1.

S. WILLCOCK.

CLOCK CHIMES MECHANISM.

No. 451,353. Patented Apr. 28, 1891.

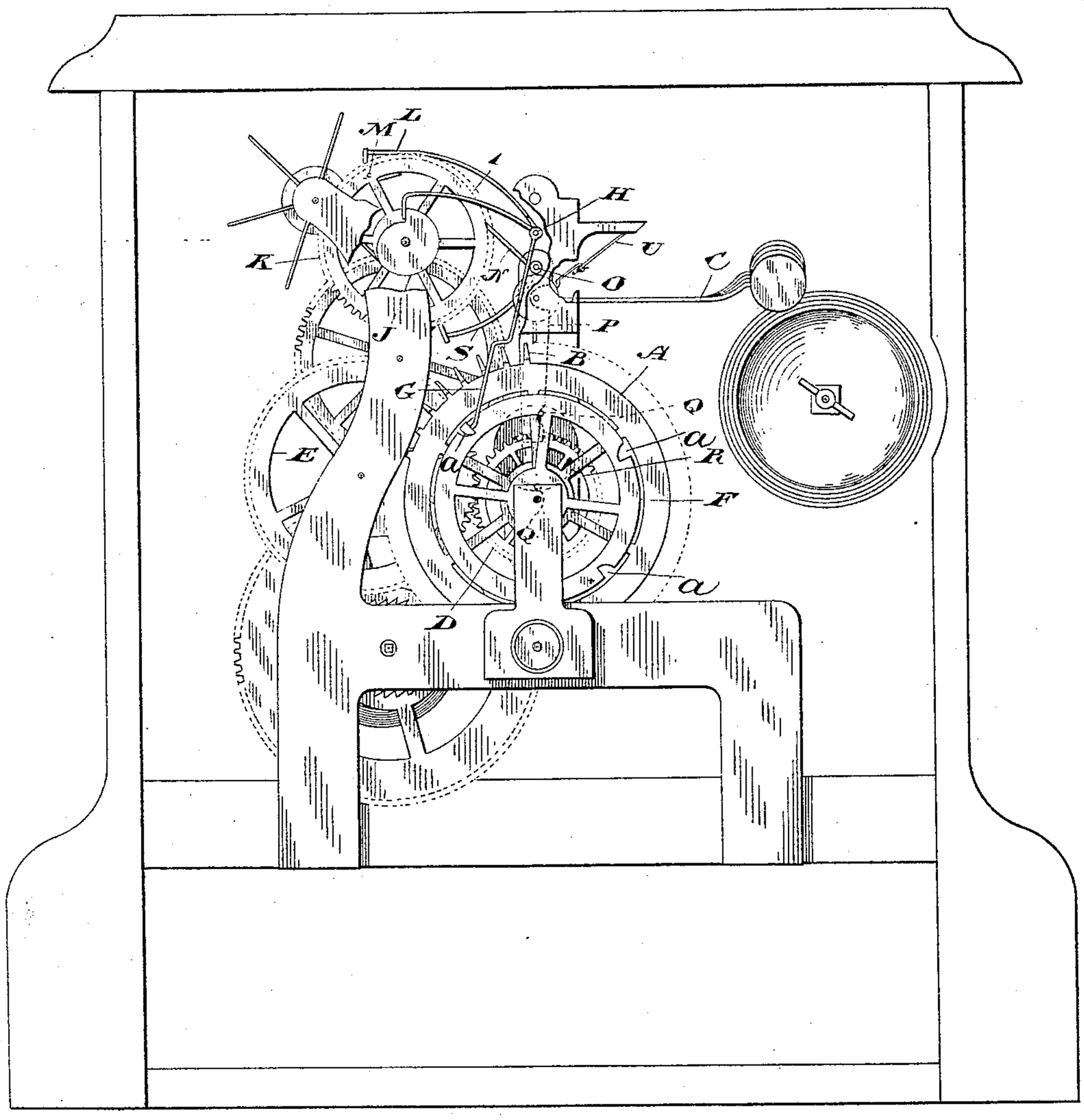

Fig. 1

Witnesses

J. Edw. Maybee

H. G. McMillan.

Inventor

Stephen Willcock

by Donald C. Ridout & Co

(Model.) 2 Sheets—Sheet 2.

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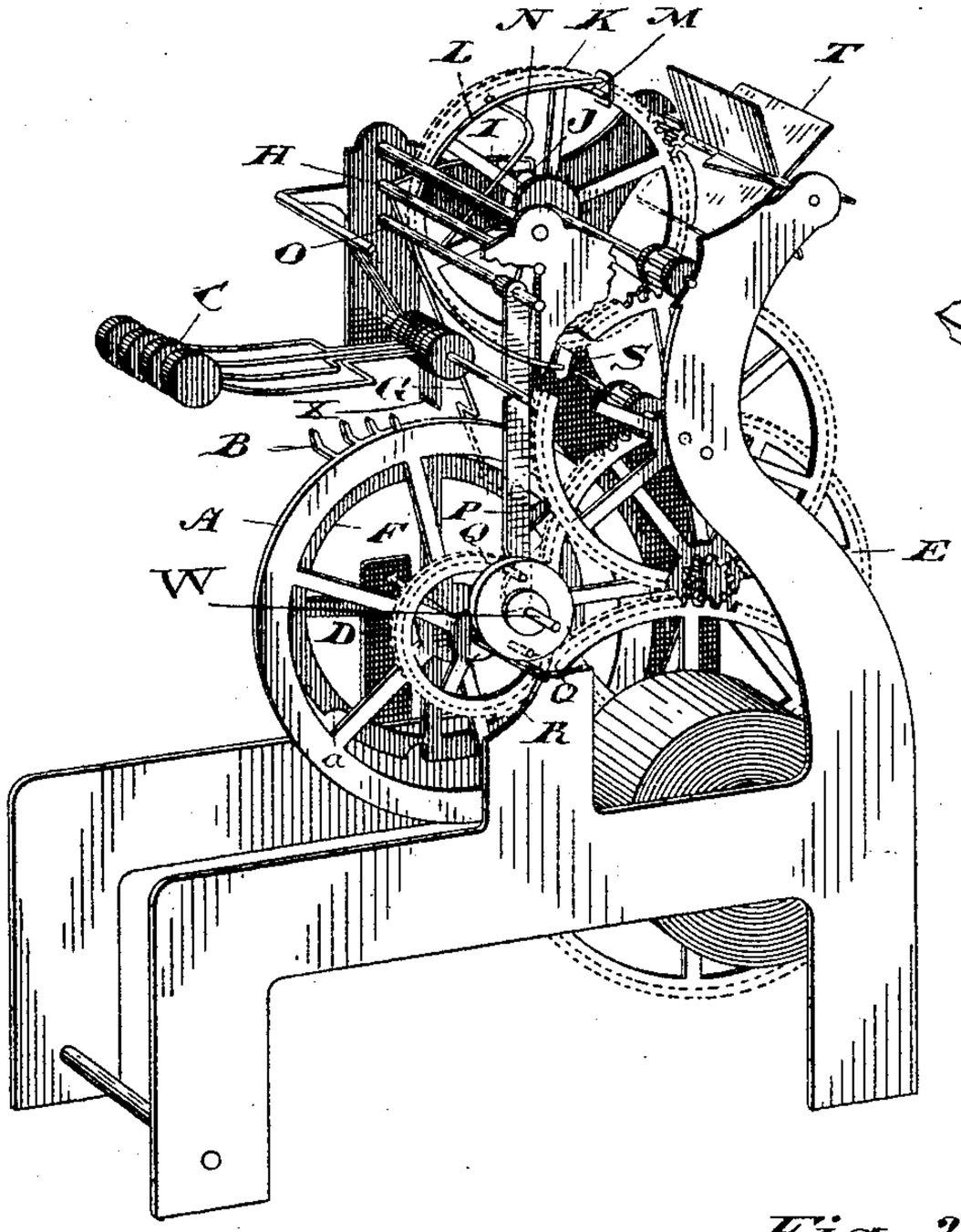

Fig. 2

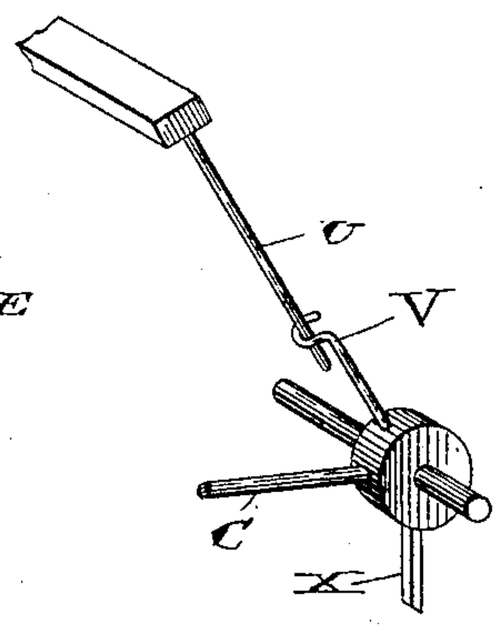

Fig. 3

Witnesses

Jo. Edw. Maybee

W. G. McMillan

Inventor

Stephen Willcock

by Donald C. Ridout & Co.

Attys.

UNITED STATES PATENT OFFICE.

STEPHEN WILLCOCK, OF TORONTO, CANADA, ASSIGNOR TO SAMUEL DAVISON, OF SAME PLACE.

CLOCK CHIMES MECHANISM.

SPECIFICATION forming part of Letters Patent No. 451,353, dated April 28, 1891.

Application filed January 2, 1891. Serial No. 376,453. (Model.)

To all whom it may concern:

Be it known that I, STEPHEN WILLCOCK, watch-maker, of the city of Toronto, in the county of York, in the province of Ontario, in the Dominion of Canada, have invented a certain new and useful Improvement in Clock Striking Mechanism, of which the following is a specification.

The object of this improvement is to design simple mechanism by which various chimes may be produced; and the invention consists in the peculiar construction, arrangement, and combinations of parts, hereinafter more particularly described and then definitely claimed.

In the accompanying drawings, Figure 1 is a side elevation of my improved finger-wheel and operating mechanism connected therewith. Fig. 2 is a perspective view of the said mechanism from the side opposite to that shown in Fig. 1, a portion being broken away to expose the operating mechanism. Fig. 3 is a detail of the bell-hammer and operating-spring.

In all chime-ringing clocks with which I am familiar the wheel by which the bell-hammers are operated forms a part of the train of wheels constituting the driving mechanism, and consequently the clock provided with the chime can only play a single chime or tune for which it is made. By my invention I am able to play various chimes and tunes without in any way interfering with the driving mechanism, which may be attached to any kind of a clock of any size and whether simple or complicated, or it may be arranged to operate without being connected to a clock. All that I have to change in order to produce a different chime or tune is the single wheel from which the bell-hammers are operated, and there is no limit to the number of tunes or the number of octaves which can be produced by my invention.

In the drawings, A represents what I call the "chime-wheel," from which a series of teeth B project. These teeth are cut on the periphery of the wheel and are bent and arranged in such a manner that when moving they will act against and trip the different bell-hammers C so as to produce the desired chime or tune. The chime-wheel A is carried on a suitable spindle and has connected to it a spur-wheel D, which meshes with the spur-wheel E, located in and forming part of a driving mechanism. The wheel A is made so that it can readily be removed and be replaced by another with teeth arranged to play a different chime or tune.

F is a notched rim or wheel formed upon or connected to the wheel A. G is an arm fixed to the rock-shaft H, from which rock-shaft another arm I also projects. The end of this arm rests upon the cam J, which is connected to the spur-wheel K.

L is a hooked arm also fixed to the rock-shaft H, the hook on the said arm being designed to engage with a pin M, which projects from the spur-wheel K, as indicated.

N (see Fig. 2) is an arm projecting from the rock-shaft O, to which another arm P is also fixed, projecting down to a point that will bring it in the path of a pin Q, which projects from the disk R, fixed to or connected with the minute-hand spindle W of the time-movement.

If desired to ring the chime but once an hour, only one pin Q will be provided, but if it is to be rung every quarter of an hour it will of course follow that four pins Q will be used. When the pin Q comes in contact with the arm P, it will, in passing the said arm, push it so as to cause the rock-shaft O to rock. The rocking of this shaft O causes the arm N (see Fig. 2) to move upwardly and come in contact with the arm L and raise it clear of the pin M. The wheel K being thus released will of course revolve until its pin M comes in contact with the arm S, which is fixed to the rock-shaft O, as shown. At this instance the pin Q has passed the arm P, leaving it free to fall back into its initial position, which motion of the arm P carries the arm S clear of the pin M, thus releasing the wheel K, which then continues to revolve until arrested by the stop mechanism hereinafter described.

When my invention is adapted to ring large bells, such as those used in churches and public buildings, and where it is not desired to attach it to a clock, the mechanism for auto-

matically operating the starting mechanism may be dispensed with and the arm P moved by the attendant.

The fly T, which operates in the usual way and for the ordinary purpose, has, it will be observed, six blades arranged to balance each other, which arrangement makes the fly more sensitive and more effective than if only two blades were used.

It will be observed on reference to Fig. 1 that the arm G is shaped so as to fit the notches *a* formed on the wheel F. When the arm N (see Fig. 2) comes in contact with and raises the arm L clear of the pin M, the arm G is simultaneously raised clear of the notch *a*, leaving the wheel A, which is geared to the ordinary chain of wheels, as before described, also free. As the cam J is connected to the wheel K, the said cam revolves with the said wheel. Said cam J being shaped for that purpose, holds the arm I up until the notch *a* has passed the end of the arm G, which then rests upon the periphery of the wheel F and holds the arm I clear of the cam J and the arm L clear of the pin M until the next notch *a* is reached, when the arm G falls into the said notch, which action causes the arm I to fall into contact with the cam J and the arm L to fall in the path of the pin M, thereby locking the mechanism until it is once more put into action by the movement of the arm P.

From the hub of each of the bell-hammers C a crooked arm V extends and is arranged to engage with a spring-arm U. Depending from the hub of each hammer is an arm X in the path of the teeth B. As each bell-hammer C is raised by teeth B coming in contact with its arm X, the arm V pushes against the spring U; but as soon as the teeth B have passed the arm X the spring U reacts against the arm V and forces the hammer against the bell.

It will be observed that the wheel D on the shaft of the wheel A forms no part of the train of driving mechanism, but is entirely independent of it, so that the train will operate just as well without it as with it, and the wheel A, its shaft, and the wheel D, through which motion is given to the wheel A, may be entirely removed without in any way affecting the integrity or the operation of the train of gearing normally used to drive the same. This I deem an important point, inasmuch as it allows of the ready change of chime-wheels to play different tunes without the necessity of allowing the train to run down before removing the wheel A.

What I claim as new is—

1. In combination with two or more bells and hammers therefor, a rotary wheel having a series of teeth cut on the periphery thereof and bent to engage with different hammers, substantially as described.

2. The combination of a driving mechanism, two or more bells and corresponding hammers therefor, with a wheel having a series of peripheral teeth projecting from the same and constructed and arranged to be removed without breaking the connection of the driving mechanism, substantially as described.

3. In combination with a driving mechanism, a wheel having a series of peripheral teeth projecting from it and a quarter-hour disk, both driven by and independently geared to said driving mechanism, whereby said wheel may be detached from said mechanism without affecting the latter, with two or more pivoted bell-hammers arranged in the path of the fingers formed on said wheel, substantially as and for the purpose specified.

4. In combination with a driving mechanism, a wheel having a series of peripheral teeth projecting from it and a quarter-hour disk, both driven by and independently geared to said driving mechanism, whereby said wheel may be detached from said mechanism without affecting the latter, and two or more pivoted bell-hammers arranged in the path of the teeth formed on the said wheel, with mechanism arranged to start and stop the driving mechanism, substantially as and for the purpose specified.

5. A wheel having a series of teeth B projecting from its periphery and independently geared to an ordinary striking mechanism of a clock, a rim or wheel F, fixed to the wheel A and having notches *a* made in its periphery, in combination with the arms G, I, and L, fixed to the rock-shaft H and arranged to operate in connection with the notches *a*, cam J, and pin M, substantially as and for the purpose specified.

6. The arm G, fixed to the rock-shaft H and extending to the notched wheel F, the arm I, fixed to the rock-shaft H and extending to the cam J, the arm L, fixed to the shaft H and extending to the path of the pin M in the spur-wheel K, in combination with an arm N, fixed to the rock-shaft O and extending to a point below the arm L, the arm P, fixed to the rock-shaft O and extending to a point in the path of the pin Q, and the arm S, fixed to the rock-shaft O and extending to a point in the path of the pin M, substantially as and for the purpose specified.

Toronto, November 25, 1890.

STEPHEN WILLCOCK.

In presence of—
CHARLES C. BALDWIN,
F. A. WOODWARD.