

(No Model.)

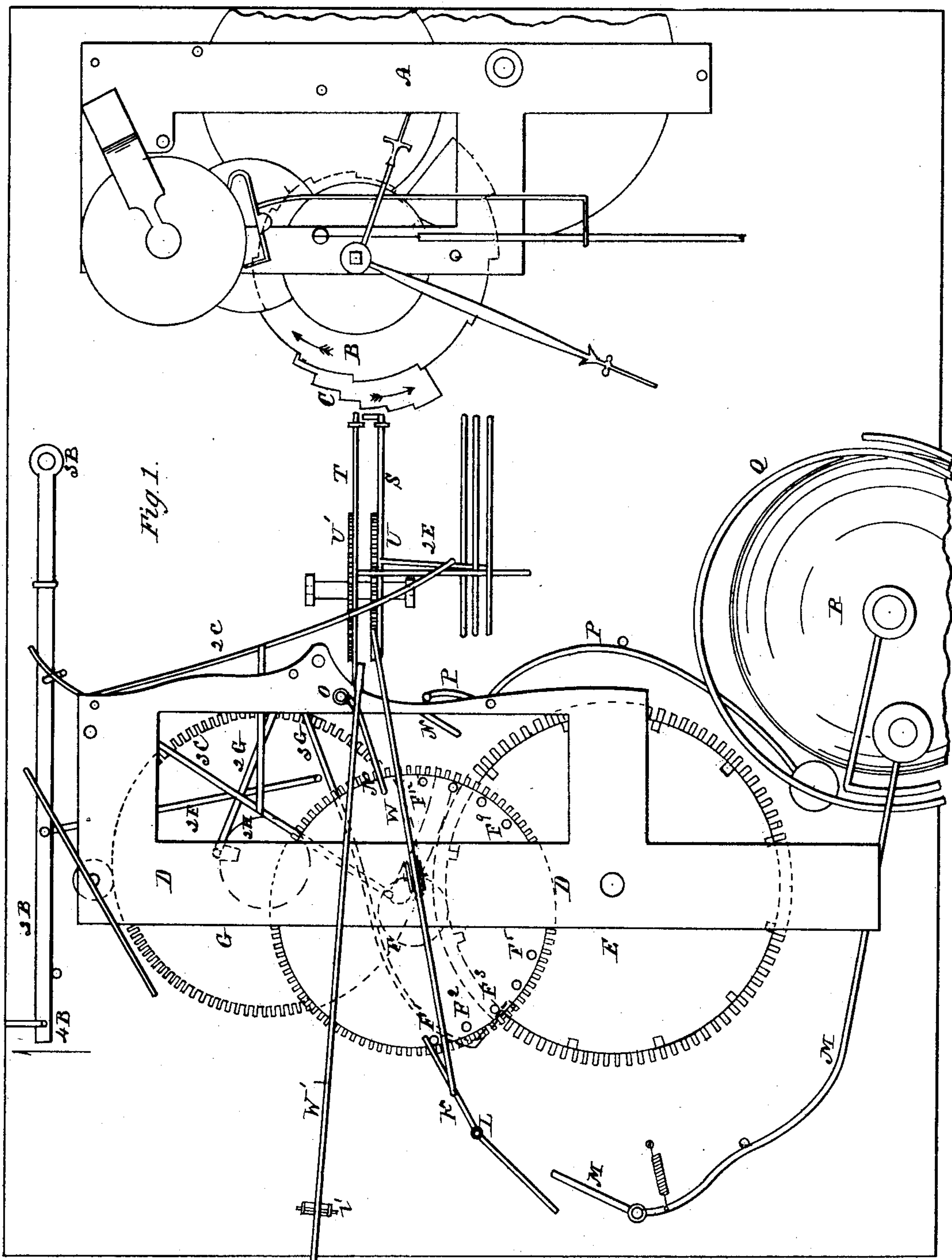
3 Sheets—Sheet 1.

E. Y. JUDD.

REPEATING MECHANISM FOR CLOCKS.

No. 257,339.

Patented May 2, 1882.



Witnesses.

Chas. L. Burdett

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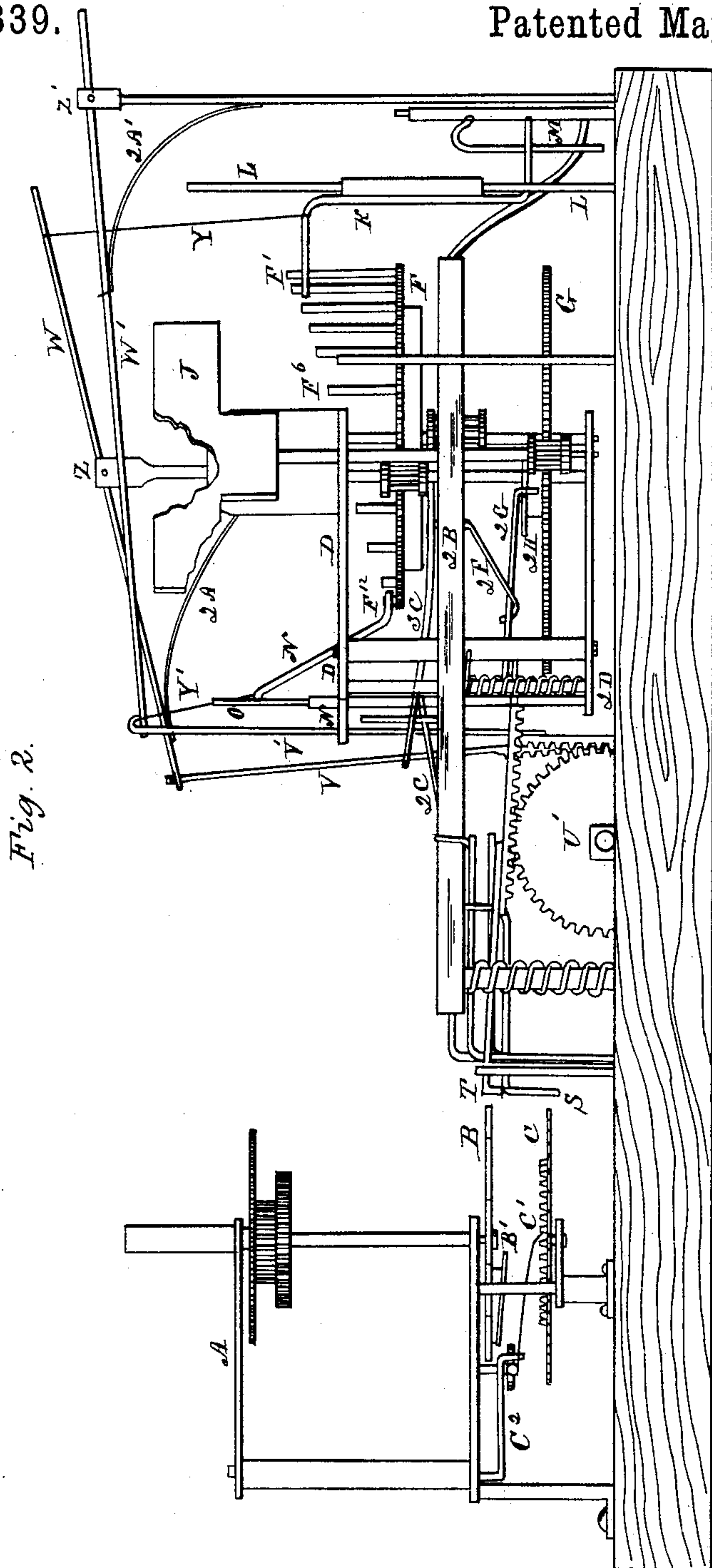
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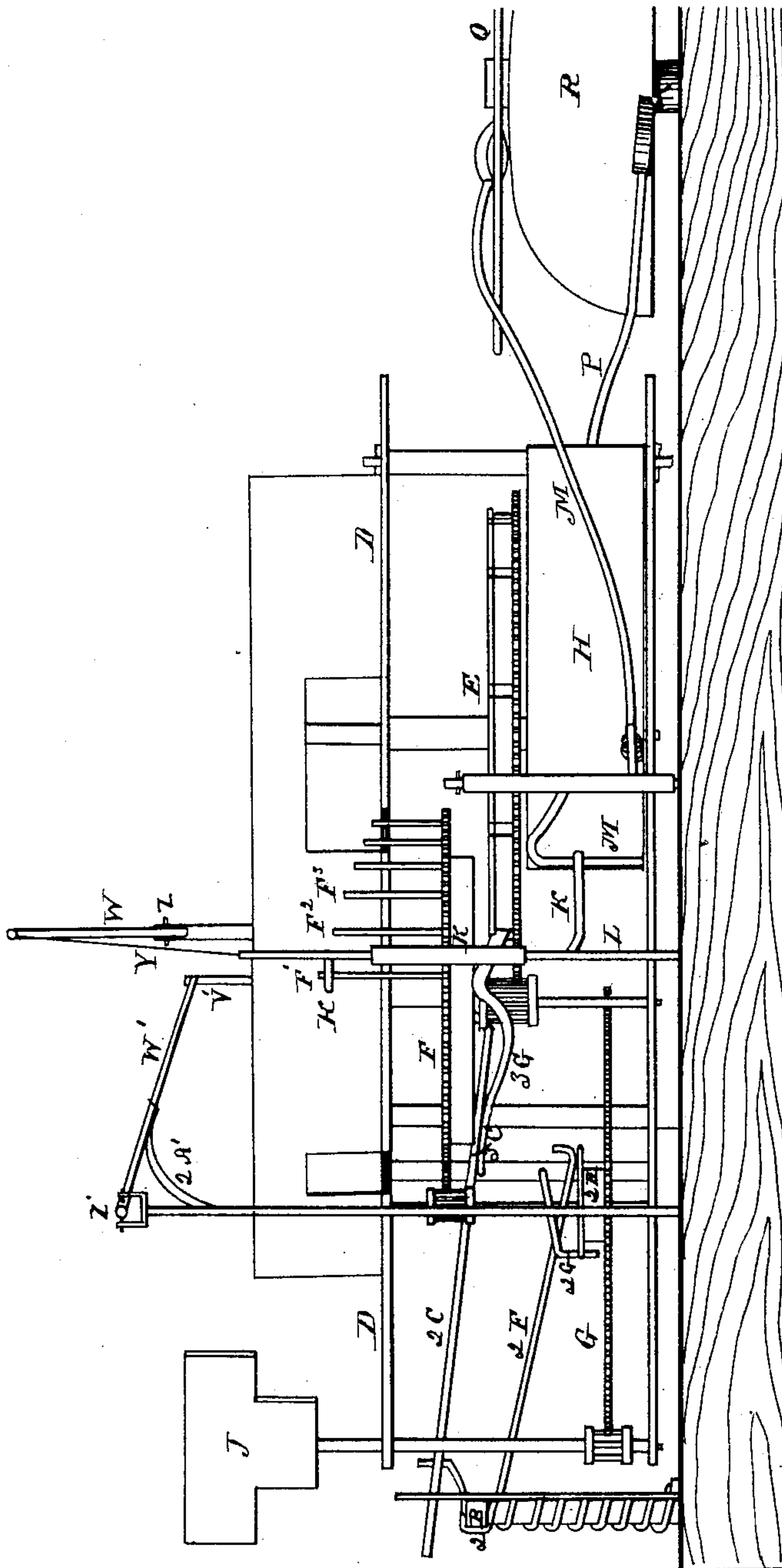
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Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWIN Y. JUDD, OF HARTFORD, CONNECTICUT.

REPEATING MECHANISM FOR CLOCKS.

SPECIFICATION forming part of Letters Patent No. 257,339, dated May 2, 1882.

Application filed November 12, 1881. (No model.)

To all whom it may concern:

Be it known that I, EDWIN Y. JUDD, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and
5 useful Improvements in Repeating Mechanism for Clocks; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference being
10 had to the accompanying drawings, and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

My improvement relates to an independent
15 repeating mechanism to be attached to clocks for the purpose of striking the hour and minute, or as near to the exact time as may be desired, whenever it is wished to know the time by sound.

20 The object of my invention is to provide a mechanism which shall be detached from the ordinary time-keeping train of the clock, but which can at will be made to indicate the exact time by night or day by striking the hour and
25 minutes upon suitable bells.

It also has for its object the accomplishment of the foregoing result at all times without having intervals in which the mechanism will not operate, as is the case with ordinary re-
30 peating mechanisms in clocks which strike the hours in passing.

My invention also has for its object a simpler and better construction of the striking mechanism than has heretofore been in use.

35 In the accompanying drawings, illustrating my invention, Figure 1 is a front view of my improved repeating mechanism and part of an ordinary clock-train to which it is attached. Fig. 2 is a top view of the same, looking down-
40 ward from the ordinary position when in the clock-frame. Fig. 3 is a view of the same from the left side.

A is the frame containing the clock-train, which may be of any ordinary construction.

45 B is a snail fixed to the spindle which carries the minute-hand of the clock. This snail is divided into twelve steps, and forms the stop which regulates the minute-striking mechanism. The twelve steps divide the hour into

intervals of five minutes each, the repeating- 50 works striking to the nearest five minutes.

C is a snail concentric with the minute spindle or arbor, and moving the reverse way from B by means of a ratchet and pawl, one step for each revolution of B. The snail B is provided 55 with a projection, B', which in passing round pushes the pawl C' back over one tooth of the ratchet, which, as soon as B' passes on and releases it, is thrown forward by the spring-
60 arm C² and moves the snail C one step. The snail C is provided with a series of steps for regulating the hour-striking mechanism. Three sets of twelve steps are supposed to be used, as indicated in the drawings; but any number of twelves may be used, depending upon the
65 throw of the pawl.

The wheels E, F, and G constitute the train of the repeating mechanism. They are supported by and turn in journals in the frame D. The wheel E is driven by a spring in the 70 usual manner, and the wheel G drives a fly, J, for regulating the speed. These wheels are formed with teeth, and drive pinions upon the arbors of the next wheel in the manner usual with clock-work. The wheel F has upon it a 75 series of pins, F' F² F³, &c., of different lengths, projecting outward from its face. These pins are for raising the hammers of the striking-bells, of which there are two—one for the hours and the other for the minutes. The number 80 of blows is regulated by the number of pins which successively engage the striking-levers.

K is the striking-lever, which operates the hammer striking the hours. It rocks upon the fixed spindle L, which supports it, and upon 85 which it slides back and forth so as to engage a greater or less number of the pins upon F. The opposite arm of this lever K acts upon the short arm of the hammer-lever M to raise the hammer as each pin passes. The hammer- 90 lever is of such a form that it will be acted upon in all positions of the striking-lever K. On the opposite side of the wheel F there is a corresponding mechanism for striking the minutes, or each five minutes, as shown in the 95 drawings.

N is the striking-lever, turning and sliding back and forth on the fixed pin O. Its arm op-

posite to that which engages the pins on F acts upon the short arm of the minute-hammer lever P, which it operates to raise the hammer in the same manner as the lever K upon the opposite side of the wheel F.

Q and R are the two bells upon which the hour and minute hammers strike. They are intended to be of different pitch or tone, so as to be readily distinguishable.

S and T are feelers, which, when released, as will be explained, drop onto the snails C and B, respectively, to determine the position of the striking-levers and the number of strokes of the bells. The feeler S has upon its rear end a rack which gears into the wheel U, which in turn gears into a rack on the rod V. This rod moves the rocking lever W, pivoted at Z, and by means of the rod or tie Y operates the striking-lever K so that it will engage more or less of the pins on F, according as the feeler S drops farther in or out upon the snail C.

2^A is a spring which throws the feeler S against the snail when it is released, as will be described.

The feeler T has upon its rear end a rack, which gears into the wheel U', which operates a rack on the rod V' and moves the lever W', which is pivoted to the frame at Z'. This lever operates the striking-lever N so that it will engage more or less of the pins on F, according as the feeler T drops farther out or in on the snail B.

2^{A'} is a spring which throws the feeler T against the snail when it is released.

2^B is the releasing-bar. It is pivoted to the frame at 3^B, and is operated by being drawn upward at the end 4^B by means of a cord, or in any other convenient manner.

2^C is the releasing-lever, which has a short arm resting on a pin in the bar 2^B, which acts to draw back the lever against the spring 2^D, which is attached to the lever 2^C and to the fixed frame of the mechanism. This releases the pins attached to S and T at 2^B and allows the feelers to drop onto the snails. The lever 2^C has another arm, 3^C, which extends under the wheel F, and has a pin which passes into a slot in the circumference of the wheel when the parts are in the position shown in the drawings, but, when the bar 2^B is raised and the movement of the parts commences, rides on a flat circular rim on the wheel F and holds the lever 2^C up until one whole revolution of the wheel F has been made. As soon as the wheel has made one complete turn the pin again drops into the slot and allows the other arm of the lever 2^C to spring back by the force of the spring 2^D and withdraw the feelers from the snails.

2^F is a rod attached to the bar 2^B, which serves to unhook and start the repeating mechanism. It operates upon the arm 2^G of a bent lever, which enters into a notch in the plate 2^H upon the arbor of the wheel G, and locks the mechanism when it is at rest. The rod 2^F draws this arm 2^G out and allows the

movement to start when the bar 2^B is raised. The other arm, 3^G, of the lever 2^G passes to the wheel E and enters one of a series of notches in its rim. From this notch it is raised by the movement of the bar 2^B and rides upon the circumference of the wheel until it reaches the next notch, which it falls into and allows the arm 2^G to again engage with the notch in the plate 2^H. This occurs at each complete revolution of the wheel F.

The operation of my invention is as follows: Whenever at night or other time it is desired to cause the repeating mechanism to strike the cord is pulled and the end of the bar 2^B raised and then allowed to fall back into its place by its weight or a suitable spring. This drops the feelers onto the snails and unhooks the striking mechanism. According as the position of the snail is varied by the clock-movement, the feelers drop a greater or less distance and cause the striking-levers K and N to engage with more or less of the pins projecting from the wheel F. This is adjusted so that the proper number shall interpose to make the striking conform to the hour and minute indicated by the dial of the clock. The pins pass first along the hour-striking lever and give the last hour passed by the hands of the clock, and then the pins move round to the minute-striking lever and give the minutes in the same manner. This makes one revolution of the wheel F, during which the locking-bars have been held up, as before described. At the end of the revolution the locking-bars enter their respective slots and stop the movement, which then remains at rest until the bar 2^B is again raised.

What I claim as my invention is—

1. The hour-snail C, concentric with the arbor of the minute-hand of a clock-train and provided with a series of teeth or notches on the side, in combination with said arbor and a ratchet or spring pawl, C', and a device, B', turning with the minute-arbor for operating said pawl, whereby the said snail is moved one notch for each revolution of the minute-arbor, substantially as described.

2. The combination of one or more feelers, S T, connected by suitable mechanism with the striking-levers K N, for operating them, with said levers and a series of pins of different lengths upon the wheel F, whereby said levers are made to engage a greater or less number of the pins, according to the position of said feelers, and with mechanism for releasing said feelers at will and allowing them to drop upon snails operated by the clock-movement and withdrawing them after one turn of the wheel F, substantially as described.

3. The combination of the bar 2^B, the lever 2^C, having the arm 3^C and the spring 2^D, the feelers S T, and the wheel F, having a slot for the end of the arm 3^C, whereby the said feelers are released and kept released during the revolution of the wheel F, and then withdrawn, substantially as described.

4. The combination of the snails C B, the
feelers S T, the levers K N, having their posi-
tions regulated by said feelers by connecting
mechanism, the repeating-train, constructed as
5 described, and driven by a spring, H, or its
equivalent, the levers M P, carrying the ham-
mers of the bells Q R, the releasing-bar 2^B, the
lever 2^C 3^C, and the lever 2^G 3^G, with a clock-

movement, the whole forming an independent
repeating mechanism for clocks, substantially
as described.

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Witnesses:

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