

(No Model.)

2 Sheets—Sheet 1.

G. B. OWEN.

STRIKING MECHANISM FOR CLOCKS.

No. 294,262.

Patented Feb. 26, 1884.

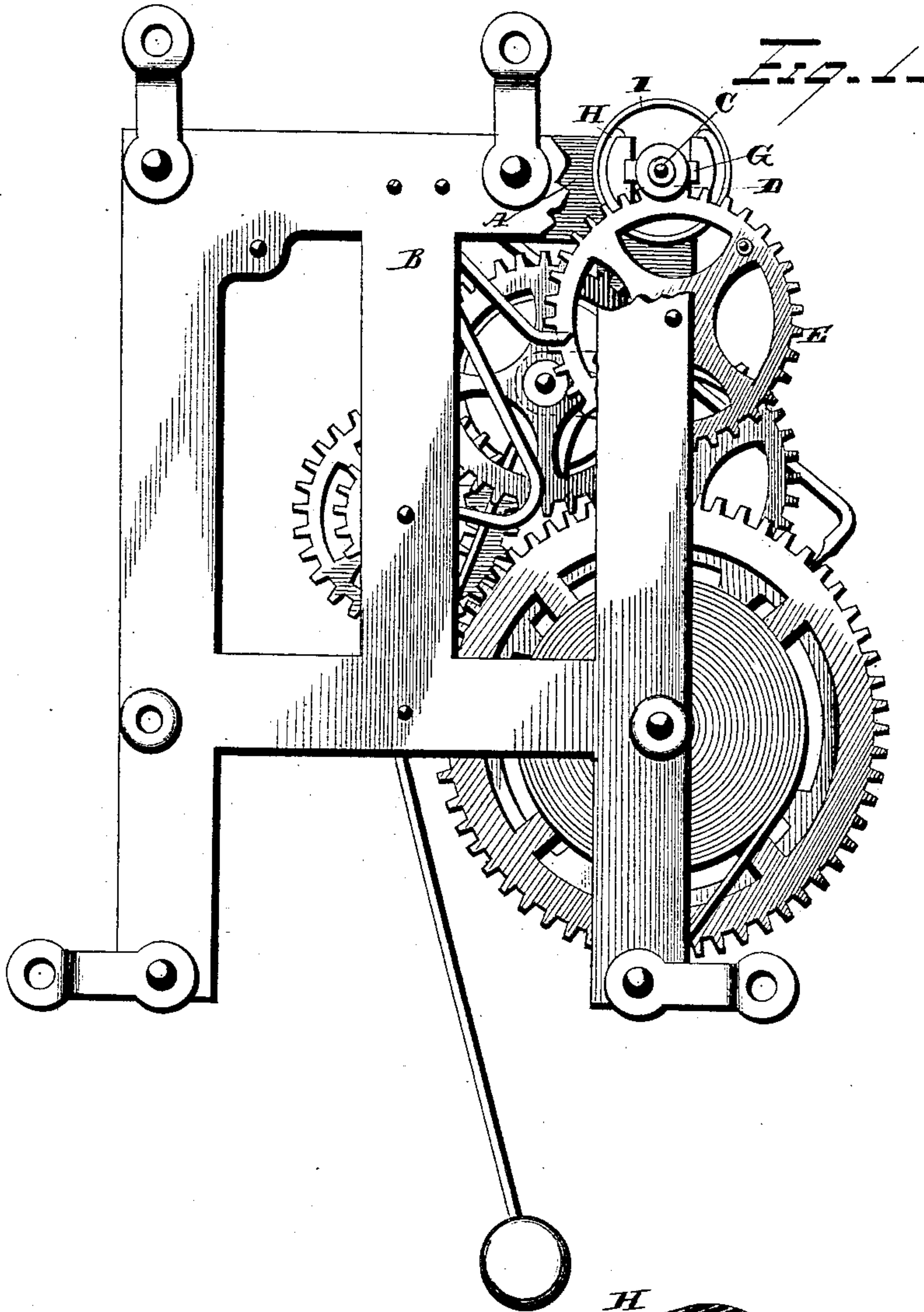
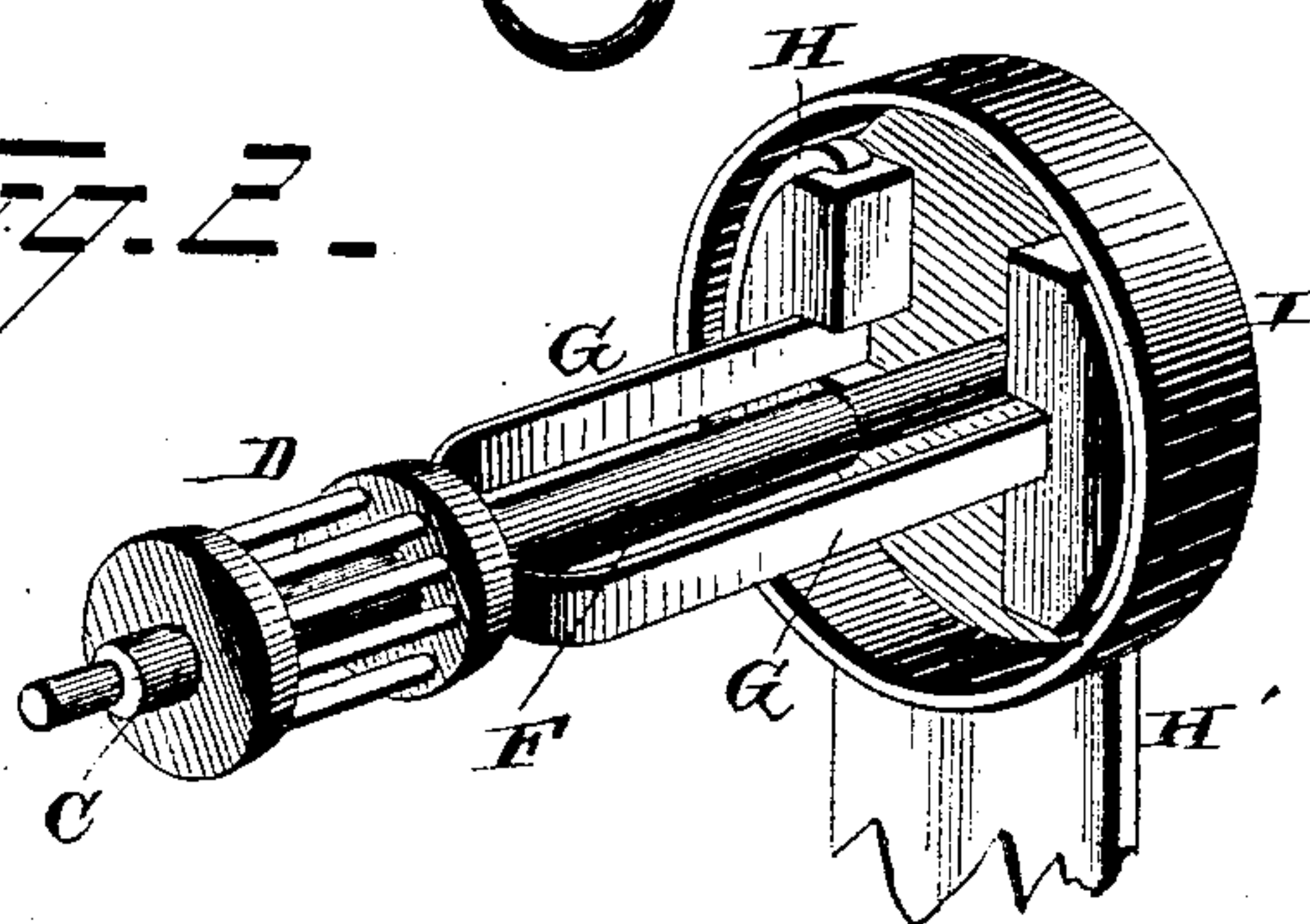


Fig. 1.



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Fig. 3.

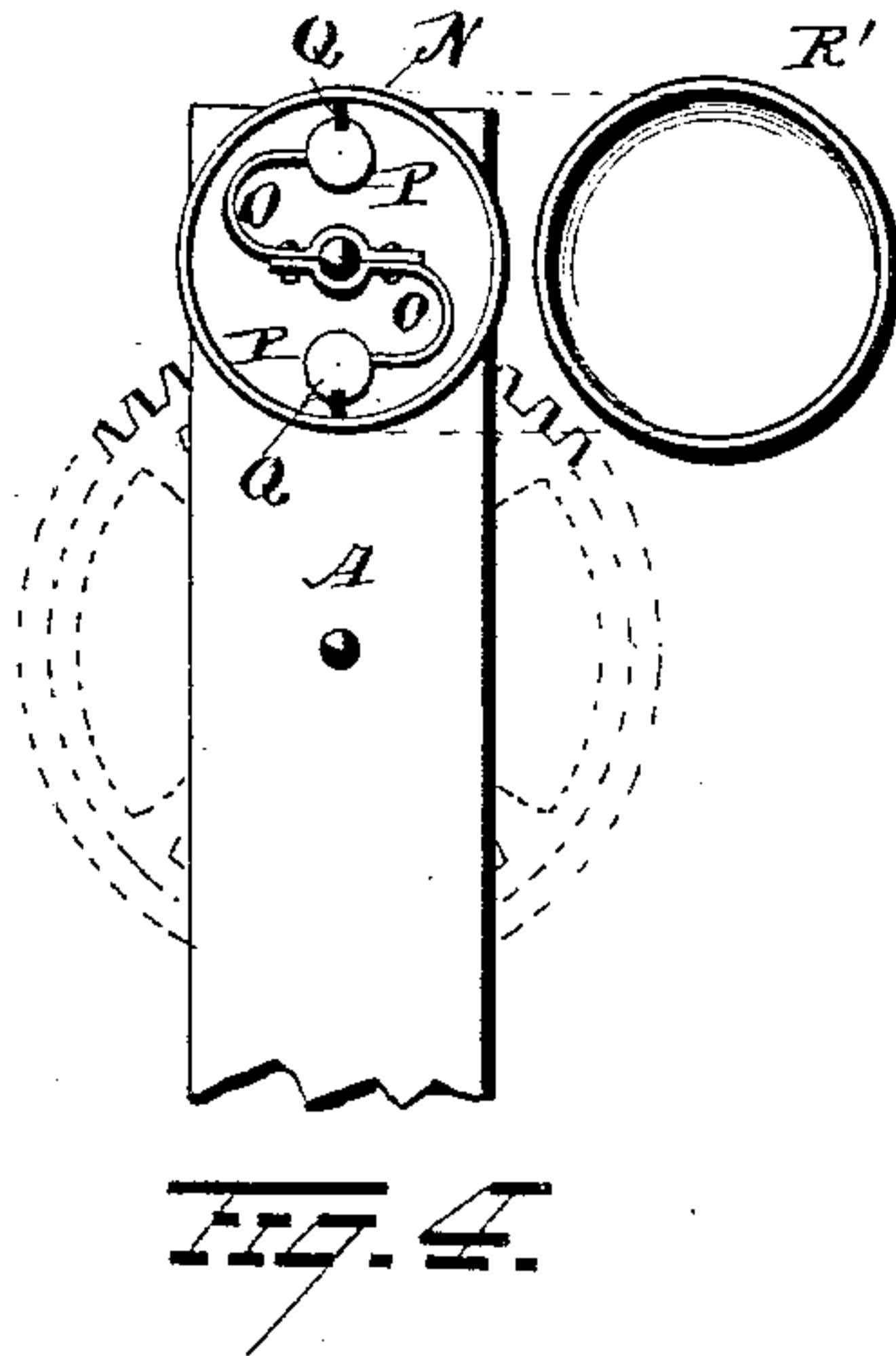
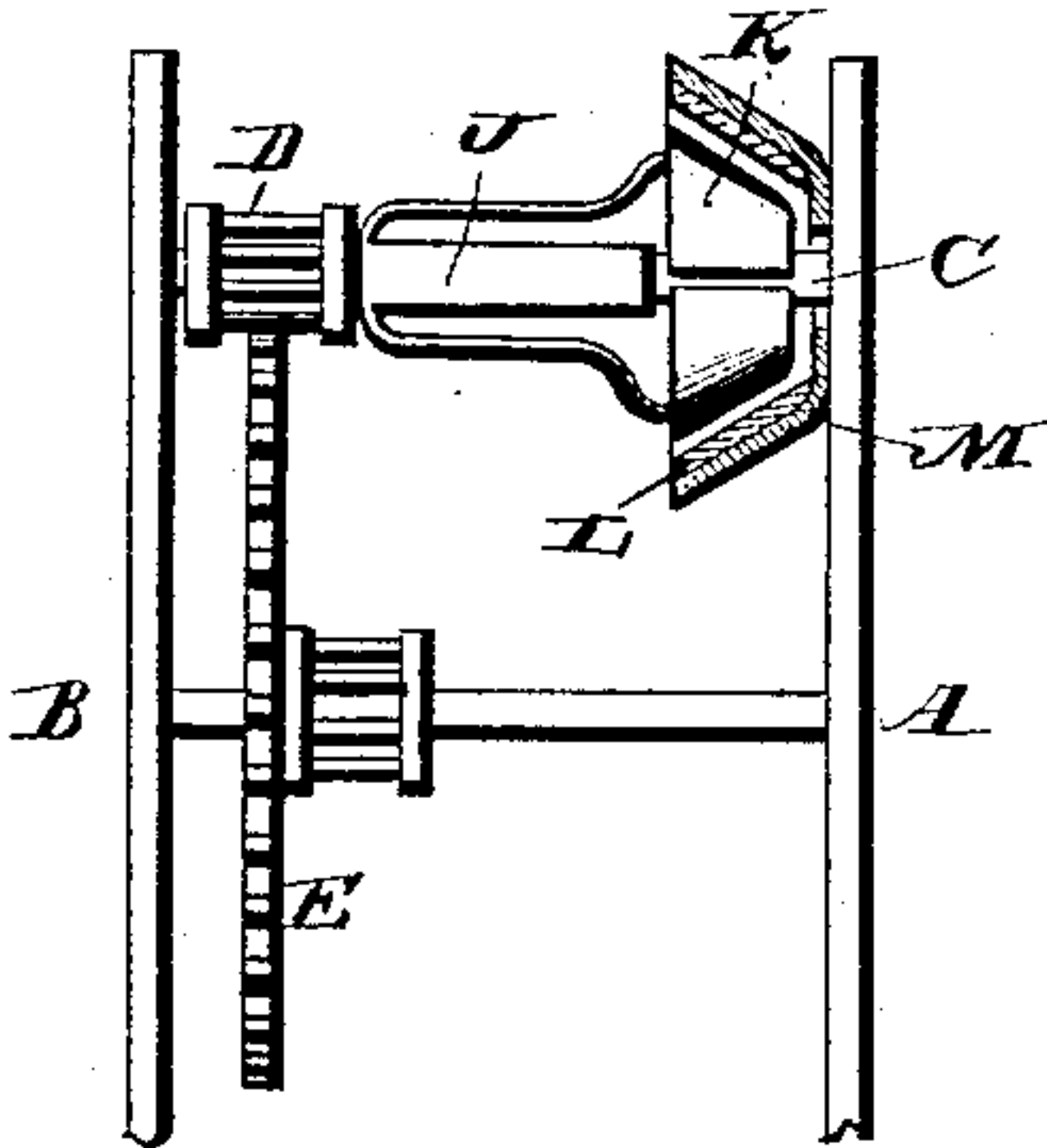


Fig. 5.

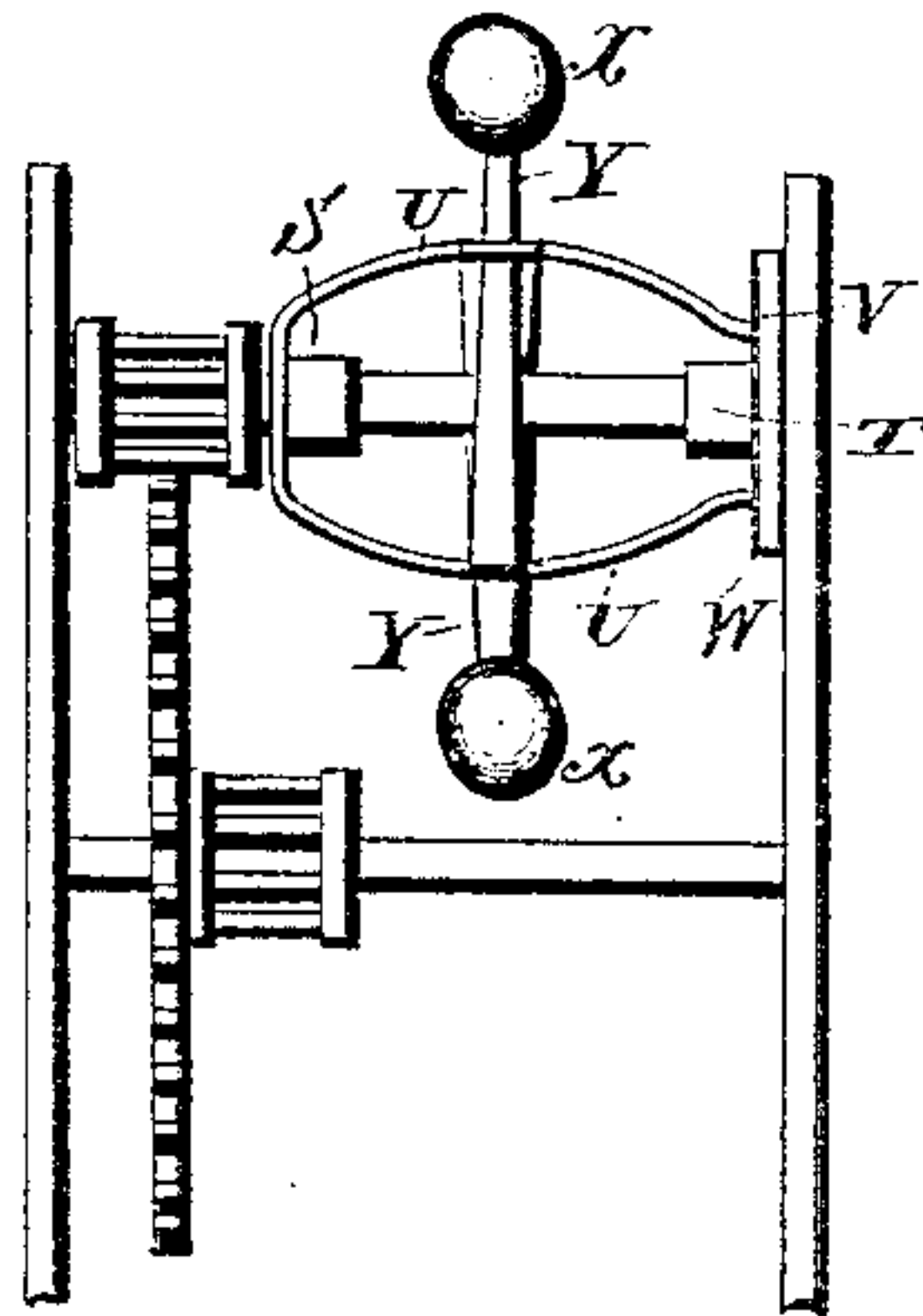


Fig. 6.

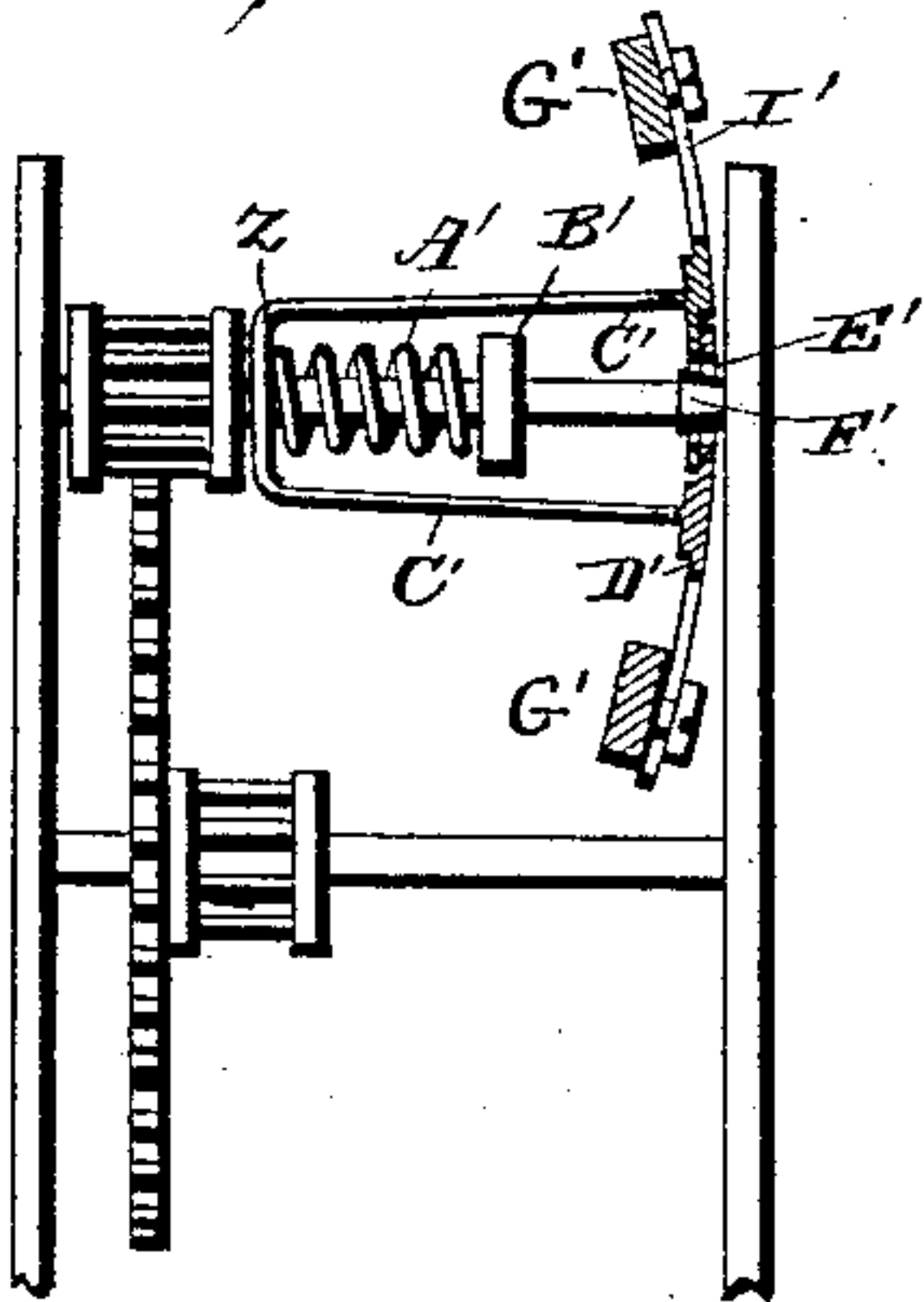


Fig. 7.

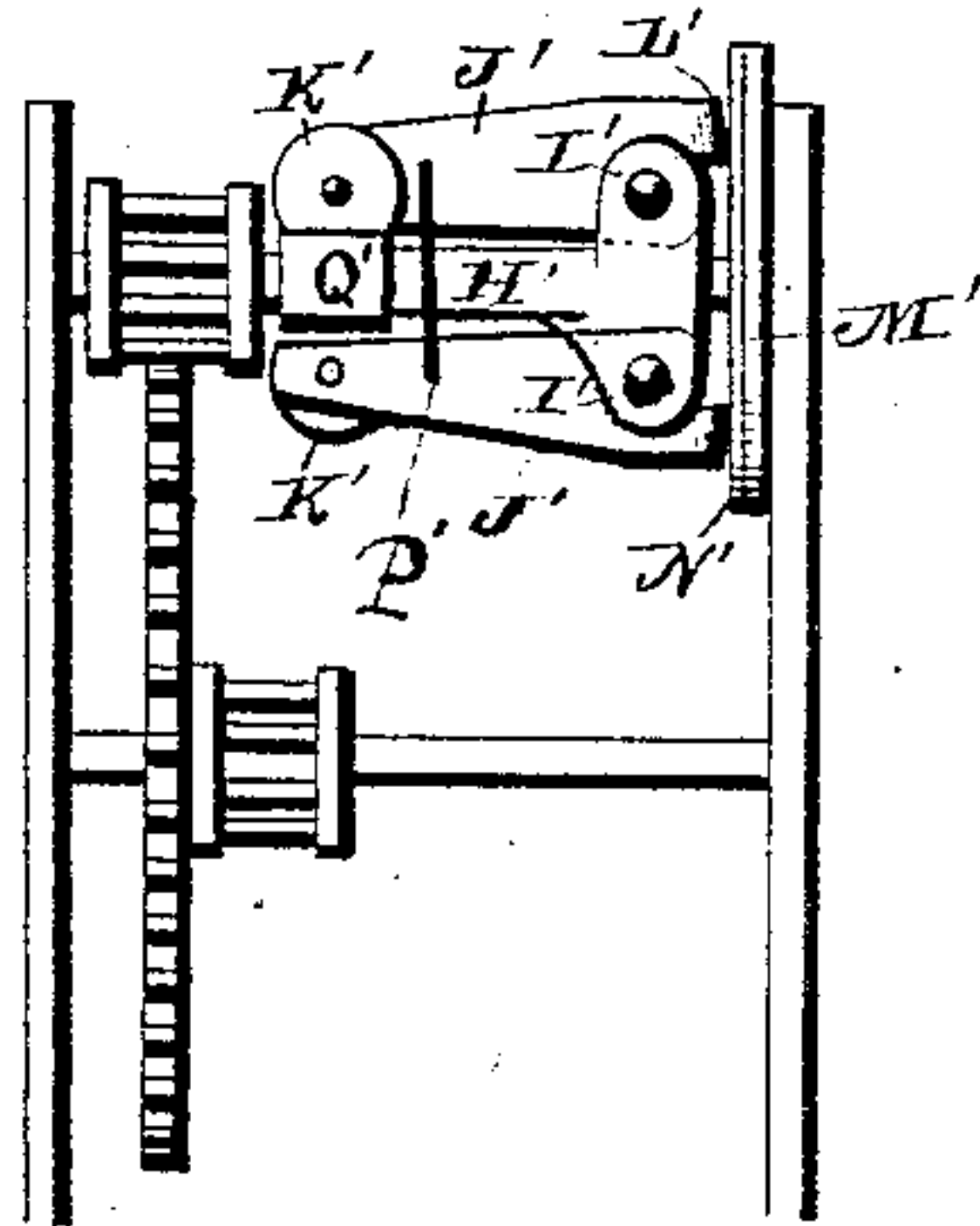


Fig. 8.

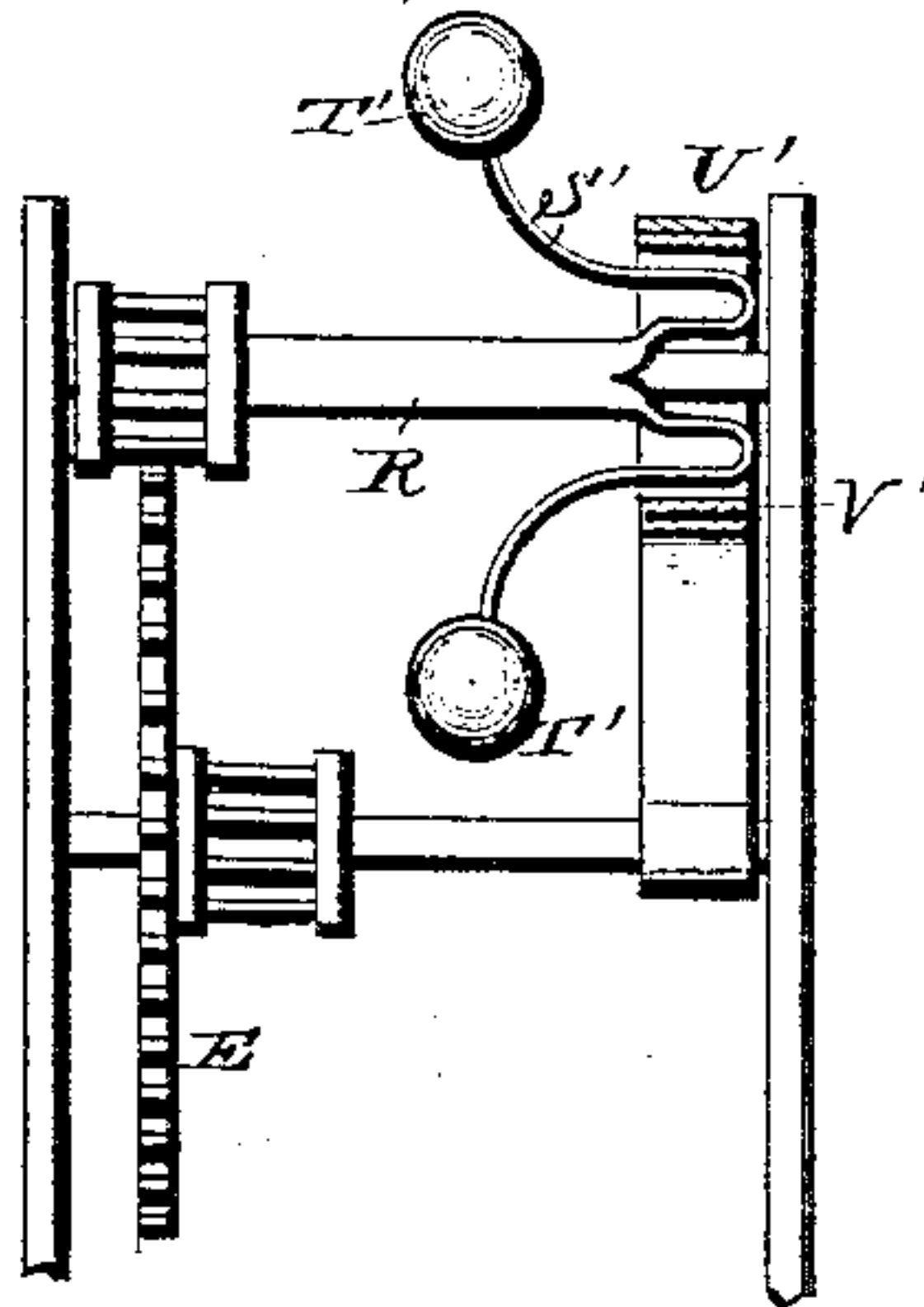
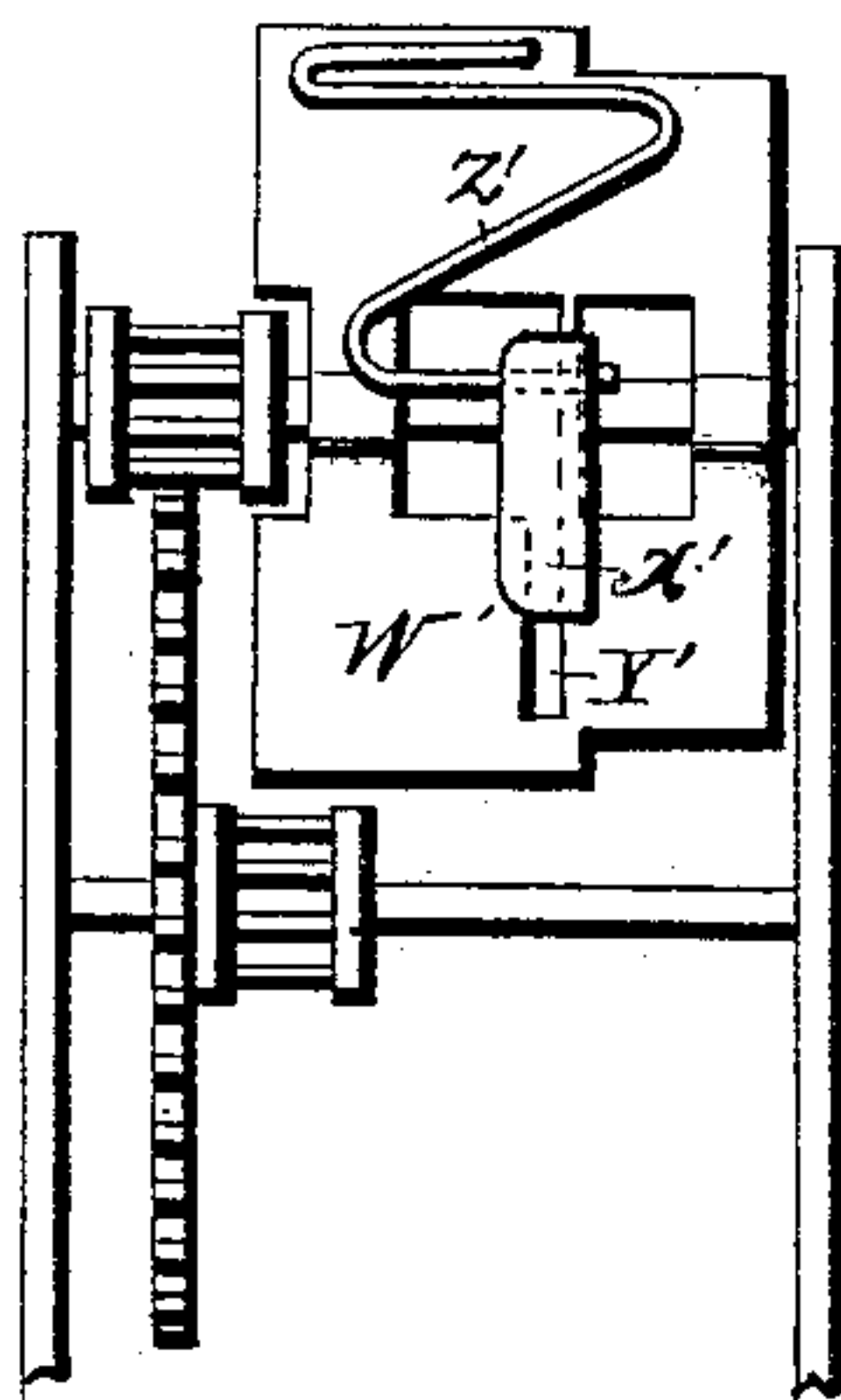


Fig. 9.



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UNITED STATES PATENT OFFICE.

GEORGE B. OWEN, OF WINSTED, CONNECTICUT.

STRIKING MECHANISM FOR CLOCKS.

SPECIFICATION forming part of Letters Patent No. 294,262, dated February 26, 1884.

Application filed April 24, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. OWEN, of Winsted, in the county of Litchfield and State of Connecticut, have invented certain new and
5 useful Improvements in Striking Mechanisms for Clocks; 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
10 make and use the same.

My invention relates to an improvement in speed-regulators for the striking mechanism of clocks, the object being to provide means whereby all operations of striking shall be per-
15 formed uniformly as to time and be unaffected by the varying impulse of the actuating-spring.

With this object in view my invention consists in certain details of construction and combinations of parts, as will be hereinafter de-
20 scribed, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in perspective of the striking mechanism of a clock, said mechanism embodying
25 one of my improved speed-regulators. Fig. 2 is a detached view of the speed-regulator, and Figs. 3, 4, 5, 6, 7, 8, and 9 are views of modified forms which my invention may assume.

30 A and B, respectively, represent the front and rear frame-plates of a clock from which the time mechanism has been removed, the striking mechanism remaining.

The arbor C, upon which the fan has heretofore been mounted, is provided with the ordinary pinion, D, which meshes with the upper-
35 most wheel, E, of the striking-train.

My invention comprehends the removal of the fan and replacing it by devices arranged
40 and adapted to develop a resistance sufficient to absorb the impulse tending to actuate the striking-train beyond its normal rate of speed, which is gaged by the said regulating devices. In virtue, therefore, of the regulating devices,
45 a constant rate of speed is maintained in the striking mechanism, whereby all operations of striking are performed uniformly and independent of the impulse of the actuating-spring, the tension of which declines as it relaxes, or,
50 in other words, as the clock runs down.

The regulating devices aforesaid may assume many different forms, the principle upon which they are constructed remaining, however, the same in all, and consisting, essentially, of an association of weights and springs, 55 and in some cases friction devices in such manner that after the striking mechanism exceeds a predetermined rate of speed a resistance exactly counterbalancing the increase of impulse will be developed and restore the normal speed 60 of the striking-train.

The regulating device shown in Fig. 1 of the drawings consists of a sleeve, F, mounted upon the arbor C, and provided with two spring-arms, G, terminating in weights hav- 65 ing convexed peripheries, in which strips H, of leather or equivalent material, are mounted. The tension of the said spring-arms is adjusted to support the weights in their normal positions and exactly counterbalance the 70 centrifugal force developed by the striking-train when moving at its normal rate of speed. This principle of construction extends to all speed-regulators embodying my invention. When, however, the speed of the striking- 75 train exceeds the predetermined rate, the weights are deflected apart against the force of the arms G, the strips H of the weights being engaged with the inner periphery of the cup I, the same being secured to the plate H' 80 of the clock. The tension of the arms and the mass of the weights are relatively so adjusted that the retarding effect of the weights and the friction will always be sufficient to absorb the excess of impulse over that required to actuate 85 the striking mechanism at its normal speed. The excess of impulse will be the greatest when the actuating-spring is at its highest tension or when it is first wound up, gradually declining as the tension of the spring is 90 relaxed. On account of this variation in the excess of impulse, it is necessary that the regulating devices should be adapted to compensate for any excess of impulse. It should also be observed that the normal rate of speed 95 determined upon for the striking mechanism should be the rate at which the spring is capable of actuating it when in its most relaxed condition, in order that the normal rate may be preserved until the clock runs down. The 100

normal rate of speed depends upon the mass of the weights and their normal positions with respect to the fan-arbor, and these conditions may be varied as desired to produce different rates of speed. By the use of the speed-regulator the time elapsing between the successive soundings of the bell is well marked and uniform and confusion of tone avoided, the regulator being an especially desirable and important adjunct of clocks provided with the so-called "cathedral gong-bells," which require a deliberate and uniform striking action in the production of the best effects to be obtained from them.

The device shown in Fig. 3 of the drawings closely approximates the construction above described. It consists of a sleeve provided with spring-arms J, to the outer ends of which segmental weights K are attached. When the said weights are thrown apart, they are engaged with the lining L of the flaring cup M, which is secured to the front plate of the clock, the divergence of the weights and the friction operating to counterbalance any excess of speed in the striking-train.

The device illustrated in Fig. 4 of the drawings comprehends the extension of the fan-arm through the frame-plate A, to which the cup N is attached. A spring attached to the projecting end of the arbor, and consisting of two bent arms, O, terminating in weights P, is located within the cup aforesaid. Strips Q, of leather or equivalent material, mounted in the said weights, are engaged with the inner periphery of the cup when an accelerated action of the striking-train causes the weights to diverge. If desired, a cap, R, adapted to fit over the cup, may be employed to conceal and protect the spring and its attachments.

The modification represented in Fig. 5 of the drawings consists, essentially, of sleeves S and T, mounted upon the fan-arbor and connected by two bow-shaped springs, U, of a disk, V, attached to the collar T, and provided with a facing, W, and of ball-weights X, attached to the said spring by arms Y, crossing and respectively affording bearing for each other, as shown. When the centrifugal force developed by the arbor exceeds the tension of the springs, the weights are separated, with the effect of drawing the springs together and practically lengthening them, whereby the disk V is forced into contact with the plate, the friction thus developed, and the divergence of the weights operating to retard the speed of the striking-train.

In Fig. 6 of the drawings my invention is shown as embodied in a device employing adjustable weights and friction devices in connection with both flat and coiled springs. It consists of a plate, Z, mounted upon the fan-arbor, and normally held against the pinion thereof by the spring A', encircling the arbor, and interposed between the said plate and a nut, B', located on the arbor. The said plate Z is provided with two flat spring-arms, C',

terminating in plates D', the lapping ends of which are provided with apertures E', which inclose a conical collar, F', secured to the fan-arbor. The outer ends of said plates are bifurcated, as shown, for the attachment and adjustment of the weights G. Of the operation of this device it is to be said that when the striking-train exceeds its normal speed the weights diverge, and to the retarding effect thus obtained is added that derived from friction between the walls of the apertures E' with the collar F'. After the striking-train has acquired a certain speed beyond that normally attributed to it the tension of the spiral spring will be overcome, allowing the plate F' and the arms I' to move forward and the weights to be more widely separated with increased retarding effect, in virtue of the conical shape of the collar F', which tapers toward the plate A.

The device shown in Fig. 7 of the drawings consists of a sleeve, H', rigidly attached to the fan-arbor, and provided with two laterally-extending arms, I', to which arms J' are fulcrumed. The inner ends of the said arms J' are provided with weights K', while their outer ends terminate in bearings L', the same being located in close proximity to the disk M', which is attached to the frame-plate A, and provided with a face, N', of leather or felt. The arms I' are held together by an elastic band, P', or its equivalent, the weights K' being held against a sleeve, Q', encircling the arbor. When the centrifugal force developed by the striking mechanism exceeds the normal tension of the elastic band, the weights will fly apart, with the effect of impinging the bearings L' upon the face N' of the disk M, the friction thus developed operating to reduce the speed of the striking mechanism to its normal rate.

The modification represented by Fig. 8 of the drawings consists, essentially, of a sleeve, R', mounted on the fan-arbor, and provided with diverging spring-arms S', terminating in ball-weights T', and of an adjustable friction device consisting of a stop, U', having its lower end secured to the arbor of the train-wheel E, while its upper end is bent to form a loop, provided with a lining, V', of leather or felt, and arranged to embrace the diverging arm S'. When the striking-train exceeds its normal rate of speed, the weights will separate and the said arms assume greater divergence, the latter being then engaged with the loop with retarding effect, which may be increased or decreased by moving the friction device toward or from the weights, respectively.

In Fig. 9 of the drawings my invention is shown to be embodied in a device consisting, essentially, of a fan, W', mounted upon the fan-arbor of a slotted weight, X', mounted in a slot, Y', extending from the center to one edge of the fan, and of a spring, Z', arranged to maintain the weight in its normal position in which its slot receives the fan-arbor, as shown. When

the speed of the striking-train is accelerated, the weight will move toward the edge of a fan for a distance proportional to the degree of the acceleration over the normal speed of the train, the retarding effect of the device being proportional to the degree of displacement in the weight, for as the same is moved from the arbor the power required to actuate it is increased.

It should be here observed that as soon as the speed-regulators have performed their work of correcting any acceleration in the speed of the train, the springs associated with them will at once restore their weights to their normal positions.

In view of the modification set forth, and of others of which the invention is obviously susceptible, I would have it understood that I do not limit myself to the exact constructions and arrangements of parts herein described, but hold myself at liberty to make such slight changes and alterations as fairly fall within the spirit and scope of my invention.

I am aware that patents have been granted for machine-brakes consisting, essentially, of weighted arms connected with the main shaft, and adapted to be separated by centrifugal action, and engage a stationary surface, and retard the speed of the main shaft by the frictional contact of said weights with such stationary surface, and hence I would have it understood that I make no broad claim to an automatic brake or governor.

My improvement relates to and is especially adapted for the striking mechanism of clocks.

Instead of employing a fan on the fan-arbor, which device has almost universally been adopted in strike-movements, and is objectionable and defective, owing to the fact that it is not uniform and constant in its operation, I dispense with the fan altogether, and on the fan-arbor secure a delicately-constructed governor, which has the effect of insuring a

regular and constant motion to the strike mechanism, and thereby secure results impossible to be attained by the devices heretofore employed in the manufacture of clocks.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a clock, the combination, with the fan-arbor of the strike-train, of a speed-regulator attached to the fan-arbor and actuated thereby, said regulator consisting, essentially, of springs and weights constructed and arranged to regulate the rate of speed of the striking-train, substantially as set forth.

2. In a clock, the combination, with the fan-arbor of the striking-train, of a speed-regulator attached to the fan-arbor and actuated thereby, and constructed and arranged to regulate the rate of speed of the striking-train by varying frictional resistance, substantially as set forth.

3. In a clock, the combination, with the fan-arbor of the striking-train, of a speed-regulator attached to the fan-arbor and actuated thereby, said speed-regulator constructed and arranged to be adjusted and insure any predetermined uniform rate of speed to the striking-train, substantially as set forth.

4. In a clock, the combination, with the fan-arbor of the strike-train, of a speed-regulator consisting, essentially, of spring-arms attached to the fan-arbor, weights attached to the outer ends of said arms, and a stationary frictional surface with which said weights engage, substantially as set forth.

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

GEORGE B. OWEN.

Witnesses:

FRANK D. HALLETT,
HENRY B. ABEL.