M. G. FARMER.

Electric Clock.

No. 9,279. Patented Sept 21, 1852.

Fig: 4.

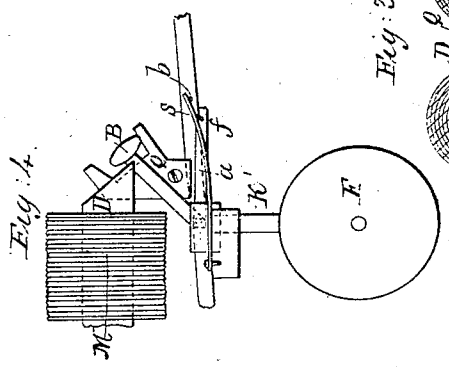


Fig: 3

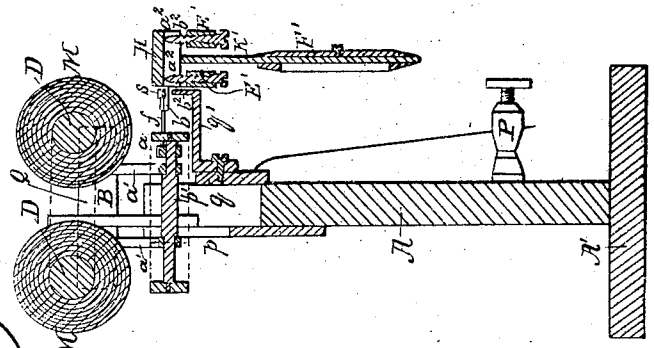


Fig: 1.

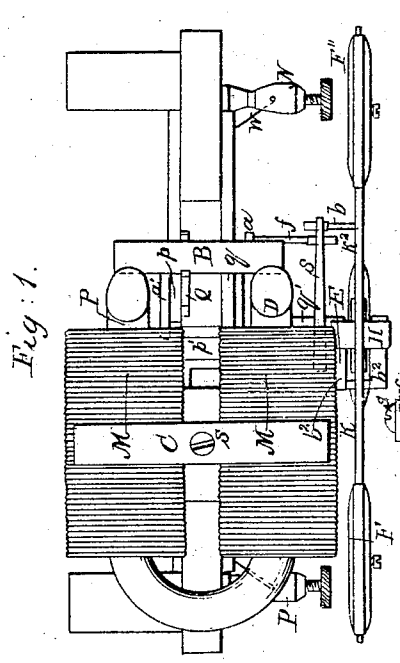
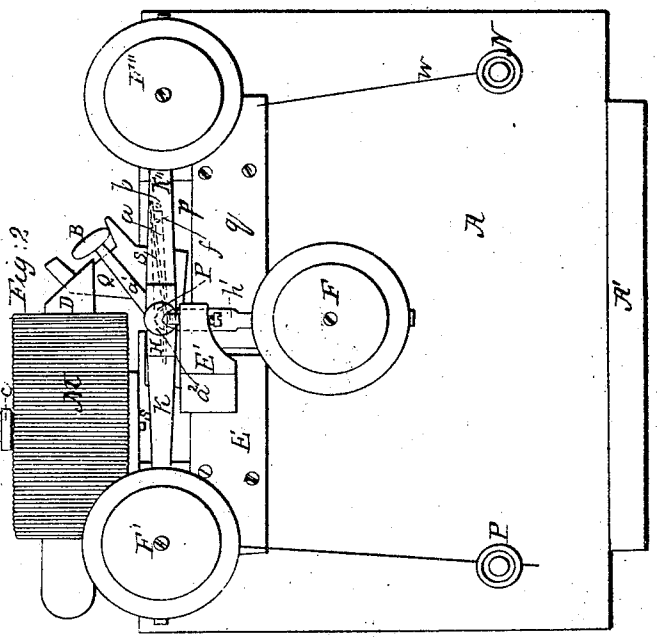


Fig: 2



UNITED STATES PATENT OFFICE.

MOSES G. FARMER, OF SALEM, MASSACHUSETTS.

IMPROVEMENT IN GALVANIC CLOCKS.

Specification forming part of Letters Patent No. **9,279**, dated September 21, 1852.

To all whom it may concern:

Be it known that I, MOSES G. FARMER, of Salem, in the county of Essex and State of Massachusetts, have invented a certain new and useful Improvement in the Construction of Galvanic Clocks; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, letters, figures, and references thereof.

Of the said drawings, Figure 1 is a top view of my galvanic or electric clock improvement. Fig. 2 is a rear elevation of it. Fig. 3 is a central, vertical, and transverse section of it. Fig. 4 is a side view, giving the relative position of the pendulum-impulse spring, pallet, armature, and magnet.

In Figs. 1, 2, and 3, A′ represents a horizontal board to which is affixed the upright board or partition A. To one side of this partition or board is attached the metallic plate *p*, which supports the bearings of the armature, and also supports the fork Q, which limits the motion of the armature B.

q is a metallic plate attached to the partition A. To this plate is affixed the arm *q′*, which projects therefrom and supports the impulse pallet or spring *s*.

E is another metallic plate secured to the partition A. To this plate E is affixed an arm, E′, from which project upward knife edges or points a^2 a^2, upon which is suspended the pendulum.

The cross-bar H of the pendulum has a groove on its under side, which rests on the points a^2 a^2, projecting upward from the arm E′. The arm E′ is forked, as seen at b^2 b^2. The perpendicular rod K′ of the pendulum hangs between the prongs b^2 b^2 of the fork E′. The plates E and *q* are on the same side of the partition A, and are insulated from each other, (they not being allowed to touch each other,) as also from the plate *p*, which is the other side of the partition A.

M is the electro-magnet, confined above the partition A by the cross-piece C and screw S, which enters the plate *p* or a projection from it. One end of the wire of the electro-magnet M is in contact with the plate *p*, and thus is in connection with the armature lever or arm *a* and lifting-pallet *f*. The other end of the coil of wire is connected with the screw-cup P. The cup N is connected by a wire, *w*, with the plate *q*, which, by means of the arm *q′*, supports the impulse spring or pallet *s*.

The armature B is attached to its axis or turning-axle *p′* by the arm *a′*. The pendulum is composed of a horizontal bar, *k″ k*, with a cross-piece, H, which rests upon the knife edges or points projecting upward from the arm E′, that is attached to the plate E by screws.

A perpendicular arm, *k′*, Fig. 1, projects downward from the middle of the bar *k″ k*. Upon the ends of the bar *k″ k* are bobs F″ F′. There is a bob, F, on the lower end of the arm *k′*. *a* is an arm attached to the axis *p′*, Fig. 3, of the armature B.

f is a pin (called the "lifting-pallet") projecting from the arm *a*. Its use is to lift or bend the impulse pallet or spring *s*. The pin *b* that projects from the arm *k″* of the pendulum is used to lift the impulse spring or pallet *s* from the lifting-pallet *f*. It also receives the impulse from the impulse-pallet.

D D represent the poles of the magnet, with inclined faces.

Suppose a suitable electric battery or generator of electricity to be connected with the screw-cups P and N. If, under such circumstances, the impulse-pallet *s* is in contact with the lifting-pallet *f*, the magnet M will become charged and attract the armature B and draw it toward it, at the same time lifting the arm *a*, the motion of which and its lifting-pallet *f* will lift the impulse-pallet *s*. If now the bob F″ be depressed a sufficient distance and released on the return of it, the pin *b* will lift the impulse-pallet *s* from the lifting-pallet *f*, and thus break the circuit and discharge the magnet M. The armature B will then instantly recede or fall away from the magnet, so as to leave the impulse pallet or spring *s* free to act on the pin *b* and impel the bob F″ of the pendulum downward, which it will do until it (the said impulse-pallet *s*) comes into contact with the lifting-pallet *f*, when the circuit will be again restored, the magnet M again charged, and the impulse spring or pallet again lifted by the motion of the lifting-pallet and armature. The pendulum still goes on until it has completed its vibration, when it will return and the same action will again take place. Thus the pendulum will

receive equal and constant impulses, while the battery retains sufficient power to raise the armature up to the extent of its motion, and no increase of battery power beyond that point ought to affect the times of vibration of the pendulum.

It is evident that the motion of the pendulum may be controlled by the force of a spring instead of the force of gravity. It will also be evident that if the impulse pallet or spring *s* were properly adjusted below the lifting-pallet *f* and the pin *b*, and if the end of the wire of the electro-magnet which is now connected with the plate *p* were charged and connected with the plate E (and, of course, with the pendulum) when the magnet is not charged, the weight of the armature B, acting by means of the lifting-pallet *f*, would depress the impulse pallet or spring *s*, and if the bob F″ were depressed till the pin *b* came into contact with the impulse-pallet *s*, the circuit would be complete, the magnet M charged, the lifting-pallet *f* raised by the motion of the armature B, and the impulse-pallet *s* left free to act upon the pin *b* and impel the bob F″ of the pendulum upward until the impulse-pallet *s* came into contact with the lifting (or, in this case, depressing) pallet *f*, when the motion of *s* would stop; but the pendulum would continue onward, thus breaking the circuit between the pin *b* and pallet *f*. The magnet M being discharged, the armature would recede depressing the impulse-pallet *s*, and it be prepared for another impulse when the pendulum returns. Thus the motion of the pendulum would be kept up while the strength of the battery was sufficient to entirely raise the armature.

It is well known that in electric clocks the armature of the magnet is connected to the wheel-work in some manner or by some machinery by which its periodical movements may be made to impel the clock-work. This connecting machinery is usually an impelling or draw pawl acting on a rachet-wheel fixed on the axle of the second-hand of the clock, or on the axle of some wheel that aids in giving motion to such axle of the second-hand.

As my improvement has no reference to such means of connecting the armature of the magnet and the wheel-work of the clock, I have not deemed it necessary to represent such in the drawings. Nor do I wish it understood that my improvement is to be confined to a pendulum, constructed in manner or having the form as described, as it may be applied to a pendulum otherwise made.

What I claim as my improvement or invention is—

The combination of the impulse-spring *s* and the pallets *f* and *b*, respectively connected with the armature of the magnet and the pendulum, and made to operate together and to make the pendulum operate or impart impulse to it, substantially as described.

In testimony whereof I have hereto set my signature this 10th day of May, A. D. 1852.

MOSES G. FARMER.

Witnesses:

R. H. EDDY,

G. W. CUTLER.