C. F. JOHNSON.

Clock

No. 4,662. Patented July 28, 1846.

Fig. 2,

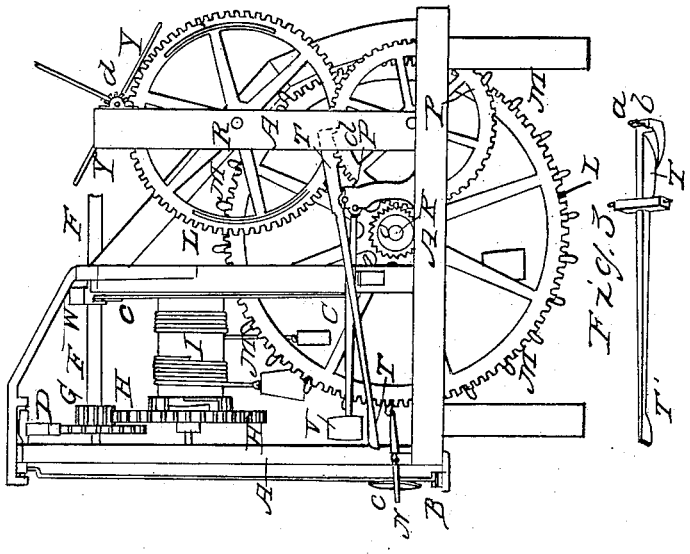


Fig. 3.

Fig. 4,

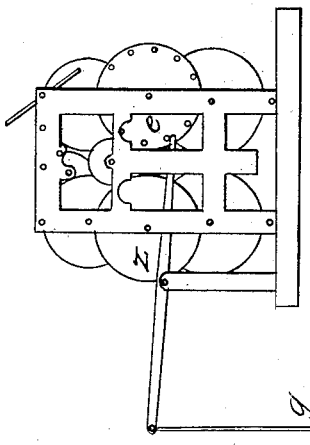
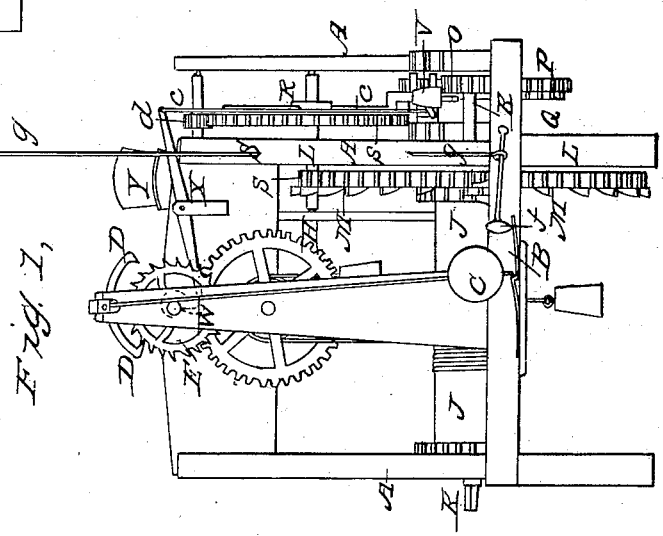


Fig. 1,



UNITED STATES PATENT OFFICE.

CHS. F. JOHNSON, OF OWEGO, NEW YORK.

TURRET-CLOCK.

Specification of Letters Patent No. 4,662, dated July 28, 1846.

To all whom it may concern:

Be it known that I, CHARLES F. JOHNSON, of the town of Owego, in the county of Tioga and State of New York, have invented certain new and useful Improvements in the Manner of Constructing Town or Turret Clocks; and I do hereby declare that the following is a full and exact description thereof.

In constructing my turret, or town clocks, I so arrange and combine the dial part thereof, which consists of the wheel work, and the other machinery that is employed to carry the hour and minute hands, and those also which govern the striking part, as to cause them to be governed in their action and indications by a time piece of the size and construction of those in ordinary use for household purposes, or a similar time piece made for the purpose, which will keep good time, and run for the period usually required in a town clock, say eight days. Such a time piece need not be furnished with a striking or clock part, its office being merely to lift a light hammer weighing half an ounce more or less, which hammer is to strike a blow at regular intervals, say every two and a half minutes, which is the interval that I prefer, although it may be made to strike a blow every minute if desired; in my description however, I will suppose the interval to be two and a half minutes. This blow is to be made upon a spring catch which holds a pendulous weight or pendulum at rest until such blow is struck, when such pendulum is allowed to make one vibration, and in so doing is to cause the minute and the hour hands to move to a distance required to represent two and a half minutes; this pendulum as it swings back is again detained by the spring catch until another blow is struck by the small hammer. The dial movement or parts concerned in giving motion to the hands of the turret clock are so connected with the striking parts of said clock as to cause it to strike the hours at the proper time under an arrangement to be presently described.

By my improvements I am enabled to substitute common cast iron toothed wheels in nearly all the parts of the turret clock concerned in the carrying of the hands and in the striking of the hours; no greater accuracy being required in these wheels than in those used for a common windlass, or other machinery employed for the moving of weights. I am enabled therefore to manufacture such public clocks at less than one half their ordinary cost, the accuracy of their indications being dependent entirely upon that of a small time piece which may be purchased, or made, at a cost of four or five dollars.

In the accompanying drawing, Figure 1 is a back, and Fig. 2 is a side elevation of one of my turret clocks without the time piece by which its motions are to be regulated.

A A is the frame work which is represented as if made of wood, but it may if preferred be made of cast iron. In these figures the respective parts are drawn on a scale of two inches to the foot as taken from an ordinary sized turret clock.

B is the spring catch which latches the pendulous body or pendulum C that is suspended from the arbor or shaft that carries the pallets D that engage with the swing wheel E of twenty four teeth; the arbor F of this swing wheel has a cast iron pinion G upon it of twelve leaves; this is driven by the cast iron wheel H of forty eight teeth on the shaft of the drum I, from which the weight is suspended that constitutes the maintaining power of the pendulous body or pendulum C. This pendulum is shown as detained by the spring latch B, and it is manifest that were this latch depressed by a blow, or otherwise, the pendulum would make one vibration, and would, on its return, be again detained by the spring catch. The office of the time piece employed to regulate the action of the turret clock is merely to depress this spring catch at the proper intervals; and under the arrangement given the minute hand would be moved twice in five minutes, passing to the distance of two and a half minutes at each motion. Were the spring B depressed once in a minute, the combination of the toothed wheels must be such as to carry the minute hand to the distance indicating one minute. The arbor F when used for a clock with a single dial, extends forward to the dial plate, and carries the minute and hour hands by means of cannon arbors in the ordinary manner; these parts not differing in any respect from those in general use are not represented.

J is the drum upon which the cord is wound that carries the weight to actuate

the striking part which is wound up in the usual manner; it is eighteen inches long and six inches in diameter. Upon the shaft K of this drum there is affixed a cast iron cog wheel L, of a hundred and fifty six teeth and having upon its side twenty six studs M, M, placed equidistant from each other and extending out about three eights of an inch beyond the cogs; these operate on the lever N that raises the hammer for striking the hours, as usual. On the projecting end of the shaft K is keyed a cast iron cog wheel O, of thirty two teeth, which gears into a cast iron count wheel P of ninety six teeth; this count wheel has on its inner side a projecting rim Q in which are notches duly spaced off to regulate the striking of the hours in a manner well known.

Upon a shaft or arbor R is affixed a cast iron cog wheel S which may be fifteen inches in diameter and which is denominated the stop wheel. This wheel is driven by the main cog wheel L for which purpose it has on its shaft a pinion S′, of twelve leaves that gear into the wheel L. The outer face of the wheel S, stands about an inch within the inner face of the count wheel, to make room for the action of a stout iron lever T T′ which is to operate in a manner to be presently described. On the stop wheel there are two projecting sectional rims U, U, rising about half an inch from the face of the wheel and each occupying about one fourth of a circle. The short end of the lever T has on its lower side a projecting tooth shown in dotted lines at *a* Fig. 2, which tooth is to fall into the spaces on the rim Q of the count wheel, or to rest on said rim after being relieved from the stop rim U as the hour is being struck. The inner end of the lever T is made about an inch in width so as nearly to fill the space between the count and stop wheels and is sufficiently heavy to cause it to preponderate over the long arm. Fig. 3 shows this lever separate from the clock and inverted; *a* is the tooth that falls into the spaces on the count wheel and *b* is that part which is to rest on the inner side of the rims U U when the tooth *a* is raised from said spaces. When within said spaces the part *b* arrests the motion of the stop wheel by its contact with one end of one of the rims U. The lever T has to be raised from the count wheel at the termination of every hour and this is effected in the following manner. V Fig. 2 is a hammer which may weigh from 1 to 2 lbs., and is to be raised to the height of about five inches; it is to strike at the proper time on the end T′ of the lever T and is thereby to raise its inner or shorter arm and disengage it from the count and stop wheels, when both these wheels will consequently be put in motion by the weight on the barrel J of the striking part. This hammer is raised by means of a snail formed cam W on the shaft F of the swing wheel as shown most distinctly by the dotted lines in Fig. 1. As the swing wheel revolves once in an hour it will gradually act on the end of the lever X by means of the cam and raise the hammer V, to the handle of which the cord *c c* is attached; the offset on the cam allows the hammer to fall at the proper time; that is to say, at the termination of each hour. This hammer is made to recoil by the action of a spring on its handle in the ordinary way. When the wheels are put in motion, the stop rim U passes immediately under the stop projection and holds the short arm of the stop lever up, and before the stop rim passes from under the stop projection, the count wheel moves so as to bring its rim under the tooth *a* of the lever and holds the short arm up, thus allowing the stop rims to pass freely under the stop projection until the opening in the rim of the count wheel allows the lever to descend, which brings the stop part *b* of said lever again into the circle of motion of the stop rims ready to arrest the action of the weight. This stopping apparatus does not differ materially from such as has been heretofore used but it is so modified as to adapt it to be operated upon by the sudden action of the hammer V and I have therefore thought it necessary to describe it particularly.

Y is a fan to govern the motion of the striking works which fan is driven by the gearing of a pinion *d* with the stop wheel; the operation of this part is well known.

Fig. 4 shows a part of a common eight day time piece which may be used for disengaging the pendulum C; the wheel *e e* on this time piece is represented as having upon it twelve pins which as the wheel revolves, will each in succession operate upon one end of the lever Z the opposite end of which lever is made to raise a small hammer *f* by means of a cord or wire *g*. If the wheel *e e* revolves once in thirty minutes it will cause the small hammer *f* to strike a blow at the end of every two and a half minutes. It will be manifest that wheels that revolve in other periods of time may be substituted for the wheel *e e*, the number of the lifting pins being made to correspond with the time of revolution. In Fig. 1, the hammer *f* is shown as resting on the spring catch B upon which it is to strike. Its weight is not sufficient to cause it to depress the spring catch but this it does by its momentum and then rests on said spring catch until again raised by the time piece. Although any accurate time piece may be used for determining the motion of the hands and the striking of the hours in a town or turret clock, upon the principle or in the manner herein made known, as a time piece for that purpose may

be more simple in its construction than most of those in general use, it will probably be preferred to make them with a view to their employment solely for the regulating of turret clocks.

When it is desired to have four dial plates, the same principle of communicating motion to the respective hands which is now in general use, that is, by means of suitable shafts and miter wheels, may be adopted.

Having thus fully described the nature of my improvements in the manner of constructing town, or turret clocks, and shown the manner in which I arrange and combine the respective parts thereof, what I claim therein as new and desire to secure by Letters Patent is—

1. The giving motion to the parts of such clocks as are concerned in carrying the hands, and in striking the hours, by the employment of a small time piece which is to raise a light hammer and to allow it to fall at determinate intervals and by its momentum, to disengage a pendulous body, or pendulum, connected with the hands and other parts of the dial work substantially in the manner herein set forth.

2. I also claim the manner of operating the striking parts of such clocks by the action of a hammer at the end of every hour; said hammer being operated upon by means of the apparatus that governs the motion of the hands, and substantially as herein described; it being understood that the numbers herein given are not absolute, but relate to proportion only.

I have already stated that turret clocks so constructed may be made at half the cost of those in general use but besides the point of economy they are more accurate than others, as, the time keeper being entirely detached from the apparatus which moves the hands, the powerful action of the wind on said hands has not the slightest influence on the rate of going.

CHAS. F. JOHNSON.

Witnesses:
THOS. P. JONES,
EDWIN L. BRUNDAGE.