(No Model.) 3 Sheets—Sheet 1.

O. SKRIVAN & F. DVORAK.

WATCHMAN'S ELECTRIC CONTROLLING APPARATUS.

No. 376,920. Patented Jan. 24, 1888.

Fig. 1.

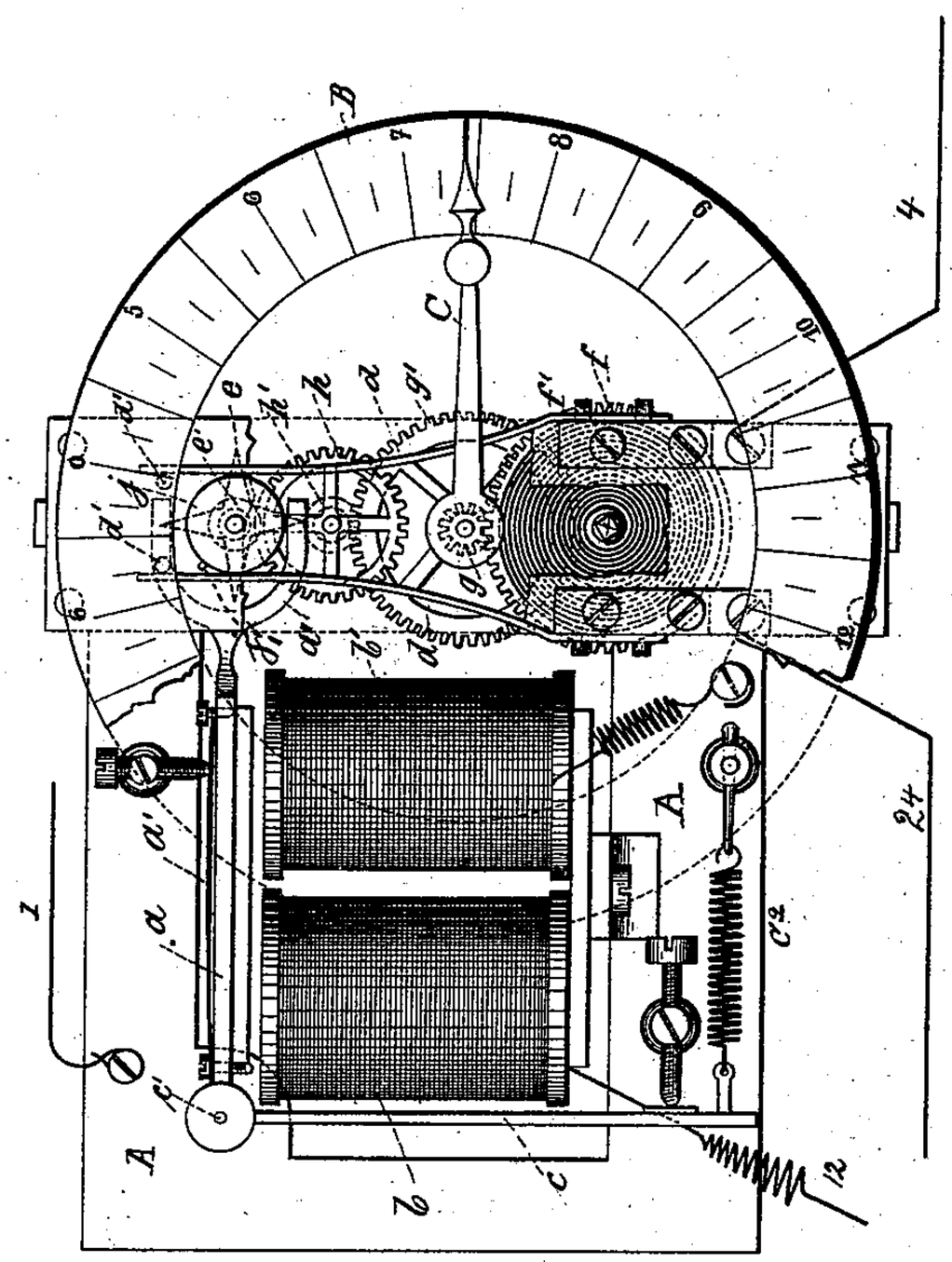
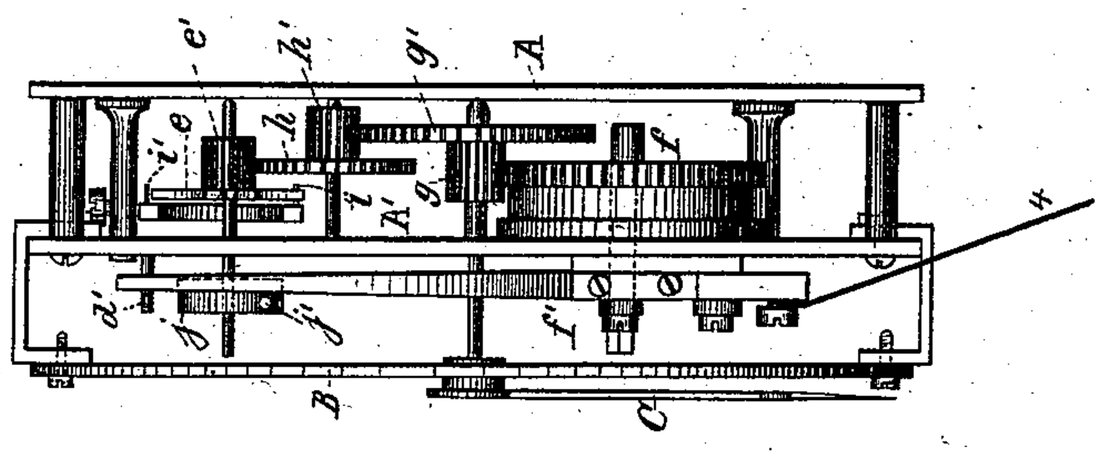


Fig. 2.



Witnesses

B. von Bültzingslöwen

F. W. Kubien.

Inventors

Otokar Skrivan

By Francis Dvorak.

Singerhöner.

Attorneys

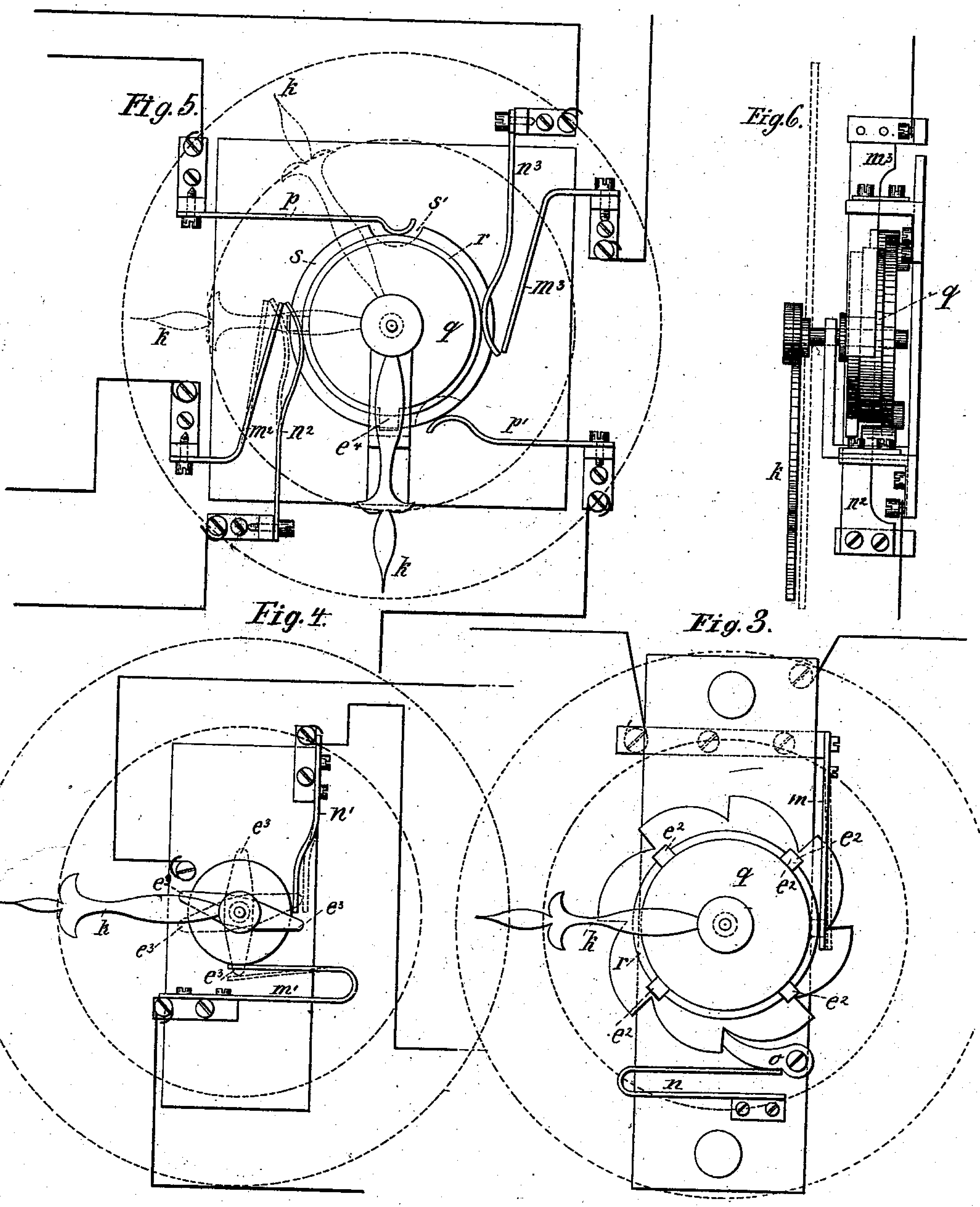
(No Model.)

3 Sheets—Sheet 2.

O. SKRIVAN & F. DVORAK.

WATCHMAN'S ELECTRIC CONTROLLING APPARATUS.

No. 376,920. Patented Jan. 24, 1888.



Witnesses
B. von Bültzingslöwen
F. W. Rubien.

Inventors
Ottokar Skrivan
Francis Dvorak
By Singer & Abner,
Attorneys

(No Model.)

3 Sheets—Sheet 3.

O. SKRIVAN & F. DVORAK.

WATCHMAN'S ELECTRIC CONTROLLING APPARATUS.

No. 376,920. Patented Jan. 24, 1888.

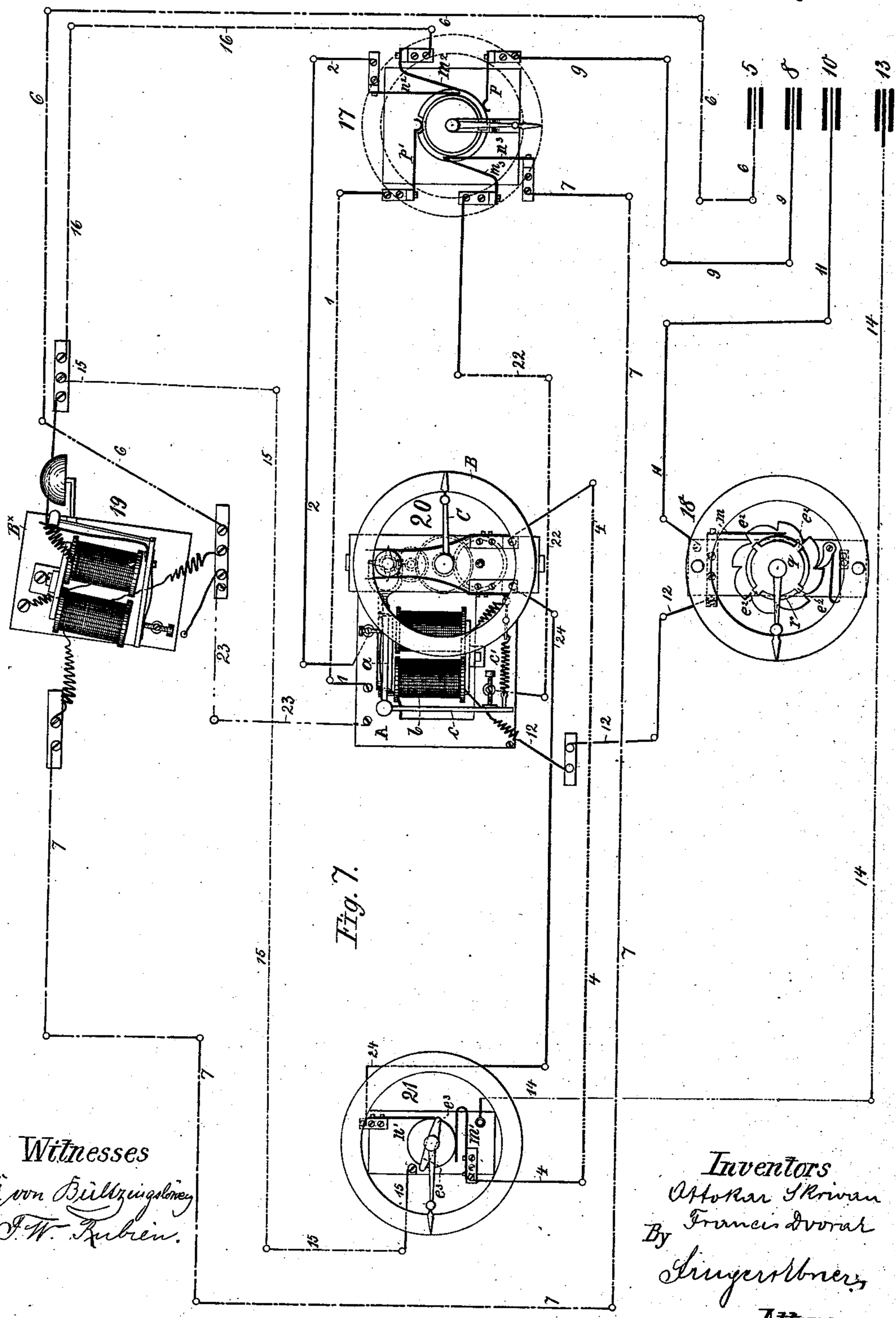


Fig. 7.

Witnesses
B. von Bülzingslöwen
F. W. Rubien.

Inventors
Ottokar Skrivan
Francis Dvorak
By Singerlbners,
Attorneys

UNITED STATES PATENT OFFICE.

OTTOKAR SKRIVAN AND FRANCIS DVORAK, OF VINOHRADY, PRAGUE, BOHEMIA, AUSTRIA-HUNGARY.

WATCHMAN'S ELECTRIC CONTROLLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 376,920, dated January 24, 1888.

Application filed February 5, 1887. Serial No. 226,695. (No model.)

To all whom it may concern:

Be it known that we, OTTOKAR SKRIVAN and FRANCIS DVORAK, both subjects of the Emperor of Austria-Hungary, and both residing at Vinohrady, Prague, in the Kingdom of Bohemia, in the Austrian Empire, have invented certain new and useful Improvements in Electric Watchmen-Controlling Apparatus, of which the following is a specification.

It is always very desirable to be able to know if a watchman on duty be at his post at the proper times.

The object of our invention is to provide an electric apparatus by means of which a watchman visiting certain designated stations at certain given intervals can make registry of each visit to each station upon a registering device at a central station at which the controlling watchman is on duty. The various devices by which this is accomplished will be more fully hereinafter described.

The nature of the invention consists in the details of construction and combination, substantially as illustrated in the drawings, hereinafter described, and subsequently pointed out in the claims.

Figure 1 illustrates a front view of a central registering-clock with part of the frame broken away for the purpose of better illustration. Fig. 2 is an edge view of the same. Figs. 3, 4, and 5 illustrate various forms of the transmitter to be used by the watchman at his station in signaling the central station. Fig. 6 is an edge view of the same modification illustrated in Fig. 5. Fig. 7 is a diagrammatic illustration of the relative arrangement of the various stations and their connecting-circuits.

The central registering-clock, which is illustrated in Figs. 1 and 2, is described as follows: A A′ is the frame of the clock. In this is set the spur-wheel and barrel *f*. Within this barrel is coiled the spiral spring *f′*, with its inner end made fast to the shaft of the wheel and its outer end fastened to the barrel both in the common and well-known way, and arranged with ratchet, pawl, and winding-post, as such devices are ordinarily constructed for winding in clocks. This spur-wheel *f* meshes into the pinion *g* upon the same shaft which carries the index C. Upon this same shaft is mounted the spur-wheel *g′*, which meshes into the pinion *h′*. Upon the same shaft with the pinion *h′* is mounted the spur-wheel *h*, which meshes into the pinion *e′* upon the same shaft with the escapement-wheel *e* and the disk-wheel *j*. The shafts of all this train of wheels are journaled in bearings in the frame A A′ of the clock. The escapement consists of the said wheel *e*, which is star-shaped, and the forked bell-crank lever *a″ a c*. Upon each of the forks of this lever is a pin. The upper one of these pins is designated by *i′* and the lower one by *i*. This bell-crank lever *a″ a c* is pivoted at *c′* and actuated by the magnet *b b′* and the spring c^2. The graduated dial B is provided, on which are designated signals transmitted by the watchman from the out station. Two springs, *d* and *d*, attached to the frame of the clock, rest upon the insulating-pins *d′* and *d′* and act in connection with the pin *j′*, which the disk-wheel *j* carries on its edge.

The out stations, where the watchman is to call and make signals, are each provided with a transmitter, by which the circuit from this station to the central station may be closed or broken to give the signal. Three different modifications of this device are illustrated in Figs. 3, 4, 5, and 6.

In the example illustrated in Fig. 3 an index-hand is mounted upon the disk *q*. The edges of this disk are formed into a ratchet, as illustrated, in which works the pawl *o*, held by the resilience of the spring *n*. Upon the disk *q* is a shoulder, upon which are lugs e^2, between which and the ratchet is placed the insulating-ring *r*, so that the spring *m*, when the disk *q* is turned, will be sometimes on the lugs e^2 and sometimes on the insulating-band *r*, and thus an electric circuit may be closed and broken alternately by revolving the disk-wheel *q*. This may be accomplished by moving the index-hand K on a dial-plate provided for that purpose, each graduation of the dial marking the distance the index-hand must be moved to transmit the signal.

Fig. 4 illustrates another example of the transmitter. In this the points e^3, coming into contact with the springs *m′* and *n′*, alternately close and break circuits with the central clock and a bell in the central station.

In the example of the transmitter illustrated

in Fig. 5 the springs n^2 and n^3, while resting on the insulating-band r, are not in contact with the springs m^2 and m^3; but when the lug e^4 raises either n^2 or n^3 the contact with the other spring is complete, as shown in dotted lines at n^2 m^2. In this way by properly attaching conductors a circuit may be closed and broken with the central clock or the bell in the central station; or this form of the transmitter may be used to break the circuit. As long as both the springs p and p' ride on the edge of the disk q, so long the circuit will be closed; but as soon as the revolution of the disk q brings the notch s' to the bent end of one of these springs the bend, falling into the notch, rests on the insulating-ring r and the circuit is broken; and it is obvious that the apparatus may be so arranged that the signal may be as easily transmitted by breaking as by closing the circuit.

The simplest form of this invention is illustrated by the connections of 18 and 20 of Fig. 7. Let 10 represent the battery, a wire from one pole of which is conducted to the earth in the usual way. Conductor 11 connects the other pole with the signal-transmitter 18. This is connected with the central clock, 20, by the conductor 12, and a proper connection is made from the said central clock to the earth. As long as the spring m lies on the insulating-ring r, the connection between the battery 10 and the clock 20 is incomplete; but as soon as the watchman comes and turns the mechanism, as heretofore described in relation to Fig. 3, until one of the lugs e^2 comes upon the spring m. Then the circuit is closed. As the central clock, 20, is the same as that illustrated in Fig. 1, we now refer again to said Fig. 1. The current from the battery 10 is, as aforesaid, transmitted through the station 18 to the central clock, entering the central clock through the conductor 12, and charges magnet b b'. Until now one point of the escapement-wheel e was resting upon the lower pin, i, of the escapement-lever a a'', pressed by the resilience of the spring f', acting through the train of wheels in the clock heretofore described; but as soon as the magnet b b' becomes charged by reason of the watchmen at the out station closing the circuit, as before described, the arm a of the escapement-lever is drawn downward by the attraction of the magnets, carrying the pin i below the point of the escapement-wheel. This point of the escapement-wheel instantly passes this pin i and catches on the pin i', which by reason of the movement of the escapement-lever is now in its way. This pin i' holds the wheel in such a position that as soon as the watchman at the out station has moved the index so far as to again break the circuit, and the resilience of the spring c^2 returns the escapement-lever to its original position and releases the point of the escapement-wheel resting on the pin i', the point of the escapement-wheel e second after that just escaped from the pin i falls upon the said pin i. Thus as there are only four equidistant teeth in the escapement-wheel it makes the half of a turn with each escapement, and at each escapement allows the mechanism motion enough to carry the index-hand C forward to the next graduation on the dial B, and thus each visit of the watchman to the out station is registered by the central clock. If it is desirable, the conductor from the clock, instead of leading to the ground, may be connected with a bell, also in the central station, as illustrated by the conductor 23 and the bell mechanism $B^{\times}$ of Fig. 7. From this bell mechanism a wire may be conducted to the earth to complete the circuit; or, if it may be desired, the conductor 23 may be connected with the insulated springs d d, so that as the pin j' of the disk-wheel j springs around and impinges with momentary connection on one of the springs d the bell will give a single stroke to announce the registry of the signal from the out station. Each separate out station may thus have its separate transmitter and separate central clock and bell; or the whole series may be joined together and be operated with one central clock or one central clock and one bell; or the bell mechanism may be operated by an independent battery, which is designated by 5. In the case of the transmitter 21, whose actuating-battery is designated by 13, the circuit may be closed with the bell and clock alternately, transmitting the current through the conductors 15 and 24 alternately by alternate contact of the points e^3 with the springs m' and n'. In the case of transmitter 17, whose actuating-battery is designated by 8, the circuit may be closed on one side with the bell and with the clock on the other, or with the bell on both sides, or with the clock on both sides, by the proper connection of the conductors 7, 22, 2, and 16 and the springs m^2 n^2 m^3 n^3, as hereinbefore specified. This transmitter may also be used to break the circuit by the proper disposition of the conductors 9 and 1 and by the operation of the springs p and p', as hereinbefore described.

By means of this apparatus one watchman at a central station is made aware of the proper attendance of other watchmen at out stations at proper designated intervals of time, and if either watchman fails in properly visiting an out station and transmitting his signal the failure of registry at the central station makes it immediately apparent.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In an electric clock, the combination of the frame A A', the spring f', the train of wheels f g g' h h' e', their shafts journaled in said frame, the escapement-wheel e, the escapement-lever a'' a c, pivoted to said frame at c', the spring c^2, the magnet b b', the disk-wheel j, the pin j', the springs d d, attached to the said frame, and electric connections, substantially as specified, for transmitting an electric current to and through said mechanism, substantially as and for the purpose set forth.

2. The combination, with an electric clock, a bell mechanism, and an electric battery and

circuit, all substantially as hereinbefore specified, of a transmitter consisting of the disk *q*, having edges formed into a ratchet in which works pawl *v*, held by spring *n* and carrying the index-hand K, the lugs e^2, the insulating-ring *r*, and the spring *m*, by the use of which, to break and close said circuit, signals may be transmitted, registered, and announced, substantially as and for the purpose set forth.

In witness whereof we hereunto set our hands in presence of two witnesses.

OTTOKAR SKRIVAN.
FRANCIS DVORAK.

Witnesses:
ADOLF FISCHER,
JOSEF BEROUNSKY.