

(No Model.)

T. W. SHEPHERD.
ELECTRIC CONTROLLING DEVICE.

No. 493,602.

Patented Mar. 14, 1893.

Fig: 1.

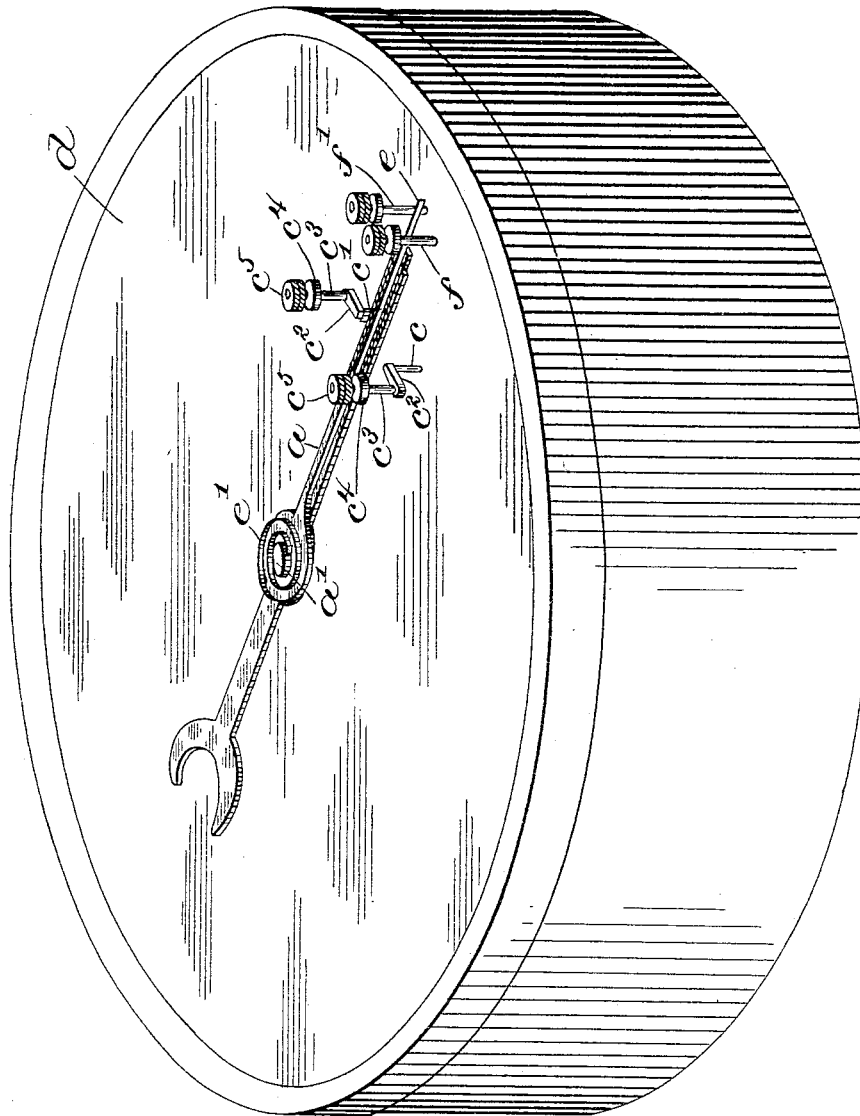
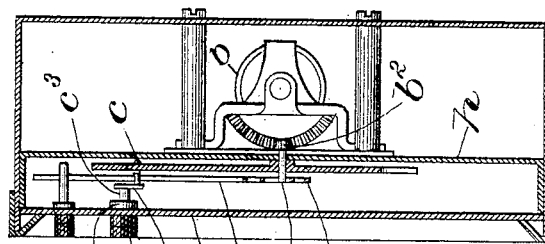


Fig: 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

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ELECTRIC CONTROLLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 493,602, dated March 14, 1893.

Application filed October 24, 1891. Serial No. 409,665. (No model.)

To all whom it may concern:

Be it known that I, THOMAS WM. SHEPHERD, of Peabody, county of Essex, State of Massachusetts, have invented an Improvement in Electric Controlling Devices, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide an improved electric controlling device.

In accordance with this invention, the main contact arm, arranged to move between two fixed main contacts, is provided with an auxiliary contact arm, arranged to move between two other fixed auxiliary contacts independent of said main contacts, the auxiliary arm being flexibly or yieldingly connected with the main arm in order that the latter may have a movement not only in unison with, but also independent of said auxiliary arm, as will be more fully hereinafter described.

The invention also comprehends an improved method of supporting the fixed contacts, which consists in fixing the same to a movable glass cover, arranged to cover the working parts of the device.

Other features of the invention will be hereinafter described and pointed out in the claims.

Figure 1 of the drawings is a face view of an electric controlling device embodying this invention; Fig. 2, a section of the same taken through the main contact arm Fig. 1.

Referring to the drawings, *a* represents the main contact arm, actuated by any suitable or desired mechanism contained within the inclosing case or frame *A*. The actuating mechanism referred to, may be of suitable character to effect the desired result, it consisting as herein shown, of a lamina or thermal coil *b*, responsive to changes in temperature, expansion and contraction of the lamina, acting through the sector *b'* and pinion *b²* on the staff *a'*, to move the main contact arm *a*, in one or the other direction. The fixed main contacts *c, c'*, between which the main contact arm *a* moves, are represented as carried by the transparent glass cover or plate *d*, which insulates the contacts and which is made rotatable in its frame in the case *A*, so that the position of the contacts may be changed to any point or degree, by moving the glass in one or the other direction. A

finer adjustment is provided by placing the contacts on the ends of arms *c²*, fast on the spindles *c³*, having shoulders *c⁴*, the spindles being extended through the glass *d*, and threaded to receive the lock nuts *c⁵*. By slackening the nuts *c⁵*, the spindles *c³* may be turned in either direction, to move the contacts *c, c'*, either toward or away from the contact arm, *a* and again clamped in position, providing a very fine and accurate adjustment.

In accordance with this invention, an auxiliary contact arm *e* is provided, which as herein represented, is connected by means of the spring-like coil *e'*, with the staff *a'*, of the main contact arm *a*, the auxiliary arm *e*, having a range of movement between two auxiliary contacts *f, f'*, also carried by the front glass *d*, but preferably placed nearer to each other than the contacts *c, c'*, as represented.

In practice the two contacts *f, f'*, will be connected in circuit in suitable manner, to operate any mechanism whenever the auxiliary arm *e* closes the circuit through one or the other of the contacts, while the contacts *c, c'*, may be connected in an alarm circuit, to ring an alarm whenever a circuit is closed, by the main contact arm *a*.

The operation of the device is as follows:— The contacts having been previously adjusted, the main contact arm *a* will be moved in one or the other direction by the lamina, carrying with it in unison, the auxiliary contact arm *e*, which when moved sufficiently, will close the circuit through one of the auxiliary contacts *f, f'*, to effect the desired result. If however, the desired result is not effected by the contact of the auxiliary arm *e* with one of the contacts *f, f'*, the main arm *a* will continue to move in the same direction, the flexible connection *e'*, permitting it to move while the auxiliary arm *e* is held stationary, until it forms a connection through one of the main contacts *c, c'*, to ring an alarm to notify the attendant of the failure of the device to operate properly. The contacts *f, f'*, and *c, c'*, may be arranged in circuit in any other desired manner usual, without departing from the scope of this invention, and the contact arm *a* may be operated by a mechanism responsive to changes in pressure, instead of changes in temperature.

The term "flexible or yielding connection"

between the main and auxiliary contact arms, is understood to include any connection whereby the two may move together for a portion of their movement, but which shall permit one of the arms to move independently of the other as well.

The invention is not limited to the particular arrangement and construction herein shown, as the same may be varied to meet various requirements.

A dial or indicating plate *h*, provided with suitable indicating characters, may be provided, to assist in the adjustment of the contacts if necessary.

I claim—

1. The combination of a movable main contact arm, an auxiliary contact arm flexibly connected therewith, and independent contacts for said main and auxiliary contact arms, to operate substantially as described.

2. The combination of a movable main contact arm, main contacts between which it moves, an auxiliary contact arm connected therewith by a flexible connection *e*, and auxiliary contacts independent of said main contacts between which said auxiliary arm moves all to operate substantially as described.

3. A movable main contact arm, and main contacts between which it moves, combined with an auxiliary contact arm flexibly connected with said main arm, and movable between two auxiliary contacts placed nearer to each other than said main contacts, to operate substantially as described.

4. In an electric controlling device, a movable contact arm, combined with a transparent insulating plate covering the same, and a contact carried by said plate to co-operate with said contact arm, said plate serving as an insulating support for the contact and as a transparent covering for the device, substantially as described.

5. In an electric controlling device, a movable contact arm, combined with a movable transparent insulating plate covering the same and a contact carried by said plate to co-operate with said contact arm, said plate serving as an insulating support for the contact and as a transparent covering for the device, substantially as described.

6. In an electric controlling device, movable main and auxiliary contact arms flexibly connected, combined with a movable glass covering said arm, and contacts carried by said glass, to operate substantially as described.

7. The combination with a movable contact arm of a glass, and a contact on an arm, of a rotatable spindle extended through said glass, and locking devices to clamp said spindle, substantially as described.

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

THOMAS WM. SHEPHERD.

Witnesses:

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