F. O. HEUSER.

TWO-WAY REGISTER ACTUATING MECHANISM.

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1,084,634.

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Fig. 1

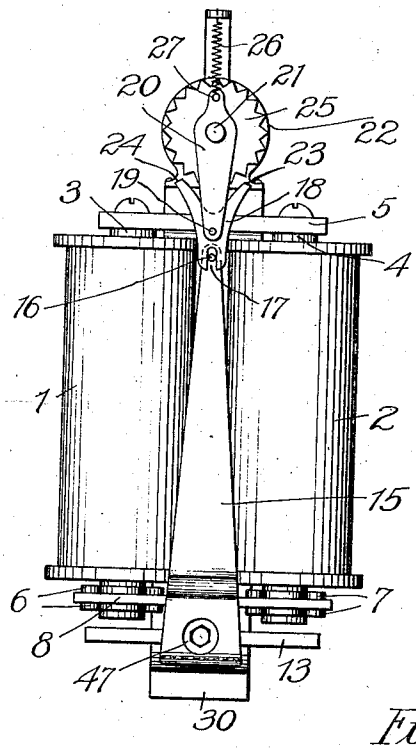


Fig. 2.

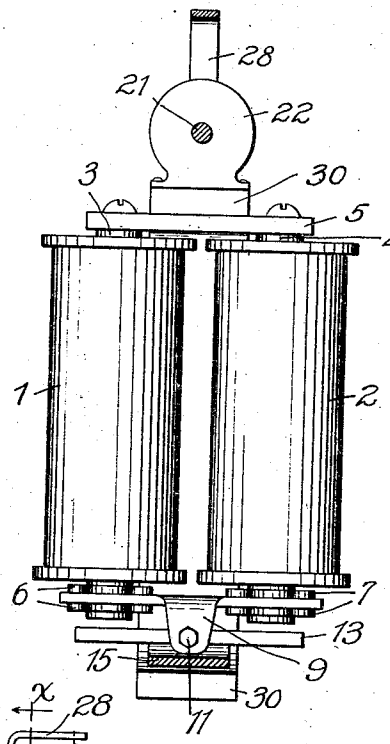


Fig. 3

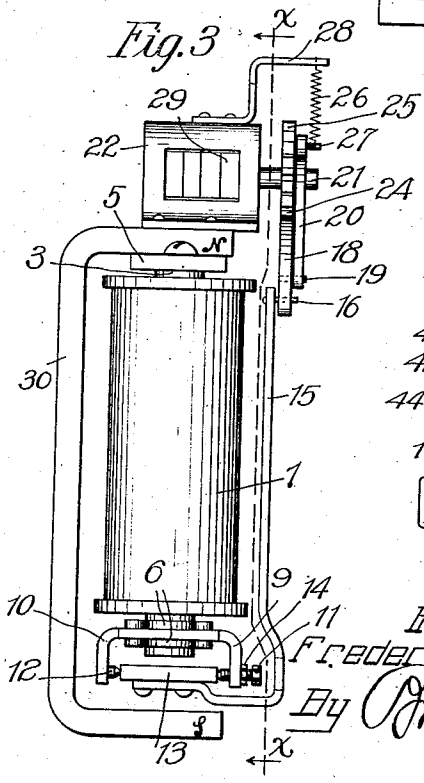


Fig. 4.

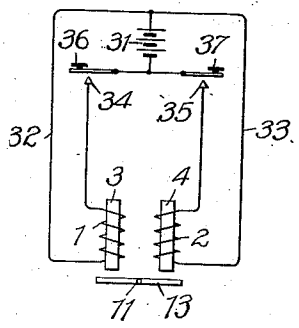
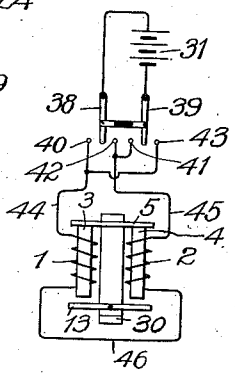


Fig. 5.



Witnesses

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TWO-WAY-REGISTER-ACTUATING MECHANISM.

1,084,634. Specification of Letters Patent. Patented Jan. 20, 1914.

Application filed April 16, 1909. Serial No. 490,320.

To all whom it may concern:

Be it known that I, FREDERICK O. HEUSER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Two-Way-Register-Actuating Mechanisms, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to an improved means for operating registers adapted to be driven in one direction to increase the reading of the register and in the opposite direction to decrease the reading of the register. Registers of this class are known in the art as two-way registers, and in connection with the use of such registers it is desirable that mechanism be employed which is adapted to operate the register in either direction as desired.

It is an object of my invention to operate registers of the class described by electromagnetic means, and in carrying out my invention I prefer to employ a single electromagnetic structure so associated with the register to be operated that the register may be operated in either direction desired, by the operation of the electromagnet. In carrying out my invention I prefer to employ a polarized electromagnet and operating mechanism between the register and the armature of the electromagnet of such a nature that when the armature is actuated in one direction, the register is advanced or moved in a direction to add to the register reading, and when the armature is moved in the opposite direction, the register is moved to decrease the register reading. While I prefer to employ a polarized electromagnet for accomplishing this result, I may accomplish the same result by using a non-polarized magnetic structure in which different windings adapted to influence the same armature may be energized so as to produce the desired character of operation of the armature.

The several drawings illustrating my invention are as follows:

Figure 1 is a face view of my electromagnet and register actuating mechanism complete; Fig. 2 is a view similar to Fig. 1 with the actuating mechanism in front of the line x, x in Fig. 3 removed to show the manner of associating the register with the electromagnet; Fig. 3 is a side view of the parts shown in Fig. 1; Fig. 4 is a diagrammatic view of a circuit arrangement that may be used to operate the electromagnetic mechanism when the electromagnet is not polarized; Fig. 5 is a diagrammatic view of the circuit arrangement that may be employed for operating the electromagnet when such magnet is of the polarized type.

Similar numerals refer to similar parts throughout the several views.

As shown in Figs. 1, 2 and 3, energizing windings 1 and 2 of an electromagnet are mounted on cores 3 and 4, which cores are connected at one end by a magnetic yoke 5. The cores 3 and 4 are threaded at their working ends and have secured thereto by means of the adjusting nuts 6, 7 a non-magnetic yoke 8, from the middle portion of which depending ears 9 and 10 are so formed as to support the pivots 11 and 12 used to support the armature 13. The pivot 11 is adjustable as indicated, being held in place by the locking nut 14. The armature 13 has rigidly secured thereto an arm or lever 15, which extends around the ear 9 and upward in front of the windings 1 and 2 and carries at its upper end a pin 16. The pin 16 engages a slot 17 in the lower end of a double pawl 18 pivoted at 19 to a lever 20 loosely mounted on the operating shaft 21 of the register 22. The pawl 18 has two upwardly extending arms 23 and 24 adapted to engage the ratchet wheel 25 rigidly secured to the shaft 21. The lever 20 is normally held in vertical position by a spring 26 secured to such lever by means of a pin 27, the other end of this spring being held by a bracket 28 secured to the register 22. As a result of the construction above described, when the armature 13 is moved by the energization of the electromagnet in a direction to move the lever 15 to the right, as shown in Fig. 1, the pawl 18 is moved around to the left on its pivot 19, since the lever 20 is maintained in its normal position by means of the spring 26. When the arm 23 engages the ratchet wheel 25, the pawl 18 and lever 20 are moved together against the action of the spring 26 to turn the ratchet wheel 25 and shaft 21 to advance the indicator wheel 29 one step. The register 22 may be of any well known type in which a plurality of indicator wheels is used, each wheel being

adapted by its rotation to actuate the wheel of next higher order when such first wheel passes from its maximum indication to its zero indication. If the electromagnet is energized in such a manner as to cause the armature 13 to move the lever 15 to the left, as shown in Fig. 1, the pawl 18 is rotated around to the right on its pivot 19, as a result of which the arm 24 engages the ratchet wheel 25, and the subsequent motion of the lever 15 moves the ratchet wheel 25 and shaft 21 to move the indicator wheel 29 one step in the opposite direction to what it was moved by the operation previously described. As a result of the operations above described it follows that by my invention I provide a means for operating a register in one direction or the other as desired, the direction of operation being determined by the nature of the energization of the operating electromagnet and that therefore the reading of the register may be increased or decreased as desired, by this operating means.

The yoke 8, which supports the armature 13, may be moved relatively to the windings 1 and 2 by loosening the nuts 6 and 7, and therefore the amount of motion imparted to the armature 13 and ratchet wheel 25 can be changed as desired, which is necessary in order to secure the proper adjustment of the mechanism to change the reading of the register 22 by the correct amount for each motion of the armature 13. A hole 47 is formed in the arm 15 to facilitate adjusting the pivot screw.

The character of operation imparted to the armature 13 may be determined either by individually and separately energizing the windings 1 and 2, as indicated in Fig. 4, or by polarizing the armature 13 by means of a permanent magnet 30, as indicated in Figs. 1, 2, 3 and 5.

As shown in Fig. 4, the battery 31 is permanently connected to one terminal of each of the windings 1 and 2 by means of wires 32 and 33. The other terminals of the windings 1 and 2 extend to contacts 34 and 35 adapted to be engaged by keys 36 and 37, respectively. When the key 36 is depressed the winding 1 is therefore energized, and when the key 37 is depressed the winding 2 is energized. Energization of the winding 1 serves to move the armature 13 around to the right upon its pivot 11, while energization of the winding 2 serves to move it around to the left upon such pivot.

As shown in Fig. 5, the battery 31 is connected permanently to the pivotal points of the reversing switch 38, 39, which may be moved to engage contacts 40 and 41, or 42 and 43, as desired. The contacts 40 and 41 are connected by wires 44 and 45 to one terminal of each of the windings 1 and 2, the other terminals of the windings being connected together by means of wires 46. The wire 44 is also connected to the contact 43, and the wire 45 is also connected to the contact 42. As a result of this, when the reversing switch 38, 39 rests upon contacts 40 and 41, current flows from the battery 31 through the windings 1 and 2 in one direction, and since the armature 13 is polarized in this modification by means of the permanent magnet 30, such armature will be caused to move in but one direction, while the reversing switch 38, 39 is moved upon contacts 42 and 43. The direction of current flow through the windings 1 and 2 will be reversed and the armature 13 will be caused to move in the opposite direction.

While I have shown my invention in the particular embodiment herein described, I do not, however, limit myself to this construction, but desire to claim broadly any equivalent that will suggest itself to those skilled in the art.

What I claim is:

1. In combination, a register, an operating pawl adapted to operate the register in two directions, an actuating lever, and a third member for controlling the operation of the pawl according to the direction of motion of the lever.

2. In combination with a register, actuating mechanism consisting of an electromagnet, a lever between the electromagnet and the register, such lever being normally disengaged from the register, and means for establishing connection between the lever and register in a direction corresponding to the motion of the lever.

3. In combination with a register, actuating mechanism consisting of an electromagnet, a lever between the electromagnet and the register, and a pawl adapted to be operated by the lever, such pawl being normally disengaged from the register and adapted to engage and operate the same in either direction when the lever is operated.

4. In combination with a register, actuating mechanism consisting of an electromagnet, an armature for the electromagnet, a lever secured to the armature and a single member controlled by said lever and adapted to operate the register in either direction as desired.

5. In combination with a register, actuating mechanism consisting of an electromagnet, an armature for the electromagnet, a lever secured to the armature, said lever being normally disengaged from the register, and means for establishing connection between the lever and the register in a direction corresponding to the motion of the lever.

6. In combination with a register, actuating mechanism consisting of an electromagnet, an armature for the electromagnet, a lever secured to the armature, and a pawl adapted to be operated by the lever, such

pawl when operated serving to operate the register in a direction corresponding to the direction of operation of the lever.

7. In combination with a register, actuating mechanism consisting of an electromagnet, an armature for the electromagnet, a lever secured to the armature, and a pawl adapted to be operated by the lever, such pawl normally disengaged from the register and adapted to engage and operate the same in either direction when the lever is operated.

8. In combination with a register, actuating mechanism consisting of an electromagnet, an armature for the electromagnet, a lever secured to the armature, an arm connected to the register, and a pawl pivoted to such arm, such pawl so engaged by the lever as to actuate the register when the lever is operated.

9. In combination with a register, actuating mechanism consisting of an electromagnet, an armature for the electromagnet, a lever secured to the armature, an arm connected to the register, and a pawl pivoted to such arm and normally disengaged from the register, such pawl being so engaged by the lever as to actuate the register when the lever is operated.

10. In combination with a register, actuating mechanism consisting of an electromagnet, and means between the electromagnet and register for operating the register in a direction determined by the manner in which the electromagnet is energized, said means including a pivoted lever adapted to be rocked by the electromagnet in either direction.

11. In combination with a register, actuating mechanism consisting of an electromagnet, and means between the electromagnet and register for operating the register in a direction depending upon the direction of current flow through the electromagnet winding, said means including a pivoted lever adapted to be rocked by the electromagnet in either direction.

12. In combination with a register, actuating mechanism consisting of a polarized electromagnet, an armature for the electromagnet, a lever secured to the armature, an arm connected to the register, and a pawl pivoted to such arm, such pawl so engaged by the lever as to actuate the register when the lever is operated.

13. In combination with a register, actuating mechanism consisting of an electromagnet, a lever between the electromagnet and the register, such lever normally disengaged from the register, means for establishing connection between the lever and register in a direction corresponding to the motion of the lever, and means for changing the throw of such lever.

14. In combination with a register, actuating mechanism consisting of an electromagnet, a lever between the electromagnet and the register, a pawl adapted to be operated by the lever, such pawl when operated serving to operate the register in a direction corresponding to the direction of operation of the lever, and means for changing the throw of such lever.

15. In combination with a register, actuating mechanism consisting of an electromagnet, an armature for the electromagnet, a lever secured to the armature, an arm connected to the register, a pawl pivoted to such arm, such pawl being so engaged by the lever as to actuate the register when the lever is operated, and means for changing the throw of such lever.

16. In combination with a register, actuating mechanism consisting of a polarized electromagnet, an armature for the electromagnet, a lever secured to the armature, an arm connected to the register, a pawl pivoted to such arm, such pawl being so engaged by the lever as to actuate the register when the lever is operated, and means for changing the throw of such lever.

17. In a register-actuating device, the combination of a pivoted lever, a rotatable member, a pivoted pawl having oppositely disposed portions for engaging said member, said pawl being controlled by said lever, and means for actuating said lever in either direction as desired, the direction of rotation of said member being determined by the direction of movement of said lever.

18. In combination, a register, a lever normally disconnected from said register, means interposed between said lever and said register for establishing connection between these two elements, and means for operating the said lever in either direction as desired, the register being operated in a direction determined by the direction of operation of said lever.

19. As a means for converting reciprocating motion into rotary motion, the combination of a shaft to be rotated, a lever, and connecting mechanism between one end of such lever and the shaft, motion of the lever in one direction from its normal position serving to rotate the shaft in one direction and motion of the lever in the other direction from its normal position serving to rotate the shaft in the opposite direction.

20. As a means for converting reciprocating motion into rotary motion, the combination of a shaft to be rotated, a lever, a ratchet wheel secured to the shaft, and a pivoted pawl loosely engaging such lever, such pawl adapted to engage such ratchet wheel in one direction or the other according to the direction of operation of such lever from its normal position.

21. As a unitary structure, an electromagnetic register-actuating device adapted to operate a register in either direction as de-

sired, said device including a single oscillatory lever between the electromagnet and the register, the direction of operation of said lever determining the direction of operation of said register.

22. In combination, a rotatable member, a single oscillatory lever normally disconnected therefrom, and means for establishing operative connection between said member and said lever for actuating the said member in a direction determined by the direction of operation of said lever.

23. In combination, an electromagnet provided with an armature at one end, a register associated with said electromagnet at the other end, and connections between said armature and said register for operating the latter in either direction if desired.

24. In combination, an electromagnet provided with an armature at one end, a register associated with said electromagnet at the other end, and connections between said armature and said register for operating the latter in either direction if desired, said connections including a pivoted lever adapted to be rocked by the armature in either direction.

25. In a register-actuating mechanism, the combination of an electromagnet provided with an armature, a lever adapted to be rocked by said armature in either direction, and an oscillatory actuating member controlled by said lever.

26. The combination of a rotatable member, a pivoted pawl having oppositely disposed engaging portions, means for automatically rocking said pawl in either direction into engagement with said rotatable member, whereby the latter is actuated in a direction determined by the direction of movement of said pawl.

27. A unitary device adapted to actuate a register in either direction, said device including a double acting yoke-shaped pawl whose direction of operation determines the direction of operation of the register.

28. As a unitary structure, a register-actuating device in which a single pawl is adapted to actuate the register in a direction dependent upon the direction of movement of said pawl.

In witness whereof, I hereunto subscribe my name this 12th day of April, A. D. 1909.

FREDERICK O. HEUSER.

Witnesses:
MARGARET WILLIAMS,
C. H. TALLMADGE.