Sept. 29, 1931. P. P. SOSINSKI 1,825,482

ELECTROMAGNET

Filed Aug. 6, 1930

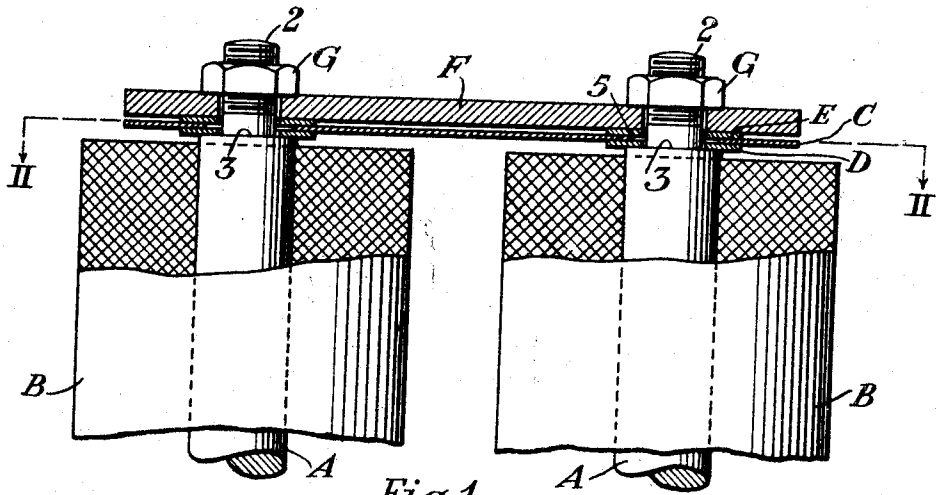


Fig. 1

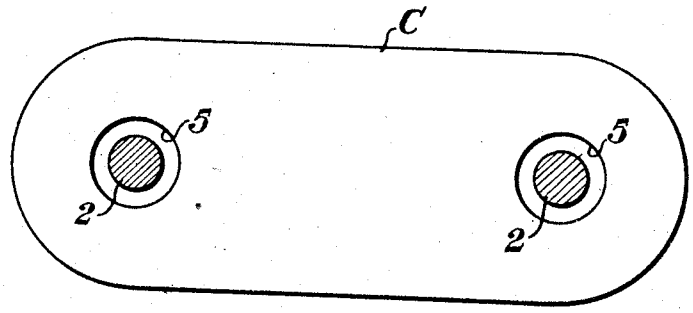


Fig. 2.

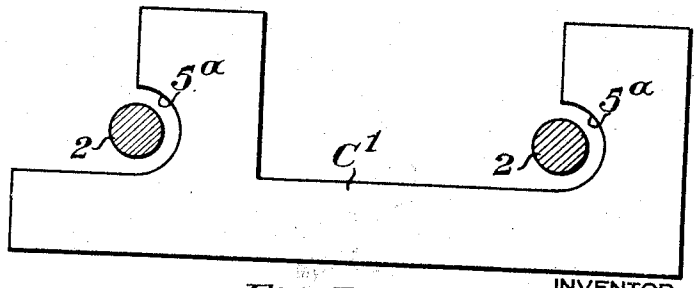


Fig. 3.

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UNITED STATES PATENT OFFICE

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ELECTROMAGNET

Application filed August 6, 1930. Serial No. 473,479.

My invention relates to electromagnets, and has for an object the provision of novel and improved means for varying the reluctance of the magnetic circuit without affecting the adjustment of armature or other elements associated with the magnet.

I will describe one form of electromagnet embodying my invention, and will then point out the novel features thereof in claims.

In the accompanying drawings, Fig. 1 is a view showing in cross-section a portion of one form of electromagnet embodying my invention. Fig. 2 is a sectional view on the line II—II of Fig. 1 looking in the direction indicated by the arrows. Fig. 3 is a view similar to Fig. 2 but showing a modification of a portion of the magnet also embodying my invention.

Referring first to Figs. 1 and 2 of the drawings, the magnet comprises two spaced parallel cores A of magnetizable material provided with the usual operating windings B. Each core A terminates in an end portion 2 of reduced cross-sectional area, thereby forming a shoulder 3. The cores A are connected by a back strap C of magnetizable material having two holes 5, which register with the cores and which are larger than the reduced ends 2 of these cores. The back strap C is spaced from each shoulder 3 by one or more washers D of non-magnetizable material, and surrounding each core above the back strap C is another washer E likewise of non-magnetizable material. Above the washers E is an auxiliary back strap F of non-magnetizable material, having holes which register with the reduced ends 2 of the cores A. The back straps and washers are clamped against the core shoulders 3 by means of nuts G coacting with screw threads on the outer ends of the reduced portions 2.

The reluctance of the magnetic circuit of the electromagnet may be varied in two ways. A rough adjustment of the reluctance may be accomplished by varying the number of the washers D between the back strap C and the shoulders 3. A finer adjustment may be accomplished by shifting back strap C laterally with respect to the cores A, thereby bringing this back strap into closer or more remote relation to the reduced core ends 2. The purpose of the enlarged holes 5 in the back strap C is to permit this lateral adjustment of the back strap with respect to the cores.

Referring now to Fig. 3, the structure shown in this view is the same as that shown in Figs. 1 and 2 except as to the shape of the magnetizable back strap which is here designated C^1. This back strap is provided with two notches 5^a which receive the two core ends 2 with clearance. This structure is somewhat more effective than that shown in Fig. 2 in varying the reluctance of the magnetic circuit as the back strap is shifted laterally with respect to the cores.

Electromagnets embodying my invention are particularly suitable for use in direct current relays of the type used in railway signaling. One advantage of my invention is that small changes in the characteristics of a relay, that is, in the pick up and release values, may be made easily, and these changes will be definite because other adjustments of the relay are not disturbed.

Although I have herein shown and described only one form of electromagnet embodying my invention, it is understood that various changes and modifications may be made therein within the scope of the appended claims without departing from the spirit and scope of my invention.

Having thus described my invention, what I claim is:

1. An electromagnet comprising two spaced parallel magnetizable cores, each having a reduced end forming a shoulder, a magnetizable back strap having two holes larger than and surrounding the reduced ends of the cores, a variable number of non-magnetizable washers located between said back strap and each shoulder, an auxiliary non-magnetizable back strap having holes to receive said reduced core ends and lying on the outside of said magnetizable back strap, and means for clamping said washers and back straps against the shoulders on said cores, whereby the reluctance of the magnetic circuit may be varied by changing the number of said washers and also by shifting said mag-

netizable back strap laterally with respect to the cores.

2. An electromagnet comprising two spaced parallel magnetizable cores each having a reduced end forming a shoulder, a magnetizable back strap movable laterally toward and away from the reduced ends of said cores, a variable number of non-magnetizable washers located between said back strap and each shoulder, an auxiliary non-magnetizable back strap having holes to receive said reduced core ends and lying on the outside of said magnetizable back strap, and means for clamping said washers and back straps against the shoulders on said cores, whereby the reluctance of the magnetic circuit may be varied by changing the number of said washers and also by shifting said magnetizable back strap laterally with respect to the cores.

3. An electromagnet comprising two spaced parallel magnetizable cores each having a reduced end forming a shoulder, a magnetizable back strap movable laterally toward and away from the reduced ends of said cores, an auxiliary non-magnetizable back strap having holes to receive said reduced core ends and lying on the outside of said magnetizable back strap, and means for clamping said back straps against the shoulders on said cores, whereby the reluctance of the magnetic circuit may be varied by shifting said magnetizable back strap laterally with respect to the cores.

In testimony whereof I affix my signature.

PAUL P. SOSINSKI.