

(No Model.)

D. SHIVE.

DEVICE FOR EQUALIZING THE TENSION OF SPRINGS.

No. 249,409.

Patented Nov. 8, 1881.

Fig. 1.

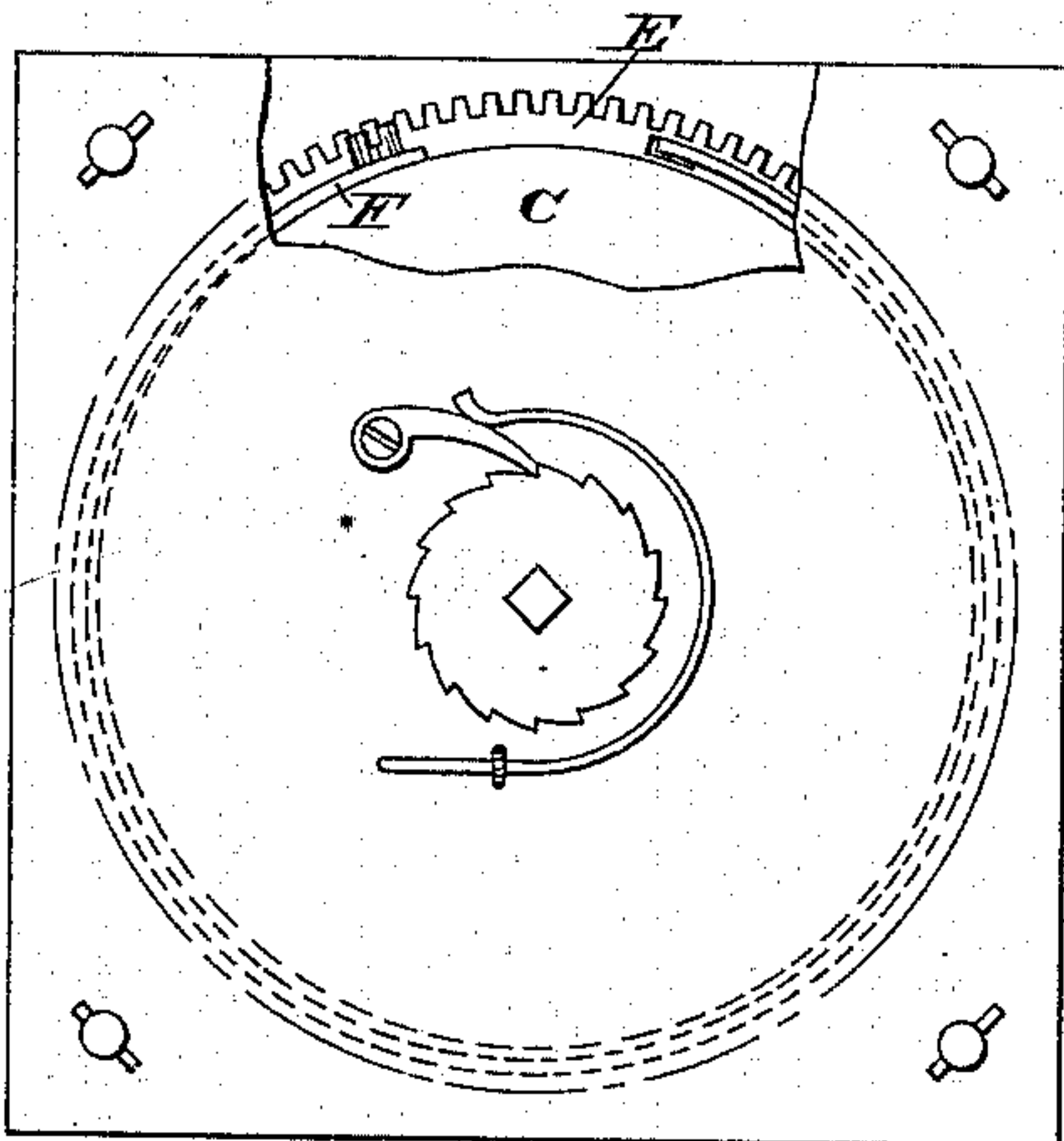


Fig. 4.

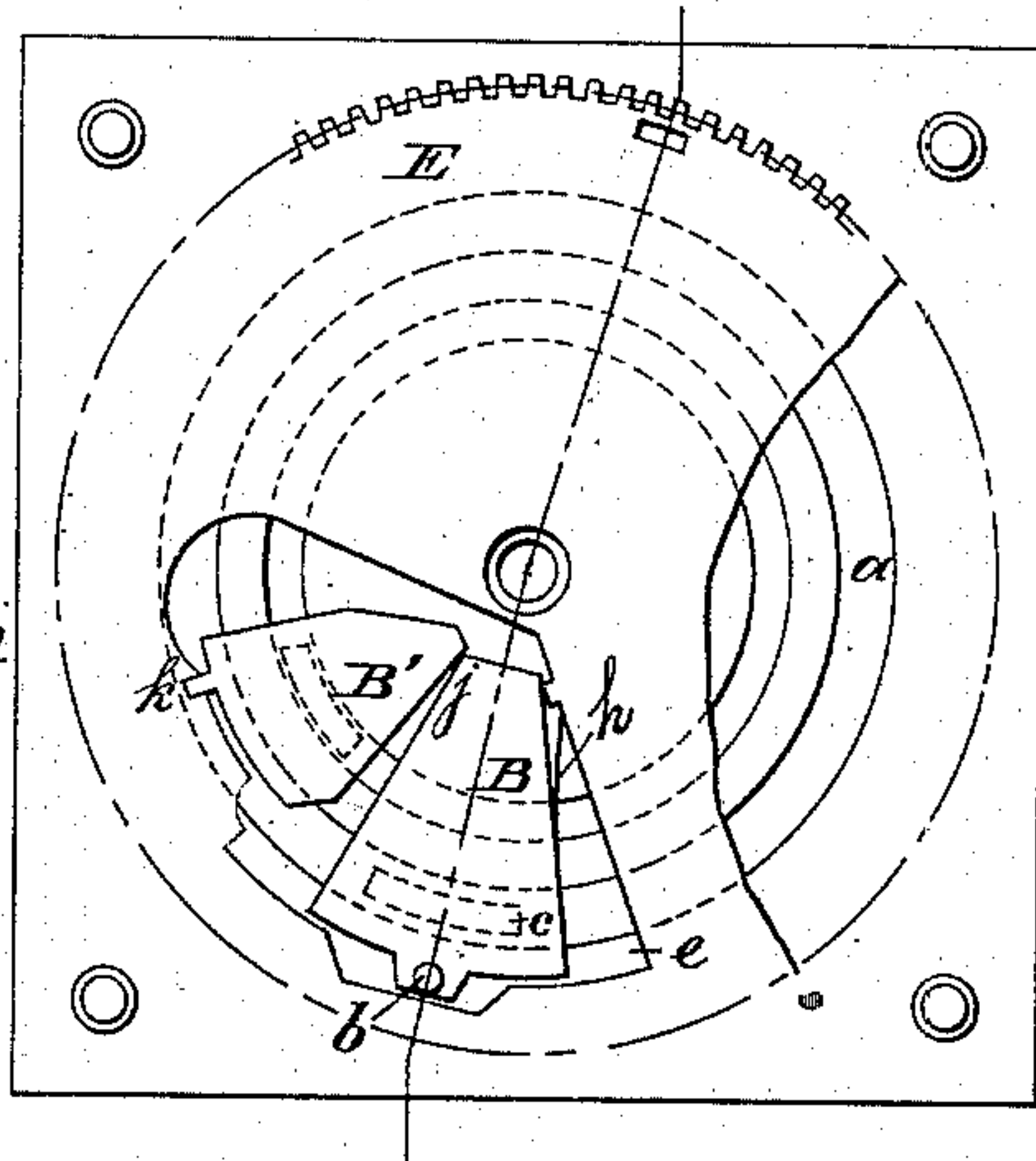


Fig. 2.

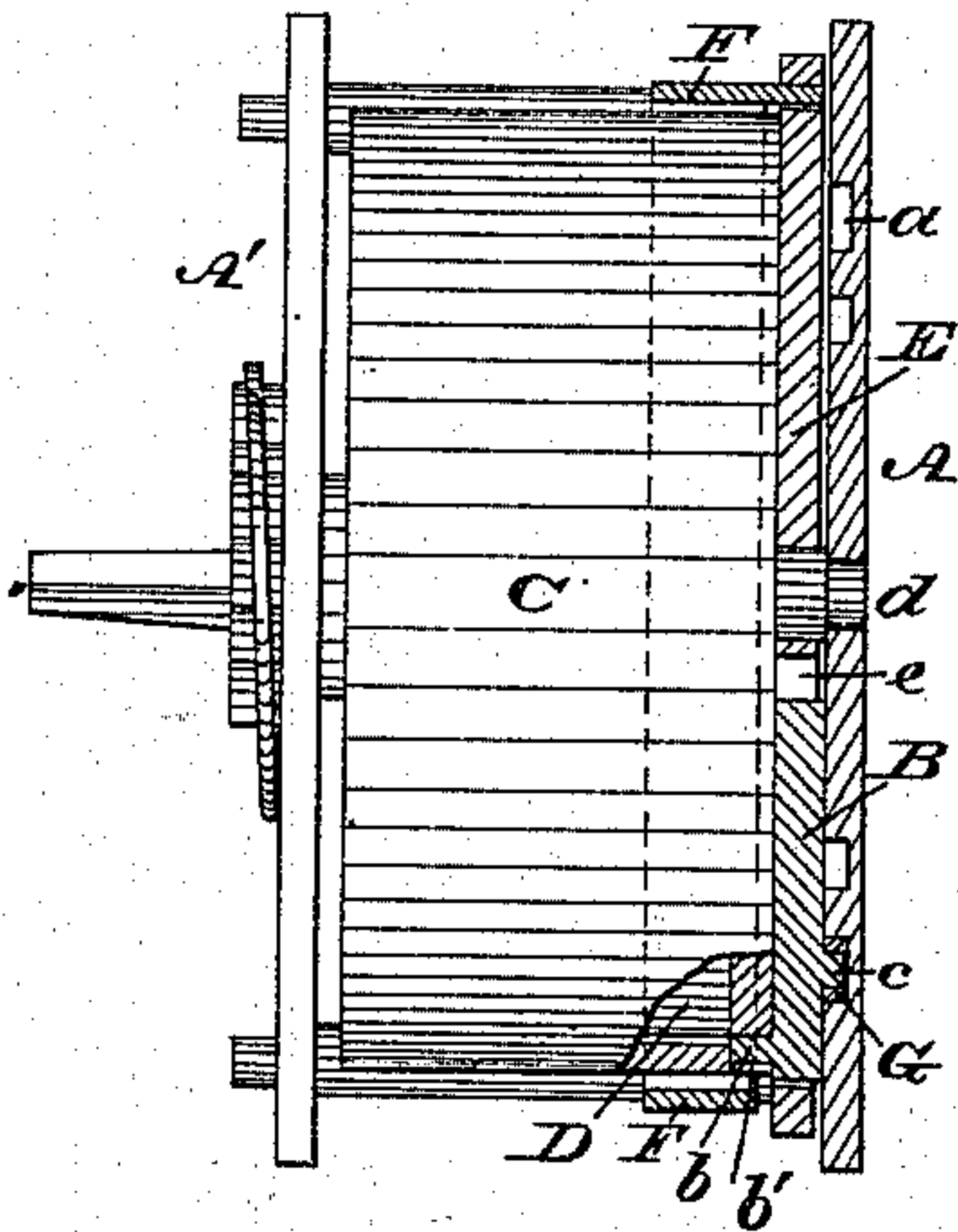


Fig. 3.

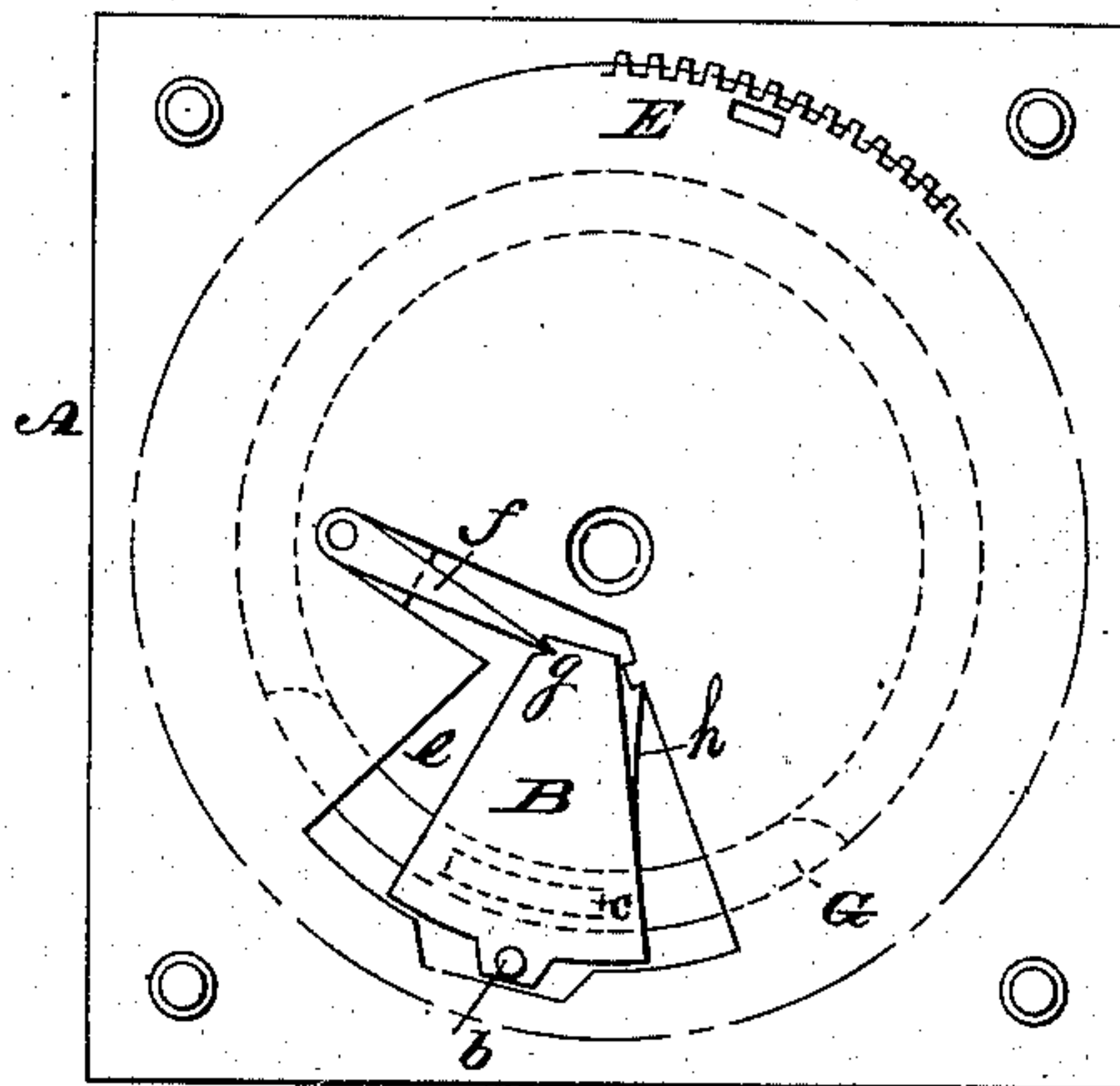


Fig. 5.



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## DEVICE FOR EQUALIZING THE TENSION OF SPRINGS.

SPECIFICATION forming part of Letters Patent No. 249,409, dated November 8, 1881.

Application filed May 4, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID SHIVE, a citizen of the United States, residing in the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Equalizing the Tension of Springs, which improvement is fully set forth in the following specification and accompanying drawings, in which—

10 Figure 1 is a face view, partly broken away, of the device embodying my invention. Fig. 2 is a side elevation, partly broken away. Fig. 3 is a face view, the outer plate of the frame being removed. Fig. 4 is a view of a modification. Fig. 5 is a view of a detached portion.

15 Similar letters of reference indicate corresponding parts in the several figures.

My invention consists in locking the barrel and mainspring with a stationary plate or part of the frame of the device in such manner that the tension of the spring is equalized, as will be hereinafter fully set forth.

Referring to the drawings, A represents a stationary plate or part of the frame A' of the device, having on its face an annular groove, a.

25 B represents a piece of steel or a friction-plate, having on one side a projecting pin, b, and on the opposite side a lug, c, the latter being fitted freely in the groove a and the former entering a notch, b', in the periphery of the barrel C of the coiled mainspring D, said barrel having its arbor d mounted on the frame A'.

30 E represents a toothed wheel, which is mounted on the arbor d, and has a portion of its body cut away, forming a recess, e, which freely receives the friction-plate B.

F represents a spring or curved spring-plate, one end of which is attached to the barrel C and the other end is formed into a hook, which is connected to the wheel E. If a longer spring is employed, it may be wound around the barrel convolute, or otherwise properly applied.

40 In Fig. 3 is shown a steel piece, f, which is fitted in a lateral extension of the recess e, and pinned at one end to the wheel E and bearing at the other end against the inner end of the friction-plate B at the point g, and a spring, h, is connected to the wheel E and presses against the friction-plate B on the side opposite to the piece f. The wheel E, having within it the

plate B, is placed between the barrel C and plate A of the frame. The barrel has no means of imparting motion to the wheel E excepting through the medium of the spring F, and moves only by carrying the friction-plate B with it, the lug c of said plate being in the groove a, as has been stated. The slightest pressure on the point g locks the lug c firmly in the groove, so that neither the steel or plate B nor the barrel C can move forward. Now, if the main-spring is wound, the spring F takes all the power of the mainspring up to the proper point of tension, after which the barrel begins to move forward the steel or plate B. If this movement were not checked, the tension would become too great on the spring F. The movement of said plate B is, however, very slight before a pressure from the steel f upon the point g takes place, when the plate B and barrel C are locked, so that an undue pressure upon the spring F cannot be created. The locking of the barrel is continued until the wheel E has advanced to relieve the point g, when the spring h unlocks the friction-plate B, and the barrel moves forward and keeps the required tension on the spring F, the barrel being always locked at the proper point and again released at the proper time.

55 In order to make the action of the lock more delicate, another plan is shown in Fig. 4, in which, in addition to the locking or friction plate B, there is a second piece, B', also moving and locking in a groove of the plate A, the recess e being enlarged to receive said piece B', the steel f not being employed. When the spring is wound the plate B is carried forward until it impinges upon the piece B' at j, the latter bearing against the wheel E at k. The wheel E itself becomes locked by the slightest touch at j. Thus the plate and piece B B' and the barrel C are locked, while by the power of the spring F the wheel E moves forward the train until the piece B' is carried forward and unlocked by the wheel E at k, where the piece B' is hooked into said wheel. The piece B' being released releases the plate B at the point j, when said plate is again brought forward by the mainspring and barrel until again locked by contact at j.

60 In Fig. 5 I show a segmental friction-plate, 100



G, having an opening to receive the lug *c* of the plate B, the wall of the lug being split, said plate G freely fitting the groove *a*. The pressure of the lug *c* on said wall forces the latter against the groove *a* of the plate A, and thus increases the friction between the plate or steel B and said groove.

Should the segment G be somewhat long, the lug of the second plate, B, when used, may be fitted in a groove independent of the groove *a*; but ordinarily a single groove is sufficient for both the piece B' and plate B.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The barrel and mainspring locked to a part of a stationary frame by means of a friction-plate carried around with said spring and working in a groove of said frame, substantially as and for the purpose set forth.

2. The wheel E, with cut-away portion *e*, the

“steel” B, and the frame with the groove *a*, combined and operating with the mainspring and an auxiliary spring, substantially as and for the purpose set forth.

3. The steel B, with a projection, *b*, and lug *c* on opposite sides, in combination with the barrel having a notch, *b'*, and the frame having an annular groove, *a*, all operating substantially as and for the purpose set forth.

4. The spring-connection F between the mainspring and the great wheel of the train, substantially as and for the purpose set forth.

5. The annular groove *a*, provided with the segmental friction plate G, in combination with the friction-plate or steel B, substantially as and for the purpose set forth.

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