

No. 709,998.

Patented Sept. 30, 1902.

A. C. McCORD.  
SPRING CUSHION.

(Application filed Jan. 9, 1902.)

(No Model.)

Fig. 1.

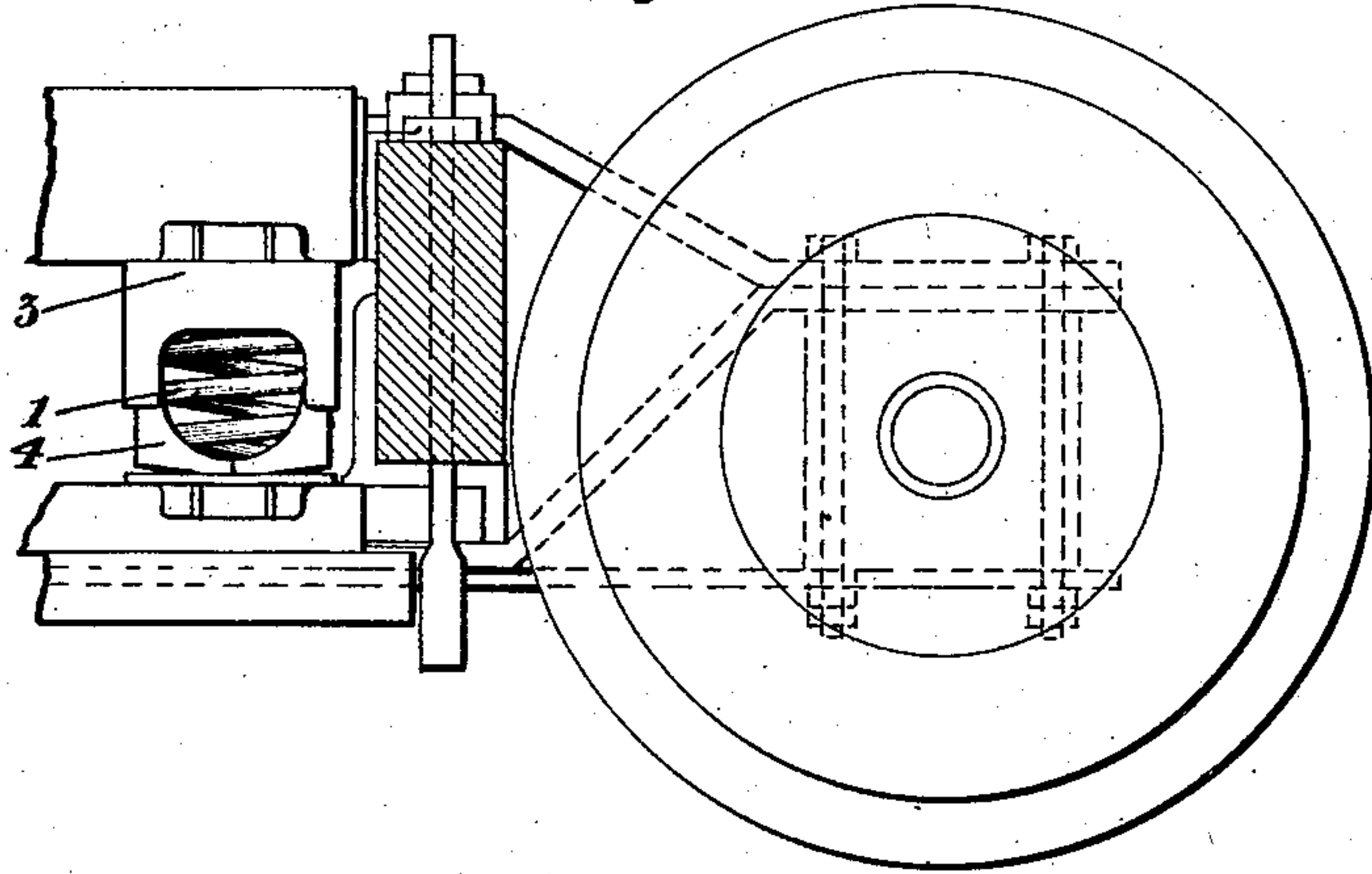


Fig. 2.

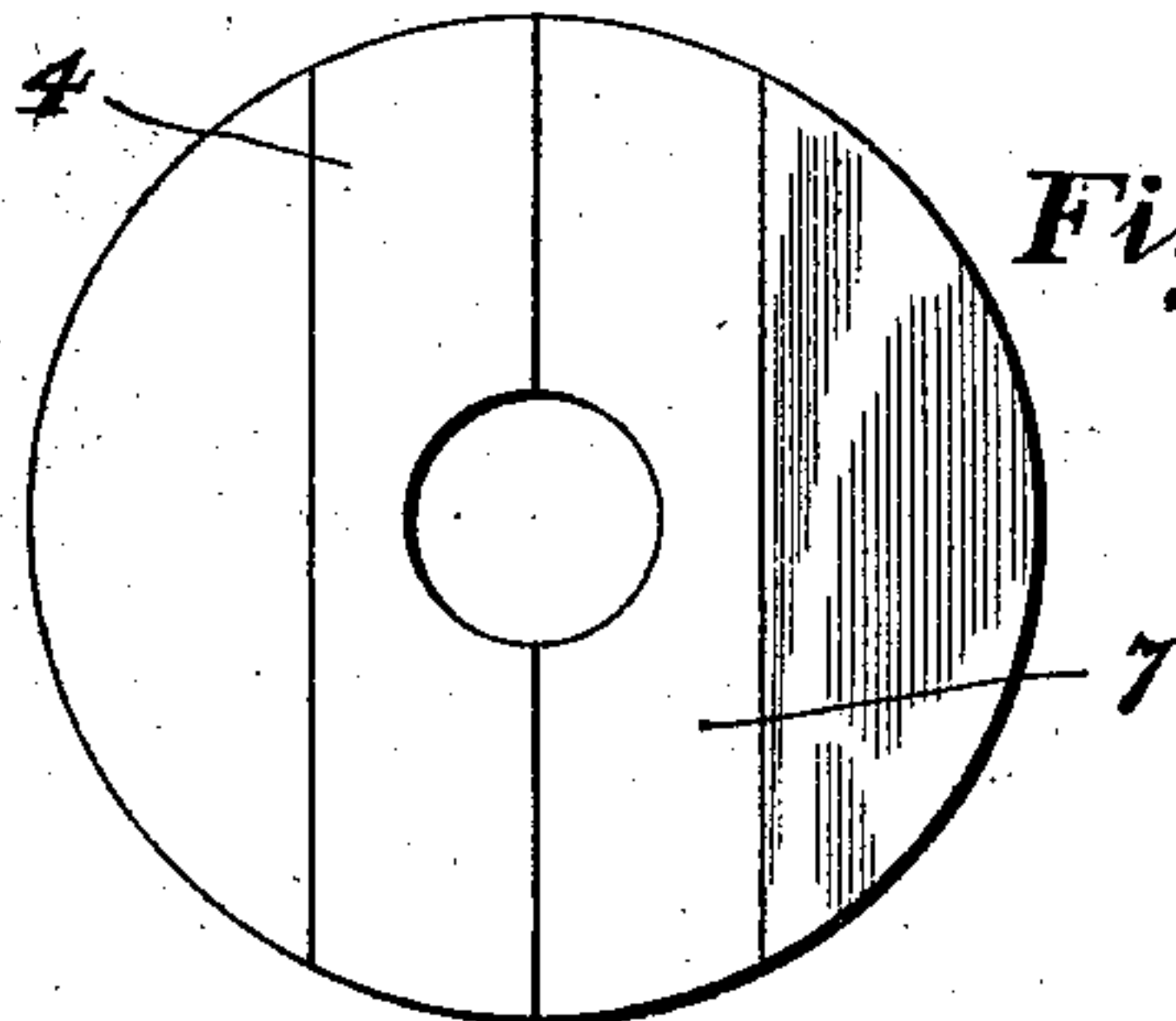
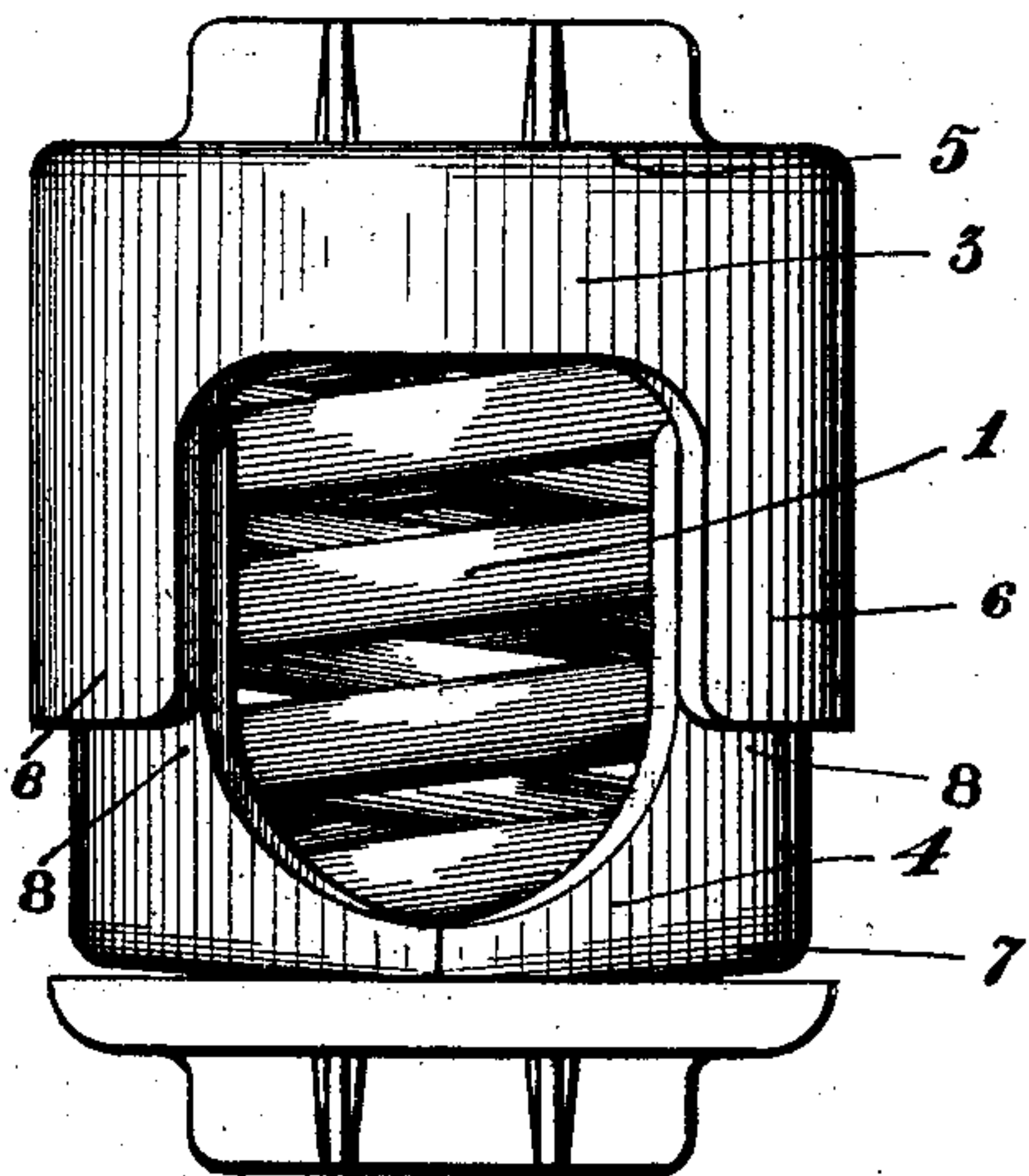


Fig. 5.

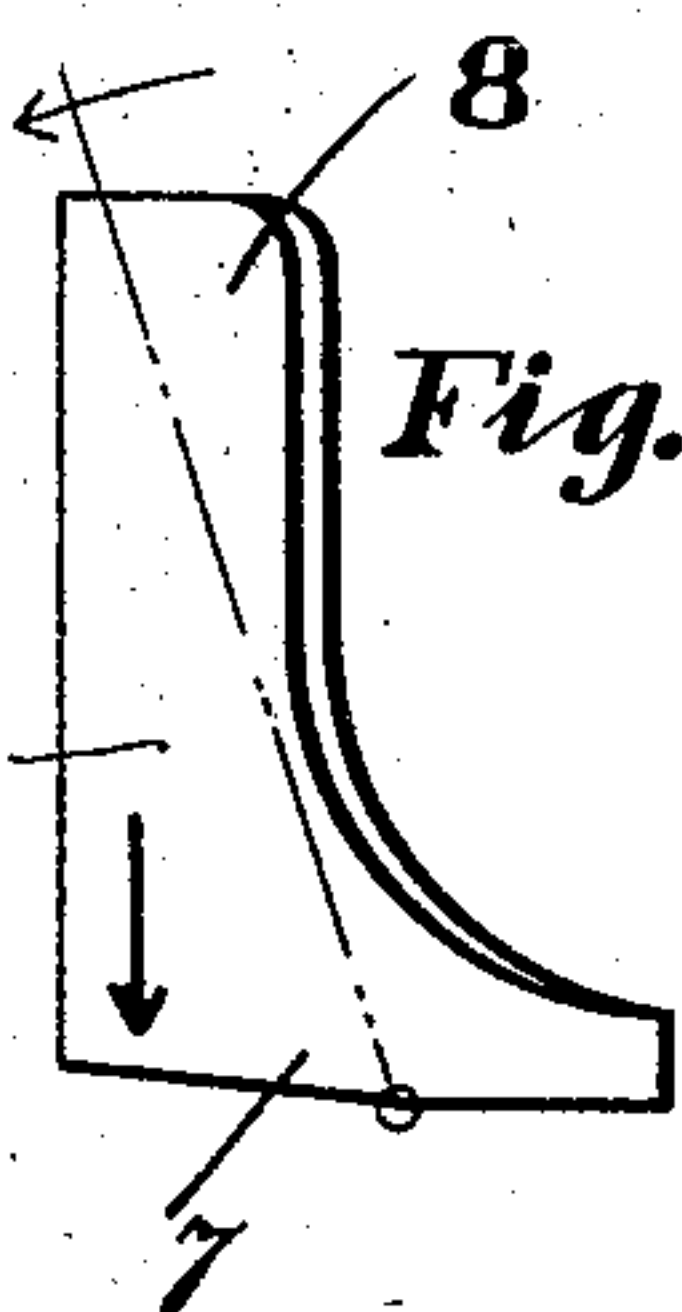


Fig. 6.

Fig. 3.

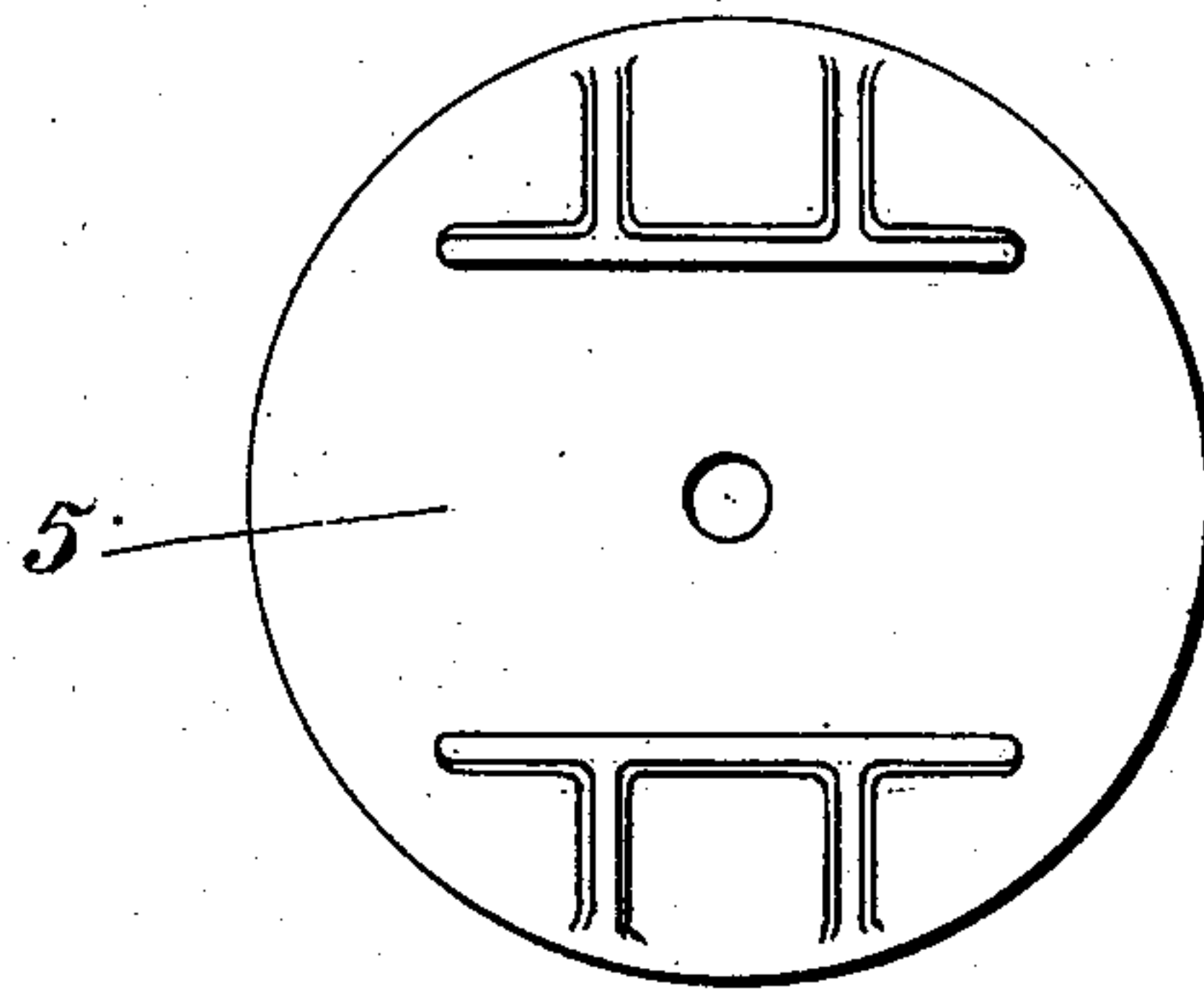
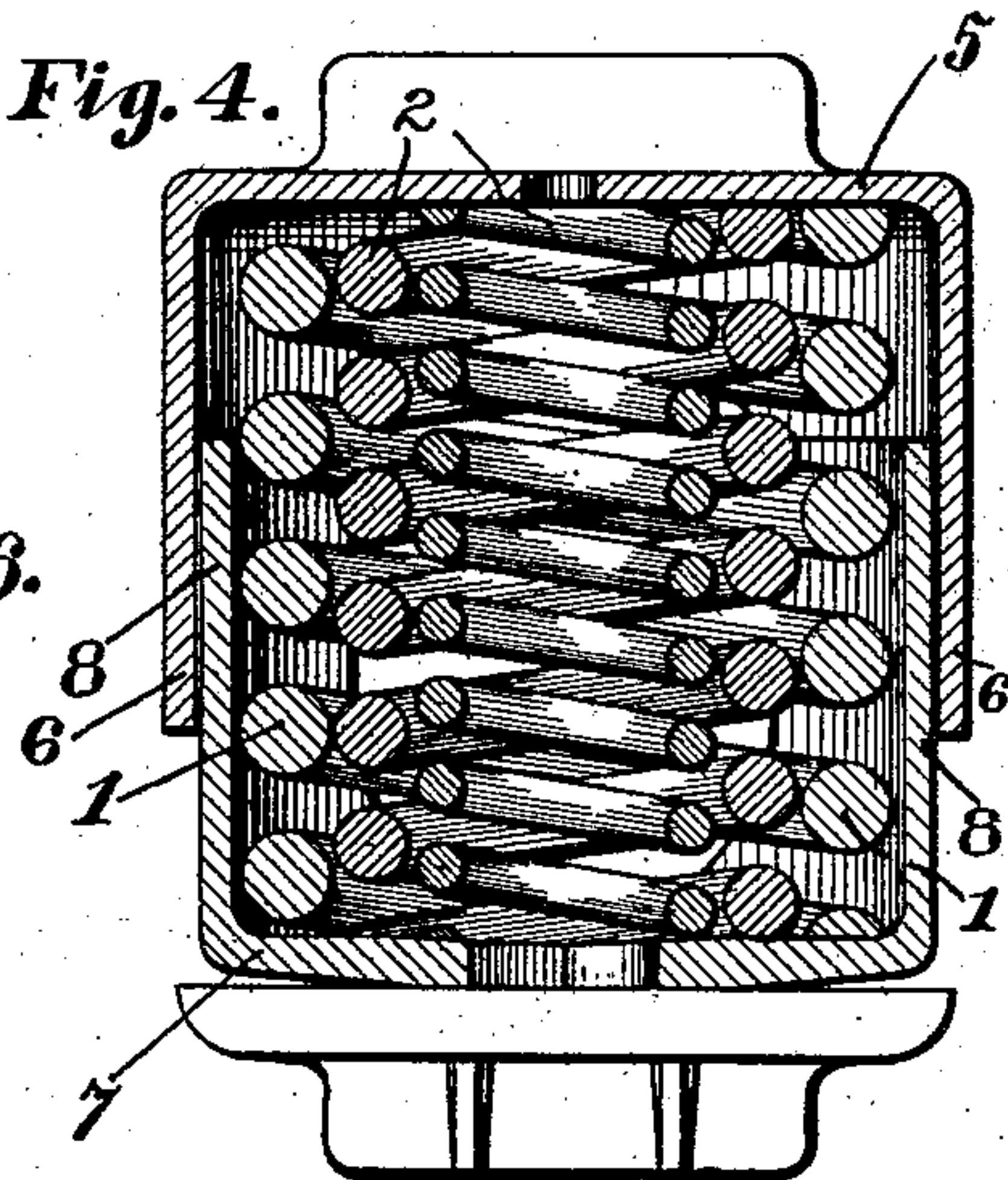


Fig. 4.



Witnesses:

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# UNITED STATES PATENT OFFICE.

ALVIN CARR McCORD, OF CHICAGO, ILLINOIS, ASSIGNOR TO McCORD & COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF NEW JERSEY.

## SPRING-CUSHION.

SPECIFICATION forming part of Letters Patent No. 709,998, dated September 30, 1902.

Application filed January 9, 1902. Serial No. 88,981. (No model.)

*To all whom it may concern:*

Be it known that I, ALVIN CARR McCORD, 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 Spring-Cushions, (Case No. 8,) 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 spring-cushions, and has particular adaptability in the construction of railway-vehicles, being especially serviceable in connection with car trucks and buffers.

The invention in its preferred embodiment employs two cap-plates provided with integral side flanges arranged to be forced into frictional engagement by the load, each of the cap-plates constituting a friction element. At least one of the cap-plates is preferably slightly curved, tending to straighten out under load and spring the flanges into engagement. The base of one of the cap-plates is preferably made convex, the flanges of the convexly-formed plate being arranged within the flanges of the companion plate, whereby the flanges of the convexly-formed plate are sprung into engagement with the flanges of the companion plate, the greater the load and the greater the surface of the flanges in contact the greater the friction and the effect of retarding the recoil and lessening the vibrations. But one of the plates is thus preferably adapted to have its flanges brought into frictional contact with the flanges of the companion plate; but it is obvious that the construction may in this respect be departed from, and I do not wish to be limited to a construction wherein but one of the plates is thus adapted for movement into frictional engagement with the other, as obviously the desired result may be secured if only there is provided the relative movement between the flanges of the plate.

To complete the structure, the cap-plates, in addition to performing these functions, also serve to inclose springs of the cushion and retain the same in position. In this manner a pair of cap-plates may be employed

for retaining a number of coaxially-arranged springs disposed one within another.

I will explain my invention more fully by reference to the accompanying drawings, illustrating the preferred embodiment thereof, in which—

Figure 1 is a view of my improved damper associated with an axle and a wheel. Fig. 2 is an enlarged side view thereof. Fig. 3 is a top view thereof. Fig. 4 is a longitudinal sectional view thereof. Fig. 5 is a bottom view of the levers which I prefer to employ. Fig. 6 is a detailed view of one of the levers.

Like parts are indicated by similar characters of reference throughout the views.

In the figures, 1 indicates the main coiled spring, retained in position between the cap-plate 3 and convex cap-plate 4. The upper plate has a base 5 and integral downwardly-extending portions or flanges 6 6, which are preferably united a short distance below the top of the corresponding cap. The lower plate has a slightly-convex base 7 and integral flanges 8 8, arranged within the flanges 6 6 and adjacent thereto. These cap-plates combine the functions of retaining-plates and means for retarding the recoil and lessening vibrations. They may be made of any suitable metal, the coiled spring or springs inclosed by the cap-plates giving a springy action to the flanges 8 8, so that by the application of pressure—that is, by the load—there is a tendency to straighten out the base of the cap-plate 4 4, springing out the flanges 8 8 of the convex plate, so that practically the entire adjacent surfaces of the flanges 6 6 and 8 8 are brought into contact. The more effectively to secure this result the lower cap-plate is preferably formed into two mechanically distinct halves, though I do not wish to be limited to this construction. It will be observed that the lower cap-plate practically comprises two bell-crank levers, the flanges 8 constituting arms of these levers, while the base portion of the cap-plate constitutes the remaining arms of the levers. Under the action of the load these levers are rocked to secure the desired frictional contact.

I prefer to make the arms of each of the



bell-crank levers comprising the lower cap-plate rigid with respect to each other, as shown, though I do not wish to be limited to this construction in all embodiments of the invention.

I have illustrated inner coiled springs arranged within the outer or main coiled springs, a common arrangement for providing auxiliary springs with maximum sustaining capacity for which my peculiar cap-plates are particularly adapted.

The position of the cap-plates evidently may be reversed. As the flanges of the convex plate are sprung out by the load they must be arranged within the flanges of the companion plate.

My peculiar cap-plates combine in a strong, simple, and economical form the functions of retaining-plates and recoil-retarders. The vibrations may be absolutely controlled and regulated by increasing or diminishing the size of the flanges—that is, the size of the friction-surfaces. The spring-cushion retained within my peculiar plates may be arranged in any suitable position between the parts that are to be cushioned, as between the bolsters of car-trucks.

It will be observed that the springs interposed between the cap-plates serve to impart a springy nature to the lower cap-plate, which is thus caused to maintain frictional engagement with the flanges of the companion cap-plate irrespective of the load. I do not wish to be limited, however, to this means for imparting a springy nature to the lower cap-plate, as the function of maintaining the flanges of the cap-plates in frictional contact without regard to the load may be performed by a structure having other characteristics. I prefer the construction, however, wherein this desirable springy characteristic is supplied to the lower cap-plate by the same spring which is adapted to act as a cushion.

It will be observed that I have provided a construction wherein one cap-plate constitutes, preferably, a friction element for the companion cap-plate.

It will be observed that I have provided a cap-plate, inclosing a spring, tending to rotate with respect to the cushion part immediately associated therewith, and consequently tending to rotate with respect to the companion cap-plate, the vertical or friction-producing arms of the levers consequently having this tendency to secure the needed friction.

It is obvious that changes may be made from the device of my invention herein shown and particularly described without departing from its spirit, and I do not, therefore, wish to be limited to the precise construction herein set forth; but,

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

1. The combination with a plurality of coiled

springs arranged one within another, of upper and lower cap-plates constituting inclosing retaining-plates for the coiled springs and having side flanges arranged adjacent to each other, one of said plates being formed to have its flanges sprung into frictional engagement with the companion flanges under pressure, substantially as described.

2. The combination with a coiled spring, of upper and lower cap-plates constituting inclosing retaining-plates for the coiled spring and having side flanges arranged adjacent to each other, one of said plates being formed to have its flanges sprung into frictional engagement with the companion flanges under pressure, substantially as described.

3. The combination with a plurality of coiled springs arranged one within another, of upper and lower cap-plates constituting inclosing retaining-plates for the coiled springs and having side flanges arranged adjacent to each other, one of said plates being formed to have its flanges sprung into frictional engagement with the companion flanges under pressure, the plate that is adapted to have its flanges sprung being formed into two parts, each having a flange, thus dividing the said cap-plate into two distinct levers, substantially as described.

4. The combination with a coiled spring, of upper and lower cap-plates constituting inclosing retaining-plates for the coiled spring and having side flanges arranged adjacent to each other, one of said plates being formed to have its flanges sprung into frictional engagement with the companion flanges under pressure, the plate that is adapted to have its flanges sprung being formed into two parts, each having a flange, thus dividing the said cap-plate into two distinct levers, substantially as described.

5. In combination with one or more coiled springs, an upper cap-plate having downwardly-depending flanges, and a lower cap-plate having flanges upwardly extending adjacent to the upper plate-flanges, one of said plates having a convexly-formed base and having its flanges arranged within the flanges of the other plate, whereby the flanges of the convexly-formed cap-plate may be sprung outwardly under pressure into frictional engagement with the flanges of the other cap-plate, the said cap-plates, in addition to acting as recoil-retarders, also acting as inclosing retaining-plates for the coiled spring or springs, substantially as described.

6. In combination with one or more coiled springs, an upper cap-plate having downwardly-depending flanges, and a lower cap-plate having flanges upwardly extending adjacent to the upper plate-flanges, one of said plates having a convexly-formed base and having its flanges arranged within the flanges of the other plate, whereby the flanges of the convexly-formed cap-plate may be sprung outwardly under pressure into frictional en-



gagement with the flanges of the other cap-plate, the said cap-plates, in addition to acting as recoil-retarders, also acting as inclosing retaining-plates for the coiled spring or springs, the cap-plate that is provided with the convexly-curved base being divided into structurally distinct levers, each having a flange and a portion of the base of the said cap-plate, substantially as described.

7. The combination with a spring, of a cap-plate therefor and a friction element, the said cap-plate being formed to have its flanges relatively moved to bring the cap-plate into frictional contact with the friction element, the spring being disposed between said flanges substantially as described.

8. In a spring-cushion, the combination with a coiled spring interposed between the parts to be cushioned, of a cap-plate inclosing or surrounding the spring and interposed between the spring and one of the said parts, said cap-plate moving or tending to move with reference to the latter part, whereby it may be brought into frictional engagement with a friction element to reduce the vibration of the spring, substantially as described.

9. In a spring-cushion, the combination with a coiled spring interposed between the parts to be cushioned, of a cap-plate inclosing or surrounding the spring and interposed between the spring and one of the said parts, the said cap-plate having a flanged portion moving or tending to move with respect to the latter part, whereby frictional engagement may be effected with a friction element to decrease the vibration of the spring, substantially as described.

10. In a spring-cushion, the combination with a coiled spring interposed between the parts to be cushioned, of a spring-operated cap-plate inclosing or surrounding the spring and interposed between the spring and one of the said parts, whereby the spring-operated cap-plate may be moved into frictional engagement with the friction element to decrease the vibration of the spring, substantially as described.

11. In a spring-cushion, the combination with a coiled spring interposed between the parts to be cushioned, of a cap-plate inclosing or surrounding the spring and interposed between the spring and one of the said parts, the said cap-plate having a spring-operated flange portion whereby frictional engagement may be effected with a friction element to decrease the vibration of the spring, substantially as described.

12. In a spring-cushion, the combination with a coiled spring interposed between the parts to be cushioned, of cap-plates upon the ends of the spring and inclosing or surrounding the same, one of the said cap-plates being spring-operated to effect its frictional engagement with a companion cap-plate, substantially as described.

13. In a spring-cushion, the combination

with a coiled spring interposed between the parts to be cushioned, of cap-plates provided upon the ends thereof and inclosing or surrounding the same, one of the said cap-plates tending to move with reference to its cushioned part to bring it into frictional engagement with the companion cap-plate, substantially as described.

14. In a spring-cushion, the combination with a coiled spring interposed between the parts to be cushioned, of cap-plates upon the ends thereof and inclosing or surrounding the same, one of the said cap-plates being provided with a flange which moves or tends to move with respect to its cushioned part to bring it into frictional engagement with the companion cap-plate, substantially as described.

15. In a spring-cushion, the combination with a coiled spring interposed between the parts to be cushioned, of cap-plates provided upon the ends thereof and inclosing or surrounding the same, one of the said cap-plates being spring-operated, whereby it is brought into frictional engagement with the companion cap-plate, substantially as described.

16. In a spring-cushion, the combination with a coiled spring interposed between the parts to be cushioned, of cap-plates upon the ends thereof and inclosing or surrounding the same, one of the said cap-plates being provided with a spring-operated flange to bring the same into frictional engagement with the companion cap-plate, substantially as described.

17. In a spring-cushion, the combination with a coiled spring interposed between the parts to be cushioned, of a cap-plate inclosing or surrounding the spring and interposed between the spring and one of the said parts, and a friction element, said cap-plate moving or tending to move with reference to the latter cushioned part, whereby it may be brought into frictional engagement with said friction element to reduce the vibration of the spring, substantially as described.

18. In a spring-cushion, the combination with a coiled spring interposed between the parts to be cushioned, of a cap-plate inclosing or surrounding the spring and interposed between the spring and one of the said parts, and a friction element, the said cap-plate having a flanged portion moving or tending to move with respect to the latter cushioned part, whereby frictional engagement may be effected with said friction element to decrease the vibration of the spring, substantially as described.

19. In a spring-cushion, the combination with a coiled spring interposed between the parts to be cushioned, of a friction element, and a spring-operated cap-plate inclosing or surrounding the spring and interposed between the spring and one of the said parts, whereby the spring-operated cap-plate may be moved into frictional engagement with the friction element to decrease the vibration of the spring, substantially as described.

20. In a spring-cushion, the combination  
with a coiled spring interposed between the  
parts to be cushioned, of a friction element,  
and a cap-plate inclosing or surrounding the  
5 spring and interposed between the spring and  
one of the said parts, the said cap-plate hav-  
ing a spring-operated flange portion, whereby  
frictional engagement may be effected with

the friction element to decrease the vibration  
of the spring, substantially as described. 10

In witness whereof I hereunto subscribe my  
name this 7th day of January, A. D. 1902.

ALVIN CARR McCORD.

Witnesses:

MORRILL DUNN,

HARVEY L. HANSON.