No. 869,754. PATENTED OCT. 29, 1907.

C. A. TOWER.

FRICTIONAL DRAFT RIGGING.

APPLICATION FILED JAN. 24, 1907.

3 SHEETS—SHEET 1.

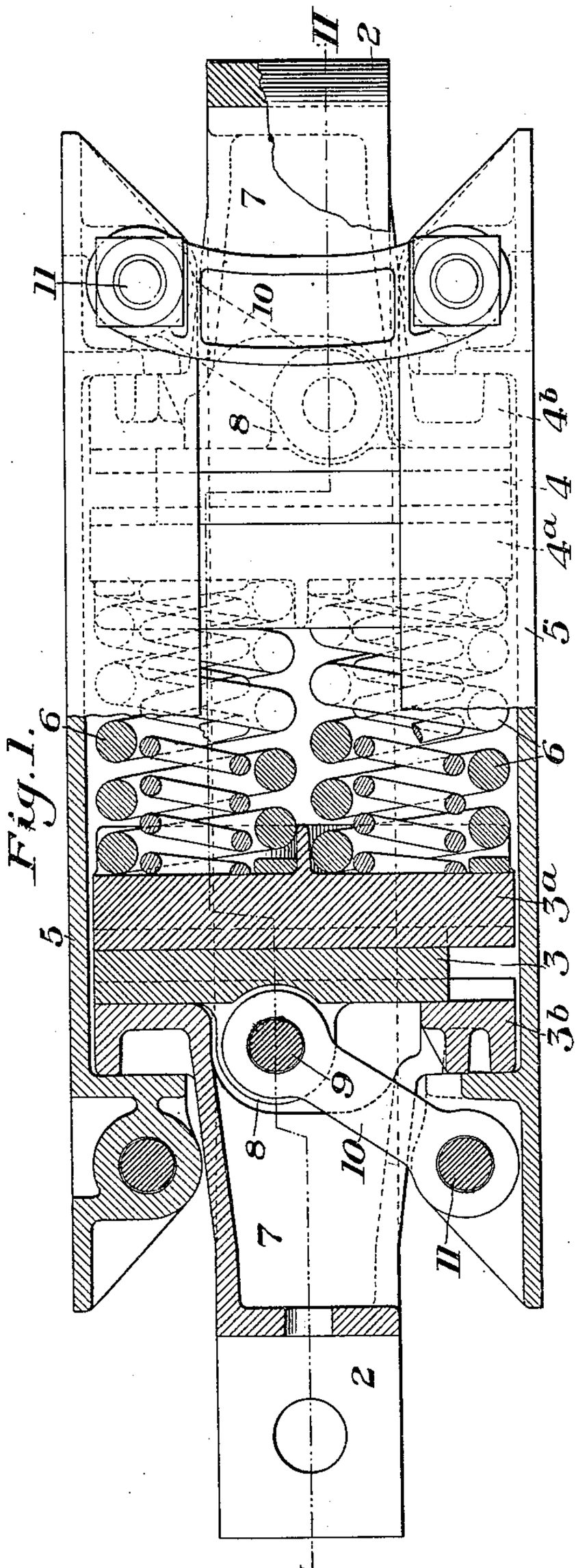

Fig. 1.

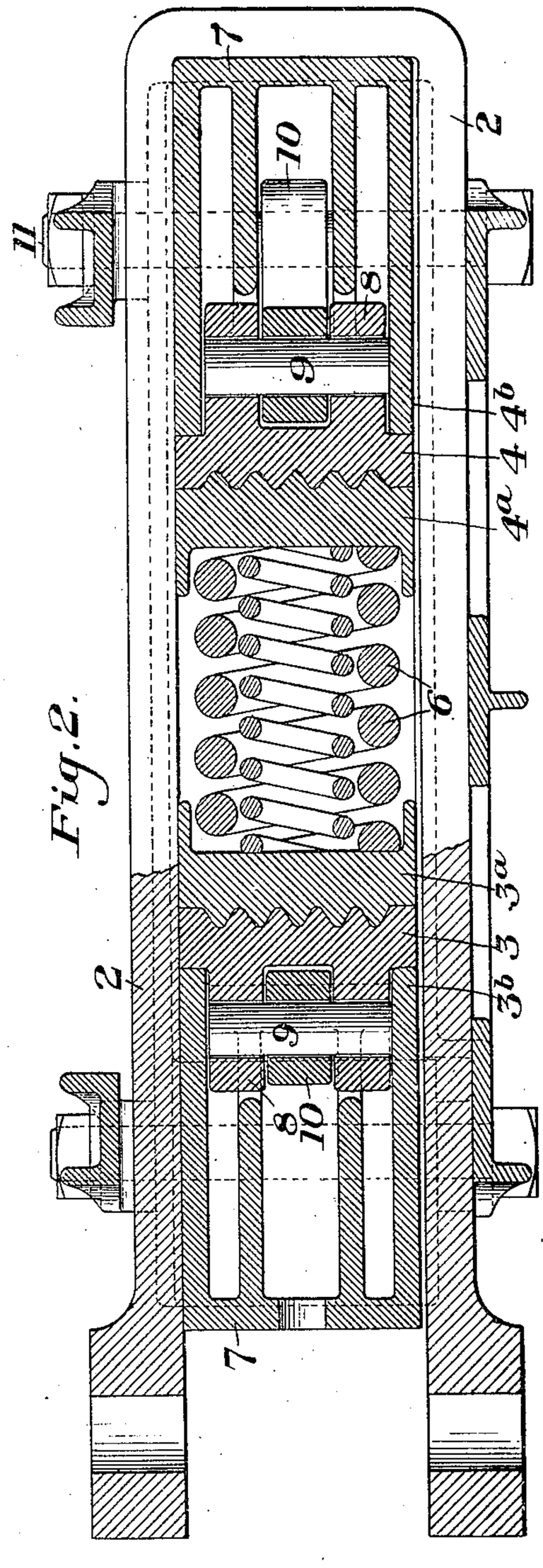

Fig. 2.

WITNESSES

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3 SHEETS—SHEET 2.

Fig. 4.

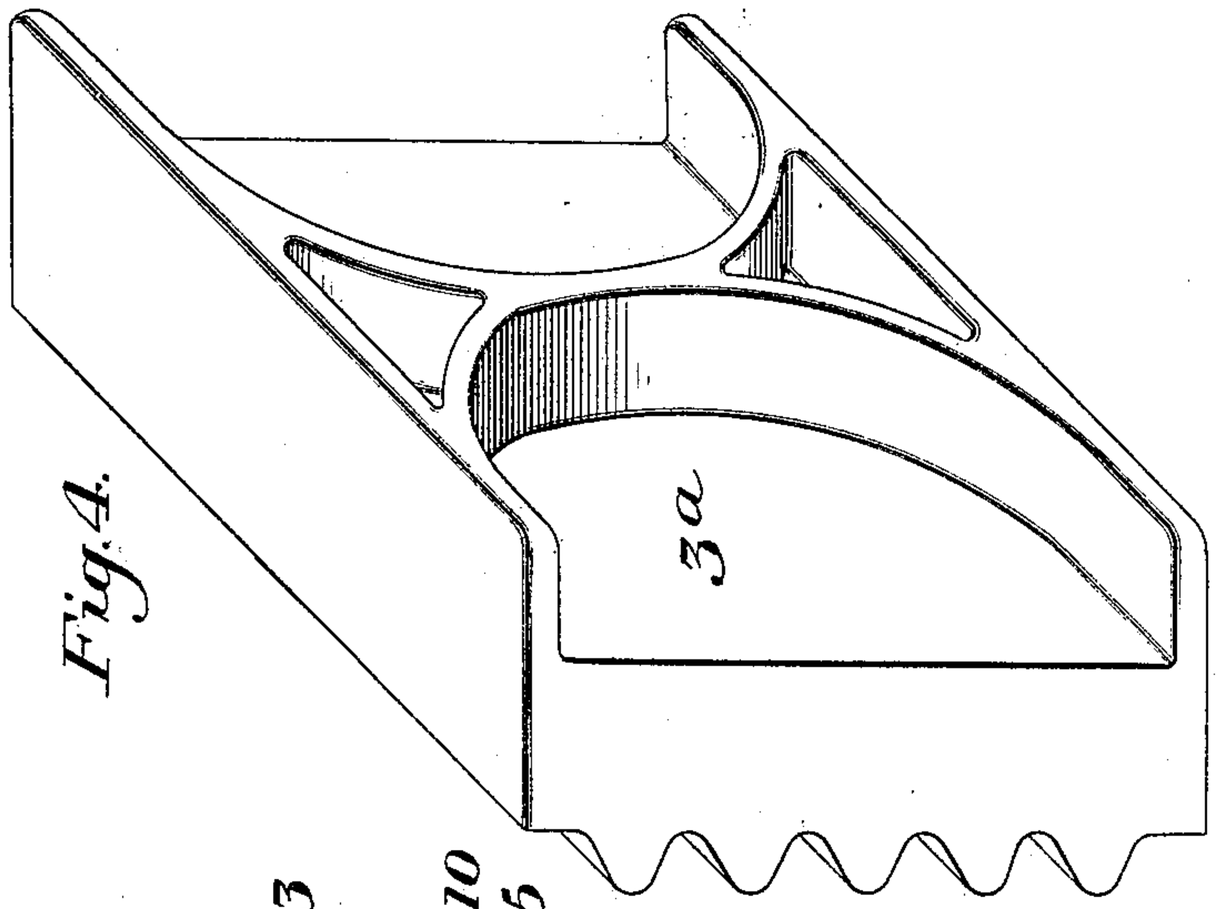
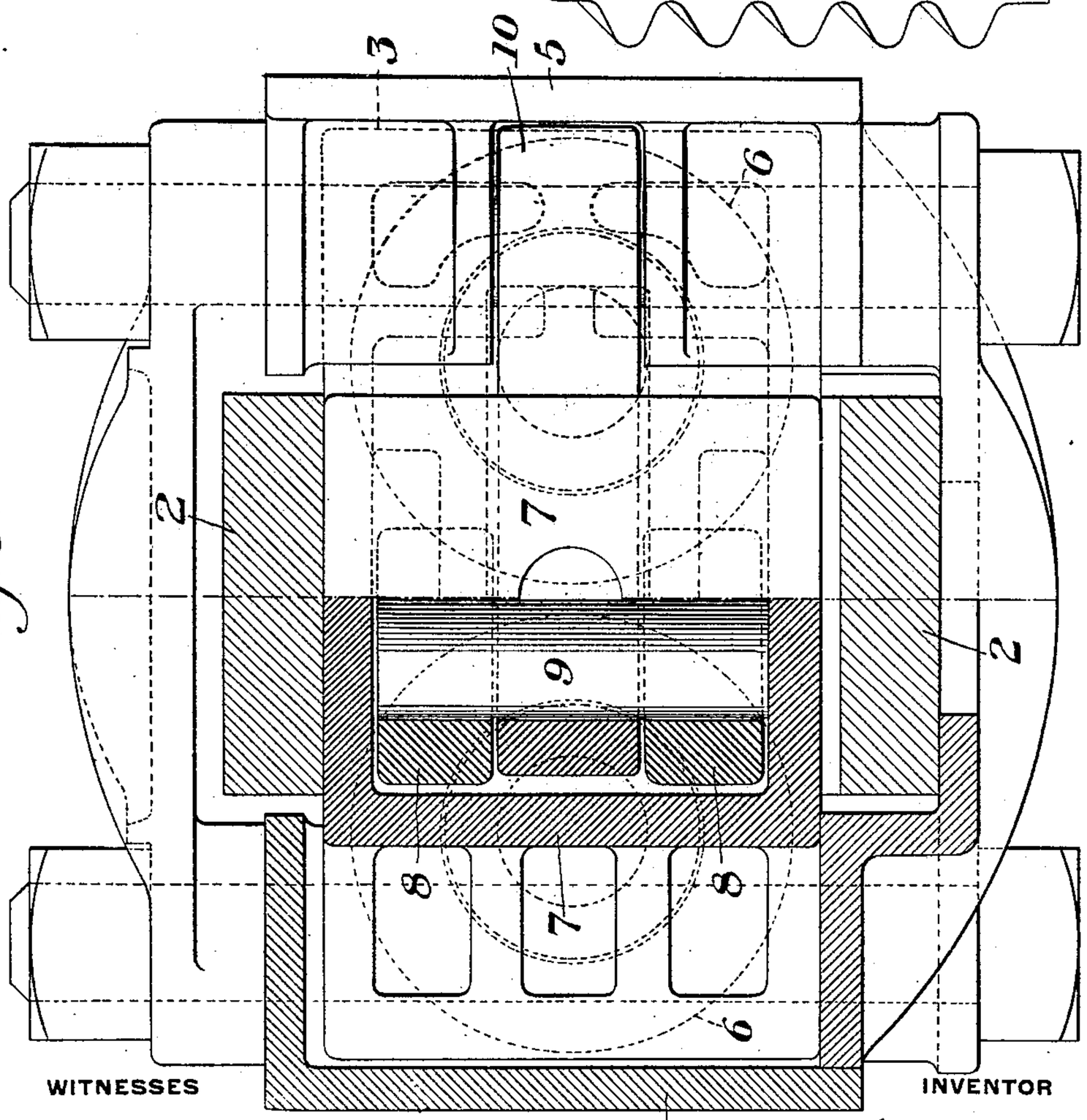


Fig. 3.



WITNESSES

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3 SHEETS—SHEET 3.

Fig. 5.

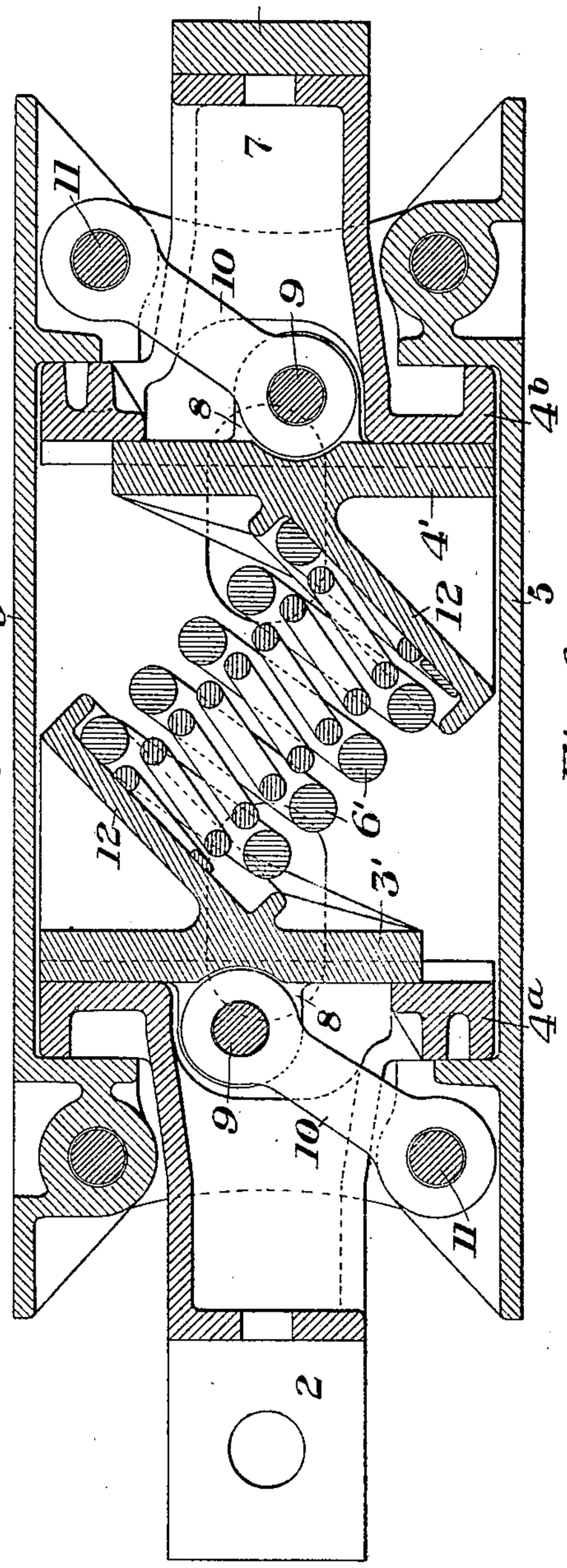
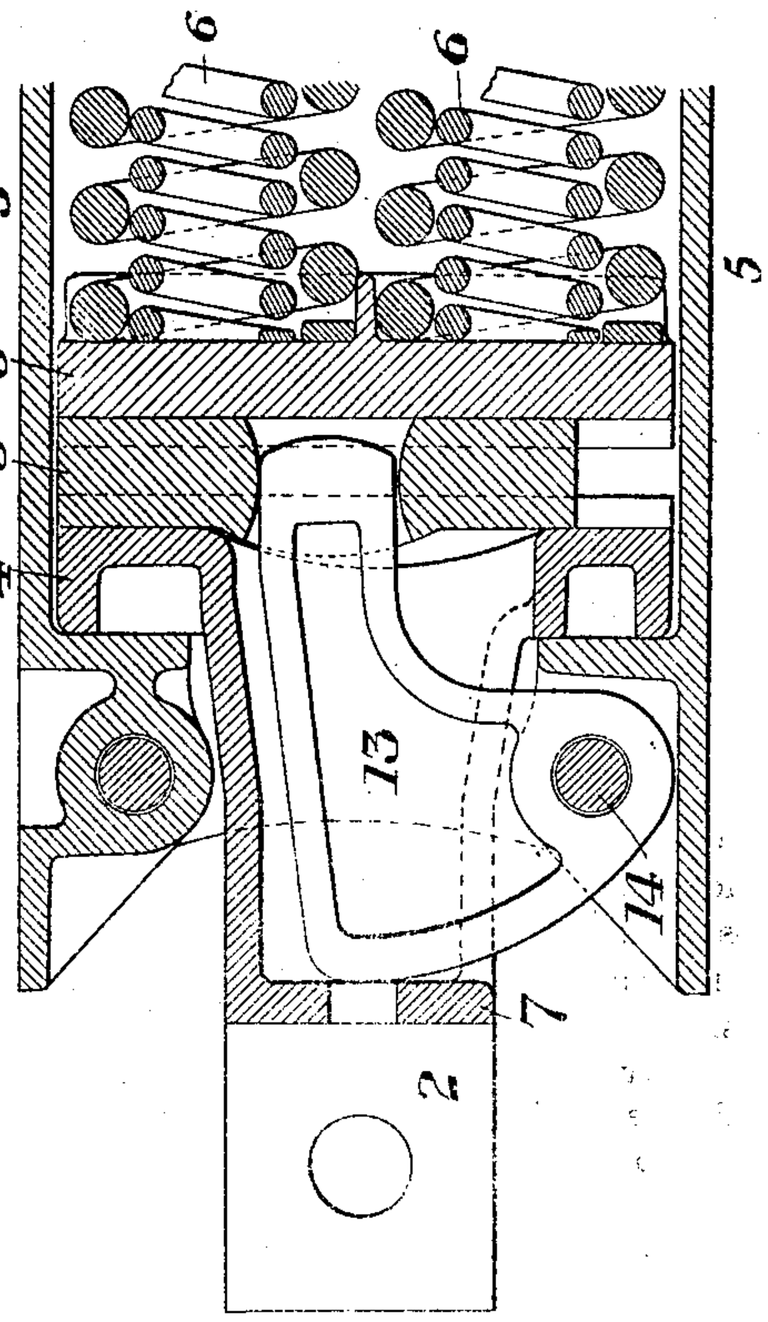


Fig. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

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FRICTIONAL DRAFT-RIGGING.

No. 869,754. Specification of Letters Patent. Patented Oct. 29, 1907.

Application filed January 24, 1907. Serial No. 353,893.

To all whom it may concern:

Be it known that I, CLINTON A. TOWER, of Cleveland, Cuyahoga county, Ohio, have invented a new and useful Frictional Draft-Rigging, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view partly in section showing one form of my improved frictional draft rigging; Fig. 2 is a sectional elevation of the same on the line II—II of Fig. 1; Fig. 3 is a cross section partially in elevation on an enlarged scale; Fig. 4 is a detail view of one of the followers; Fig. 5 is a sectional plan view showing a modified form and Fig. 6 is a partial horizontal sectional view showing another form of the invention.

In the drawings, 2 represents the yoke or strap; and 3 and 4 are front and rear follower plates, each arranged between shoes or followers 3^a, 3^b and 4^a, 4^b. The plates 3 and 4 are of less length than the distance between the side members 5 of the case, and each set of plates 3, 3^a and 4, 4^a is preferably grooved or correspondingly corrugated upon the meeting faces as shown in Fig. 2; these contacting faces extending transversely and preferably substantially at right angles to the line of draft and one or more springs 6 is provided between the sets of followers.

In order to give endwise movement to the follower-plates 3 and 4 I extend the shoes 3^b and 4^b outwardly at their ends as shown at 7. These extensions fit between the sides of the yoke 2; and each is provided with an open-sided pocket or recess into which project lugs or ears 8, 8 on the shorter followers 3 and 4. These lugs receive a pin 9 to which is pivoted the link 10, extending sidewise to a fulcrum pin 11 secured to the side portion of the case. These pins 11 at opposite ends of the draft-rigging are preferably arranged diagonally opposite to each other as shown in Fig. 1, so that the differential links 10 extend to opposite sides at the opposite ends of the draft-rigging. When a pulling force is exerted upon the coupler it is transmitted by the yoke to the rear follower 4^b, which is pulled forwardly thereby against the pressure of the spring or springs. The rear set of followers therefore moves forward and at the same time, and owing to the differential link connection the shorter follower 4 is drawn between the followers 4^a and 4^b in a direction transverse to the line of draft. It therefore moves laterally and sets up friction between its grooved faces and those of the followers 4^a and 4^b The parts are kept in close frictional contact by the pressure of the spring; and the degree of friction may be varied according to the nature of the use to which the device is to be put, by properly determining the number and form of the grooves on the faces of the pairs of followers and the number and capacity of the springs. The friction may also be varied by adjusting the angle of the differential links.

When a buffing force is applied to the draft rigging the followers 4, 4^a and 4^b are held stationary by the end of the case, while the front followers 3, 3^a and 3^b are forced rearwardly against the springs. In this case the follower 3 moves laterally in frictional contact with the followers 3^a and 3^b during the rearward movement.

In both buffing and draft the clamping action and the frictional resistance increase proportionately to the stress on the parts and the increased force thus required to move the intermediate followers 3 and 4 laterally is multiplied by the differential action of the links as they approach a position of parallelism with the line of draft. The resistance of the draft rigging to buffing and draft is thus increased differentially, and the efficiency of the device is thereby greatly enhanced. The stresses are transmitted from the draw bar to the frictional element 3 independently of the connecting piece 10.

In Fig. 5 I show a form similar to that of Figs. 1 to 3 inclusive, except that the transverse movement of the followers 3′ and 4′ is resisted by the spring 6′ which extends at an angle to the line of draft and between cap plates 12 secured to or cast integrally with these followers. In this case the pulling or buffing strain will not only move one follower longitudinally toward the other, but will also move one of the followers transversely or laterally of the case through the differential link action. This differential link will not only draw the follower across the case, but will increase the pressure through the stroke owing to its approaching more nearly a position parallel with the line of draft.

In Fig. 6 I show a form similar to that of Fig. 1, except that instead of the link 10 I employ a bell crank lever 13. This bell crank lever is fulcrumed to the case at 14 and its other arm extends into a hole in the follower 3. By suitably proportioning the arms of this bell crank lever, the amount of movement of the follower through different parts of the stroke in buffing or pulling can be proportioned as desired and a differential action thus imparted.

As the friction is caused by lateral movement of the follower, very little longitudinal movement will suffice to secure the required frictional resistance. I can thus use yokes of convenient and reasonable length, and by thus enabling springs of ordinary diameter and capacity to be used with friction devices without using a yoke of undue length, I obtain new and very useful advantages.

The device is self-releasing, and it has the additional merit that when the force of pulling or buffing is re-

lieved, the spring during the release continues its clamping action upon the follower and shoes and by maintaining their frictional contact prevents a violent recoil.

Those skilled in the art will be able to modify the construction and arrangement of the parts in many ways without departure from my invention. Thus, instead of moving laterally in a horizontal direction, the links may be arranged so as to impart to the movable friction members lateral motion in a vertical direction; or within the scope of my broader claims the movable element may be made circular in outline and arranged to rotate in a vertical plane between the shoes, the grooves in that case being made circular.

I claim:—

1. A frictional draft rigging having a spring, an end follower, a laterally movable frictional element, and a connecting piece arranged to move the frictional element transversely during the stroke, said frictional element being interposed in the draft rigging and subjected to stress thereupon independently of said connecting piece.

2. A frictional draft rigging having sets of followers, one movable relatively to another transversely of the rigging, and a swinging element arranged to draw one follower along the other during the stroke.

3. A frictional draft rigging having a spring and a laterally movable frictional follower and a pivoted element connected to the follower and arranged to move it transversely of the case.

4. A frictional draft rigging having a spring, an end follower and three frictional elements, and a connecting piece arranged to move the middle one between the others transversely to the line of draft, said frictional elements being interposed in the draft rigging and subjected to stress thereupon independently of said connecting piece.

5. A frictional draft rigging having a set of followers, one movable relatively to another transversely to the line of draft, and a connection between a fixed point and the movable follower.

6. A frictional draft rigging having a set of followers, one movable relatively to another transversely to the line of draft, and a differentially acting connection for the transversely movable follower.

7. A frictional draft rigging having a set of followers, one movable relatively to another transversely to the line of draft, and a pivotal connection between the transversely movable follower and a fixed point.

8. A frictional draft rigging having a spring and three friction elements, and a pivoted link arranged to move the middle one between the others transversely to the line of draft.

9. A draft rigging having a spring, friction elements, and a differentially acting device controlling the friction elements.

10. A draft rigging having a spring, friction elements, and a differential link.

11. A draft rigging having a draw bar, a spring, a follower, and a differential link interposed between the draw bar and the spring.

12. A frictional draft rigging having a spring and frictional elements capable of relative motion transversely of the draft rigging, said frictional elements having faces at right angles to the line of draft, and means for converting a longitudinal motion of the draft rigging into relative transverse motion of said elements.

In testimony whereof, I have hereunto set my hand.

CLINTON A. TOWER.

Witnesses:
HARRY E. ORR,
CHARLES E. POPE.