No. 724,725. PATENTED APR. 7, 1903.

E. F. MOORE.

CENTRIFUGAL EXTRACTOR.

APPLICATION FILED MAR. 17, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

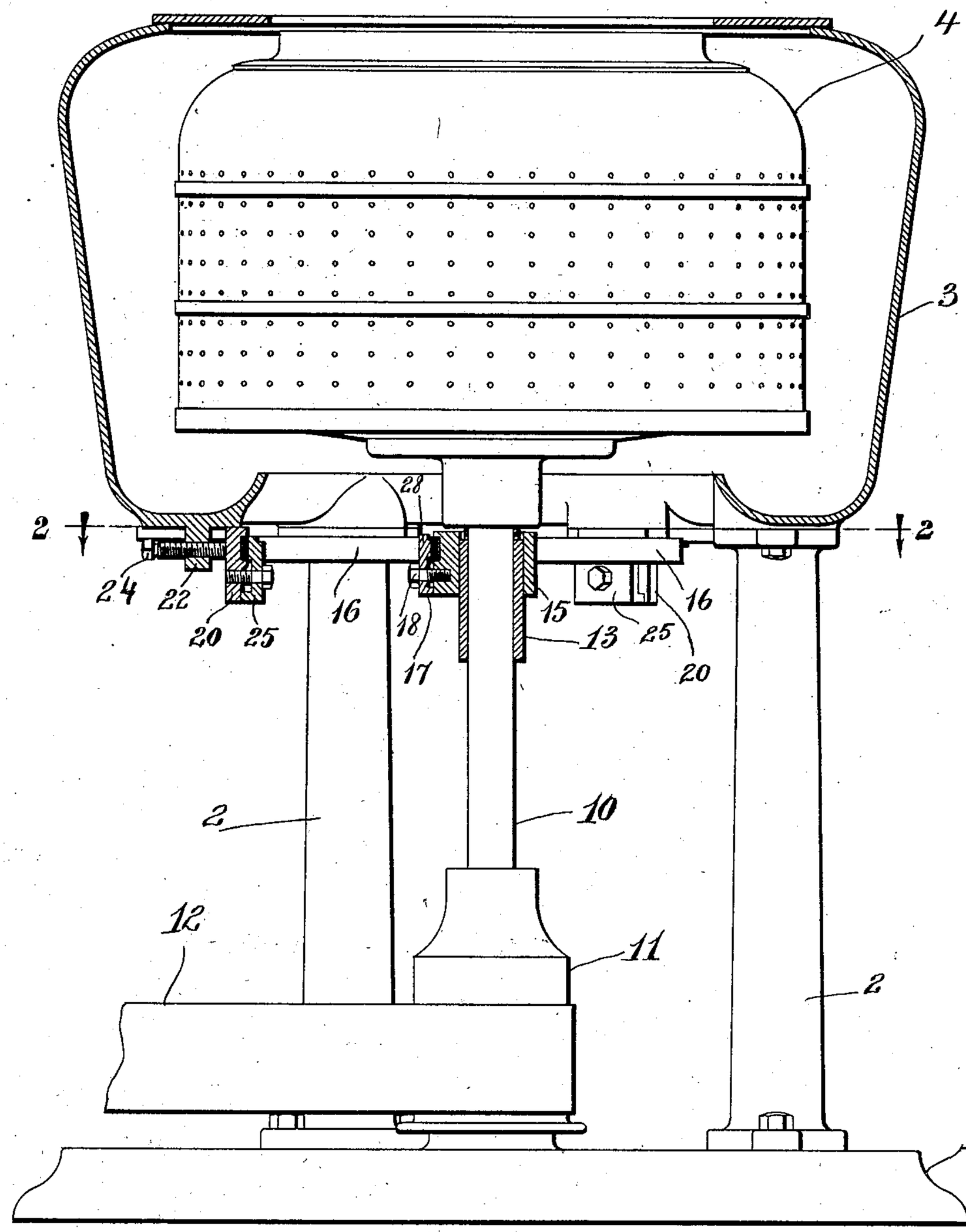

Fig. 1.

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George Pezzetti

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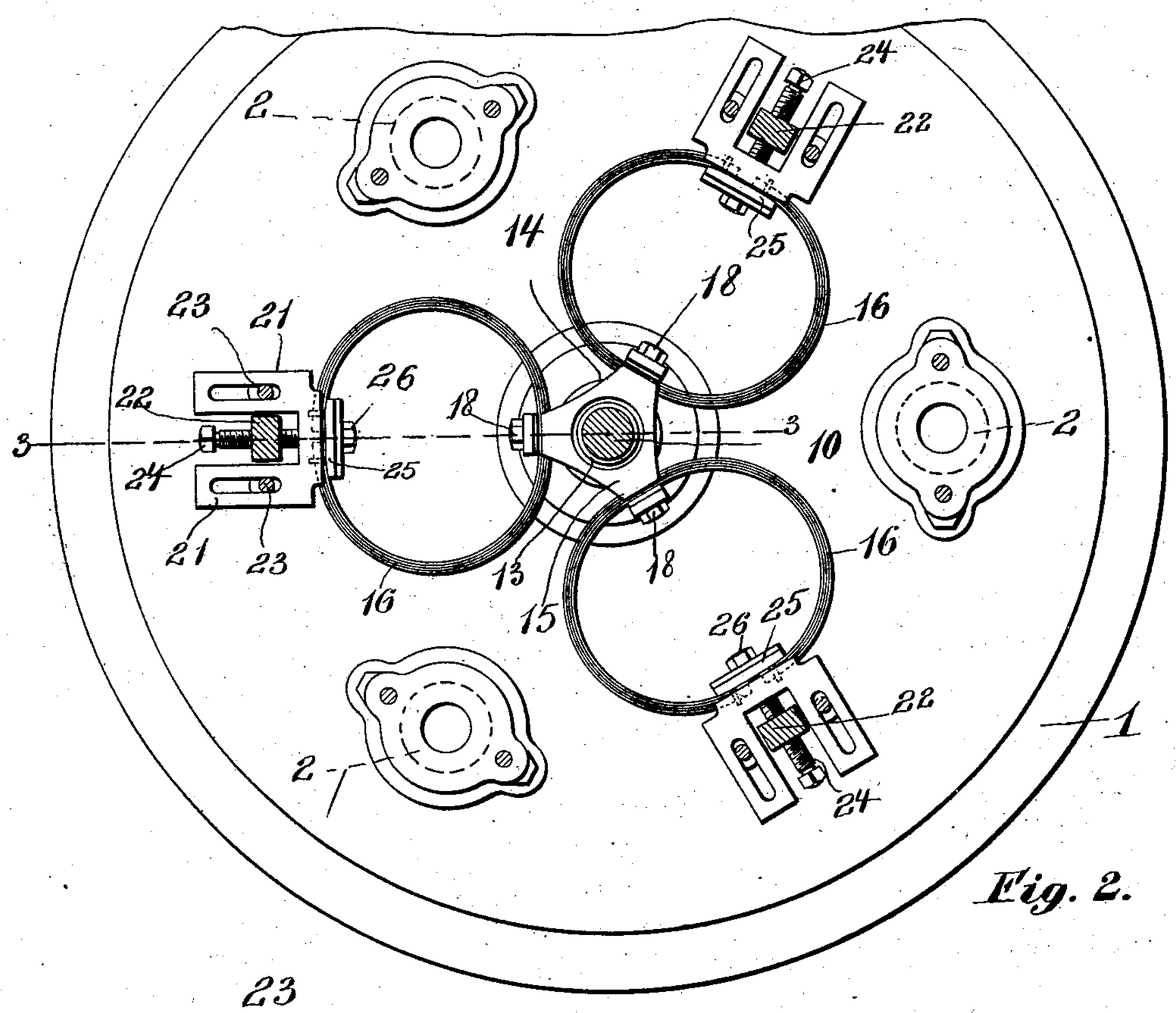


Fig. 2.

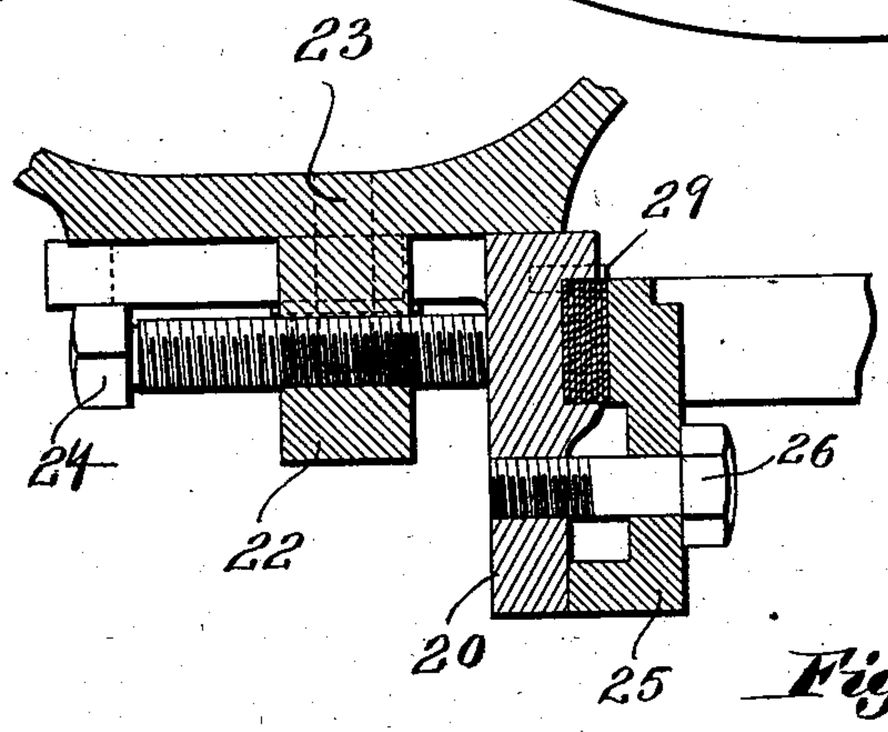
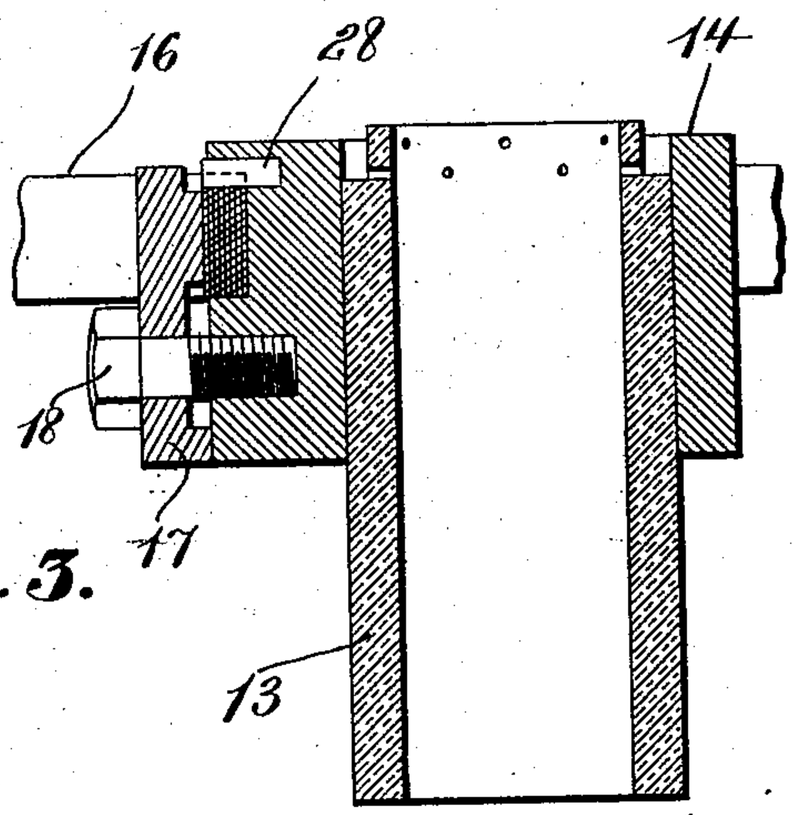


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWIN F. MOORE, OF HYDEPARK, MASSACHUSETTS.

CENTRIFUGAL EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 724,725, dated April 7, 1903.

Application filed March 17, 1902. Serial No. 98,547. (No model.)

To all whom it may concern:

Be it known that I, EDWIN F. MOORE, of Hydepark, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Centrifugal Extractors, of which the following is a specification.

This invention relates to an improvement in centrifugal extractors; and it consists in the novel features of construction and relative arrangement of parts hereinafter fully described in the specification, clearly illustrated in the drawings, and particularly pointed out in the claims.

Reference is to be had to the accompanying sheets of drawings, forming a part of this application, in which like characters indicate like parts wherever they occur.

Figure 1, in front elevation, shows a machine constructed in accordance with my invention, a part of the movable bearing for the basket-shaft being cut away and the curbing being shown in section in order to show the basket and the arrangement of its shaft with a movable bearing. Fig. 2 represents a cross-section on line 2 2 of Fig. 1 looking in the direction of the arrow, showing the spider which forms the movable bearing for the basket-shaft and the three springs connecting the spider with the curbing for maintaining the basket-shaft in a vertical position irrespective of the inequalities of the load. Fig. 3 is a vertical sectional view on the line 3 3 of Fig. 2, the spring being broken away, the view showing the manner of the attachment of the spring to the spider and to the curbing.

The base 1 of the machine, the uprights 2, the curbing 3, and the perforated basket 4 may be of any ordinary or preferred construction.

The machine may be employed for removing water from clothing or extracting fluids of any kind from solids.

10 represents a vertical shaft, to the top of which the basket 4 is secured in the usual way. The lower end of the shaft 10 rests in a ball-bearing or other socket, as usual.

11 represents a pulley on the shaft 10, and 12 a belt for driving the pulley and through it the shaft 10 and the basket 4. As the basket is revolved while the weight is supported by the lower end of the shaft, some provision is necessary for maintaining the shaft in a vertical position. It is further essential that the means that maintain the shaft 10 in its vertical position have a yielding action in order to compensate for variations or inequalities in the load as the basket is revolved at a high speed.

In carrying out my invention I employ a plurality of devices, each of which comprises a leaf-spring made up of a series of laminæ or strips, each spring, as shown, being composed of eight laminæ or strips, although a larger number could be employed. By this construction the spring is made efficient, and at the same time one leaf may break without at all impairing the efficiency of the spring or requiring the machine to be stopped, thus obviating the smash-ups that occur by the breaking of the spring in the ordinary separator. As shown, there are three springs arranged one hundred and twenty degrees apart, as usual. Since these springs are substantially duplicates of each other, a description of one will suffice for all.

13 represents a bushing arranged upon the shaft 10 and carried by the spider 14. This bushing is driven into the spider or secured in place as a bearing in any desired way. The spider 14 is formed with three arms 15, to each one of which is secured one of the laminated springs 16. As shown, the spring 16 rests between the end of the arm 15 and a clamp 17, secured to the arm by means of a screw 18. By this construction the spring is firmly clamped into place. The clamp 17 carries a pin 28, adapted to pass through a suitable notch in the spring 16 as a means for preventing the slipping of the spring.

20 represents a plate formed with two parallel wings 21, arranged on each side of a lug 22, depending from the curbing, as shown. A screw 23 is arranged in the slot of each wing 21 (see Fig. 2) and takes into the curbing. By this means the plate after it has been slid in or out to the desired position may be rigidly locked in place by setting up the screws 23.

24 represents a set-screw carried by the lug 22. The free end of said screw engages the outer face of the plate 20 and affords means whereby the plate 20 may be forced inward against the tension of the spring 16 to bring

about the proper adjustment of the spider 14 and the shaft 10, carried thereby. Each spring 16 opposite the clamp 17 is arranged against a plate 20 and gripped in place by means of a clamp 25, a bolt 26, arranged in said clamp, taking into the plate 20, thereby forcing the spring against the plate. The clamp 25 carries on each side a pin 29, adapted to engage a suitable notch or aperture in the opposite ends of the spring 16 (see particularly Fig. 3) in order to maintain said ends against working of the clamp. The relative tension of each of these springs may be lessened or increased by means of the set-screw 24. Each spring is held on opposite sides thereof by the clamps 17 and 25.

By my construction not only is the shaft 10 maintained in its proper position during rotation, but the parts are so constructed as to practically eliminate all danger of breakage of the machine due to the breaking of a spring, since any one of the leaves of the several springs may break without impairing the efficiency of the machine as a whole or necessitating the stopping of the machine. Moreover, it will be understood that since the opposite sides of each spring (which is practically circular in form) are firmly clamped if either spring should entirely break or become dislodged from its fastening the other two would support the spindle sufficiently for practical purposes. This is because each spring resists movement of the shaft either toward or from said spring—that is, each spring acts to resist either a push or a pull thereupon—and therefore while the shaft is yieldingly supported in such manner as to attain all the useful results necessary in centrifugal machines no damage can result from the breaking of either of the springs.

Fig. 2 of the drawings illustrates the three springs as in their natural position, or, in other words, in the positions which they would occupy if they were not clamped or in any way connected with any other part, so as to be either under compression or expansion. Therefore when all three springs are present they are all three actuated or flexed in opposition to their resiliency whenever the shaft moves out of a true vertical line. If the shaft sways, it will be resisted by all three of the springs instead of, as has been customary heretofore, providing one or two springs, which will pull on the shaft, while another one or two springs will push against it. The result of this construction is increased safety and the attainability of a higher speed with safety—that is, since no serious harm can result if one of the springs break the machine may be run at a considerably-greater speed than has been found practicable heretofore. It will be readily understood that if each of the springs shown in Fig. 2 exerted a pulling action on the spider 14 then if one of the springs were to break the other two would pull the spider and the shaft to one side, which would result in what is commonly termed a "bursting" of the machine, owing to the sudden contact of the rapidly-revolving basket with one side of the curbing 3.

I claim—

1. The combination with a vertical shaft adapted to support a basket, of means whereby said shaft may be rotated, a spider through which said shaft passes, and a plurality of springs clamped to said spider, and means for positively clamping the outer portions of the springs at fixed points, all of the springs being under practically no tension when the shaft is in central position.

2. The combination with a shaft adapted to support a basket upon one end thereof, of means whereby said shaft may be rotated, a laterally-movable support for the shaft at a point between the basket and the other end of said shaft, and a plurality of springs clamped to said support, said springs being normally under no tension.

3. In a machine of the character described, the combination with a shaft adapted to carry a basket upon one end thereof, of means whereby said shaft may be rotated, a sleeve surrounding said shaft, a plurality of fixed supports located at different points opposite the said sleeve, and laminated springs clamped to said sleeve and supports, the arrangement being such that all of the springs oppose swaying movement of the shaft.

In testimony whereof I have affixed my signature in presence of two witnesses.

EDWIN F. MOORE.

Witnesses:

A. D. HARRISON,

GEORGE PEZZETTI.