

(No Model.)

S. S. BARRIE.
CENTRIFUGAL MACHINE.

No. 373,577.

Patented Nov. 22, 1887.

Fig. 1.

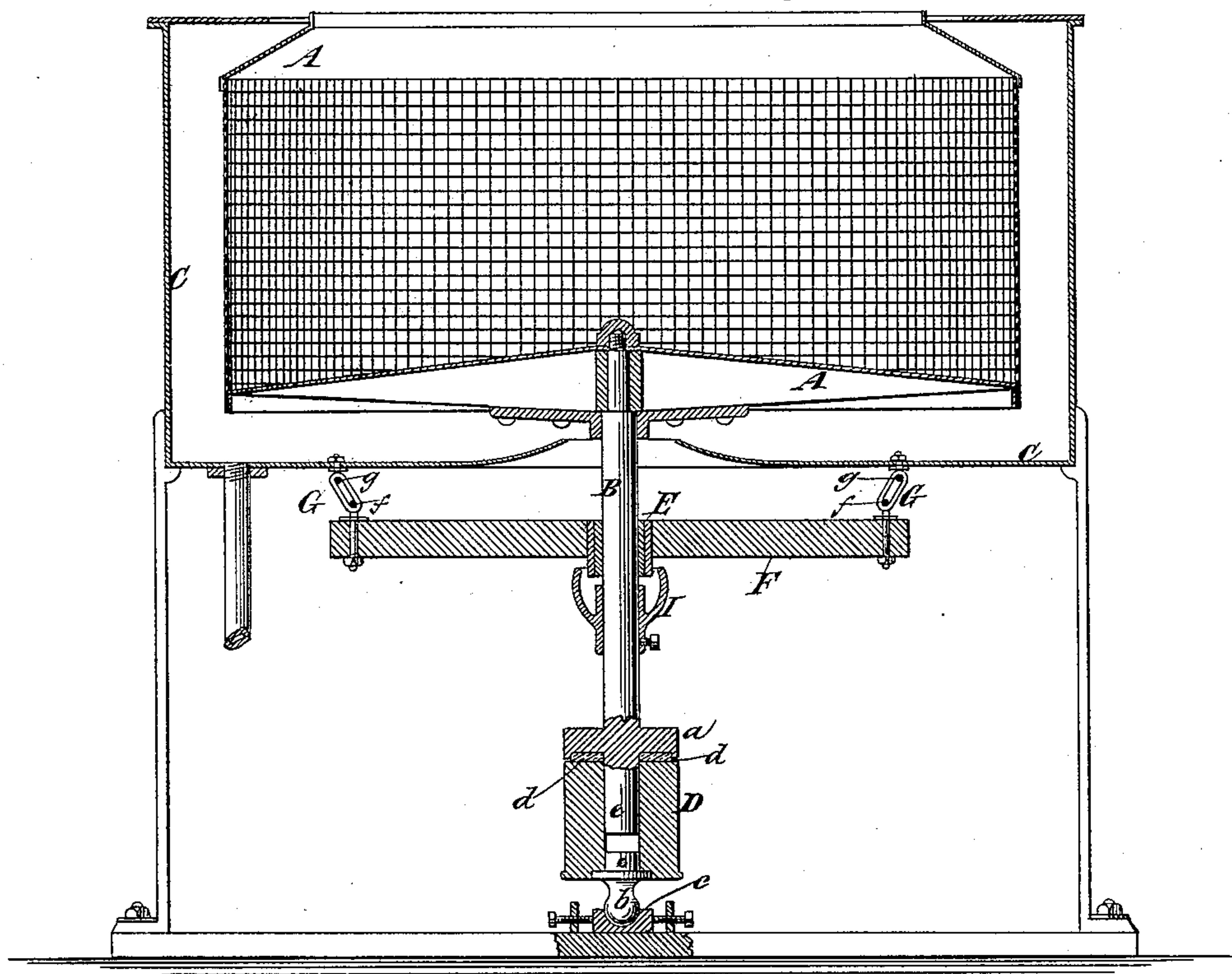
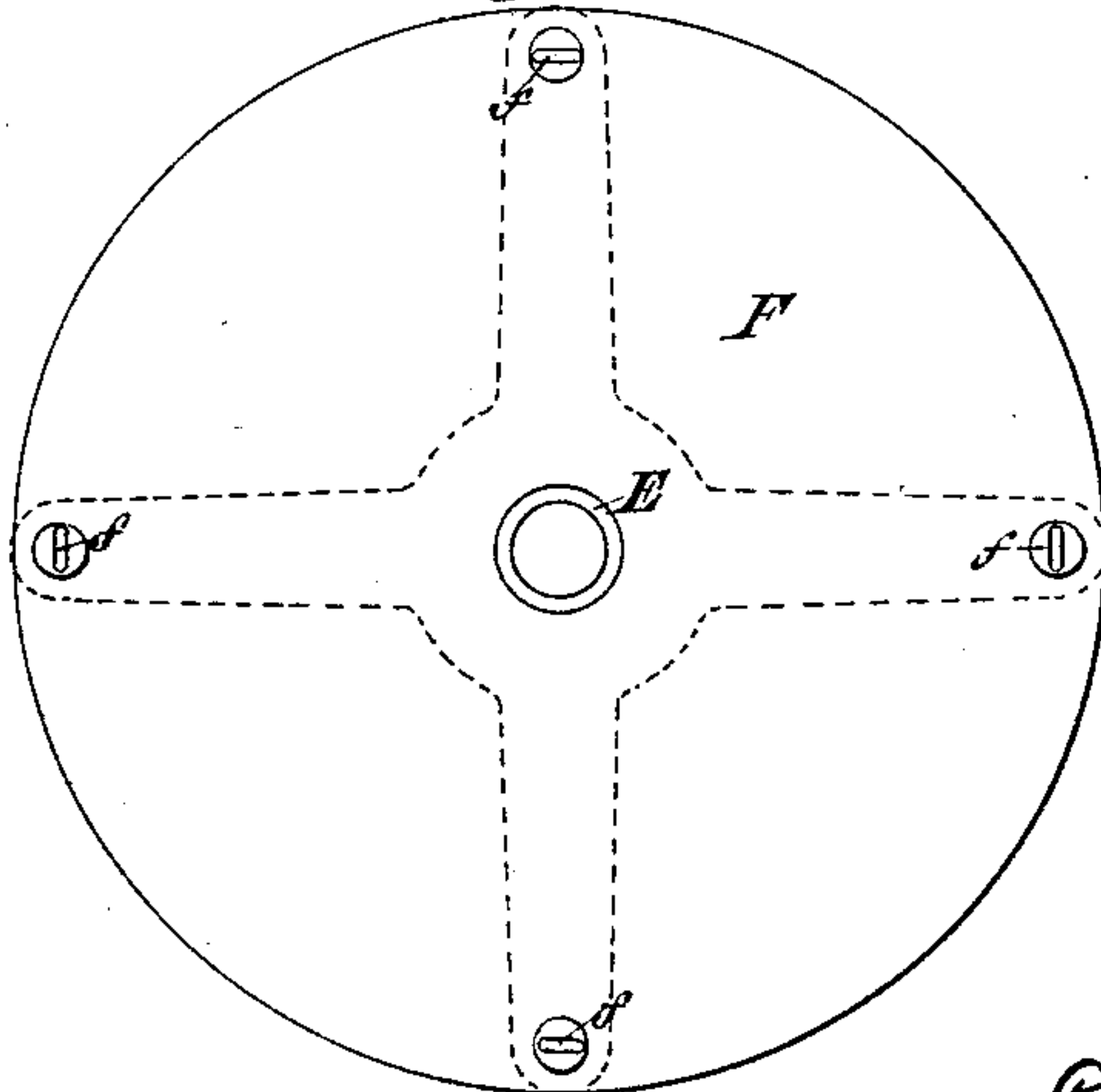


Fig. 2.



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CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 373,577, dated November 22, 1887

Application filed May 4, 1887. Serial No. 237,138. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL S. BARRIE, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Centrifugal Machines, of which the following is a specification, reference being had to the accompanying drawings.

The object of this invention is to provide for more effectually restraining the sweep or swing of the basket-spindle and the more rapid automatic restoration of the spindle and basket to their normal upright position in case of their being unequally loaded; and to this end my improvement consists in the combination, with the said spindle and its upper bearing or journal-box, of a non-rotating counter-balance attached to the journal-box, and swinging links or suspension connections for suspending the said box or bearing and counter-balance from fixed points, the said links or connections having in the normal position of the spindle an inclination from their upper ends toward the spindle, whereby the said bearings or box and counter-balance are always kept suspended with the axis of the box or bearing in line with the axis of the spindle.

Figure 1 in the drawings represents a central vertical section of a hydro-extractor with my improvement applied thereto. Fig. 2 is a plan view of the suspended, loaded, or counterbalanced journal-box.

Similar letters of reference designate corresponding parts in both figures.

A designates the basket; B, the basket-spindle, having the basket firmly secured on its upper end, and C the stationary shell surrounding the basket.

On the lower part of the spindle B is a broad fast collar or flange, *a*, which has a circumference about equal in size to the driving-pulley D. This pulley is bored to fit loosely to the part *e* of the spindle below the flange or collar *a*; but the spindle does not extend to the bottom of the pulley, a pivot, *b*, being firmly secured in the bottom thereof to be received in the fixed step-bearing *c*.

The above-described construction of spindle, driving-pulley, pivot, and friction device constitutes virtually a spindle in two rotating sections, the lower one, *b*, of which is sup-

ported in a step-bearing and carries the driving-pulley, and the other, B, carries the basket and a friction driving-collar, through which motion is received from the driving-pulley.

Between the top of the pulley and the bottom of the flange or collar *a* is a disk, *d*, of leather or other suitable substance, to transmit friction between the lower face of the said flange or collar and the upper face of the pulley. This disk is represented as secured in a cavity in the collar or flange. The collar or flange and the upper face of the pulley thus constitute two members of a friction driving device through which the power of the driving-belt applied to the pulley is transmitted from the pulley to the shaft. The necessary friction is produced in this device by the weight of the spindle, the basket, and the contents of the latter.

When power is applied to the belt, the pulley at once starts at full speed, and the friction between the pulley and the shaft causes the spindle and the basket to start easily and their speed to be gradually accelerated till they attain the maximum speed of the pulley without any straining or slipping of the belt.

E is the upper journal-box of the spindle. F is the load or counter-balance applied to said journal-box. G G are links by which the said journal-box and counter-balance are suspended from the bottom of the fixed shell C, the said links being arranged at equal distances from the normal vertical line of the axis of the spindle and equal distances from each other. By thus applying a load or counter-balance to the journal-box and suspending it to hang freely from fixed points the force of gravitation always tends to bring the center of the spindle directly in a point central to the several points of suspension, and consequently to bring the spindle to an upright position, the center of the step bearing being vertically below the said central point.

In the example represented in Fig. 1 and in bold outline in Fig. 2 the counter-balance F is a heavy disk of metal and the journal-box E is constructed, formed, or secured in the center of the said disk; but the counter-balance may consist of a central hub in or to which the journal-box is constructed or secured, and

which is provided with arms, as shown in dotted outline in Fig. 2, for the purpose of placing the points *f f* of its attachment to the suspending-links G G at a suitable distance from the journal-box and the spindle. The distances of these points of suspension and of the upper fixed points, *g g*, of suspension of the said links from the normal or vertical line of the axis of the spindle is such that when the spindle is upright the said links have inclinations downward toward the center of the spindle, as shown in Fig. 1, the inclination being such—viz., about twenty-five degrees to the vertical line in the example represented—that the counter-balance will always be suspended in a plane at right angles to the spindle and with its journal-box concentric with the spindle and parallel with the axis thereof, so that the spindle will not be cramped in the box. Ordinarily the spindle is maintained in a vertical position by the weight of the counter-balance, the latter being in a horizontal position; but if the unequal load in the basket should throw the spindle out of the vertical line the counter-balance would take a corresponding inclination, and without some means of compensating for this inclination the counter-balance would cease to be suspended by some of the links; and it is for this compensation that the links or swinging suspension-connections are inclined when in their normal positions. To illustrate the effect of this inclination of the links or suspension-connections, I will suppose that the spindle inclines to the left. The right-hand side of the counter-balance would then be raised and the left-hand side thereof would be depressed; but in the meantime the counter-balance has swung bodily to the left and taken the lower ends of the links in the same direction, and, owing to the inclination of the links, the right-hand link has its angle with the vertical increased and the left-hand link has its angle with the vertical diminished, the lower end of the right-hand one being raised to compensate for the

rise of its corresponding side of the counter-balance and the left-hand one being lowered to compensate for the depressing of its corresponding side of the counter-balance, and in this way the suspension of the journal-box and counter-balance is maintained on all sides of the spindle, notwithstanding the deviation of the spindle from the vertical position in any direction, and the axis of the journal-box is always maintained in line with the axis of the spindle at a right angle to the spindle, whether the latter be vertical or otherwise.

In starting the machine when the basket is unequally loaded it and the spindle will swing from and about the true vertical or normal axis; but the tendency of the weight toward its central position, increasing as the spindle swings farther from the normal axis, confines the swing or sweep within a given compass until the load gradually adjusts itself and the spindle assumes the vertical position.

The annular cup I (shown fastened to the spindle by a set-screw) is a drip-cup to receive any oil that flows down from the upper journal-box, E.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination, with the basket and its spindle and the upper journal-box of the latter, of a non-rotating counter-balance and swinging suspension-connections, substantially as herein described, for freely suspending the said journal-box and counter-balance from several fixed points, the said connections having in the normal condition of the spindle an inclination from their upper ends inward toward the spindle, whereby, as the spindle swings out of the vertical position, the journal-box and counter-balance remain suspended with the axis of the journal-box in line with the axis of the spindle, as herein set forth.

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