

S. S. HEPWORTH.  
CENTRIFUGAL MACHINE.

No. 104,149.

Patented June 14, 1870.

Fig. 1.

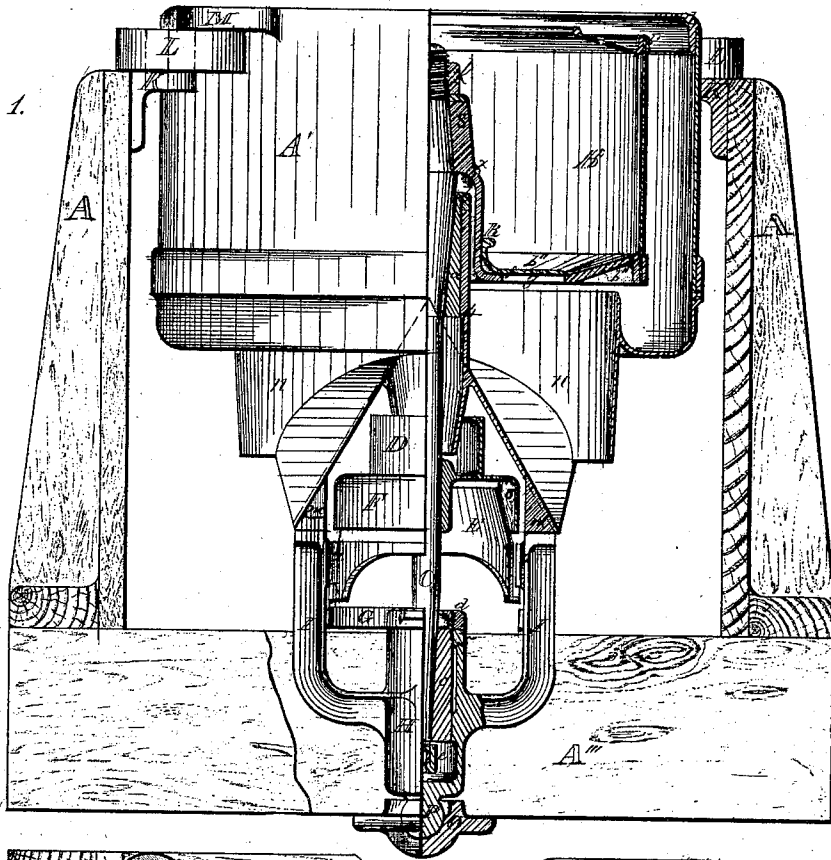
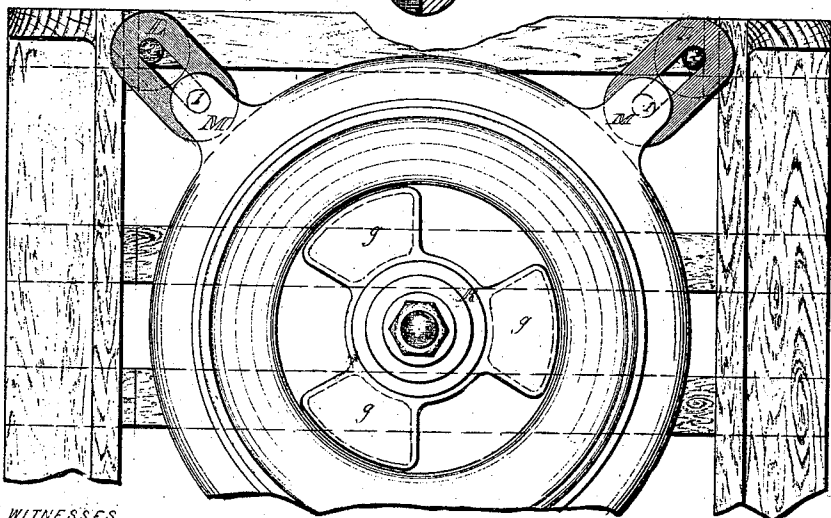


Fig. 2.



WITNESSES,

*W. B. Beecher*  
*A. L. Hodge*

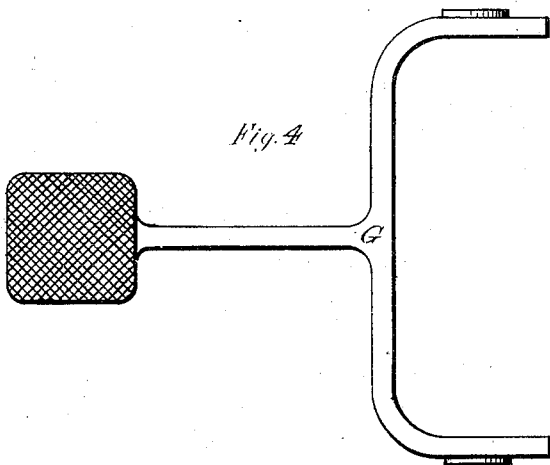
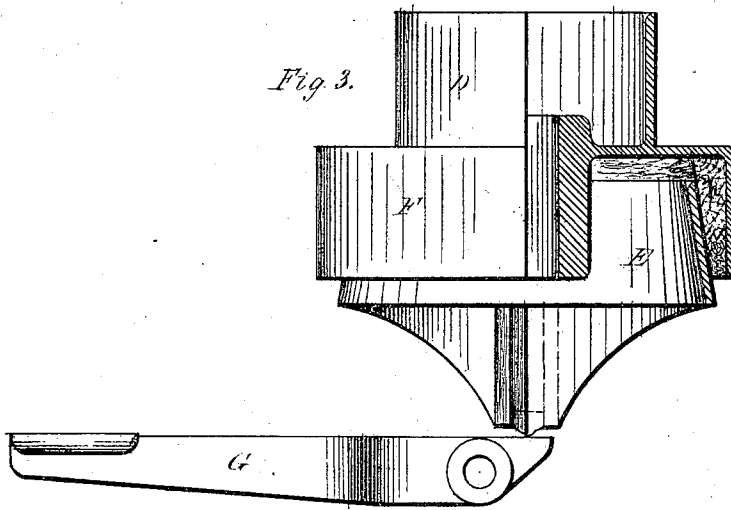
INVENTOR,

*S. S. Hepworth*

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WITNESSES,

INVENTOR,

*A. L. Lodge*  
*J. P. Bechen*

*S. S. Hepworth*

# United States Patent Office.

SAMUEL S. HEPWORTH, OF COLD SPRING, NEW YORK.

Letters Patent No. 104,149, dated June 14, 1870.

## IMPROVEMENT IN CENTRIFUGAL MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

### To all whom it may concern:

Be it known that I, SAMUEL S. HEPWORTH, of Cold Spring, in the county of Putnam and State of New York, have invented a new and useful Improvement in Centrifugal Machines, designed for draining sugar and other liquids, of the class in which provision is made for permitting gyratory or oscillating movement; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the drawings which accompany and form a part of this specification.

Of these drawings—

Figure 1 is a view, partly in elevation and partly in section, of a centrifugal machine which embodies my improvement; and

Figure 2 is a top view of the same machine.

Similar parts in the two figures are denoted by similar letters of reference.

Letters Patent of the United States have heretofore been granted to me for an improvement in centrifugal machines of the class referred to, wherein I have secured the important result of causing the basket to at all times remain concentric with the curb, whatever may be the oscillation of the machine. But in practice, this improvement, although entirely successful in operation, has been found to be somewhat more complicated and costly in its arrangement and construction than is desirable; and

The object of my present invention is to produce a centrifugal machine possessing the same important capacities of oscillating, when in motion, to the required extent, to enable the basket to automatically adjust itself upon its true center of gravity, however unbalanced its load may be; and

Also, of maintaining the basket in a condition of permanent concentricity with the curb under all circumstances; and to accomplish these results by means of a combination and arrangement of parts different from and simpler than my previous mechanism, and capable of being more cheaply and readily constructed.

In the accompanying drawings I have represented one convenient manner of embodying my improvement in a working machine, but many other forms of construction may be adopted, if desired, without parting from the principle of my invention.

A A represent suitable cast-iron standards, supports, or frame-work, for sustaining the machine upon a floor of the sugar-house, or in any other desired location.

A' is the curb, which, in the form shown in the drawings, is made of top and bottom cast-iron rings, *b b*, to which is riveted the cylindrical portion A', made of thick sheet or boiler-iron.

The lower one of these rings is so formed and extended on its under side as to contain a channel, *l*, for the reception of the syrup from the basket, and I

usually cast in one piece with said extended portion, or otherwise secure to it a downward-projecting cylindrical addition, *n*, to the channel *l*, to constitute conductors, along which the sugar may be passed after it is purged.

On the exterior of the upper ring of the curb, at, say, four points opposite to or at right angles with each other, are cast or fastened ears, M M, carrying the pins 1 1, and, at corresponding points on the standards A A, suitable pins or supports, 2 2, are secured on brackets, *k k*, projecting from the standards.

Over these respective pins or supports stout links, L L, made of India rubber or other sufficiently-strong elastic material, are firmly stretched, and, by means of these links, the curb is connected with and supported on the standards A A.

Within the curb is placed the basket B, formed of an upper cast-iron ring, *b'*, and a lower brass or wrought-iron disk, *b'' b''*, and having the cylindrical side portion B, riveted to them.

The disk *b''* at its central part, is so fashioned as to rise upward and form a somewhat tall, hollow post, S, the purpose of which will be hereafter described, and the disk is also provided with the valve-openings *g*, which are opened and closed by the valve R *f*, this valve being adapted to have its sleeve, R, turn easily around the outside of the post S, and cover or uncover the valve-openings, as desired.

C is the upright revolving shaft of the machine. As will be seen, it is of larger diameter at its upper part than at its lower. Its lower end may rest and bear directly upon the step *e*, which is made hollow, to receive oil, and is formed in the lower part of the yoke or forked casting H I, or one or more loose washers, of some considerable thickness, may be interposed within the step between the lower end of the shaft and the bottom of the interior of the step, for the purpose of lessening the friction when the shaft is revolving.

The shaft is formed with a taper for some portion of its length toward its upper and lower ends, and these tapering portions run respectively in the long sleeve-bearings *a* and *c*, made of suitable metal, the upper one of which, *a*, is held in place by a part, 4, of the curb-casting, as shown, and the lower one, *c*, by the central part, 5, of the yoke H I.

These sleeve-bearings are also made tapering on their interior surfaces to fit the taper of the shaft, but the taper of the bearings runs in the reverse direction from that of the shaft, so that, when any adjustment of the bearings to the shaft is required, the former may be brought up to the shaft as snugly as may be desired, by simply turning the adjusting-nuts *b* and *d* in a manner which will be obvious.

Over the enlarged portion of the shaft, at its upper end, which is also made slightly tapering, as shown,

the hollow post S of the basket B is placed, its interior surface being made to fit the taper of the shaft at that point, with a corresponding taper, and by the binding nut k, is held firmly in permanent contact with the shaft, so as to revolve with it.

In the post an aperture, closed by a screw-plug, x, may be made, to enable oil to be introduced to the bearing a.

D E is a hollow pulley, which is fast on the shaft, and over which the belt which drives the machine passes.

Its lower portion, F, is of larger diameter than the part D, which receives the belt, and on its inside it is lined with wood, o, or some other equivalent material.

E is a hollow conical cast drum, the upper part of which, when sufficiently elevated by any means, is adapted to come in contact with and press against the lining of the pulley. It is thus caused to constitute a brake, as will be more plainly seen in Figure 3, which represents it upon an enlarged scale. It moves in and is held in proper position by the guides z z, and it may be elevated and depressed by the forked bar G, which is worked by the treadle represented, or in any convenient manner.

The button m of the curb and its appendages, n n, rests and is sustained upon the upper ends of the forks I I, to which it is firmly fastened, either by being cast in one piece therewith, or by being otherwise secured thereto, and the lower end of the casting H, of which I I are a part, or to which they are permanently fastened, terminates in a ball, P, which is received into the socket O, bolted to the under side of the frame-work A", or to the under side of a floor. This socket-and-ball connection supports the entire weight of the machine and its load; but when the machine is in operation, it permits them to readily gyrate or oscillate to any required extent, in a manner which will be obvious.

This machine will be found to be extremely sub-

stantial, as well as simple, easy, and economical of construction.

When it is in use and the basket is revolving rapidly, as often as there is any tendency to gyration in consequence of an unbalanced load or other cause, the freedom of lateral inclination afforded by the ball-and-socket support P O, will enable the basket and shaft to yield readily and without injurious jar or vibration to this tendency, and cause the load and basket to quickly adjust themselves to their temporary true center of gravity, while the action of the elastic connections between the curb and the standards A A will, under all circumstances, restrain the gyration within proper limits.

At the same time, it will be seen that the arrangement adopted for the basket and for its combination with the curb keeps the former always permanently concentric with the latter under all conditions.

The foregoing is a description of one mode of applying my improvement in practice, which will be found successful, but, I wish it to be understood that I do not claim any particular manner of forming, constructing, or arranging the separate parts or details of the machine, as any good mechanic may vary these indefinitely.

Having thus described my invention,

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

In a centrifugal machine, a shaft, which carries a basket, and which is connected at or near its lower end with a flexible support adapted to permit the shaft and other parts of the machine, when in motion, to yield to gyratory movement; in combination with an elastic connection between the upper portion of the machine and the supporting standards or frame-work, substantially as and for the purposes set forth.

Witnesses:

S. S. HEPWORTH.

T. B. BEECHER,  
H. L. HODGE.