(No Model.)

S. G. BROSIUS.

MECHANICAL MOVEMENT.

No. 503,122. Patented Aug. 15, 1893.

Fig. 1.

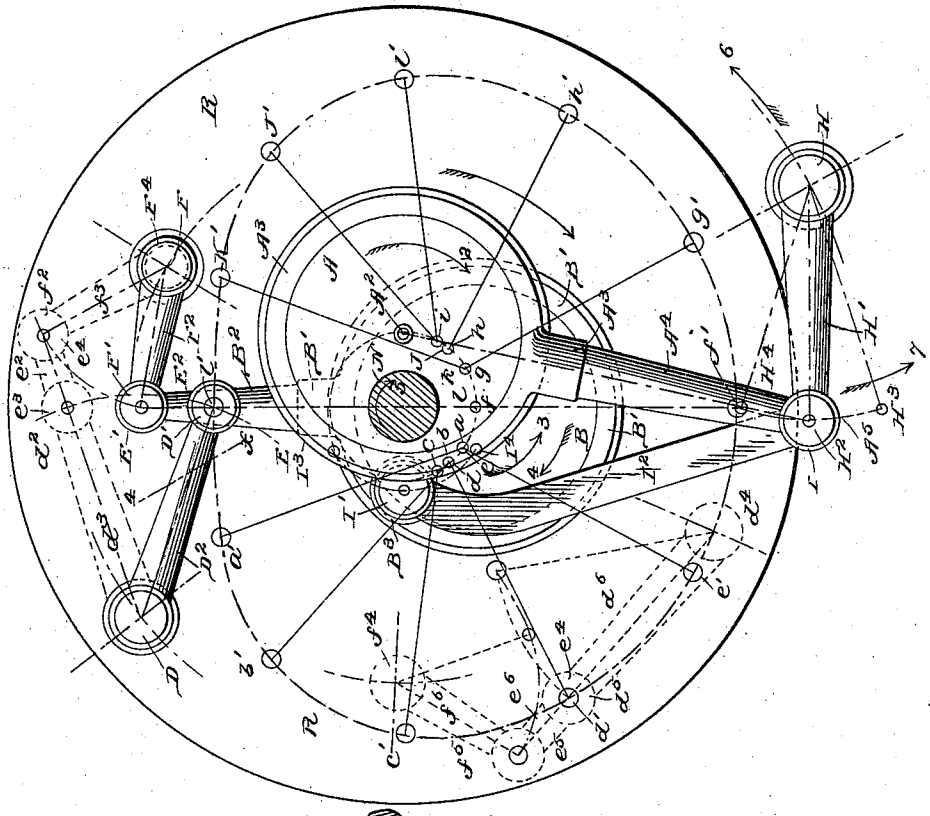
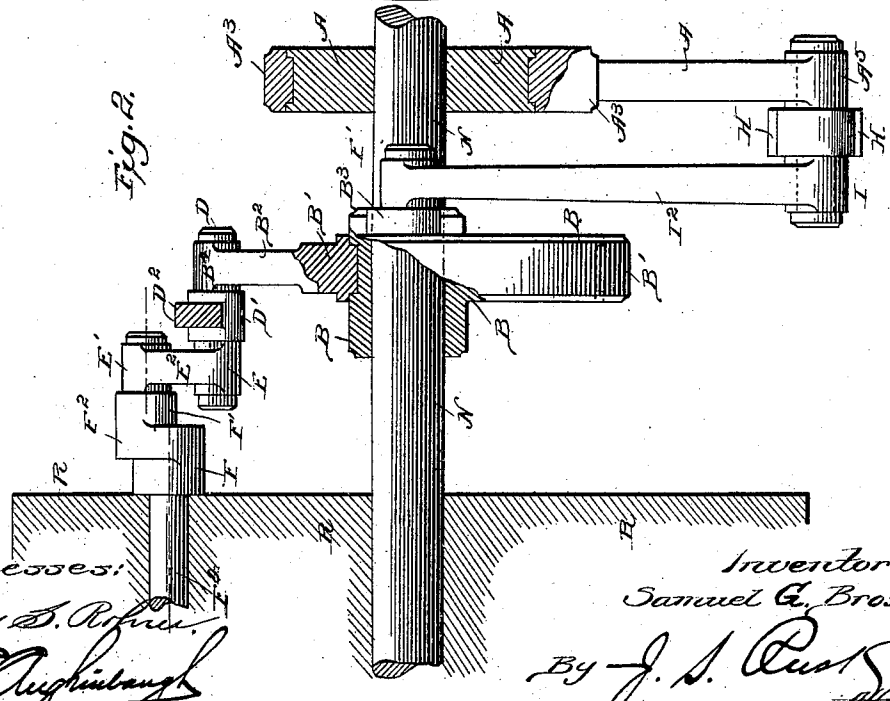


Fig. 2.



Witnesses:
Harry D. Rogers.
W. E. Aughinbaugh

Inventor:
Samuel G. Brosius.
By J. L. Rust
Atty.

UNITED STATES PATENT OFFICE.

SAMUEL GLENVILLE BROSIUS, OF SAVANNAH, GEORGIA.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 503,122, dated August 15, 1893.

Original application filed January 20, 1892, Serial No. 418,721. Divided and application filed December 1, 1892, Serial No. 453,768. Again divided and this application filed December 29, 1892. Serial No. 456,734. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL GLENVILLE BROSIUS, of the city of Savannah, State of Georgia, have invented a new and useful Improvement in Mechanical Motions, of which the following is a specification.

My invention relates to improvements in that class of mechanical motions producing a variable or intermittent motion.

The object of my invention is to accomplish a smooth variable movement by the use of the working and driving eccentrics and their co-operating parts, hereinafter described.

This application was filed as a division of two other concurrently pending applications, which are now Patents Nos. 492,860 and 492,861, respectively, and in this is broadly claimed a mechanical combination which is illustrated and described in said patents, but more specifically claimed therein in combination with other mechanical devices.

In the accompanying drawings, which illustrate my invention: Figure 1, is an end elevation and a diagram showing the movement of the mechanical motion. Fig. 2, is an elevation of the working parts of the mechanical motion partly in section on the center line and on the line *x x*.

Like letters of reference refer to like parts throughout the several views.

As shown in the figures, the eccentric A, rod B^2 and yoke B′ of eccentric B and support or disk R revolve round shaft N, eccentric A and disk R being secured thereto and driven thereby; eccentric B oscillates about said shaft N as a center. The levers F^2 and D^2 are respectively mounted on the disk R by the journals F and D, and connected by link E^2, and are free to oscillate about said journals and rotate with the said disk R. The lever H′ oscillates about the point H, which is secured stationary with regard to the driving shaft N, and the said lever H′ is driven at the end H^2 by the eccentric A from its yoke A^3 and eccentric-rod A^4, and is made to oscillate through the arc H^3, H^4, and the end H^2 of the lever H′ is also connected to and drives the connecting-rod I^2 by its journal I. The said rod I^2, by its journal I′, oscillates the eccentric B through the arc I^3 I^4 by means of its lug B^3. Said eccentric B is loosely mounted on the driving shaft N oscillating about it, while the eccentric A is secured to the shaft N which rotates with it and is driven by it. The shafts F^4 and D^4 are mounted in a disk R, and are the pivot-shafts by which the levers F^2 and D^2 are held in place, and the motion may be taken from either of these shafts.

The operation is as follows: Let shaft N, with disk R and eccentric A, which are mounted thereon, revolve in the direction shown by the arrow 1. Then shaft N rotates as shown by arrow 5, driving eccentric A rotates as shown by arrow 2, and working eccentric B will oscillate as shown by arrows 3 and 4, as hereinafter described. Let the centers of eccentrics A and B be located as shown at A^2, and *l*—*f* respectively. Then the lever H′ will be oscillating and the movement will be in the direction of arrow, and the center of said eccentric B being controlled by connecting-rod I^2, as described, is driven through points *l*, K, J, *i*. During this time the disk R bearing the levers F^2 D^2 has turned to the right, carrying along the rod B^2 at such a rate that when the center *l f* of the working eccentric has reached the point K, the end *l′* of the rod B^2 has been carried to K′, and the center line *l*, *l′* of the rod B^2 and the working eccentric will lie on the line K′ K; continuing, when the center of the working eccentric shall have moved to J, the end of the rod has been carried to *j′*; when the center has moved to *i* the end has moved to *i′*. At this point the lever H′ has reached its lowest point, and is then beginning to be moved upward carrying along the rod I^2, which in its turn causes the center of the working eccentric to be moved backward, the center moving back to *h*, the end of the rod has been carried to *h′*, and so as the center moves through the points *g*, *f*, *e*, *d*, *c*, the end of the rod moves through the points *g′*, *f′*, *e′*, *d′*, *c′*. When the center of the working eccentric is at *c*, the lever H′ has reached its highest point; thus *c* corresponds with the point *i*. The lever H′ beginning to descend, the center is moved back to *b*, and so on through *a*, *a′* to *l l′*, as shown in Fig. 1.

While the center line of the rod B^2 is moving from $j\,j'$ to $i\,i'$, the rod B^2 through its strap B′ is moved outward by the eccentric B; then the levers F^2, D^2, and connecting link E^2 take the positions shown in the dotted lines d^3, e^3, f^3, and occupy this position during the time the center line of the rod B^2 coincides with the lines $h\,h'$, $g\,g'$, f', f, e' e, d', d, c', c; this time occupies one-half the revolution of the shaft N, and is known as the period of rest. From c' c to l' l, the rod B^2, levers F^2, D^2 and link E^2 are moving in from the position they occupy during the period of rest to the position as shown in Fig. 1. From l' l to $i\,i'$ they are moving out again. The lever D^2, herewith described, oscillates about its journal D, and rotates around shaft N as a center, said lever D^2 being controlled by the eccentric B through its rod B^2 and yoke B′, the connection being made at journal end D′ by B^4. The said end D′ of said lever is made to pass through the points l', k', j', i', h', g', f', e', d', c', b', a' to l', which is also the diagram for the variable motion imparted to the said lever D^2 and its end D′. This motion is produced by oscillating the eccentric B, as heretofore described; and the end D′ of lever D^2 in passing through the points just described, oscillates through the arc l' d^2, and produces a variable motion as shown in diagram. The toggle-joint is formed by the levers D^2 and F^2 connected at their respective ends D′ F′ by the link E^2, E, E′, and the motion imparted to lever D^2 is transmitted to lever F^2, but such motion is modified by the toggle-joint action. Now if the driving shaft N and the parts heretofore described as rotating round it having it as a center, are held stationary, and the stationary center H, about which the lever H′ oscillates, is made to rotate round shaft N in the direction of arrow 6, the co-operating parts driving and being driven by the lever H′ must necessarily follow it. Then the end D′ of lever D^2, instead of describing a curve shown in the diagram, will have an oscillating movement through the arc l', and d^2, and back again for every complete revolution of the lever H′ round the shaft N as above. Changing the relative positions of the center A^2 and center l—f of eccentric B, will give a different outline to the diagram by the use of the same co-operative parts, and the smooth and variable motion is also obtained.

The driving and working eccentrics, with their co-operating parts, produce a movement that could not otherwise be obtained by eccentrics, and for simplicity may be called a compound eccentric. If desired, either the lever D^2 or F^2 may be attached to its respective journal D or F, and the motion derived by the compound eccentric taken from said journal shaft, or any other suitable means adopted whereby the said motion may be transmitted. This movement is well adapted to any class of machinery requiring an irregular or intermittent motion, such as that used in printing presses, shapers, harvesters, cut off valves of engines, &c.

I do not limit myself to the construction and arrangement shown, as the same may be varied without departing from the spirit of my invention.

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

1. In a mechanical movement, a support, a driving eccentric, means for driving said eccentric, a working eccentric loose on the shaft of the driving eccentric, and connections between said eccentrics, whereby said driving eccentric controls through said connections the operation of the working eccentric to produce a variable motion.

2. In a mechanical movement, a support, a driving eccentric, a working eccentric having its center of rotation coincident with the center line of the shaft of the driving eccentric, and connections between the said eccentrics.

3. In a mechanical movement, a rotary disk, a driving shaft, a driving eccentric operated by said shaft, a working eccentric, and a toggle-joint controlled by the working eccentric, and a connecting-rod for controlling the working eccentric, the latter being operated by the driving eccentric, whereby a variable motion is obtained.

4. In a mechanical movement, a rotary disk, a driving shaft, a driving eccentric operated by said shaft, a working eccentric a toggle-joint consisting of two levers and a connecting-rod, said toggle-joint being controlled by the working eccentric, and a connecting-rod operated by the driving eccentric and controlling the working eccentric.

5. In a mechanical movement, a rotary disk, a driving eccentric, means for operating said eccentric, a working eccentric, connections between said eccentrics, and a toggle-joint controlled by the working eccentric, said driving eccentric controlling through said connections the operation of the working eccentric to produce a variable motion.

6. In a mechanical movement, a support, a shaft, a driving eccentric mounted thereon, a working eccentric loosely mounted on said shaft and oscillating thereon, and connections between said eccentrics.

7. In a mechanical movement, a rotary disk, a shaft, a driving eccentric mounted thereon, a working eccentric mounted on said shaft and oscillating thereon, connections between said eccentrics, and a toggle-joint controlled by said working eccentric.

8. In a mechanical movement, a support, a shaft, a working eccentric loosely mounted on said shaft and oscillating thereon, and means for oscillating said eccentric.

9. In a mechanical movement, the combination of a driving eccentric, an oscillating eccentric having its center of oscillation coincident with the center line of the shaft of the driving eccentric, and a connecting rod for

controlling the oscillating eccentric through the driving eccentric.

10. In a mechanical movement, the combination of a driving eccentric and an oscillating working eccentric upon the same shaft, and connections whereby the driving eccentric operates the working eccentric.

In testimony whereof I have signed my name to this specification, in the presence of two witnesses, on this 24th day of December, A. D. 1892.

SAMUEL GLENVILLE BROSIUS.

Witnesses:
E. L. HARLOW,
HELEN DURWARD.