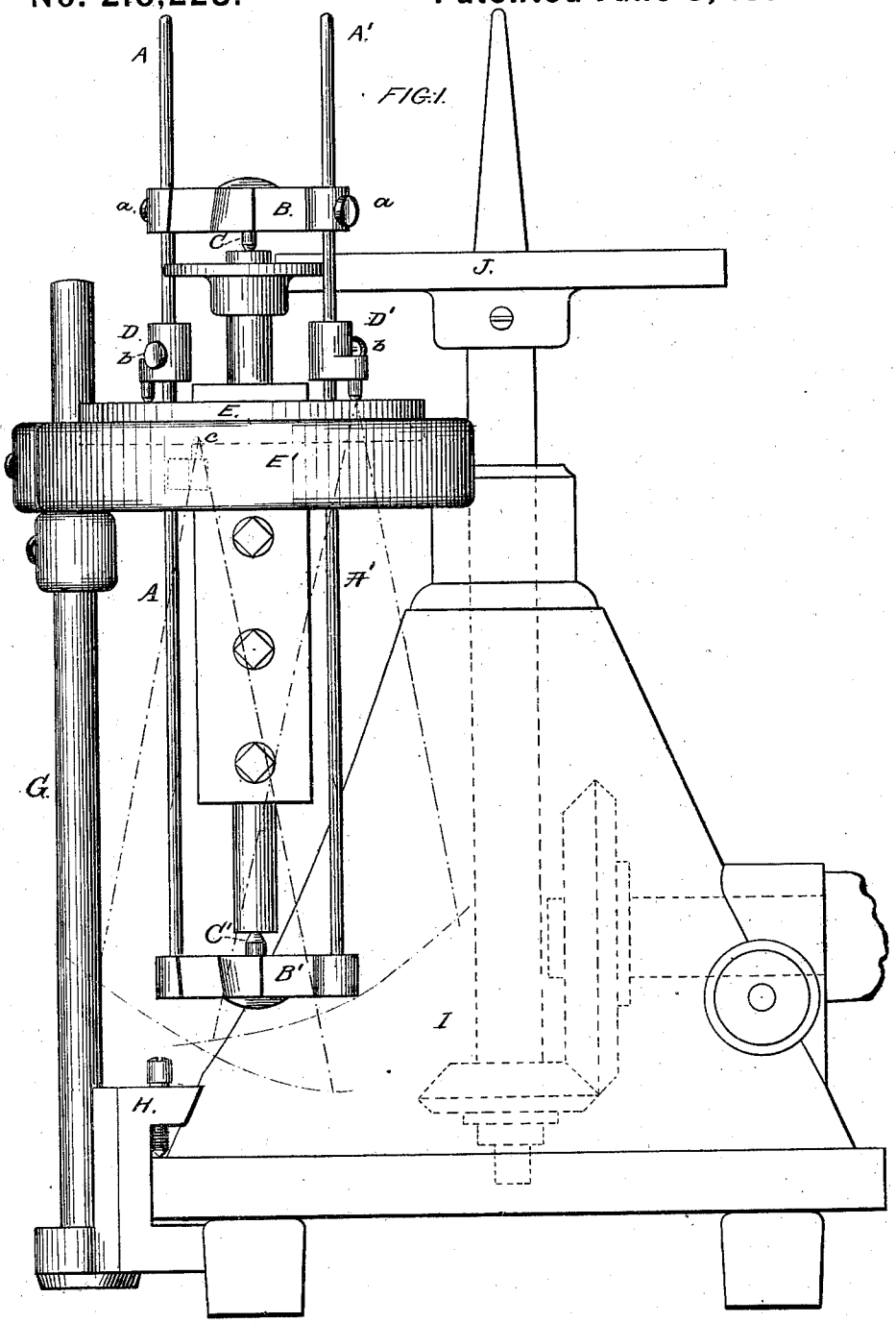
2 Sheets—Sheet 1.

C. SEYMOUR.

Device for Balancing Cylinders, Cutter Heads, &c.

No. 216,228. **Patented June 3, 1879.**

FIG. 1.



WITNESSES:

John F. C. Brinkhoff

Edw. W. Byrn

INVENTOR:

Chas. Seymour

BY Munn & Co

ATTORNEYS.

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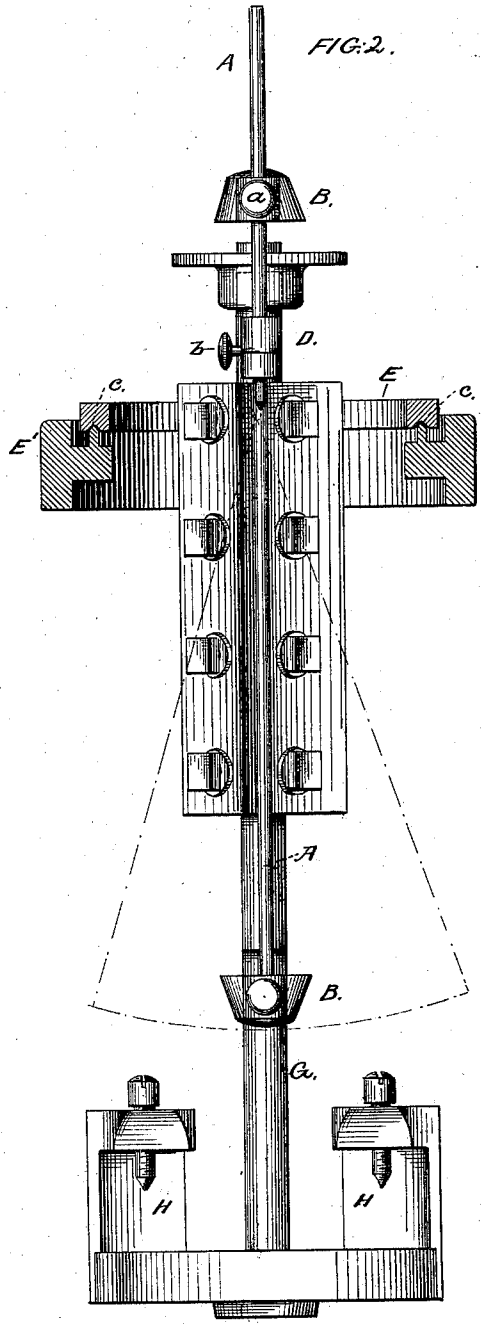
2 Sheets—Sheet 2.

C. SEYMOUR.

Device for Balancing Cylinders, Cutter Heads, &c.

No. 216,228. **Patented June 3, 1879.**

FIG. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES SEYMOUR, OF DEFIANCE, OHIO, ASSIGNOR TO DEFIANCE MACHINE WORKS, OF SAME PLACE.

IMPROVEMENT IN DEVICES FOR BALANCING CYLINDERS, CUTTER-HEADS, &c.

Specification forming part of Letters Patent No. **216,228**, dated June 3, 1879; application filed March 14, 1879.

To all whom it may concern:

Be it known that I, CHARLES SEYMOUR, of the city and county of Defiance, and State of Ohio, have invented a new and Improved Device for Balancing Cylinders, Cutter-Heads, &c.; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation. Fig. 2 is a view in another plane, showing the rings in section.

My invention relates to a novel construction of device for balancing cutter-heads of planing-machines, cylinders, and other analogous parts of machinery which are run at a high rate of speed.

The improvement consists, mainly, in a frame provided with centers for holding the cylinder or cutter-head, which frame is supported in gimbals or upon a universal joint, so that when the cylinder is rotated the "throw" of the same due to inequalities of weight or form is made manifest and furnishes sufficient data for the correction of the difficulty.

As the running balance depends simply upon the distribution of the weight, which may be affected by the greater density of some portions of the cylinder independent of increased bulk, it is obvious that any adjustment of mere configuration, or adjustment even of the standing balance, would not reach the desired result. With this in view I have constructed an apparatus which indicates any predominance of weight at one point irrespective of form.

In the drawings, the rods A A′ and cross-heads B B′ constitute a frame, in which the cylinder, cutter-head, or other body is held by means of the centers C C′. The upper cross-head, B, with its center C, is made adjustable on the rods A A′ by set-screws *a*, for the purpose of fitting the cylinder to its place and accommodating various lengths of the same. D D′ are adjustable pivot-stocks, secured to rods A A′ by set-screws *b*. These pivot-stocks rest in seats in the upper side of a ring, E, which ring is sustained upon diametrical pivots *c*, fixed in the outer ring, E′. These two rings, with their sets of diametrical pivots, one of which sets is arranged in a plane at right angles to the other set, constitute a set of gimbals, which give perfect freedom to the movement of the frame and cylinder.

For supporting and using the device as thus described, the gimbals may be placed upon any suitable frame-work, and rotary motion imparted to the cylinder or cutter-head by any suitable means. As shown, however, the outer ring, E′, of the gimbal is fastened adjustably to a standard, G, which standard has at the bottom a clamp, H. This is to adapt the device to the driving-gear of the balancing-machine for which Letters Patent were granted me April 10, 1877. In such relation the clamp H is attached to the bottom flange of the conical frame I, in which a vertical shaft is rotated by a bevel-gear, and carries at the top a friction-disk, J, which is made to bear against a disk or pulley on the same shaft with the cylinder or object to be rotated.

For balancing, the cylinder or other object is suspended so that a small portion of its length projects above the gimbal-pivots. The cylinder is then rotated by the means described to a speed sufficient to cause the lower end to throw its maximum amount. A pencil of moistened clay or other marking material is then brought against the lower journal or other concentric part, so that the marks will be made upon the parts which are thrown farthest from the center of revolution. These marks will always be found to be made on the light side. The correction, either by cutting away the opposite side or by counter-weighting the light side, should be made at a distance from the lower end not exceeding half the length of the cylinder. When the lower end is thus corrected the cylinder is reversed, and the other end treated in a like manner.

Having thus described my invention, what I claim as new is—

1. A balancing apparatus for rotating bod-

ies, consisting of a frame carrying centers for the body to be balanced, and gimbals or universal joints for sustaining said frame, all combined substantially as shown and described.

2. The gimbals E E′, the frame composed of rods A A′, and cross-heads B B′, provided with centers, the pivot-stocks D D′, and the friction-gear F, all combined substantially as shown and described.

CHARLES SEYMOUR.

Witnesses:

JACOB I. GREENE,

P. KETTENRING.