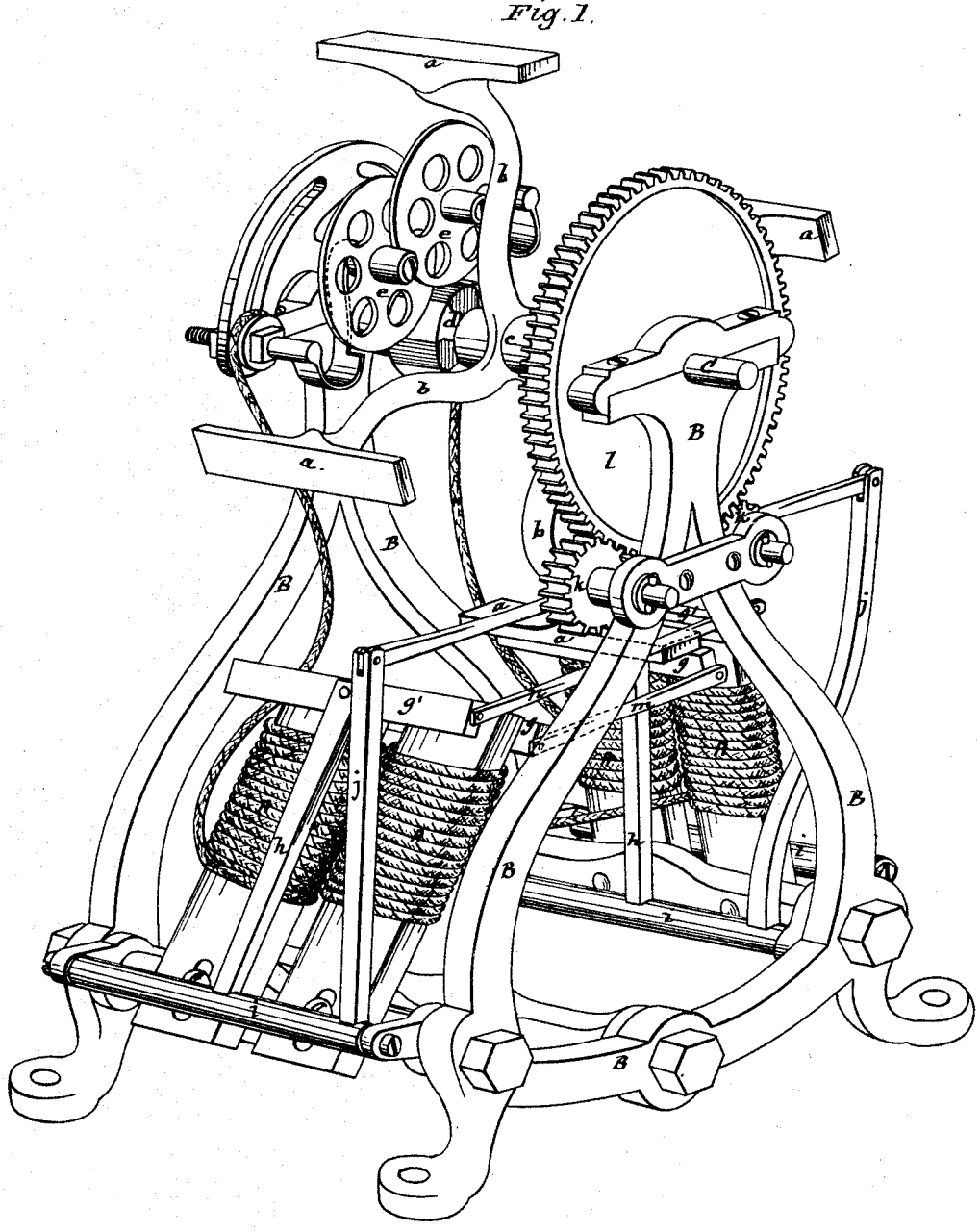
2 Sheets--Sheet 1.

L. BASTET & C. J. B. GAUME.

Electro-Magnetic Engines.

No. 155,062. Patented Sept. 15, 1874.

Fig. 1.



Witnesses

D. P. Dowl

W. D. Chapple

Inventors.

Louis Bastet by

Chas. J. B. Gaume by

A. Bollok Atty

2 Sheets--Sheet 2.

L. BASTET & C. J. B. GAUME.

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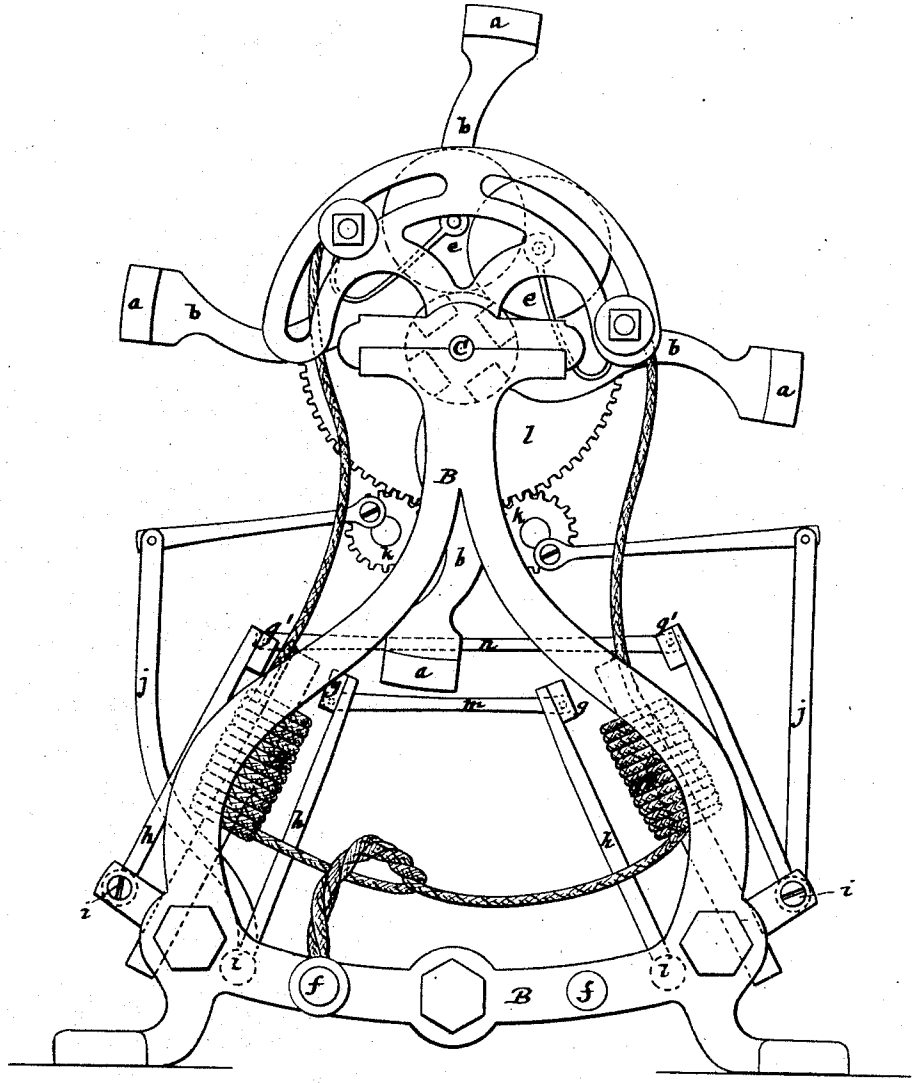
Fig. 2.



Witnesses
D. R. Cowl
W. B. Chaffee

Inventors.
Louis Bastet &
Chas J. B. Gaume by
A Bollok Atty.

UNITED STATES PATENT OFFICE.

LOUIS BASTET, OF TARRYTOWN, AND CHARLES J. B. GAUME, OF BROOKLYN, ASSIGNORS OF ONE-EIGHTH THEIR RIGHT TO CHARLES F. ALVORD, OF NEW YORK, N. Y.

IMPROVEMENT IN ELECTRO-MAGNETIC ENGINES.

Specification forming part of Letters Patent No. **155,062**, dated September 15, 1874; application filed August 21, 1874.

To all whom it may concern:

Be it known that we, LOUIS BASTET, of Tarrytown, Westchester county, New York, and CHARLES J. B. GAUME, of Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Electro-Magnetic Machines, of which the following is a specification:

The object of our invention is to utilize, as far as possible, all the available attracting surface of the magnet in an electro-magnetic motor, with a view of imparting increased power to the machine. To effect this result, we combine with the electro-magnets and set or series of revolving armatures usually found in such machines, extra or auxiliary armatures, independent of the main series of revolving armatures, and arranged to transmit, by their independent movement, power which is in addition to that obtained from the main set of revolving armatures.

The accompanying drawing represents one way in which our invention is carried into effect.

Figure 1 is a perspective view of an electro-magnetic machine embodying our invention. Fig. 2 is a side elevation of the same.

As many electro-magnets, A, as desired, may be employed. In this instance we have represented two. In bearings in the frame B is supported the main shaft C, which carries the armatures *a*, fixed on radial arms *b*, extending from a hub, *c*, fast on shaft C. The commutator consists of the circuit-breaker wheel *d*, on shaft C, and the insulated adjustable friction-wheels *e*, bearing on the circuit-breaker, and properly connected each with its own electro-magnet. The battery-connections are made by means of binding-screws *f*. The combination of these parts, as well as the arrangement of the circuit, is not new with us, and the operation of the machine thus far described will be understood without further explanation. Only the end surfaces of the electro-magnets are availed of when using the revolving armatures *a;* but these end surfaces do not constitute, by any means, the whole of the attracting surface, the sides of the cores adjoining the poles being quite as available. To utilize, therefore, these side surfaces, we combine with each magnet one or more vibratory armatures, independent of the main series of revolving armatures, and geared or connected with the driving-shaft by suitable intermediaries, so as to impart to that shaft power superadded to that derived from the armatures *a*. The arrangement of these extra or auxiliary armatures may be considerably varied, and so, also, may be the means by which they are connected with the driving-shaft.

One convenient arrangement for the purpose is represented in the drawing. With each electro-magnet is combined a pair of vibrating armatures, *g g'*—one on each side of the magnet—mounted each on an arm, *h*, projecting from a rock-shaft, *i*, supported in a suitable bearing in frame B. Each armature vibrates on its shaft *i* as an axis. Projecting from the rock-shaft of the outer armature of one pair, and the inner armature of the other pair, is a second arm, *j*, to which is jointed a connecting-rod, hung at the other end on a wrist or crank pin on a pinion, *k*, that gears with the large spur-wheel *l* on driving-shaft B. The two pairs of vibrating armatures are connected by means of jointed rods, of which the rod *m* connects the interior opposite armatures *g g* of the two pairs, and the rod *n* the exterior opposite armatures *g' g'*.

It is understood that when the circuit through the one electro-magnet is broken, it is closed in the other. It will consequently be seen that, when the one armature, *g'*, is attracted, the other one, *g'*, will be free to move back, and the same is true of the armatures *g g*. It will also be seen that each set *g g*, *g' g'*, drives one of the pinions *k*, and that, consequently, the attractive force exerted to draw the armatures to the magnets is being constantly exerted on each pinion through the instrumentality of one or the other of the armatures assigned to operate that pinion. Thus to the power derived from the combination of the electro-magnets and main set of revolving armatures is added that derived from the combined action of extra and independent armatures, and the same electro-magnets,

whose attracting surfaces are, therefore, utilized to a much greater extent than has heretofore been the case.

As hereinbefore intimated, we do not limit ourselves to the special mechanical contrivances herein shown in illustration of our invention, for it is manifest that the same may be varied to a great extent without departure from the principle of our invention; but

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

1. In an electro-magnetic motor, the combination, with the electro-magnets and main set of revolving armatures of extra or auxiliary vibrating armatures, arranged and operating to impart to the driving shaft, through proper intermediaries, power in addition to that derived from the movement of the main set of armatures, substantially as and for the purposes specified.

2. The extra or auxiliary armatures, one on each side of each electro-magnet, the armatures of the several pairs being coupled together and geared with the main or driving shaft of the machine, substantially in the manner, and by the means shown and set forth.

In testimony whereof we have hereunto signed our names this 17th day of August, A. D. 1874.

L. BASTET.
C. J. B. GAUME.

Witnesses:
B. F. LEE,
A. A. ALVORD.