F. YEISER.

Electric Motor.

No. 21,105. Patented Aug. 3, 1858.

Fig. 1.

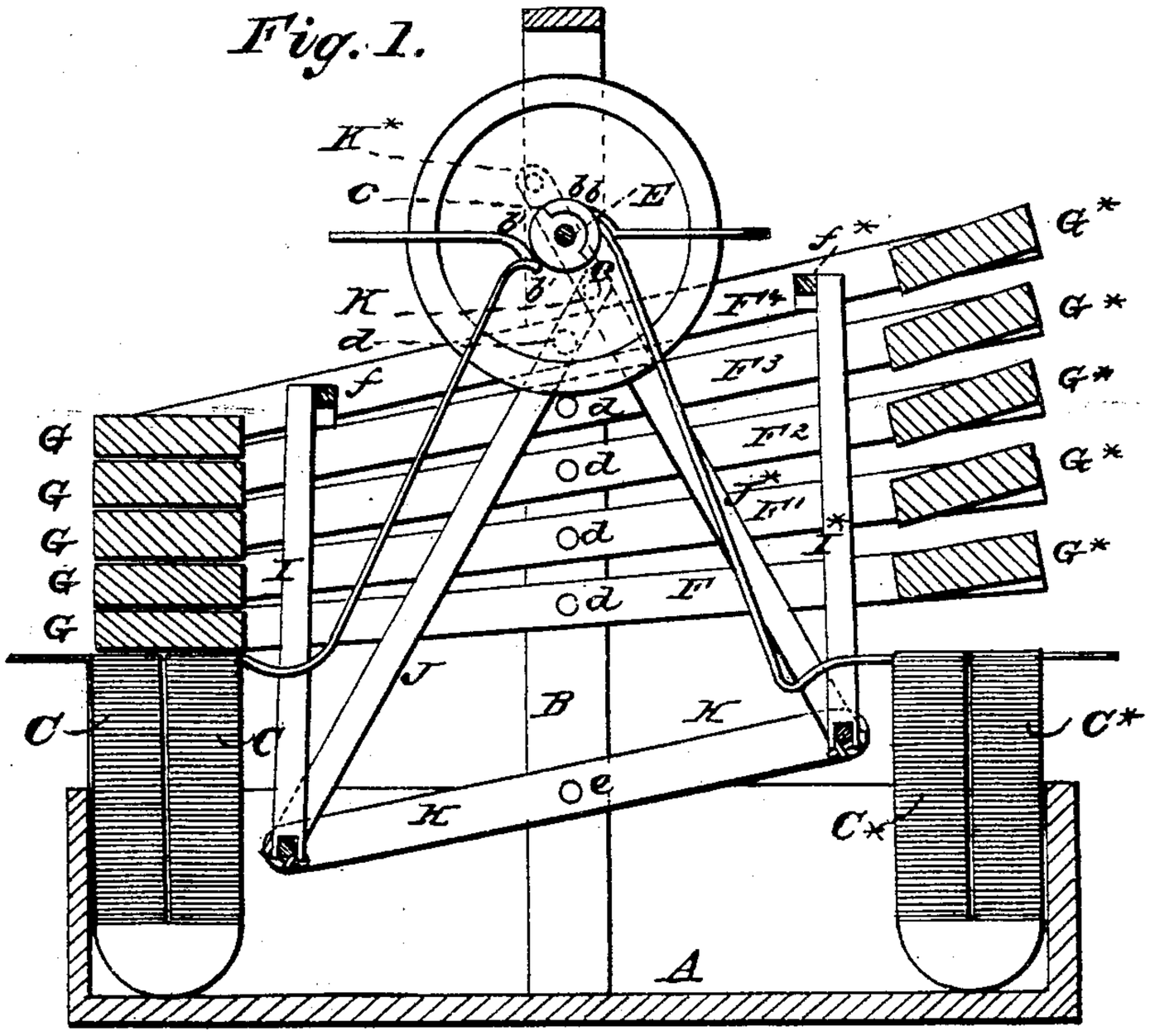
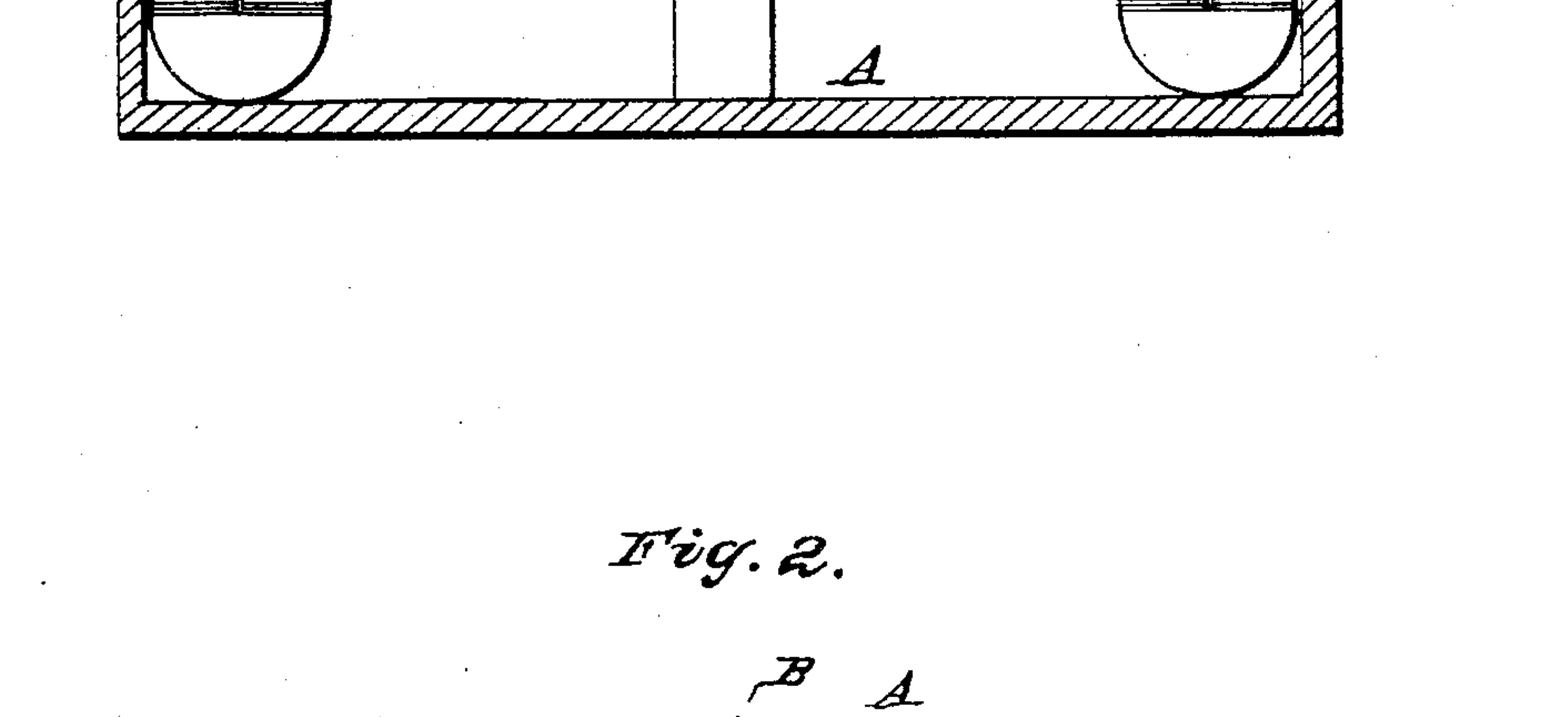


Fig. 2.



UNITED STATES PATENT OFFICE.

F. YEISER, OF LEXINGTON, KENTUCKY.

IMPROVED ELECTRO-MAGNETIC ENGINE.

Specification forming part of Letters Patent No. **21,105**, dated August 3, 1858.

To all whom it may concern:

Be it known that I, F. YEISER, of Lexington, in the county of Fayette and State of Kentucky, have invented a new and useful Improvement in Electro-Magnetic Engines; 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, making a part of this specification, in which—

Figure 1 is a vertical section of an electro-magnetic engine constructed according to my invention. Fig. 2 is a plan of the same.

Similar letters of reference indicate the same parts in both figures.

This invention consists in a certain system of balanced beams or frames carrying soft-iron bars at each end, applied to be operated upon alternately by two series of electro-magnets in such a manner as to receive an oscillating motion, and having combined with them certain mechanism through which their oscillating motion is caused to produce the rotary motion of a shaft.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

A B B is the framing of the engine, consisting of a bed, A, and standards B B, the latter being stayed in a suitable manner. This framing should be made of wood, or, if made of metal, it will require most of the parts of the engine to be well insulated from it. At one end of the frame is arranged a series, consisting of any number of upright electro-magnets, C C, and at the other end a similar series, C* C*, the two series being at equal distances from the standards B B, and all having their poles in the same horizontal plane. The whole of the coils of each series of magnets consist of a continuous wire, and the wires of the two series of coils are connected with the same battery; but the circuits of the two series of magnets are independent of each other. The wire *d* of the circuit in which are the magnets C C is broken at *b b*, and the wire *a** of the circuit of the magnets C* C* is broken at *b* b**, as shown in Fig. 1; but the breaks are closed alternately to complete the circuits through the two series of magnets alternately by means of a change-wheel, D, on the main shaft E of the engine, which rotates in bearings in the standards B B and transmits the power developed by the engine. This change-wheel is of well-known construction, consisting of a cylinder of ivory or other insulating material, having one-half of its circumference covered with copper or other metal, as shown at *c c*, (tinted red in Fig. 1,) and the ends *b b* and *b** *b** of the wires are arranged to bear on its periphery. The piece of copper *c c* closes the break between the ends *b b* of the wire *a* during one half of the revolution of the main shaft, and closes the break between the ends *b** *b** of the wire *a** during the other half of the revolution, leaving the circuit through one wire open as it closes the other, and thus changing the circuit from one to the other of the two series of magnets twice in every revolution of the shaft.

F F′ F² F³ F⁴ are double beams or frames, of wood or metal, of which there may be any number, each having attached at one end a flat soft-iron bar, G, and at the other a similar bar, G*. These beams, with their attached bars G G*, are hung and balanced on pivots *d d* secured at equal distances apart in the standards B B, and when in place the bars G G occupy positions one above another over the magnets C C, and those G* G* occupy similar positions over the magnets C* C*, the distance between the pivots *d d* being such that the beams or frames F F′ F² F³ F⁴ have a limited amount of movement independent of each other. The pivots *d d* of the lowest beam or frame, F, are so arranged that the movement of said beam on its pivots *d d*, which is limited by its bars G G* coming in contact with the magnets C C*, is permitted to be no more than that which the several frames are permitted to make independently of each other.

Below the frames or beams F F′ F² F³ F⁴ there is arranged a beam or frame, H, which is balanced on pivots *e* secured in the standards B B below the pivots *d d*, and the ends of this frame are connected by two rods, I I*, with cross-bars *f f**, which are pivoted to the uppermost frame or beam, F⁴. The ends of said beam or frame H are also connected by two rods, J J*, with two cranks, K K′, on the main shaft E, which should also be furnished with a fly-wheel.

The operation of the engine is as follows: The wires *a a** being connected with the battery, one or other of the two series of bars G G G* G* is attracted to the magnets C C or C* C*,

according to which series of magnets has its circuit closed at *b b* or *b* b** by the copper plate *c* of the change-wheel. The copper and ivory surfaces of the periphery of the change-wheel are so arranged that as all of the series of bars that are operated upon come down as close as possible together, with the lowest one in contact with or as near as it is permitted to the magnets, the change of circuit is effected by the plate *c c* from one set of magnets to the other, and hence the other series of bars is attracted by its respective series of magnets and caused to descend, and in this way an oscillating motion of the beams F F′ F² F³ F⁴ is produced, and the upper beam communicates a similar movement to the beam H, which, through the rods J J*, produce the rotary motion of the shaft E′. When the circuit is first closed through the series of magnets under one end of the beams the lowest of the corresponding series of bars is attracted directly to the magnets, and by the movement of the lowest beam, F, thus produced, all the beams whose other ends rest upon each other are caused to move a corresponding distance, after which the lowest bar becomes magnetic, attracts the second one, and draws it down in contact with it, thus giving all the beams a further movement. The second bar, as it comes in contact with the first, becomes magnetic and attracts the third, and so on through the series till all the bars of the series are close together, as shown to the left hand of Fig. 1. In this way, by employing several beams, F F′ F² F³ F⁴, and bars G G G* G*, a considerable movement of the upper beam is produced, while the bars G G G* G* have to be separately attracted but a short distance. The movement of the engine is rendered continuous and uniform by the fly-wheel on shaft E.

Every one of the beams F F′ F² F³ F⁴ may be separately connected with the beam H by rods like I I*; but that is unnecessary.

Instead of connecting the two ends of the beam H with two cranks on the same shaft for the transmission of power, they may be connected with cranks on separate shafts, which may be both geared to the same driving-shaft.

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

The employment of a series of balanced beams, F, with bars G arranged and combined with the magnets C, frame H, and rods J, substantially as and for the purposes herein set forth.

F. YEISER.

Witnesses:
CHAS. B. THOMAS,
AD. KROEFING.