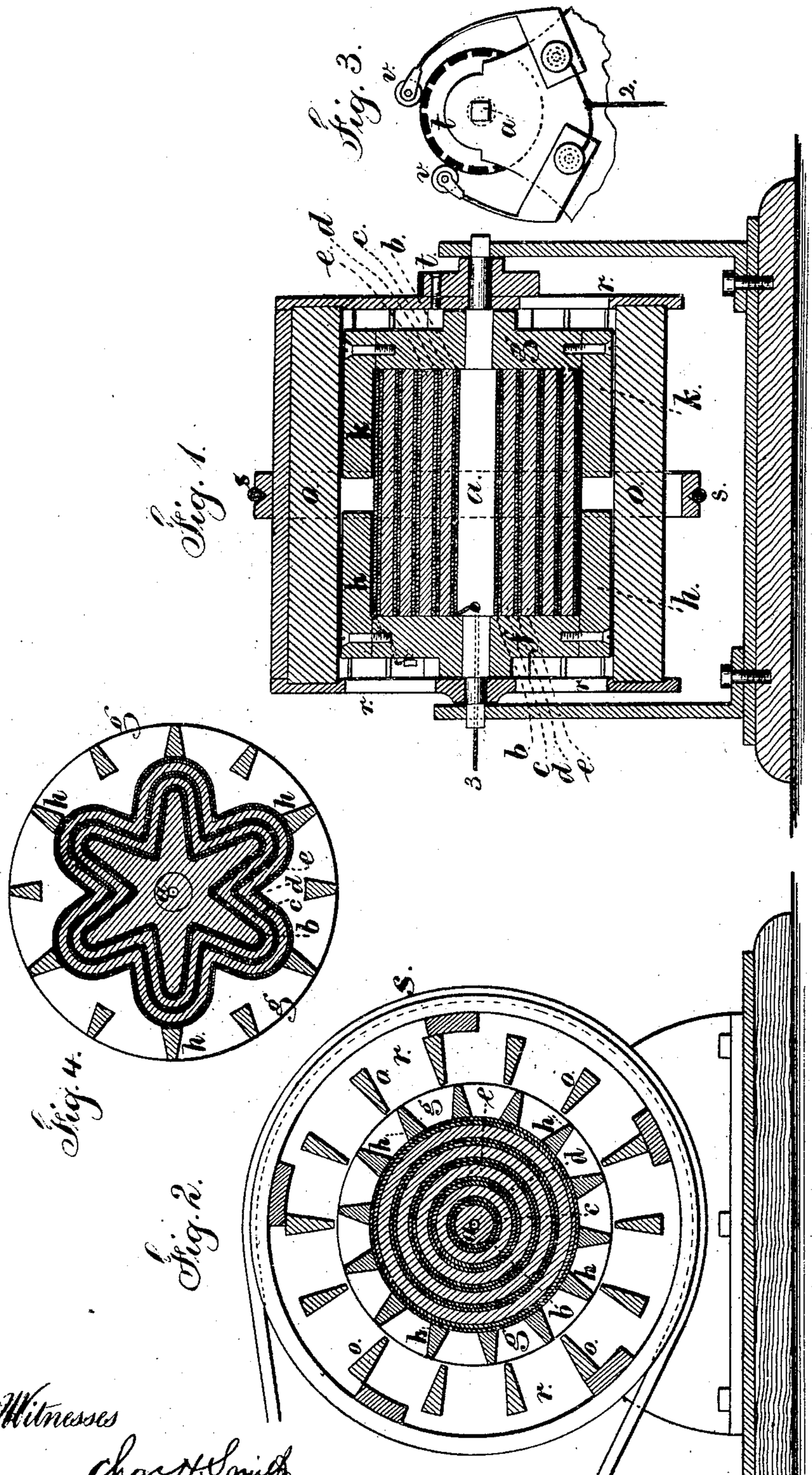
J. H. GUEST.

ELECTRO MAGNETIC-MOTORS.

No. 172,309. Patented Jan. 18, 1876.



Witnesses

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JOHN HENRY GUEST, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN ELECTRO-MAGNETIC MOTORS.

Specification forming part of Letters Patent No. **172,309**, dated January 18, 1876; application filed August 10, 1875.

To all whom it may concern:

Be it known that I, JOHN H. GUEST, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Electro-Magnetic Motors, of which the following is a specification:

This invention is for concentrating the effective magnetism, and rendering the motor very compact and efficient.

The magnet is composed of a central core, around which is a helix, so that the current polarizes the same. Outside this helix is a cylinder and a second helix, and then a second cylinder and a third helix, and so on, whereby all the cylinders become polarized. These cylinders and core are all in metallic contact with soft or cast iron heads that become polarized by induction, and these heads have parallel poles, approaching toward each other and surrounding the helices, and these poles are rendered powerfully magnetic by induction, and this device becomes a cylinder of highly-magnetic poles in a very compact form. Outside this cylinder of poles there is a cylindrical cage of armatures corresponding in number with or a multiple of the poles, and either the cylinder of poles revolves with its core within the stationary circular cage of armatures, or else the armatures revolve about the cylinder of poles, the latter being stationary, and in either case there is a circuit-breaker that interrupts the flow of the current through the helices as the armatures leave the poles, and pass to the sphere of the attraction of the next poles, when the current is again closed. The power is taken from the portion that revolves by a pulley and belt or otherwise.

In the drawing a motor is shown with a stationary magnet. Figure 1 is a longitudinal section. Fig. 2 is a cross-section. Fig. 3 is an elevation of the circuit-breaker, and Fig. 4 is a cross-section of a modification of the electro-magnet.

The shaft *a* forms the core for the electro-magnet. Around this the coil *b* is wound, and then the cylinder *c* is placed over the same, and that is wound with the second helix *d*, and then a second cylinder, *e*, is slipped over the same, and so on, to any desired extent. The cylinders may be plain, or more or less corrugated or fluted, and if fluted, as shown in Fig. 4, the helices should be separately wound of a diameter sufficient to allow the wires to be bent into the flutes of one cylinder before placing over them the next and correspondingly-fluted outer cylinder.

In all cases the heads *f* and *g* are upon the core *a*, and the inner faces are in metallic contact with the respective ends of the cylinders, and the helices are wound or connected so as to be continuous, and hence the current will pass through all the helices, and powerfully magnetize both the core and cylinders, and, by induction, the heads *f* and *g*, and the inwardly-projecting poles *h* and *k*, will be powerfully magnetized, one north, the other south. These poles are parallel, or nearly so, to each other, and cast with or attached to the heads *f g*, and they extend toward each other, but there is a sufficient space between them to prevent contact, and they are preferably numerous and made with narrow edges, as shown. Around the magnet is a cylinder or cage of armatures, *o o*, connected with heads *r*. If this cage is stationary the magnet will revolve, and vice versa. I have shown the cage as revolving, and provided with a cord-pulley, *s*, by which the power is transferred, through a belt, to the article to be revolved The poles *f g* and armatures *o* being **V**-shaped sectionally, as shown, the narrow edges coming toward each other increase the efficiency of the motor.

There is a circuit-breaker, *t*, placed in the circuit to the battery, and it is provided with as many non-conducting sections as there are pairs of armatures, so that the circuit will be interrupted as the armatures arrive over the respective poles, and the circuit is not closed until the momentum has carried the armatures more than half the distance to the next poles.

It is preferable to place the circuit-breaker upon one of the heads *r*, and to have two contact-wheels, *v v*, as in Fig. 3. These close the circuit simultaneously, and lessen the risk of imperfect contact. These contact-wheels *v* should be insulated and connected to one pole of the battery by the wire 2. The other pole of the battery is to be connected to the

the wire 3 that leads through the helices, and to a spring, with which the head *r* travels in contact, or to the shaft *a*, upon which the head revolves.

I claim as my invention—

1. The poles *h k*, connected with the heads *f g*, and extending toward each other, in combination with the core *a*, helices *b d*, and cylinders *c e* between those heads *f g*, substantially as set forth.

2. The combination of a magnet, having a cylindrical range of poles, with a cylinder or cage of armatures surrounding such magnet, and a circuit-breaker, substantially as set forth.

3. An electro-magnetic motor made by combining a circular range of V-shaped poles with a cylindrical cage of V-shaped armatures, substantially as specified.

Signed by me this 6th day of August, A. D. 1875.

J. H. GUEST.

Witnesses:
GEO. T. PINCKNEY,
CHAS. H. SMITH.