No. 638,901. Patented Dec. 12, 1899.

D. BACON.

MAGNETIC ACTUATOR.

(Application filed Feb. 24, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

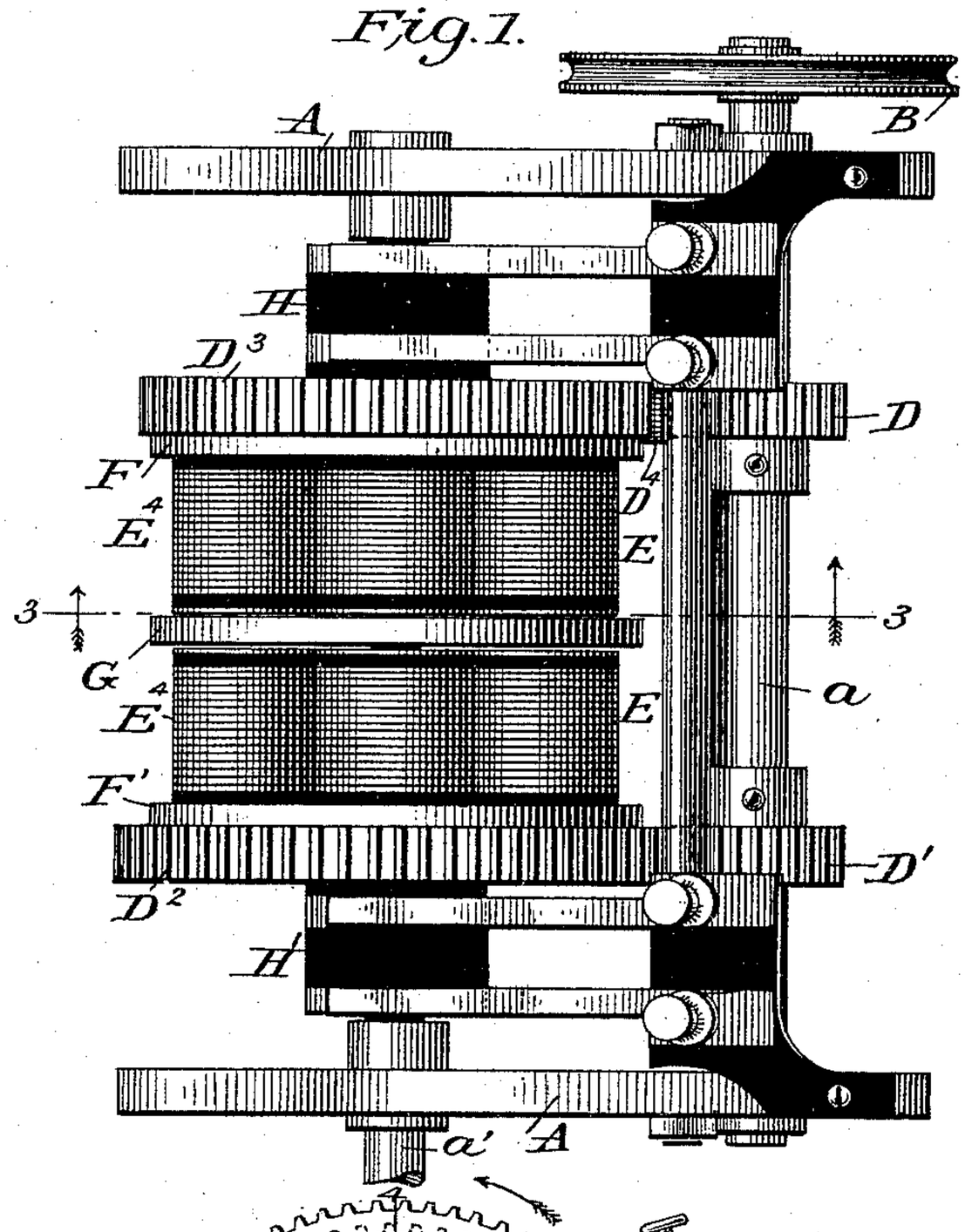
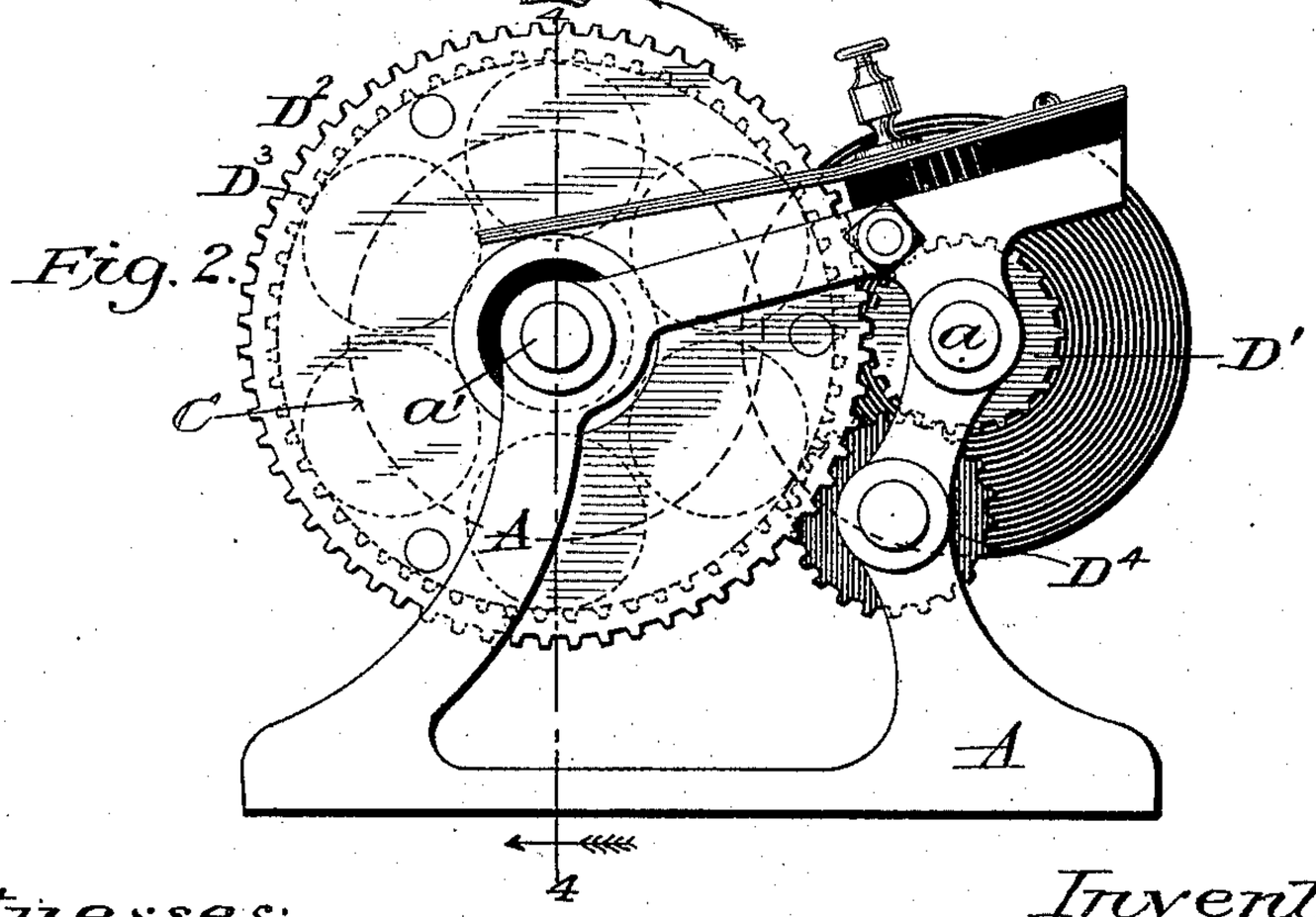


Fig. 2.



Witnesses:
Chas. H. Baker.

Inventor:
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by
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his attorney

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Fig. 3.

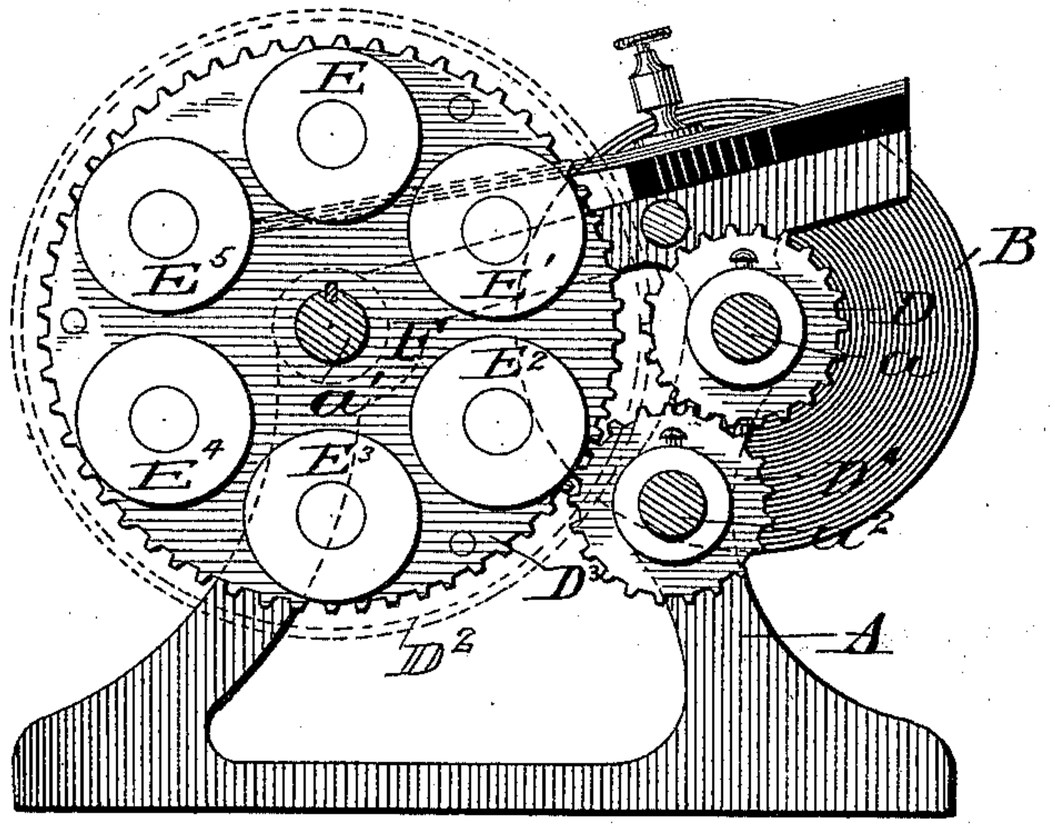
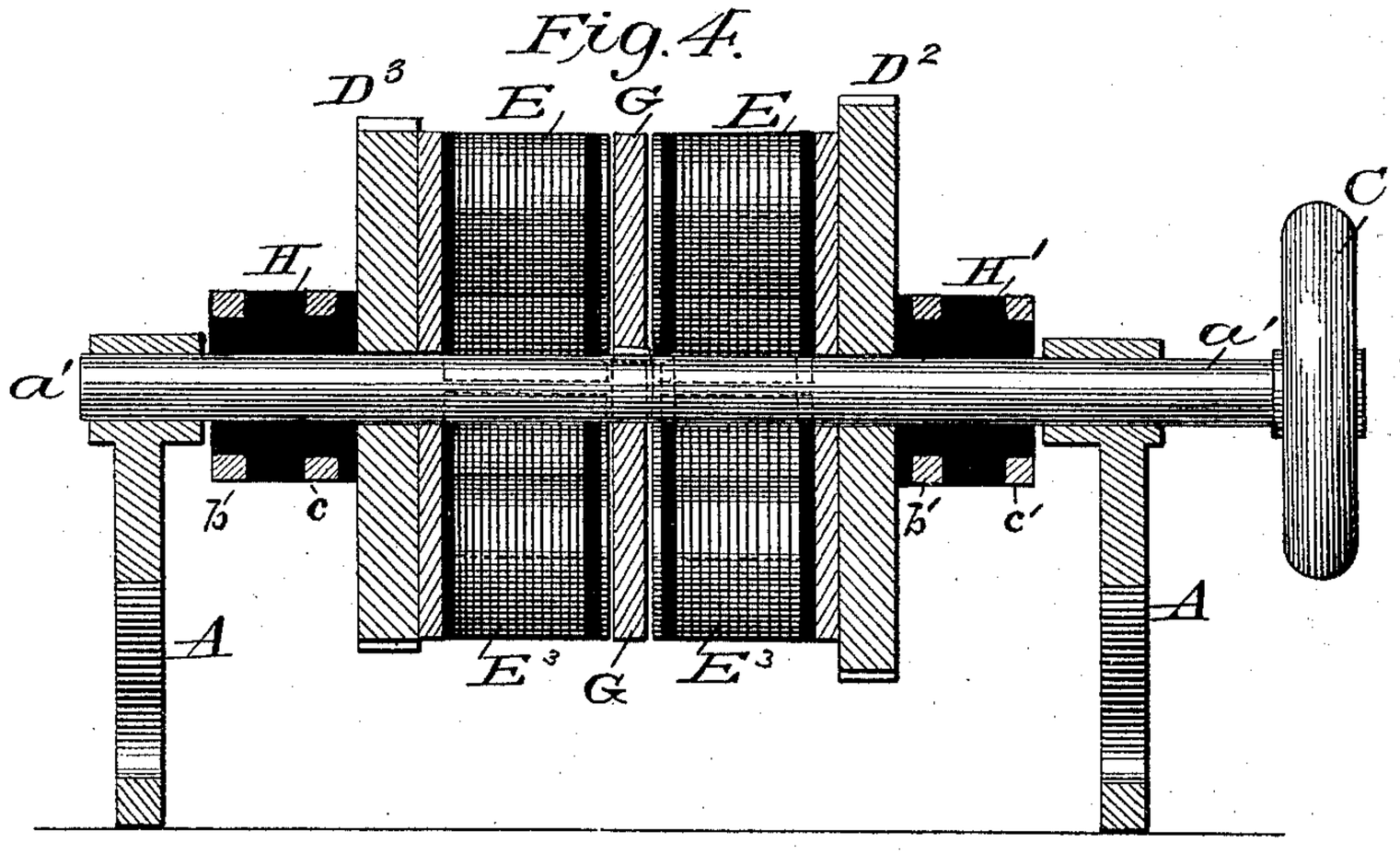


Fig. 4.



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Inventor:
Daniel Bacon
by
W. P. Preble Jr
his attorney

UNITED STATES PATENT OFFICE.

DANIEL BACON, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND A. G. WHEELER, JR., TRUSTEES, OF SAME PLACE.

MAGNETIC ACTUATOR.

SPECIFICATION forming part of Letters Patent No. 638,901, dated December 12, 1899.

Application filed February 24, 1899. Serial No. 706,755. (No model.)

To all whom it may concern:

Be it known that I, DANIEL BACON, a citizen of the United States, and a resident of New York city, borough of Brooklyn, in the State of New York, have invented a certain new and useful Magnetic Actuator, of which the following in a specification.

The object of my invention is to provide a device whereby motion derived from any convenient source of power, whether the same arises from the employment of steam, water, electricity, air, or gas, may be transmitted to the mechanism intended to be operated thereby in such a way as to agree in quantity and direction with that desired for the mechanism so driven and may also be adapted under the action of a governor, regulator, or similar device (not shown) to guard against variations in action usually caused by variations in the speed or quantity of the driving power or variations of power exerted by mechanism or devices being operated or propelled.

To this end my invention consists in a magnetic actuator adapted to be interposed between the source of power and the mechanism to be driven thereby and comprising magnets adapted to revolve in opposite directions and transmit to the apparatus to be actuated thereby power applied thereto, an armature placed in the field of said magnets, a shaft connected to said armature and adapted to revolve therewith in opposite directions as determined by the magnet or magnets energized at the time, and a rotating transmitting device mounted on said shaft.

One embodiment of my invention is shown in the accompanying drawings, in which—

Figure 1 is a top plan. Fig. 2 is an end view. Fig. 3 is a section on lines 3 3 of Fig. 1. Fig. 4 is a section on lines 4 4 of Fig. 2.

The same letters indicate similar parts in the different figures.

A is the framework of the device upon which the moving parts are mounted.

B is what I term the "receiving-pulley," being the pulley by means of which the power is received from the source of power. (Not shown.) This power, as before stated, may be generated in any convenient way and will be large or small, constant or intermittent, according to the work desired of it after transmission to the mechanism which it is designed to operate. This pulley is mounted upon the shaft a, journaled in the framework A.

C indicates what may be called the "transmitting-pulley" and is mounted upon the shaft a', journaled in the framework A. In the drawings this transmitting-pulley is represented as a fly-wheel, because I do not desire to limit myself to any specific mechanical device for transmitting power received by the actuator from the receiving-pulley B. It may be desirable to have the transmitting-pulley C a simple pulley or an eccentric or any other of a large variety of forms, according to the specific work which the mechanism to which the power is transmitted has to do. It will therefore be understood that it is immaterial to the operation of my magnetic actuator whether the one or the other of the usual mechanical devices by means of which motion is received or imparted is employed at what may be called the "entrance" and "exit" of my device. The function of my device is to receive the power, however delivered, and to transmit it in the manner required by the work intended to be performed.

The shaft a carries two gear-wheels D D'. One of these, D', meshes directly with the gear D^2 on the shaft a', while the other gear-wheel D engages with the gear D^3, also on the shaft a', through the intermediate gear D^4 upon the shaft a^2, journaled in the framework. It is therefore evident that when motion is communicated to the shaft a' from the shaft a through the gears D D^4 D^3 both shafts will revolve in the same direction. When, however, the motion is communicated through the gears D' D^2, the shafts will revolve in opposite directions.

The choice of one or the other set of gears as the efficient set to rotate the shaft a' is determined as follows: The gears D^2 and D^3 are loose upon the shaft, and to each is rigidly secured a set of electromagnets E E' E^2, &c., arranged radially about the shaft a' and carried on the plates F F', made rigid with the wheel D^3 or D^2, respectively. Within the magnetic field of both sets of magnets and conveniently or preferably between the two sets is the armature G, keyed to the shaft a', as shown in Fig. 4. Each set of magnets is

so wound as to present alternately poles of opposite polarity to the armature G. The collars H H′ are mounted on the gears D^3 D^2, respectively, and turn with them loosely about the shaft. These collars carry the collecting-rings *b c* and *b′* and *c′*, respectively, which collecting-rings are connected with the magnets E E′, &c., which may be wound in series or multiple, as desired. The current is brought to the collecting-rings by suitable brushes from an outside source of electrical power. It is obvious that whenever the armature G is caused to revolve it carries with it the shaft *a′* and that the direction of such revolution will depend upon whether said armature revolves in unision with the disk F′ and its set of magnets or with the disk F and its set of magnets. The armature G, being made of soft iron or other magnetizable material, is attracted by whichever set of magnets is electrically excited. This is brought about by the collars H H′, loose on the shaft *a′*, which are electrically connected with a battery or other source of electrical energy and also with the governor, indicator, or similar appliance of the mechanism which is to be driven. I have found that a very slight electric current is sufficient to energize either set of magnets sufficiently to secure such a hold upon the armature as will enable the power received through the receiving-pulley B to be transmitted unimpaired to the shaft *a′* and hence to the mechanism to be driven.

The many advantages of my magnetic actuator will be readily apparent without further explanation.

I claim—

A magnetic actuator adapted to be interposed between the source of power and the mechanism to be driven thereby, and comprising magnets normally revolving in opposite directions, and transmitting to the apparatus to be actuated thereby power applied thereto, means for revolving said magnets simultaneously in opposite directions, an armature placed in the field of said magnets, a shaft keyed to said armature and normally revolving therewith in opposite directions as determined by the magnet or magnets energized at the time, and a rotating transmitting device mounted on said shaft, substantially as set forth.

DANIEL BACON.

Witnesses:
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J. KENNEDY.