(No Model.)

H. M. BYLLESBY.

SYNCHRONIZING DEVICE FOR ALTERNATE CURRENT DYNAMOS.

No. 383,618. Patented May 29, 1888.

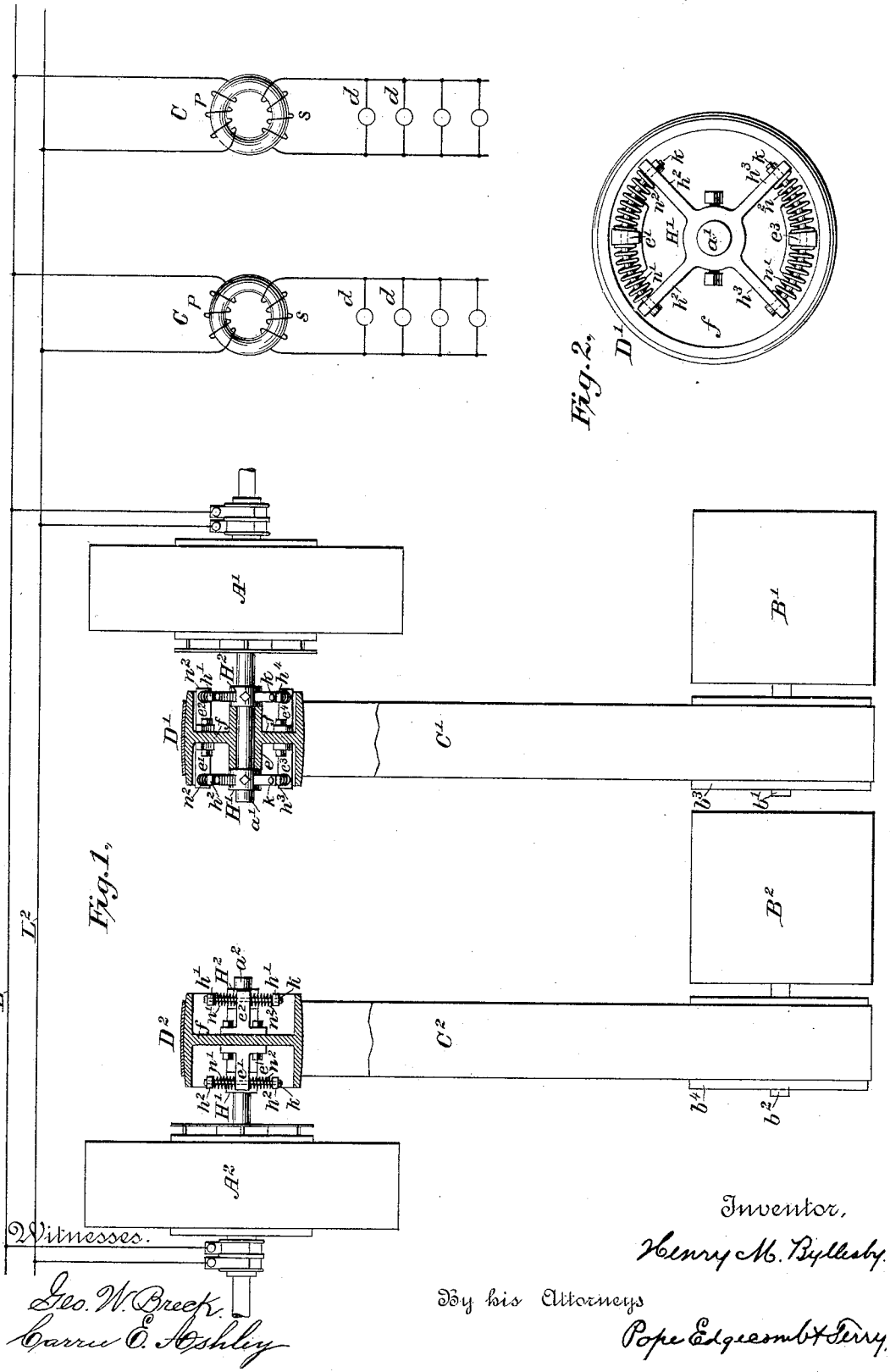


Fig. 1.

Fig. 2.

Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY M. BYLLESBY, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE WESTINGHOUSE ELECTRIC COMPANY, OF SAME PLACE.

SYNCHRONIZING DEVICE FOR ALTERNATE-CURRENT DYNAMOS.

SPECIFICATION forming part of Letters Patent No. 383,618, dated May 29, 1888.

Application filed September 1, 1887. Serial No. 248,475. (No model.)

To all whom it may concern:

Be it known that I, HENRY M. BYLLESBY, a citizen of the United States, residing in Pittsburg, in the county of Allegheny, in the State of Pennsylvania, have invented certain new and useful Improvements in Synchronizing Devices for Electric Machines, of which the following is a specification.

The invention relates to a method of constructing and organizing electric generators for the purpose of obtaining synchronism in their movements.

The invention consists, generally, in coupling the belt-wheels of alternate-current electric generators with the armature-shafts through yielding connections which will allow a slight movement of the wheels with reference to the armatures, so that any force which may tend to accelerate one of two or more machines delivering currents to the same circuit will be expended in or absorbed by the yielding connections, and will not result in throwing the machine out of synchronism.

The invention will be described more specifically in connection with the accompanying drawings, in which—

Figure 1 is a plan view of an organization of apparatus adapted to carry out the invention, and Fig. 2 is a detail of one of the pulleys.

Referring to the figures, A′ represents an alternate-current generator, and A^2 a second generator similar thereto. These are designed to be driven by the same or by different engines. In this instance two engines, B′ and B^2, are shown. These are respectively provided with shafts b' and b^2, which carry belt-wheels b^3 and b^4. These belt-wheels are connected by belts C′ and C^2 with the pulleys D′ and D^2 of the generators A′ and A^2. The pulleys are coupled with the shafts a' and a^2 of the generators through yielding springs, in a manner presently to be described. The springs are designed to allow a slight forward or backward movement of the corresponding pulley with reference to its armature, as occasion may require.

The pulley D′ is shown in horizontal section, and likewise the pulley D^2, although the latter is in a position ninety degrees in advance of the other, for the purpose of showing the construction. Each pulley is constructed with a collar, *e*, which surrounds the corresponding shaft, and this is capable of movement independently of the shaft. It is, however, coupled with the shaft by means of lugs e', e^2, e^3, and e^4 secured to the flange or web *f*. These lugs extend parallel with the armature-shaft between the arms h' h' and h^2 h^2 and h^3 h^3 and h^4 h^4, which are rigidly secured to the shaft by means of corresponding collars, H′ and H^2. A space is left between the respective arms applied to each lug e', e^2, e^3, or e^4, and preferably a rod, *k*, extends from one arm to the other and loosely through the corresponding lugs e', e^2, e^3, or e^4. Upon each side of this arm and upon the rod *k* there is a corresponding coil-spring, as shown at n' n^2. These normally hold the lugs e', e^2, e^3, and e^4 in positions midway between the corresponding arms h' h', h^2 h^2, &c., and thus the pulley-wheel is held in a given position relative to the armature, but it is capable of a slight movement against the force of the springs in either direction. There are shown, it will be understood, four sets of springs as applied to each belt-pulley; but this number may be varied as found convenient, and also the general construction may be variously modified.

It is well known that when alternate-current generators delivering approximately the same number of impulses per minute are connected in multiple arc to deliver currents in the same direction to a work-circuit, L′ L^2, for instance, they tend to fall into synchronism; but it is found in practice that there are liable to be slight fluctuations in the current that is delivered by two or more generators so connected, by reason of an occasional tendency of one machine to momentarily drive ahead or fall behind the other. This may be due to various causes—such, for instance, as a slippage of the belt, or, in the case of two different driving-engines being employed, an acceleration of speed on the part of one machine above that of the other. It will be understood that any such tendency will be overcome by the present invention, for the natural tendency of the two machines to keep together is very strong, and it will require a very considerable force to throw them out of unison, and the normal fluctuations in the driving-power and in the power required to drive the generators will be

absorbed by the springs or dynamometer-pulleys, so that the two will not be thrown out of synchronism.

In the drawings there is shown in connection with the work-circuit L' and L² a converter, C. The primary coil *p* is connected in the circuit L' L², and the secondary circuit *s* includes translating devices *d d* in multiple arc. Other converters may be connected in multiple arc or otherwise with the converter C.

I claim as my invention—

1. The combination, with an electric circuit and two or more alternate-current electric generators delivering currents to said circuit, of a source of power for driving the same, and yielding connections between the source of power and said machines, respectively, substantially as described.

2. The combination, with two or more alternate-current electric generators and a circuit common to both, of synchronizing devices consisting of two driving-pulleys and yielding connections between said pulleys and the shafts of said generators, respectively, substantially as described.

3. The combination, with two or more alternate-current electric generators and a circuit common to both, of two pulleys respectively applied to the shafts of said generators, spring-connections between said pulleys and said shafts, and means for revolving said pulleys at an approximately constant speed, substantially as described.

In testimony whereof I have hereunto subscribed my name this 1st day of July, A. D. 1887.

HENRY M. BYLLESBY.

Witnesses:
W. D. UPTEGRAFF,
CHARLES A. TERRY.