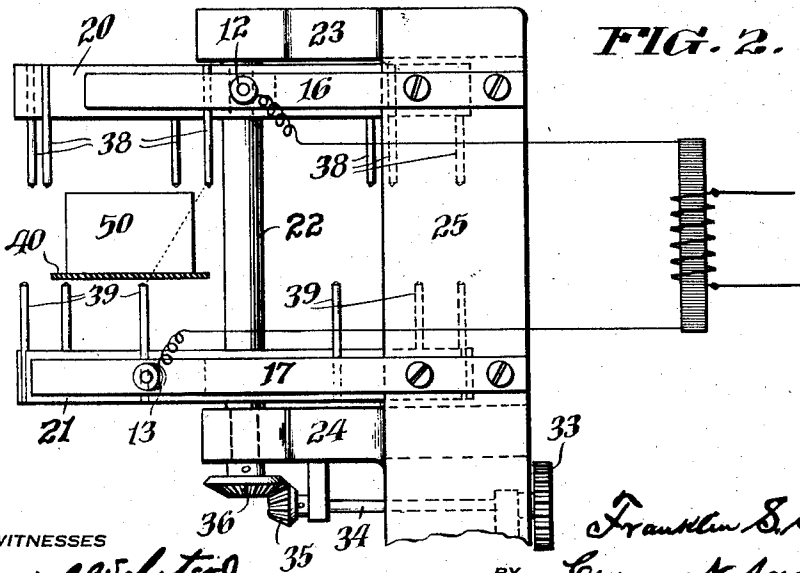
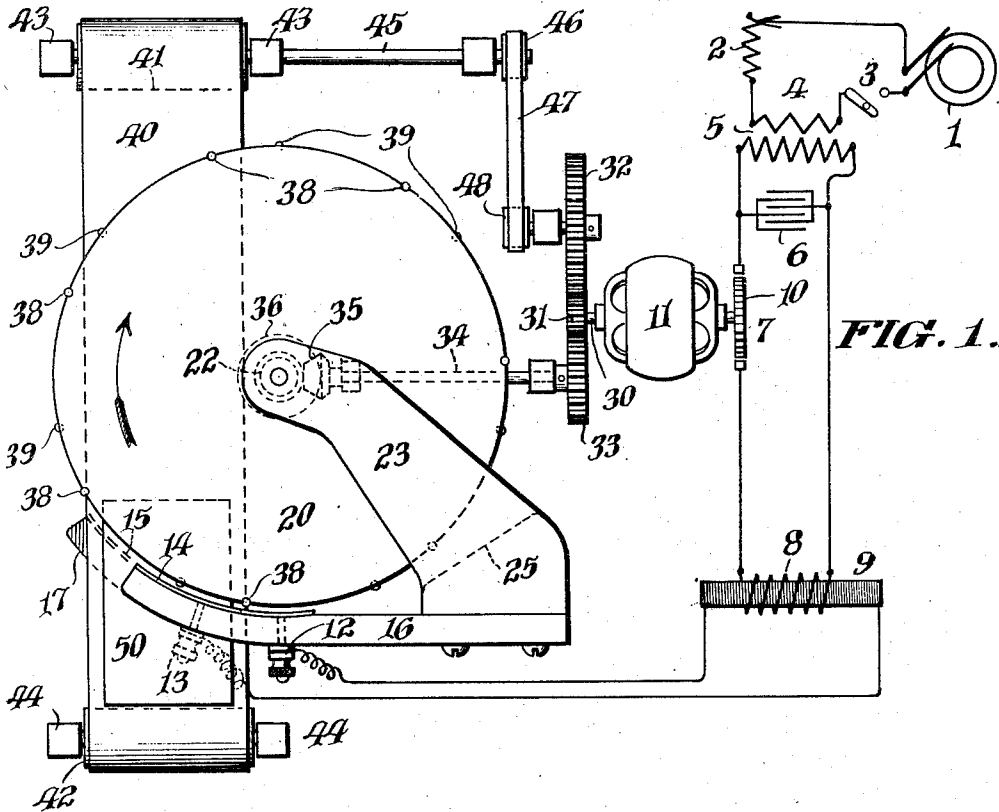


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ELECTRICAL APPARATUS FOR DESTROYING INSECTS.
APPLICATION FILED MAR. 13, 1911.

1,016,452.

Patented Feb. 6, 1912.



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ELECTRICAL APPARATUS FOR DESTROYING INSECTS.

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To all whom it may concern:

Be it known that I, FRANKLIN S. SMITH, a citizen of the United States, residing in Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Electrical Apparatus for Destroying Insects, of which the following is a specification.

My invention relates to improvements in electrical apparatus for destroying insects, their eggs, larvæ and pupæ, and it has for its object to provide an apparatus for the treatment of articles which may be infested with insects, etc., which apparatus shall be simple in construction and may, therefore, be cheaply constructed, and at the same time possess a high degree of efficiency.

My invention comprehends the combination and arrangement of parts hereinafter described and illustrated, it being understood, however, that changes in the details of construction within the scope of the claims may be made without departing from my invention.

In the drawings:—Figure 1 is a top plan view of an apparatus embodying my invention, certain of the parts being shown conventionally and symbolically; and Fig. 2 is a side elevation of a portion of the said apparatus.

Referring to the drawings:—1 designates a source of alternating electric current; 2 designates a variable resistance; and 3 a switch in the circuit 4, which includes the primary coil of a step-up transformer 5.

The variable resistance 2 and the switch 3 are in series with the source of alternating current 1 and are also in series with the primary coil of the step-up transformer 5.

6 designates a condenser which is in multiple with the secondary coil of the step-up transformer 5. The spark gap 7, of known construction, is in series with the condenser and the primary coil 8 of the Tesla coil 9. The rotary member 10 of the spark gap is rotated by means of the motor 11, the said motor also performing an additional function to which reference will be made hereinafter.

The opposite ends of the secondary wire of the Tesla coil 9 are connected to binding posts or screws 12 and 13 having connection respectively with plates 14 and 15 secured upon supports 16 and 17 of any suitable insulating material. The said parts 14 and 15 constitute what may be termed commu-

tators. These parts are curved, as indicated, and are located adjacent and in opposite curved relation to the peripheries of rotatable circular wheels 20 and 21 of any suitable insulating material, which wheels are mounted upon a rotatable shaft 22, also of insulating material, and by means of which the said wheels are insulated from the remaining portions of the apparatus.

The shaft 22 is supported upon arms or brackets 23 and 24 upon an upright or standard 25. The shaft 30 of the motor 11 is provided with a pinion 31 which is in mesh with gear wheels 32 and 33, the latter being mounted upon a shaft 34 having a bevel pinion 35 which engages a bevel gear 36 upon the lower end of a continuation of the shaft 22, which continuation may or may not be integral with the shaft 22 as desired. Rotation of the shaft 34 and its pinion 35 causes rotation of the bevel gear 36 and the shaft 22 to which it is secured and thereby causes rotation or revolution of the wheels 20 and 21.

The wheels 20 and 21 are provided with metallic rods or equivalent members 38 and 39 which are located in staggered relation with respect to each other and when brought into position opposite the parts 14 and 15 become the terminals of the secondary of the Tesla coil.

The wheels 20 and 21 each being secured upon the shaft 22 are adapted to be rotated synchronously.

It will be observed that the upper curved plate 14 is not located directly above the lower curved plate 15. These plates are substantially of the same length but the rear end of the upper one is located at a point considerably in rear of the rear end of the bottom plate 15, the forward end of the latter projecting a considerable distance beyond the forward end of the upper plate, as is clearly shown in the drawings.

Although the parts 14 and 15 are referred to as plates, it will be understood that while it is necessary that they should be of metal or some form of suitable conductor, it is not necessary that they should be in the form of plates, but they may be in the form of wires or any other desired form.

By the arrangement of the parts 38 and 39 in the manner illustrated, which parts successively become the terminals of the opposite ends of the secondary of the Tesla coil, the electrical discharges which take place between the said parts extend at an

angle to a horizontal plane. The angle at which the said sparks discharge preferably should be about 45 degrees, but my invention is not limited to the angle at which the said discharges take place.

In order to place the articles to be treated in position between the terminals 38 and 39, I have provided a conveyer 40 supported upon revoluble drums 41 and 42 which drums are sustained upon posts or standards 43 and 44. The drum 41 is supported upon a shaft 45 provided with a drive wheel 46 over which a drive band 47 is extended from a driving wheel 48 upon the shaft of the gear wheel 32. Rotation of the shaft 32 actuates the driving belt 47 which in turn causes revolution of the shaft 45 to cause the conveyer 40 to travel over the drums 41 and 42. Any article placed upon one end of the conveyer 40 is conveyed between the revoluble wheels 20 and 21 and also between the opposing ends of the terminals 38 and 39. Such an article is illustrated at 50 in the drawings.

As the object being treated is passed between the said terminals, the electrical discharges take place through the same and cause the destruction and elimination of any objectionable insects which may infest the same.

The forms of package which is treated is immaterial and substances to be treated consists of cereals and various other articles as pointed out fully in my co-pending application filed January 7, 1911, Serial No. 601,283.

The relation of the article being treated upon the conveyer 40 to the terminals 38 and 39 and to the discharges between the same is such that the discharges pass through such article at an acute angle, so that the current of electricity between the terminals will not be so apt to follow the side and end walls of a package and, therefore, will be more apt to act upon all parts of the package and the material contained therein.

The broad subject matter of invention disclosed herein and not claimed, is claimed in my co-pending applications, respectively filed January 7th, 1911, Serial No. 601,283, and March 13th, 1911, Serial No. 614,181.

Having thus described my invention, I claim:—

1. In an apparatus of the character described, the combination of a source of electrical energy, rotatable members carrying a plurality of terminals which terminals have operative connection successively with the said source of electrical energy, means for supporting an article between the said terminals, whereby the insects, eggs, larvæ or pupæ, which may infest the same may be destroyed.

2. In an apparatus of the character described, the combination of a source of electrical energy, rotatable members, means for causing rotation of the said members, a plurality of terminals supported on the said members, the said terminals being adapted to be moved successively past and in proximity to members of conducting material having operative connection with the said source of electrical energy, means for supporting and conveying articles between the said terminals, whereby the said articles are subjected to the action of electrical discharges between the said terminals, the insects, eggs, larvæ or pupæ in the said articles being thereby destroyed.

3. In an apparatus of the character described, the combination of a source of electrical energy, oppositely disposed circular members of insulating material carrying a plurality of terminals, means for causing rotation of the said circular members, members of conducting material located adjacent to the edges of the respective rotatable circular members, the said members of conducting material having operative connection with the said source of electrical energy whereby electrical discharges take place successively between the said terminals on the said rotatable members, and means for supporting and conveying articles between the said terminals at one side of the axis of rotation of the said rotatable members, whereby the said articles are subjected to the action of the electrical discharges between the said terminals and the insects, their eggs, larvæ or pupæ, which may infest the said articles, being thereby destroyed.

4. In an apparatus of the character described, the combination of a source of electrical energy, oppositely disposed circular rotatable members of insulating material, which members are provided with terminals secured at intervals to their peripheries, means for causing rotation of the said rotatable members, relatively short members of conducting material located adjacent to the peripheries of the said circular members and having connection with said source of electrical energy, the said conducting members being concentric with the said rotatable members, the said conducting members overlapping each other but one of them being located forwardly of the other so that the electrical discharges between the terminals which may be located adjacent to the said conducting members will take effect at an acute angle to a plane parallel to the planes of the said circular members, and means for conveying articles to be treated between the said circular members and the terminals carried thereby, the said means extending between the said circular members and at one side of the axis of rotation of said members.

5. In an apparatus of the character described, the combination of a source of alternating electric current, a Tesla coil having connection with the said source, oppositely
5 disposed circular members of insulating material having terminals secured at intervals to their peripheries, supports of insulating material for the said circular members,
10 members, segments of conducting material located adjacent to the peripheries of and being concentric with the said circular members, the forward portion of one of the said segments extending over the rear portion of
15 the other of said segments, supports of insulating material for the said segments which segments are connected to the opposite ends of the secondary of the said Tesla coil, whereby the said segments are electrically
20 charged and whereby electrical discharges take place between the terminals which may be oppositely disposed with respect to the said segments, and means for supporting and conveying articles to be

treated between the said terminals carried 25
by the said circular members whereby the insects, eggs, larvæ or pupæ which may infest the said articles are destroyed.

6. In an apparatus of the character described, the combination of means for producing oscillating electrical discharges, terminals between which the said discharges
30 take place, circular rotatable members of insulating material upon the peripheries of which the said terminals are supported at
35 intervals, means for supporting and conveying articles between the opposing terminals, whereby the insects, their eggs, larvæ or pupæ, which may infest the said articles, may be destroyed by the oscillating electrical
40 discharges between the said terminals.

In testimony that I claim the foregoing as my invention, I have hereunto signed my name this 11th day of March, A. D. 1911.

FRANKLIN S. SMITH.

In the presence of—

CARRIE E. KLEINFELDER,
CYRUS N. ANDERSON.