No. 714,649. Patented Nov. 25, 1902.

H. M. SUTTON & W. L. & E. G. STEELE.

ORE CONVEYING SURFACE FOR ELECTRICAL SEPARATORS.

(Application filed July 1, 1902.)

(No Model.)

Fig. 1.

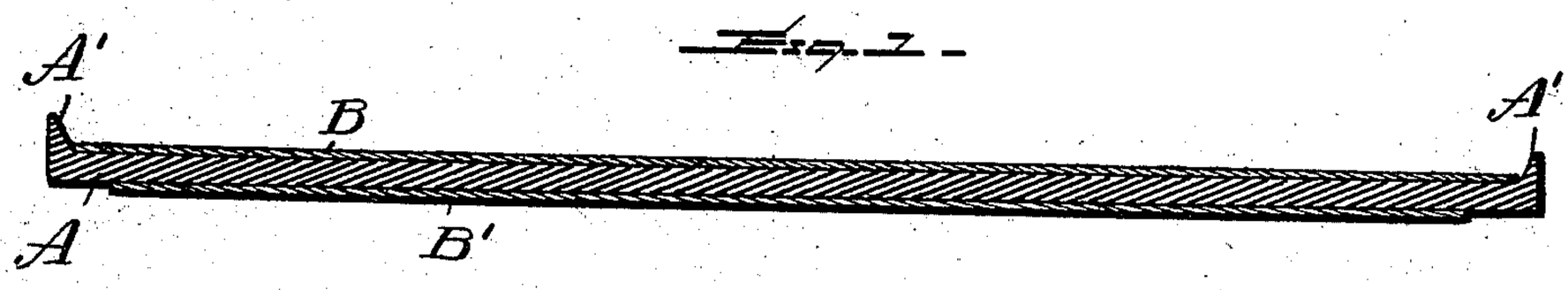


Fig. 2.

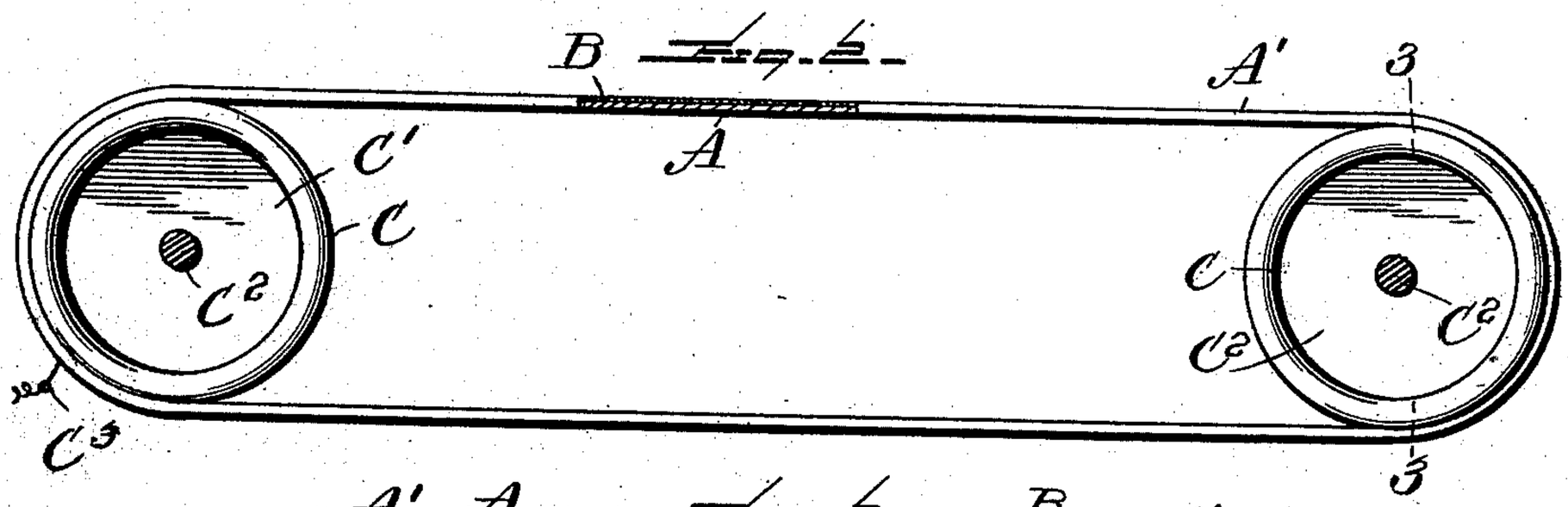


Fig. 3.

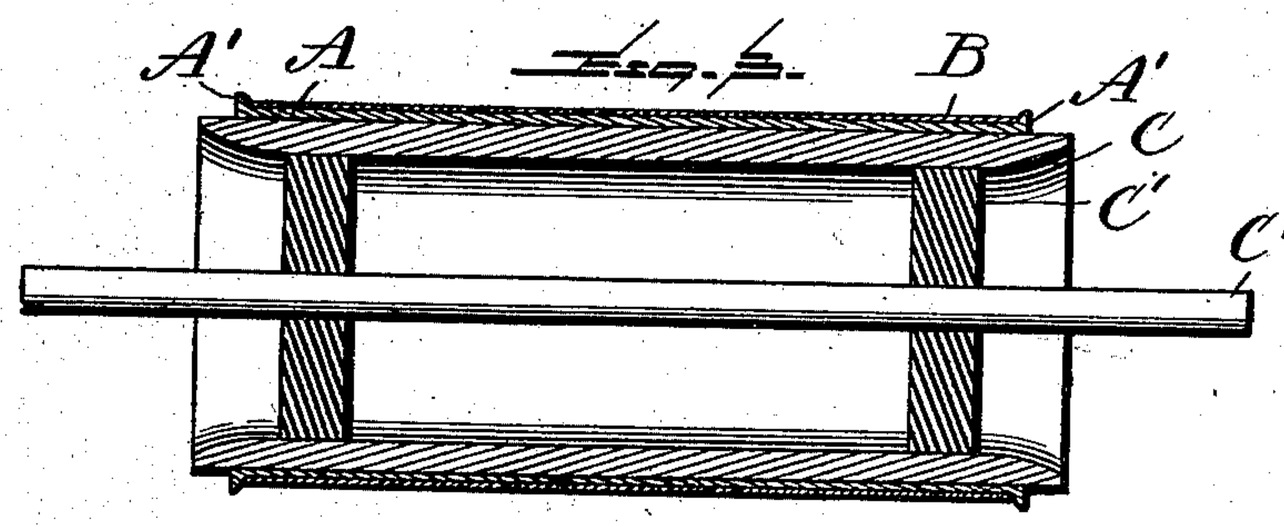


Fig. 4.

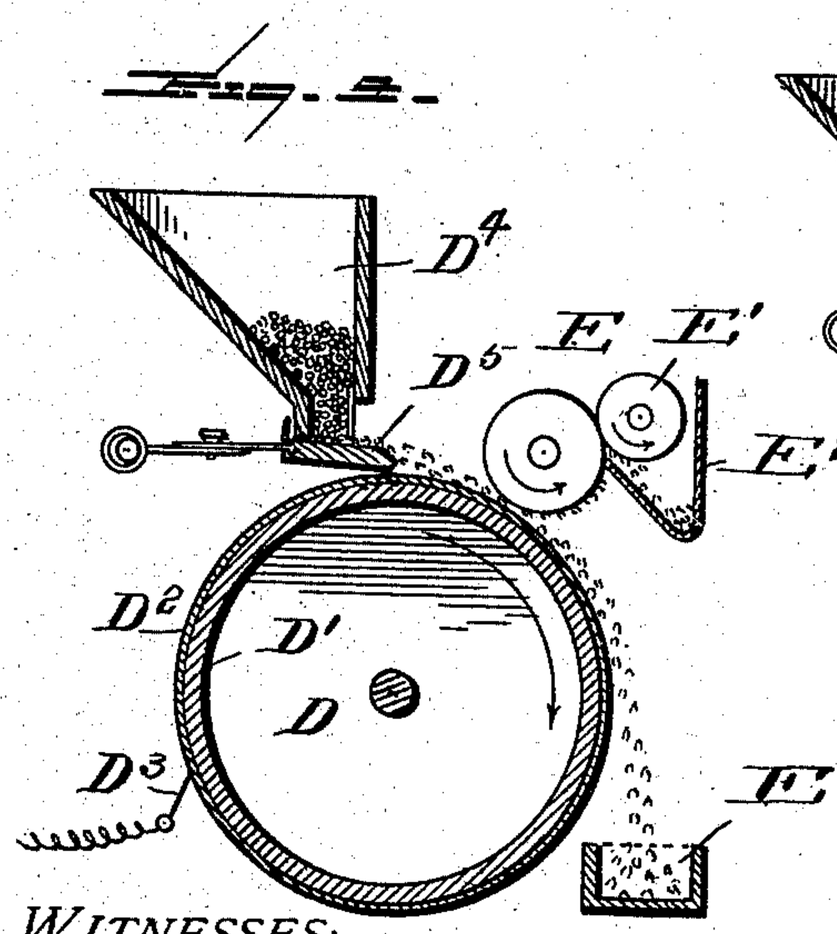
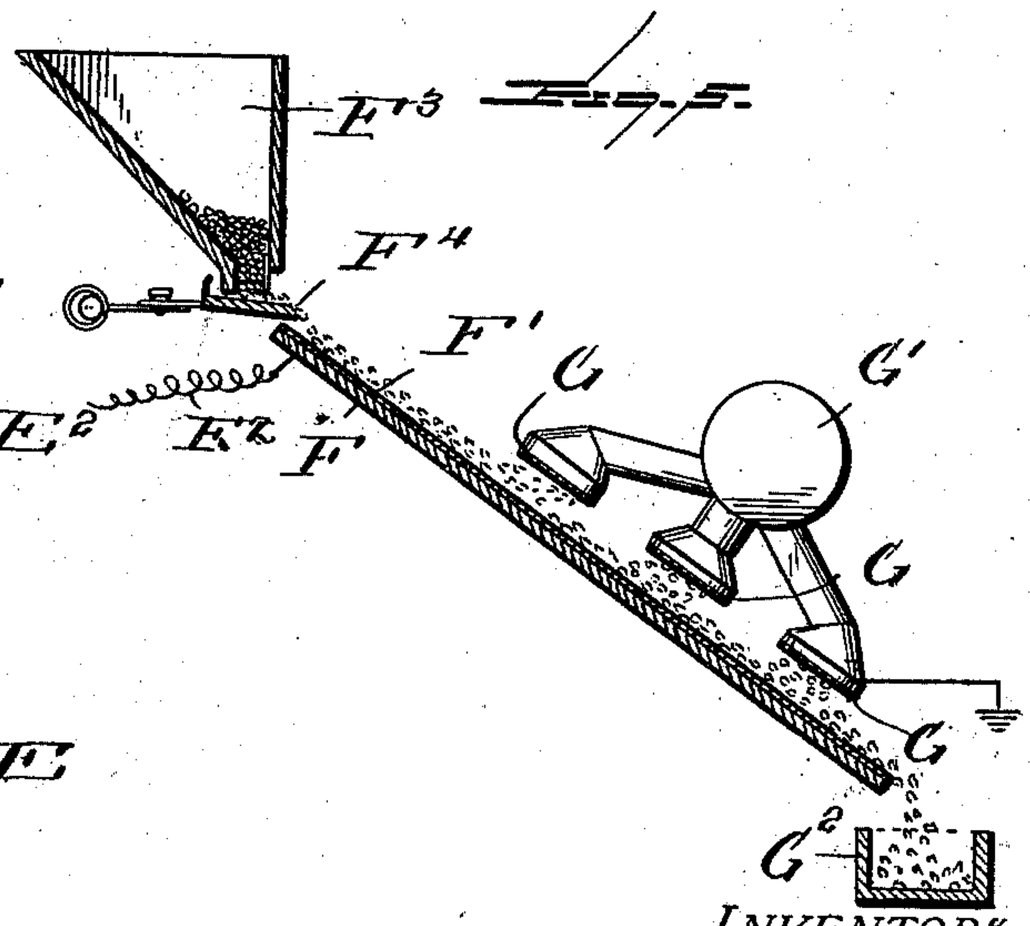


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ORE-CONVEYING SURFACE FOR ELECTRICAL SEPARATORS.

SPECIFICATION forming part of Letters Patent No. 714,649, dated November 25, 1902.

Original application filed February 3, 1902, Serial No. 92,370. Divided and this application filed July 1, 1902. Serial No. 114,020. (No model.)

To all whom it may concern:

Be it known that we, HENRY M. SUTTON, WALTER L. STEELE, and EDWIN G. STEELE, citizens of the United States, residing at Dallas, in the county of Dallas, State of Texas, have invented certain new and useful Improvements in Ore-Conveying Surfaces for Electrical Separators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an ore-conveying surface for electrical separators, and particularly to a structure adapted for use with static electricity, as shown in our application filed February 3, 1902, Serial No. 92,370, of which this case is a divisional application.

The invention has for its object to provide a conducting-face for electricity mounted upon an insulating material, so as to permit the accumulation of a large electrical charge upon the surface when otherwise only a small charge could be utilized.

A further object is to increase this accumulative capacity by a coating or conducting-surface upon opposite sides of an insulating-base, so as to produce the conditions occurring in a Leyden jar, and each coating will have an electrical charge of opposite sign or polarity separated by a dielectric comprising the insulating material.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

In the drawings, Figure 1 is an enlarged section of a belt or surface composed of insulating material having a conducting-surface upon each face; Fig. 2, a longitudinal elevation of an ore-conveying belt having a conducting-face upon one surface; Fig. 3, a vertical section on the line 3 3 of Fig. 2; Fig. 4, a modified application of the invention, showing the surface applied to a rotating member; and Fig. 5, a section of a further modification, showing a fixed conducting-surface.

Like letters of reference refer to like parts in the several figures of the drawings.

The letter A designates a base or body of insulating material composed of rubber or any suitable substance, which, if desired, may have raised edges A′ to retain the ore thereon. This insulating-support is shown in Fig. 1 as provided upon its upper face with a conducting-surface B, preferably of metal, and upon its lower face with a similar surface B′; but the lower surface B′ may be omitted when found convenient, as its effect is to increase the accumulative charge upon the upper surface, so that each surface will have a charge, for instance, of static electricity of opposite sign or polarity. This conducting-surface may be applied in any desired manner—as, for instance, by thin plates upon a fixed base—but if applied to a flexible insulating-base, such as a belt, may be produced by the use of a metallic paint or powder brushed or spread upon a surface of insulating-varnish, so as not to become injured in the passing of the belt over the supporting-rollers, as shown in Fig. 2.

In Fig. 2 the lower coating B′ has been omitted, and the belt is shown as supported upon a roller or pulley comprising a shell C, of wood or insulating material, supported upon an insulated body C′, carried by the shaft C^2, which is driven in any desired manner. The form of insulating-belt used may be either formed of rubber or of webbing with rubber facings, or any other insulating material may be substituted in the formation of the base. The conducting-surface of the belt is electrically charged by a brush C^3.

In Fig. 4 an ore-conveying cylinder D is shown having an insulated covering D′ and a conducting-face D^2, adapted to be electrically charged—for instance, by static electricity—by means of a brush D^3, while above the cylinder a feed-hopper D^4 is provided with a shaker-pan D^5 to distribute the ore upon the moving surface of the cylinder, while at one side of the cylinder a magnetic roller E is suitably mounted in connection with a cleaner-roller E′, adapted to deposit the magnetic concentrates in a hopper D^2, while the tailings fall into a hopper or receptacle E^3.

In Fig. 5 an ore-conveying slide is shown, which may be stationary, and comprises an insulating-base F and metallic face F′, the latter being charged from a static connection F^2, while the ore is fed to said slide from a hop-

per F^3 by means of the shaker-pan F^4. Above the slide a stationary screen G is mounted and suitably grounded, while connecting with this screen is a suction-pipe G′, through which the non-metallic material in the ore is drawn, while the metallic material is repelled by the screen back upon the slide and falls thence into the hopper G^2. The form of the invention shown in Fig. 4 is that of a magnetic separator assisted by a stationary action, while in Fig. 5 a static separator is illustrated.

The invention has been shown as applied to different characters of separators, and it will be obvious that it is applicable to any form of device employing a conducting-surface electrically charged, as it enables the charge to equalize instantly over the entire surface, so that the ore to be treated will be electrified to the same degree and in a static separation a similar action secured at all points throughout the surface, thus producing a most thorough and satisfactory concentration. It will also be noted that while the invention may be used with an endless belt it is not confined thereto, as the same conditions may be effected upon a stationary or vibrating non-conducting plate having a conducting-surface upon one or both sides and also by the rotating cylinder of insulating material having the same conducting-surface. As previously stated, it is not essential that there should be two coatings, as one operates satisfactorily, although a more efficient result is secured by the use of an opposite metallic coating. It will furthermore be seen that this coating accumulates a large charge, by which a more thorough electrification of the particles of ore is secured, and thus effects the advantages of a large static charge.

Having described our invention and set forth its merits, what we claim, and desire to secure by Letters Patent, is—

1. In a device of the class described, an ore-conveying surface comprising an insulated body having a conducting-face upon one surface thereof; and means for electrically charging said conducting-face; substantially as specified.

2. In a device of the class described, an ore-conveying surface comprising an insulated body having a conducting-face upon the opposite faces thereof; and means for electrically charging said conducting-faces; substantially as specified.

3. In a device of the class described, a conveying-belt formed of flexible material and having a metallic face, and means for electrically charging said face; substantially as specified.

4. In a device of the class described, a conveying-belt formed of flexible material and having a metallic face, means for electrically charging said face, and supporting-rollers for said face insulated from the shafts thereof; substantially as specified.

5. In a device of the class described, an insulated support, a metallic face upon one surface of said support comprising particles of metal adhesively connected to said support; substantially as specified.

6. In a device of the class described, a conveying-belt formed of flexible insulating material, metallic faces upon the opposite sides of said belt, and means for statically charging one of said faces; substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

HENRY M. SUTTON.
WALTER L. STEELE.
EDWIN G. STEELE.

Witnesses:
W. F. DOUGHERTY,
J. J. MOULARD.