

(No Model.)

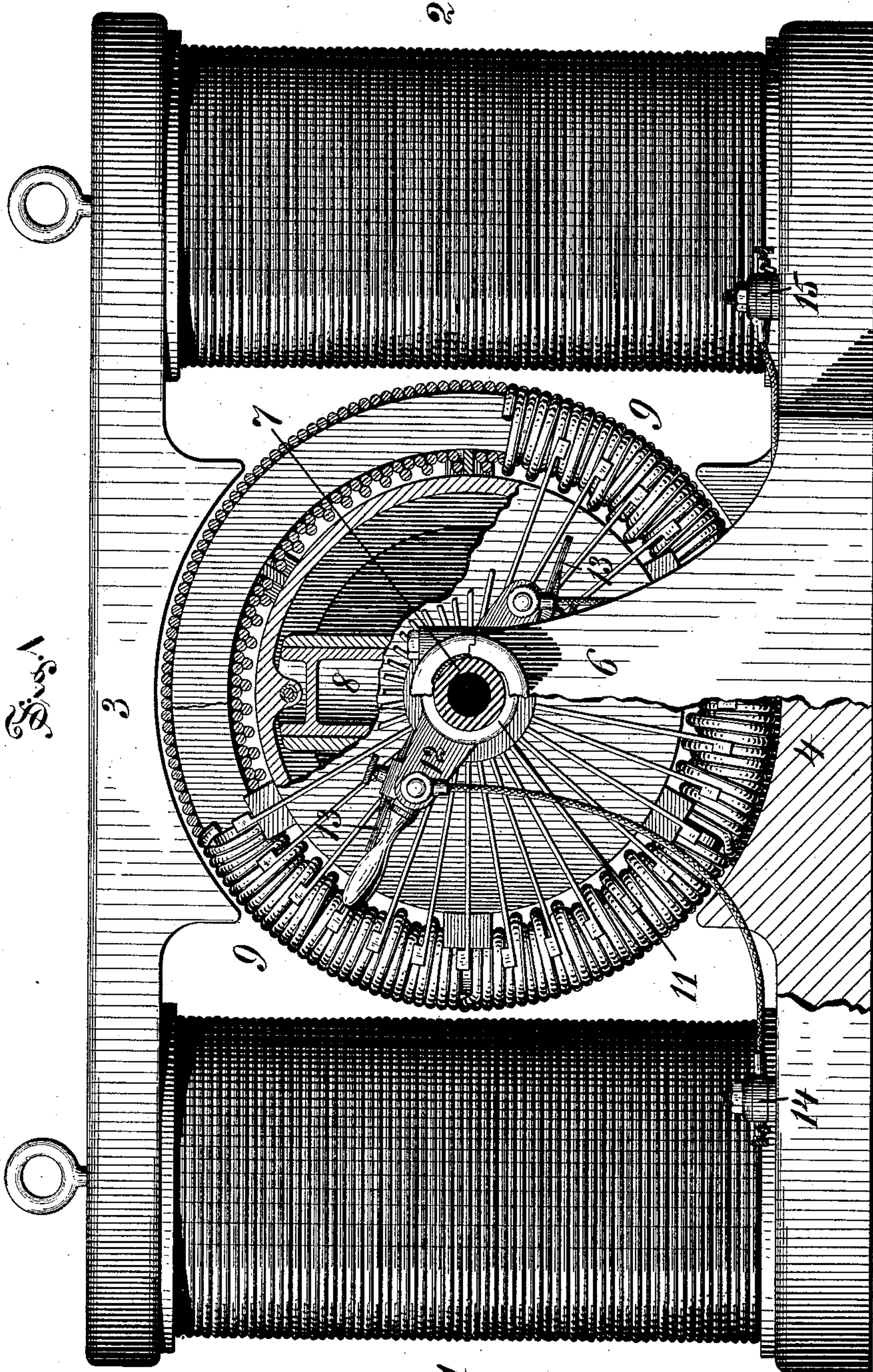
3 Sheets—Sheet 1.

R. H. MATHER.

STEAM DYNAMO ELECTRIC MACHINE.

No. 381,568.

Patented Apr. 24, 1888.



Witnesses:

Wm. R. Yorkman  
Albert H. Walker

Inventor:

Richard H. Mather.  
By Willard Eddy, Atty.



(No Model.)

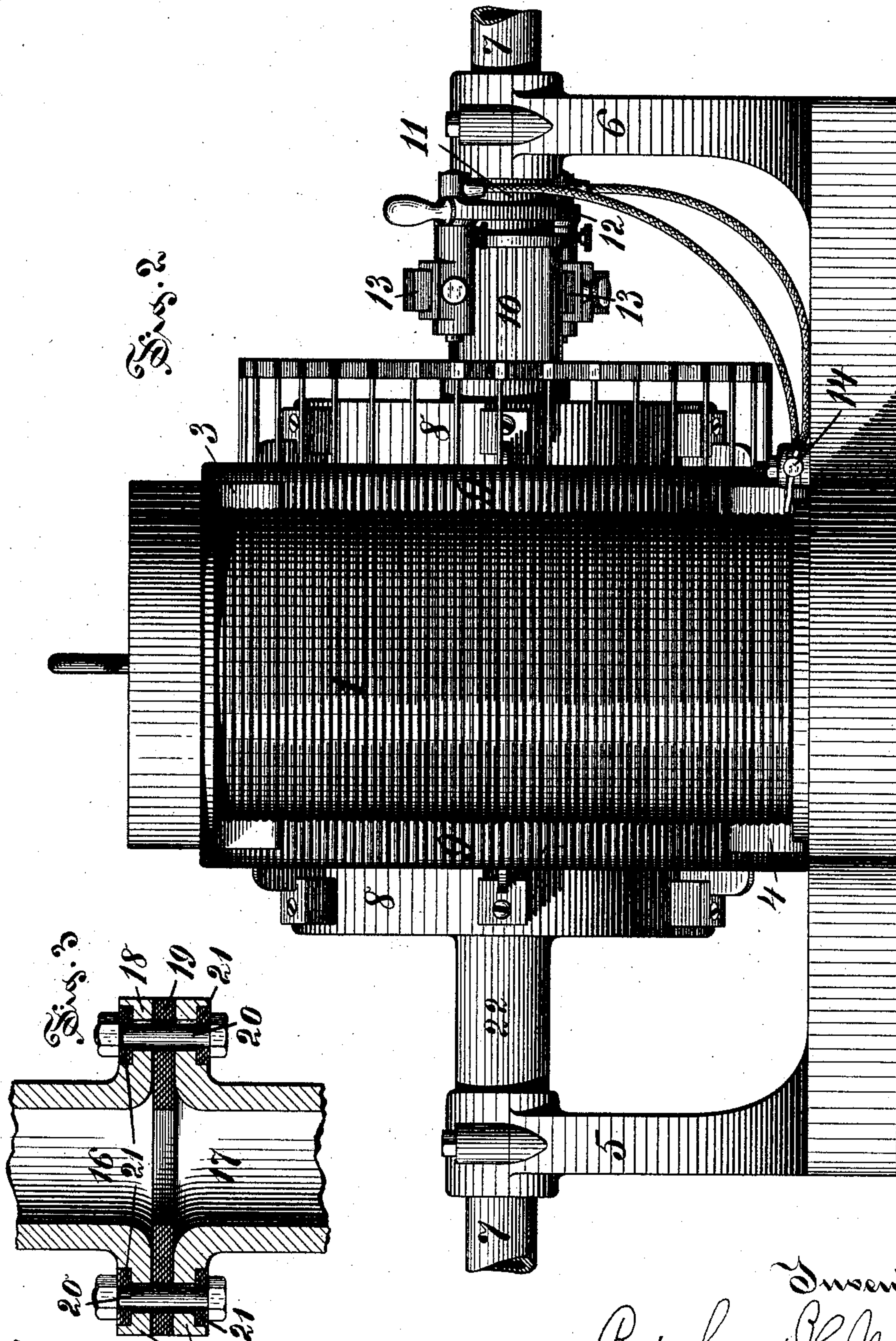
3 Sheets—Sheet 2.

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STEAM DYNAMO ELECTRIC MACHINE.

No. 381,568.

Patented Apr. 24, 1888.



Witnesses:  
Wm. B. Gorkman  
Albert B. Walker

Inventor:  
Richard H. Mather.  
By Willard Eddy, Atty.

(No Model.)

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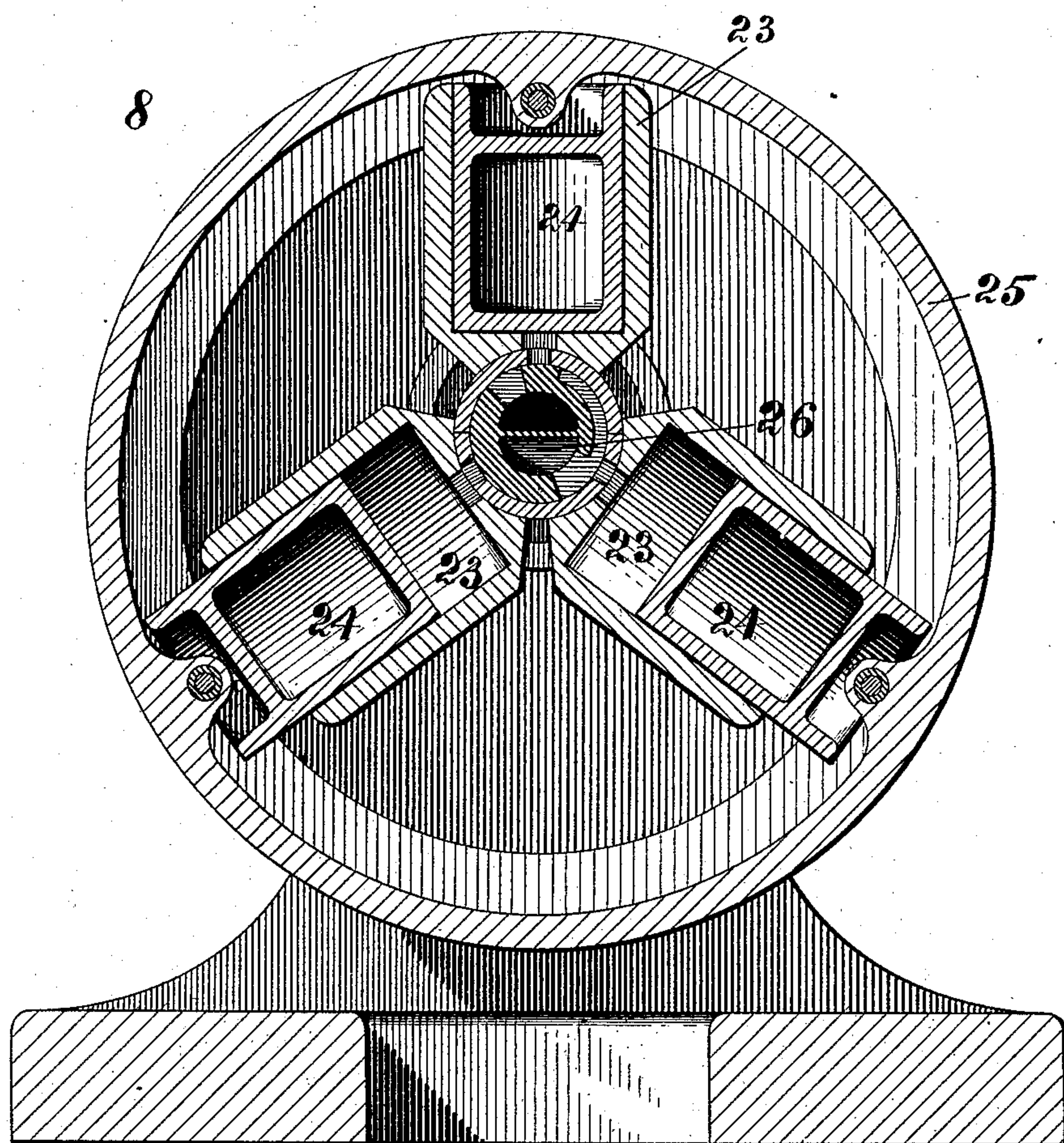
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Fig. 4



Witnesses:

Wm. Dyckman  
C. E. Buckland

Inventor:

Richard H. Mather,  
By Willard Eddy,  
Atty.



# UNITED STATES PATENT OFFICE.

RICHARD H. MATHER, OF WINDSOR, CONNECTICUT.

## STEAM DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 331,568, dated April 24, 1888.

Application filed August 19, 1886. Serial No. 211,251. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD H. MATHER, of Windsor, Hartford county, Connecticut, have invented a new and useful Steam-Dynamo, of which the following is a specification, illustrated by the accompanying drawings.

This invention is a combined steam-engine and dynamo-electric machine, and is designed to facilitate the conversion of steam-power into electric currents.

Figure 1 in the drawings is a side view of my steam-dynamo, parts being cut away. Fig. 2 is an end view of the same. Fig. 3 is a central longitudinal section of a part of the steam-pipe, showing a method of insulation; and Fig. 4 is a vertical section of a steam-engine which is adapted to be used as an element of said steam-dynamo.

The numerals 1 and 2 denote the limbs of the field-magnet, which are connected by pole-pieces, and are wound in the usual manner for the production of consequent poles 3 and 4. These pole-pieces are cylindrically concave toward each other. Two standards, 5 and 6, having any convenient form, rise upon opposite sides of pole 4 and support a steam and exhaust pipe, which passes centrally between said limbs and between said poles, and carries a revolving steam-engine, 8. This engine is externally of a cylindrical form, and may be constructed in any convenient or desired manner.

By preference I adopt that mode of construction which is described in my application No. 199,323, filed April 19, 1886, for a patent on steam-engines.

According to the method of construction as illustrated in Fig. 4, a series of steam-cylinders, 23, are disposed in radial positions about pipe 7 as a common axis of revolution, and are provided with reciprocating pistons 24, which are hinged to the inside of a surrounding rotary cylinder, 25. Pipe 7 is a stationary double crank, being a single hollow casting of irregular cylindrical form. Being divided by an internal diaphragm, 25, into two separate compartments, this pipe serves as a steam-pipe and also as an exhaust-pipe for said cylinders.

Engine 8 is adapted to rotate upon pipe 7, between poles 3 and 4. Upon the cylindrical

exterior of engine 8 is securely mounted the cylindrical or ring-shaped armature 9. The latter is preferably constructed upon the principle of a Gramme ring, and is adapted to rotate with engine 8 between poles 3 and 4. A convenient mode of constructing this armature and also of attaching the same to engine 8 is illustrated in application No. 209,750, which was filed by David Williamson, July 30, 1886, for a patent on armatures for dynamo-electric machines. A commutator, 10, whose segments are connected with the armature-coils in the usual manner, is mounted upon a sleeve which surrounds pipe 7 and forms one of the hubs 22 of engine 8. Between this sleeve and standard 6 pipe 7 is surrounded by a second metallic sleeve, 11, upon which, in the usual manner, is mounted a yoke, 12, which carries the brushes 13. The terminals of the machine are the binding-posts 14 and 15.

The insulation which is shown in Fig. 3 is designed to insulate the engine from its boiler, which is not shown in the drawings, and is preferably located near the engine.

In order to effect the electrical insulation of the engine without interrupting the continuity of the steam-pipe, the latter is constructed in two parts, 16 and 17, each of which has a flaring end or terminal annular flange, 18, and these two flanges, being separated from each other by numerous annular laminations of mica, 19, or by other insulating material in annular form, are drawn closely together upon such mica or other insulating material by screws or bolts 20, which are also separated from flanges 18 by other annular insulation, 21.

This machine further presents all other features and particulars of construction which are necessarily involved in the mode of operation, which is illustrated in the drawings, and is now to be explained.

When steam is admitted to the engine, the operation of the latter is not unlike the operation of other engines of the same general description. The rotation of the engine, however, causes a like rotation of the armature in the magnetic field of poles 3 and 4. The operation of the dynamo as such is not unlike that of any other dynamo in which a ring-armature is rotated between the poles of a field-magnet. The result is, that the power of



the engine is applied to the armature directly and without intermediate shafting or gearing. Thus the conversion of steam-power into electric currents is facilitated.

5 All things which are shown and claimed in the above-mentioned applications are disclaimed with reference to the present case.

I claim as my invention--

10 1. A dynamo-electric machine having a ring-armature, in combination with a rotating or revolving steam-engine which is surrounded by said armature, substantially in the manner and for the purpose specified.

15 2. A dynamo-electric machine whose armature contains a steam-engine, substantially in the manner and for the purpose specified.

20 3. A rotating or revolving steam-engine having a general cylindrical form, in combination with a dynamo-electric armature, which is rigidly attached to the periphery of said engine, substantially in the manner and for the purpose specified.

25 4. A steam-engine and a dynamo electric machine, combined in such a manner that the armature-shaft of the dynamo is utilized as a steam and exhaust pipe for the engine, substantially in the manner and for the purpose specified.

5. A dynamo-electric machine having a steam-engine located between the poles of the field-magnet, substantially in the manner and for the purpose specified. 30

6. A steam-dynamo in which the steam-engine is mounted upon a hollow shaft, and in which the armature is mounted upon the engine, substantially in the manner and for the purpose specified. 35

7. Upon the armature-shaft of a dynamo-electric machine, a steam-engine which is insulated from its boiler, substantially in the manner and for the purpose specified. 40

8. A steam-dynamo, a steam-boiler, and a connecting steam-pipe, in combination with steam-tight insulation which is inserted between two otherwise contiguous parts of said pipe, substantially in the manner and for the purpose specified. 45

In testimony whereof I have hereunto set my name in the presence of two witnesses.

RICHARD H. MATHER.

Witnesses:

W. M. BYORKMAN,

WILLARD EDDY.