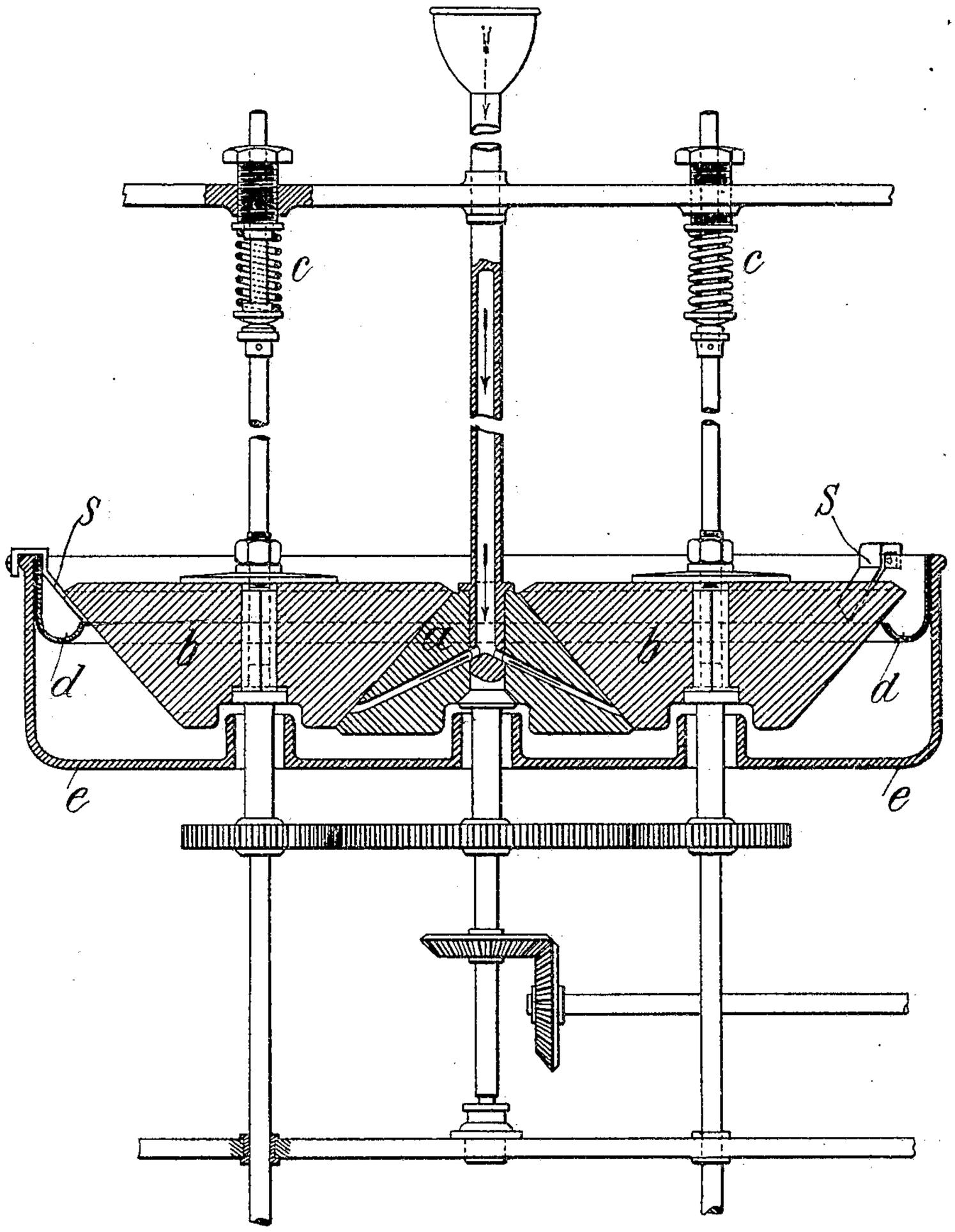
No. 788,113. PATENTED APR. 25, 1905.

H. E. MENIER.

GRINDING MACHINE.

APPLICATION FILED MAY 20, 1904.



WITNESSES

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No. 788,113. Patented April 25, 1905.

UNITED STATES PATENT OFFICE.

HENRI EMILE MENIER, OF PARIS, FRANCE.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 788,113, dated April 25, 1905.

Application filed May 20, 1904. Serial No. 208,907.

To all whom it may concern:

Be it known that I, HENRI EMILE MENIER, manufacturer, a citizen of the Republic of France, residing at No. 56 Rue de Chateaudun, Paris, in the Republic of France, have invented certain new and useful Improvements in and Relating to Grinding-Machines, of which the following is a specification.

This invention has for its object a grinder with adjacent oppositely-arranged coniform stones and adapted for effecting an intense grinding of fluid, semifluid, or pasty materials.

A constructional form of this grinder is diagrammatically represented in the accompanying drawing by way of example.

The grinder consists, broadly, of a central millstone or grindstone *a*, presenting the form of a truncated cone and surrounded by one or more other stones, *b*, of the same form, but occupying an inverted position relatively to the stone which they surround. The shaft of the stone *a* is fixed in the longitudinal direction, while the shafts of the stones *b*, free to move in this direction, are submitted to the action of counter-springs *c* or of counterweights, which cause the outer stones to constantly bear against the central stone. The pressure exerted upon the stones *b* is adapted to the nature of the material to be ground and to the degree of fineness desired. The stone *a* rotates about its axis, as do the stones *b*, the only difference being that the circumferential velocity of the latter is greater than that of the central stone at all its points. The central stone and the outer stones are driven by means of any convenient transmission-gear—for example, by means of a train of gear-wheels, as represented in the drawing.

The material to be ground (whether fluid, semifluid, or pasty) is conducted to the surface of the central stone *a* upon its greatest diameter. The supply may be effected through the interior of the stone, as shown in the drawing, or in any other convenient manner. In any event the material is instantly forced between the central stone *a* and the outer stones *b*, which by virtue of their greater circumferential velocity carry it along and cause it to travel upon their surface until it has reached the top of the central stone *a* and likewise the base of the inverted coniform stones *b*. This progression of the material is obtained by the helicoidal travel of its particles upon the surface of the stones *b*, the pitch of this helicoidal travel being a function of the circumferential velocity imparted to the stones and of the inclination of their generatrixes. These two conditions—velocity and inclination—are adapted to the nature of the material to be treated and to the degree of fineness which it is desired to obtain. The particles of the material under treatment therefore pass a great number of times between the stones *b* and *a* and none of them can escape the grinding action. The material which has been treated in this manner is detached by means of suitable scrapers S when it reaches the largest diameter of the outer stones *b*, and it then falls into a channel *d* of suitable form, which is fixed to the trough *e*, in which the stones work. From this channel the material flows through a collecting-aperture.

It will of course be understood that the shafts of the stones *a* and *b*, presenting the form of truncated cones, may be vertical, horizontal, or inclined and that they may either be parallel one with the other or converge toward a common point. The constructional details may vary infinitely. Finally, the material of which the stones are composed is adapted to the nature of the substance to be treated. Following the same principle, the central stone may be the one which receives the greatest circumferential velocity and upon which the material submitted to treatment travels. In this case, as in the preceding case, it is obvious that the combinations of cones one with the other may vary infinitely, according to the nature of the material to be treated. In this case also the cones may be inverted.

I claim as my invention—

1. A grinding-machine, comprising a central conical stone, means for rotating it, inverted conical stones with their surfaces adjacent to said central stone, and means to cause them at all times to bear upon the surface of said central stone, means for rotating said inverted cones, the central and inverted stones having different circumferential velocities,

and means for feeding the material to be ground to the surface of the central stone at its greater diameter.

2. A grinding-machine, comprising a central conical stone with its smallest diameter uppermost, interior feed-channels in said stone adapted for feeding material to its surface at a point near its largest diameter, and gearing for rotating the stone, in combination with inverted conical stones of greater diameter, having their surfaces adjacent to and bearing upon the surface of said central stone and gearing for rotating them at a greater speed than said central stone.

3. A grinding-machine, comprising a central conical stone with its smallest diameter uppermost, means for feeding material to its surface at a point near its largest diameter and gearing for rotating the stone, in combination with inverted conical stones of greater diameter, having their surfaces adjacent to and bearing upon the surface of said central stone and gearing for rotating them at a greater speed than said central stone, a trough in which all said stones rotate, a channel at the upper part thereof and scrapers adjacent to said channel and adapted to bear upon the inverted stones near their surfaces of greatest diameter.

4. A grinding-machine, comprising a trough, a central vertical shaft therein, a conical stone on said shaft with its greatest diameter lowermost, and having feed-openings from its center to the outside surface of greater diameter, adjacent inverted conical stones, and means for driving said inverted stones at a greater circumferential speed than said center stone, a channel surrounding said stones and having its inner edge beneath the upper edge of said inverted stones, and a scraper adapted to bear on said stone adjacent to its upper edge.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRI EMILE MENIER.

Witnesses:
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