

No. 861,387.

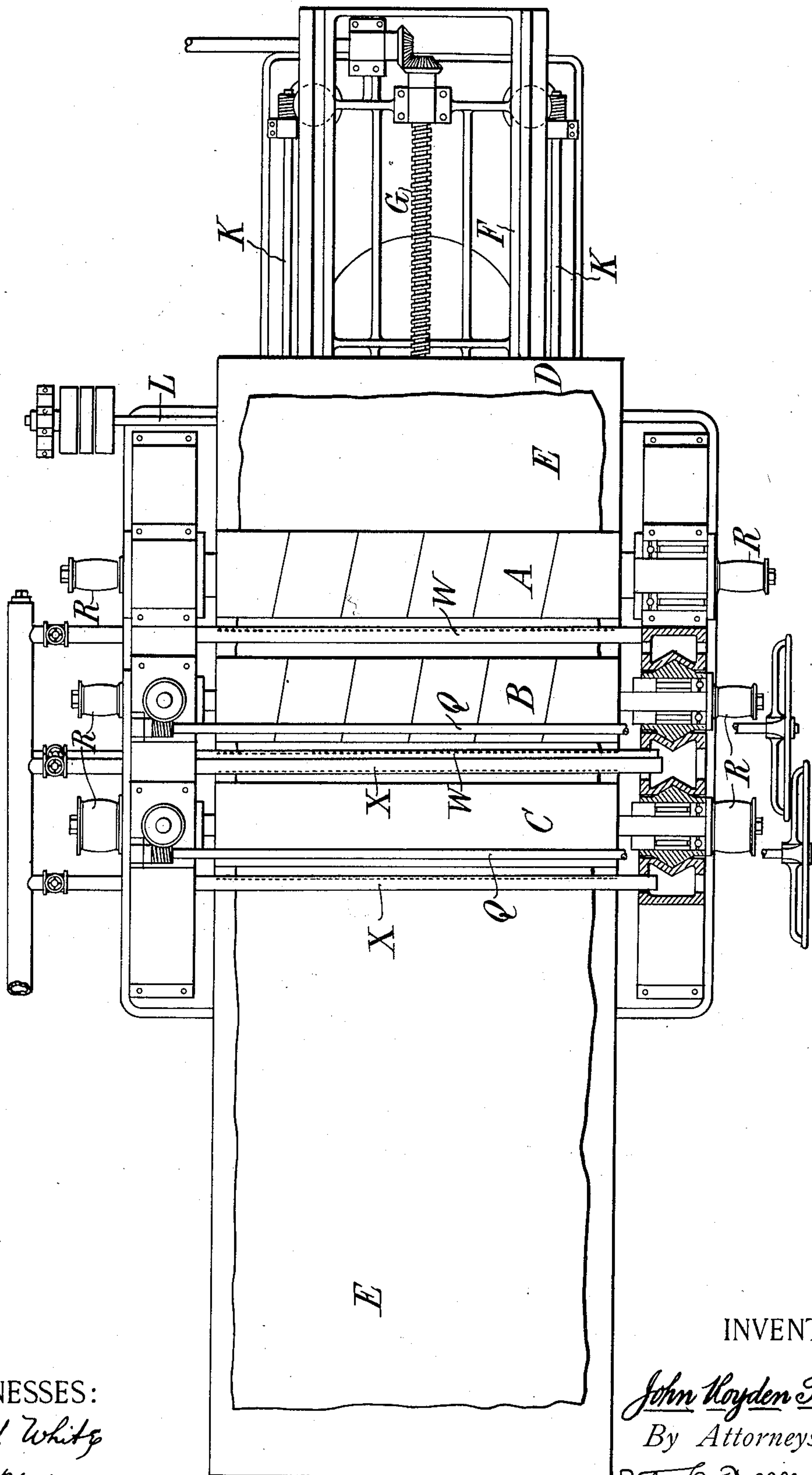
PATENTED JULY 30, 1907.

J. R. PEIRCE.
RUBBING AND FINISHING MACHINE.

APPLICATION FILED JAN. 9, 1906.

3 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:
Fred White
René Bruine

INVENTOR:

John Royden Peirce,
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Arthur C. Draper & Maine

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3 SHEETS—SHEET 2.

FIG. 2.

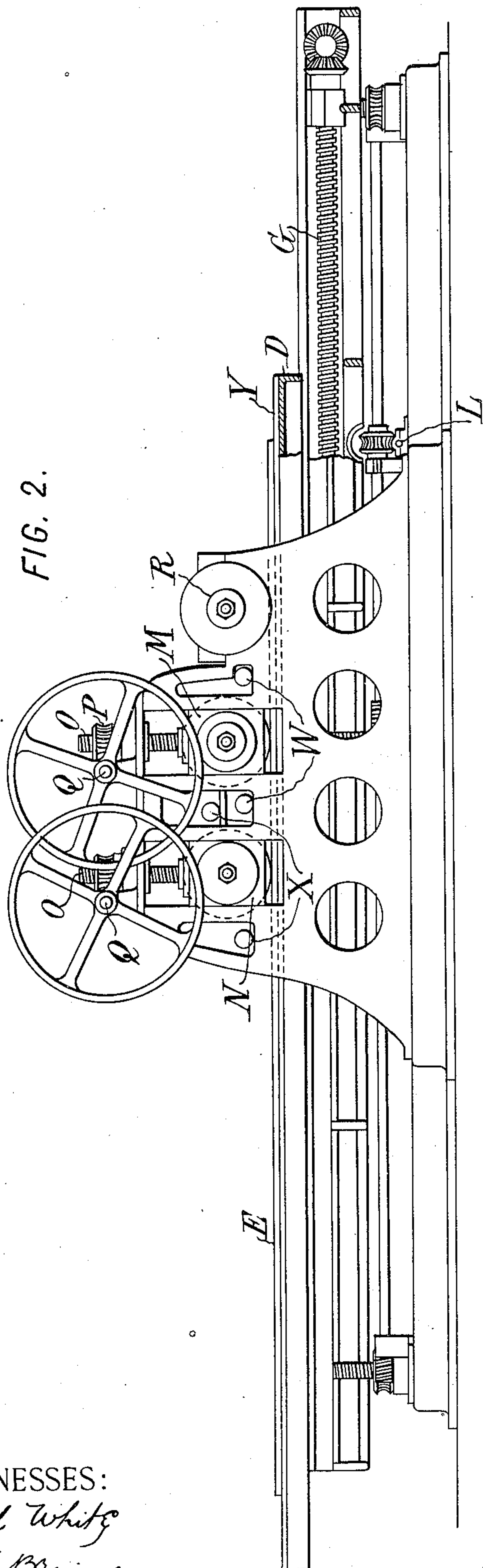
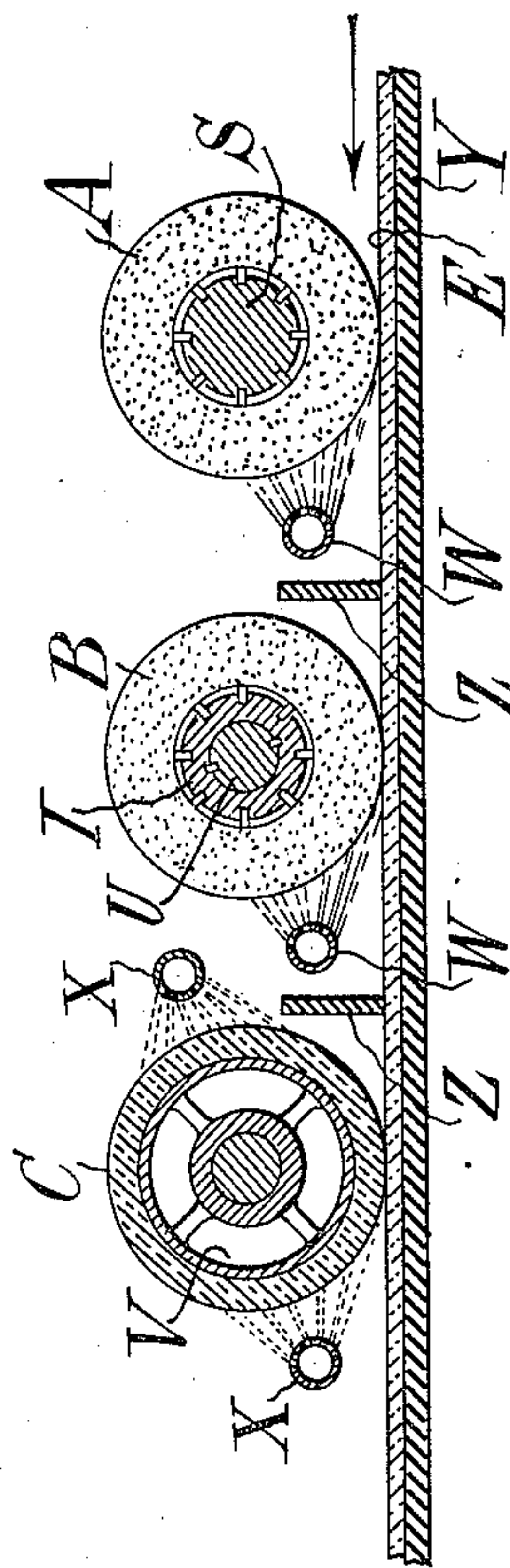


FIG. 4.



WITNESSES:

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INVENTOR:

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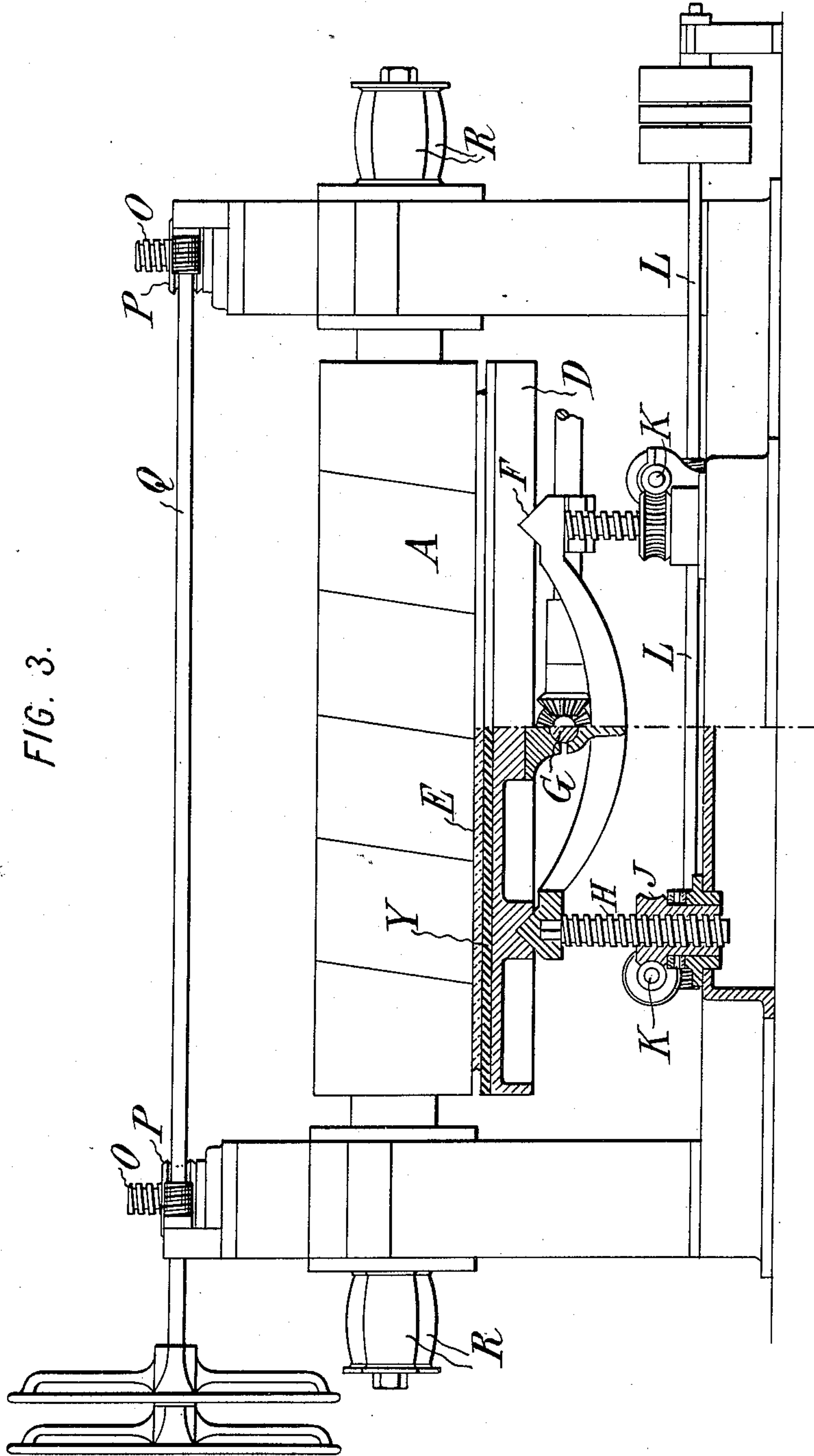
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3 SHEETS—SHEET 3.



INVENTOR:

John Royden Peirce,

By Attorneys,

Arthur C. Orason & Usina

WITNESSES:

Fred White
Rene Brune

UNITED STATES PATENT OFFICE.

JOHN ROYDEN PEIRCE, OF NEW YORK, N. Y., ASSIGNOR TO THE ROYDEN MARBLE MACHINERY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

RUBBING AND FINISHING MACHINE.

No. 861,387.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed January 9, 1906. Serial No. 295,267.

To all whom it may concern:

Be it known that I, JOHN ROYDEN PEIRCE, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Rubbing and Finishing Machines, of which the following is a specification.

This invention aims to provide an improved machine in which the face of marble or similar stone may be reduced from a rough sawed surface to a finished polished surface, all the operations necessary for this purpose being performed in one machine, and in immediate succession or substantially simultaneously upon each slab as it passes through the machine.

I have discovered that the comparatively slow action of the rubbing bed generally used for smoothing marble can be replaced by that of a roll of carborundum or the like, and have described and claimed broadly an apparatus for utilizing such a roll in a prior application (No. 262,075 filed May 24, 1905), and in a prior patent No. 798,587, August 29, 1905. In the preferred embodiment of the present invention, such a roll is used in connection with an adjacent roll of alundum (an artificial oxid of aluminium of great hardness but not so sharp as carborundum); and a third adjacent roll covered with felt for carrying powder or other polishing material. The first roll performs an action substantially equivalent to ordinary rubbing, and the second roll an action substantially equivalent to the smoothing operations which are usually necessary to prepare a rubbed surface for polishing. The smoothing roll and the felt polishing roll constitute together what I term finishing means. The combination of the rubbing and the smoothing roll, especially of the particular materials referred to, makes it possible to work at a higher rate of speed, since the rubbing roll may be quite coarse and rapid in its action, serving to cut away only the large irregularities at the surface, while the second roll has in part a cutting action to remove the small irregularities, and a true rubbing action to rub the entire face down to the necessary smoothness. The rolls may be arranged to act either upon the upper or the lower face of the slab.

Other advantages are referred to in detail hereinafter.

The accompanying drawings illustrate an embodiment of the invention.

Figure 1 is a plan partly in section; Fig. 2 is a side elevation partly in section; Fig. 3 is an end elevation partly in section; Fig. 4 is a longitudinal sectional view through the three rolls.

Referring to the embodiment of the invention illustrated, A, B and C are respectively a rubbing roll or cylinder of coarse carborundum, a smoothing or honing roll of alundum or fine carborundum, and a polishing roll, felt covered.

D is the bed upon which the stone E is laid and if necessary clamped with any of the well known styles of clamp. The bed is reciprocated upon its support F by means of a threaded shaft G, as usual in machines of this type. The face of the stone is thus carried into contact in succession with the rubbing, smoothing and polishing cylinders, and emerges from the last with its face in finished condition.

The rolls described have to be quite large and heavy in order to take slabs of commercial sizes. When the machine is adjusted so that the rubbing roll A shall bear uniformly upon the marble, it will be found difficult to adjust the smoothing cylinder B to an equally good bearing on the marble. Therefore I propose to make the latter slightly flexible by using an elastic binding medium, such as rubber or rubber compositions, for the hard particles of alundum. The roll being of more or less elastic material, and being very heavy, will then come to a substantially even bearing at all points across the width of the slab. Where the slab is supported upon the bed below and the roll bears down upon the top of it, this elasticity is of the greatest importance to prevent breakages of the roll and to insure an even effect over the full width. This roll while of material as hard as the rubbing roll, yet is not capable of cutting into marble so readily, and would break so often in an effort to keep up with the rate of the rubbing roll as to be practically worthless if it were not for its elasticity.

The bed D is vertically adjustable by means of a number of screws H passing through nuts J operated by worm gears from longitudinal shafts K at opposite sides of the machine, these shafts in turn being operated by a worm from a cross shaft L (Figs. 1 and 3). This adjustment of the bed may be used to make up for variations in the thickness of the slab, and also for variations in the diameter of the rubbing roll. The latter may however run in fixed bearings of the simplest construction. The other two rolls, however, should be adjustable each independently, and for this purpose their shafts are carried in bearings M and N respectively, which are adjustable by means of the vertically threaded shafts O which pass through nuts P, the corresponding nuts P at opposite ends of a roll being rotated by worm gearing from a single shaft Q carrying a hand wheel at one side of the machine. Each roll is provided with a belt pulley R at each end, so as to avoid twisting or lateral strains from the shaft, as it is of the greatest importance to avoid even minute deflections of the rolls from their proper positions. The rubbing roll A is maintained true by means of a dresser of any suitable type, such for example as that shown in my application for patent above referred to. The smoothing roll B may be similarly dressed, or it may be dressed by hand by means of a carborundum block.

Referring to Fig. 4, the rubbing roll of say 100-mesh carborundum, with a vitrified bond, is keyed directly upon its shaft S. The smoothing roll B of say 200-mesh alundum, with a resilient bond, is mounted upon a tube T which is removably carried upon the shaft U to facilitate removal and replacement. The polishing roll C is of felt upon an internally hollow cast iron drum V. For avoiding the burning of the marble and facilitating the action of the rolls A and B, water pipes W are provided arranged to throw copious streams of water upon the rolls immediately in the rear of the point where they make contact with the marble, so that the water is carried along therewith and acts with its maximum efficiency. Similar water pipes X are provided adjacent to the polishing roll, but these throw only fine jets sufficient to prevent the felt from being burned by the heat of friction, the best polishing effect being obtained with the felt as dry as possible.

The slab E is preferably laid upon a layer Y of rubber or plaster, to provide an even bearing of the bottom face of the marble, without which there would be considerable breakage. A good yielding bearing may be secured by inverting the entire apparatus, so that the slab should run over the tops of the roll instead of under them in the manner shown for rubbing rolls in my patent No. 798,587 dated August 29, 1905.

I propose to provide rubber mops or scrapers Z between each two successive rolls. These mops scrape off the water and grit accumulated from the action of the previous roll, and by cleaning the face of the marble, make the action of the next roll more perfect, removing any of the large particles of grit which might be brought from the previous roll and scratch the surface more deeply than is intended with the succeeding roll.

Though I have described with great particularity of detail a certain specific embodiment of my invention,

yet it is not to be understood therefrom that the invention is limited to the specific embodiment disclosed. Various modifications thereof in detail, and in the arrangement and combination of the parts, may be made by those skilled in the art, without departing from the invention.

What I claim is:—

A machine for rubbing and finishing marble including in combination a bed for carrying a slab of the marble, a roll A of carborundum of approximately 100-mesh with vitrified bond above said bed for rubbing such slab to reduce the rough sawed top face to a condition suitable for finishing, a fixed bearing for said roll, a smoothing roll B of alundum of approximately 200-mesh with resilient bond arranged to smooth the slab after it comes from the carborundum roll, adjustable bearings M for said smoothing roll, a polishing roll C of felt arranged to act on the top face of such slab after it comes from the smoothing roll, adjustable bearings N for said polishing roll, said bed being adjustable toward said rubbing roll, said rolls being arranged to act on the marble and reduce it to a completely polished condition upon the same passage of the marble through the machine, water pipes W arranged to introduce copious streams of water to said rolls A and B immediately in the rear of their lines of contact with the face of the marble, water pipes S arranged to introduce fine sprays upon the felt only sufficient to prevent it from burning while leaving it as dry as possible, mops Z between each two of the successive rolls to remove the water and grit left from the preceding operation, and belt pulleys R one at each end of each of said rolls so as to avoid even minute deflections of the rolls from their proper positions, and so as to rotate them independently and at different rates of speed to permit each of them to perform its work completely for a given rate of feed of the marble slab.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN ROYDEN PEIRCE.

Witnesses:

EUGENE V. MYERS,
FRED WHITE.