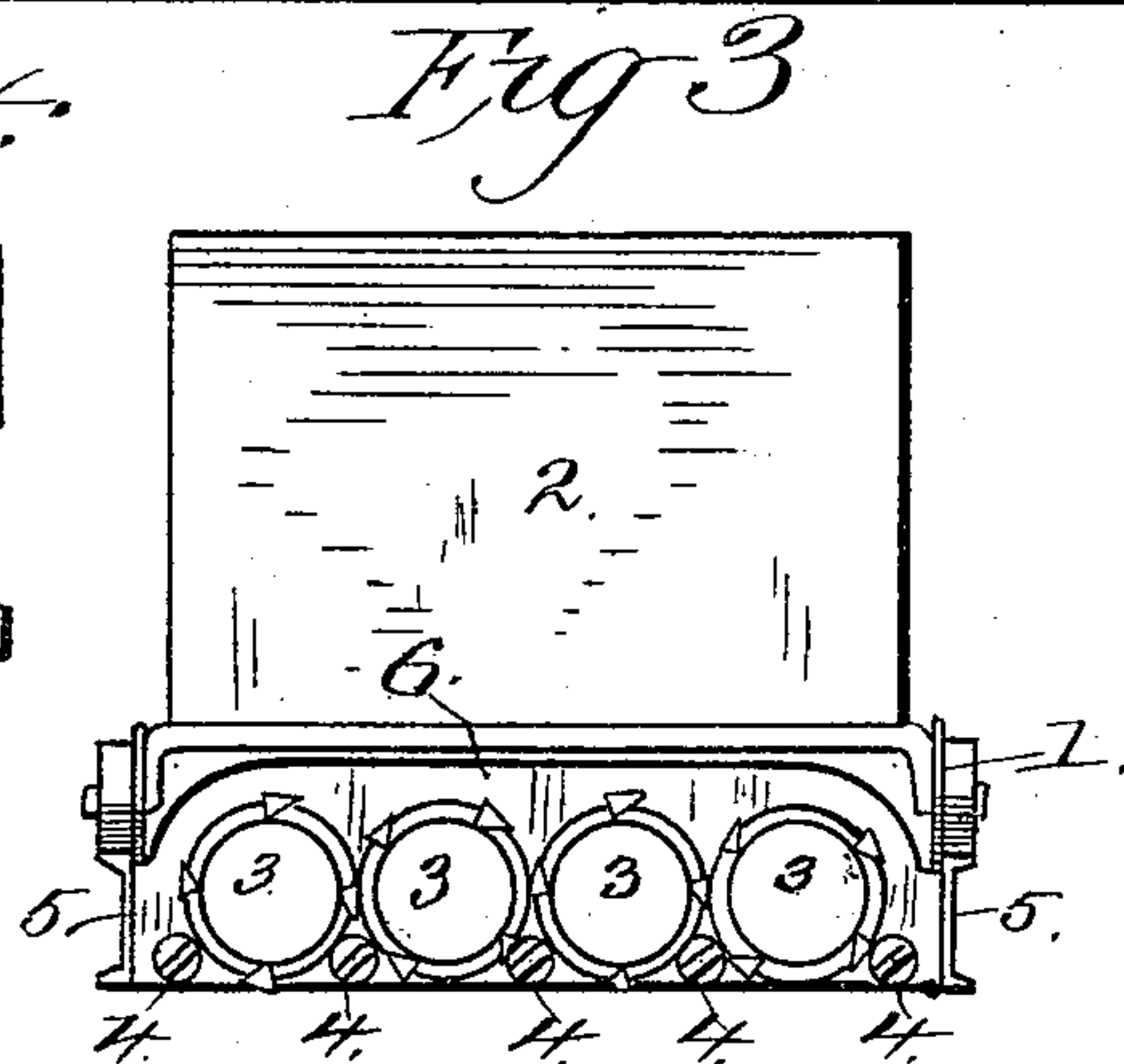
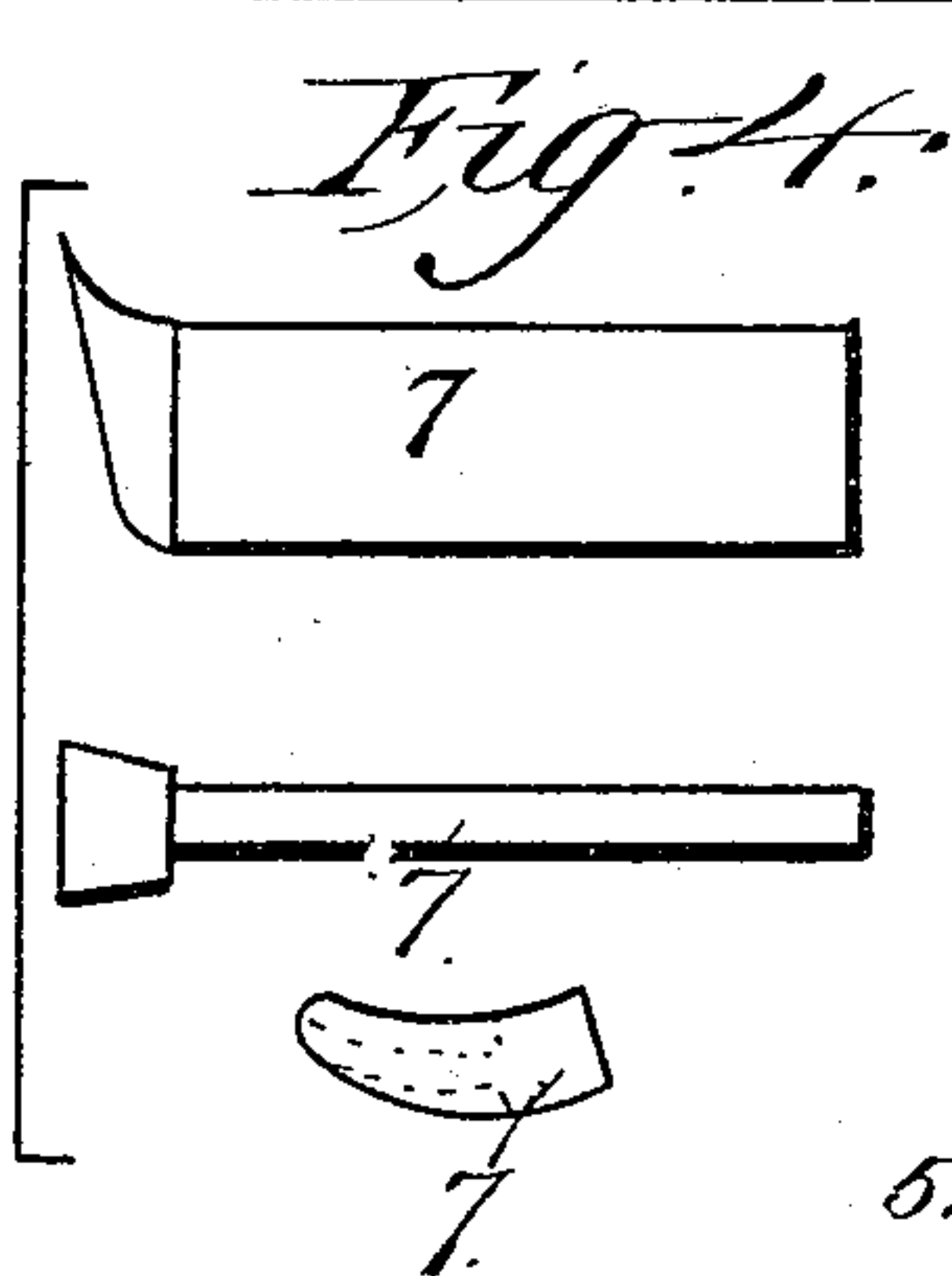
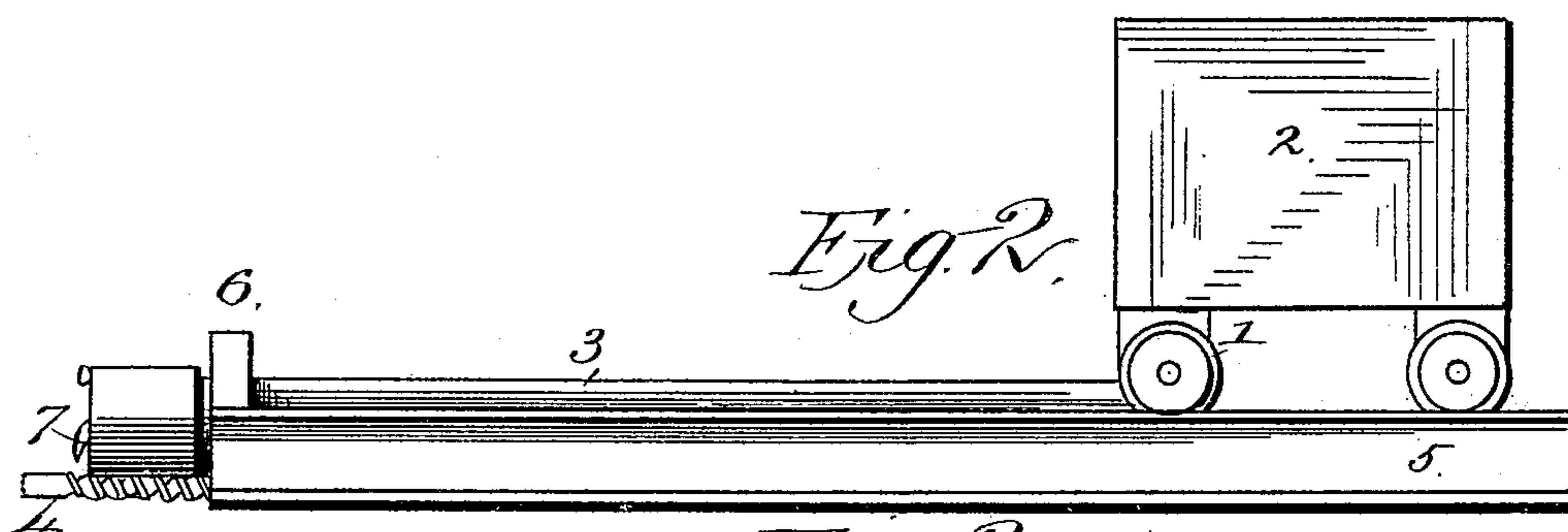
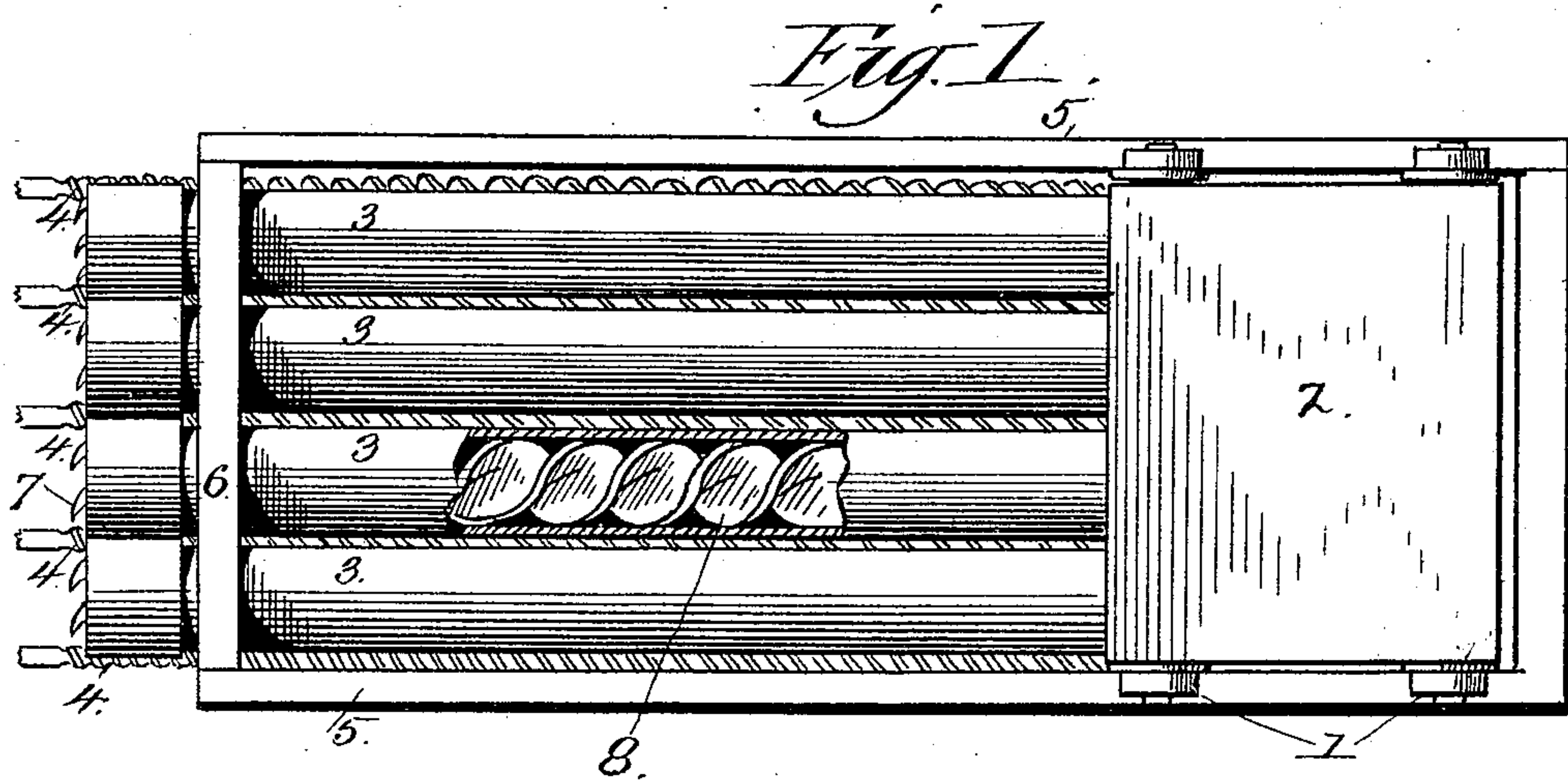


(No Model.)

G. F. MYERS.
MINING MACHINE.

No. 481,187.

Patented Aug. 23, 1892.



WITNESSES:
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UNITED STATES PATENT OFFICE.

GEORGE FRANCIS MYERS, OF PITTSBURG, PENNSYLVANIA.

MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 481,187, dated August 23, 1892.

Application filed October 5, 1891. Serial No. 407,741. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FRANCIS MYERS, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Mining-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in machines for undercutting coal and similar substances; and it has for its object to enable the miner at a small expenditure of motive power and in a comparatively short time to cut a deep seam into the face of the coal wall at the base thereof, said seam or cut being of sufficient height to enable the "breaking-down" operation to be thereafter effected with facility.

In my improved machine the main part of the cutting operation is performed by means of a plurality of rotatory cutters arranged side by side and adjacent to each other. Were these cutters alone employed the result would be that the seam cut in the face of the coal would consist of a series of adjoining cylindrical recesses or openings with intermediate ridges above and below. The bottom ridges are especially objectionable because they render the floor of the mine ragged and uneven, and both upper and lower ridges are objectionable because they interfere with the dropping of the coal mass during the breaking-down operation.

The characteristic feature of my present invention is that I practically and substantially obviate the production of said ridges by progressively reducing the portion of the coal that would otherwise constitute them by combining with the series of primary rotatory cutters referred to auxiliary rotatory cutters simultaneously operating upon the coal ridges and located within what may be called the "angle-spaces" between the adjacent primary cutters—that is, the approximately triangular spaces existing between the primary cutters at top and bottom and the horizontal planes at top and bottom tangent to the paths of rotation of said primary cutters.

In carrying out my invention I prefer to employ as the primary cutters a plurality (two or more) of hollow tubes or pipes ranged side by side and provided at their forward edges with removable or renewable cutting projections, and to employ for the auxiliary or ridge-reducing cutters a series of twist-drills located above and beneath the central line or horizontal plane of the hollow tubes or pipes and in the angle-spaces between them. I also prefer to provide the hollow tubes or pipes with internal conveyers for removing and discharging at the rear of the machine the cores as they are broken down or crumbled within said tubes or pipes, and I provide the drills with an external spiral, so as to progressively remove and discharge in like manner the broken-down ridge portions.

In the accompanying drawings I have illustrated my invention as applied to a machine wherein the ridge portions along the bottom of the cut only are reduced. It will of course be understood, however, that the machine shown is simply one of the embodiments of the invention, and that the invention is not restricted to that particular form or modification, but includes, broadly, the generic feature of employing the auxiliary rotatory cutters to remove the ridge-pieces between the primary rotatory cutters either above or below the said primary cutters or both above and below the same.

In the drawings, Figure 1 represents in plan, partly broken away, one form of machine constructed in accordance with my invention. Fig. 2 represents a side elevation thereof. Fig. 3 represents an end elevation thereof, and Fig. 4 represents in detail my preferred form of removable and renewable cutter-points for the rotating tubes or pipes.

Similar numerals of reference indicate similar parts throughout the several views.

Referring to the drawings, 1 indicates a truck or carriage for supporting the machine motor and gearing, which may be of any usual construction and which forms no part of the present invention. The motor and gearing are inclosed within a casing 2, carried upon the truck and serve to revolve in advance simultaneously the primary rotatory tubes or pipes 3 and twist-drills 4, and to retract or withdraw

said pipes and drills at the end of the cutting operation.

The truck or carriage 1 is mounted upon track-rails formed by the channel-bars 5, which channel-bars are connected together so as to form a strong framework by means of cross-pieces, as 6, of any suitable number, said cross-pieces serving as guides for the pipes and drills. The forward edges of the pipes or tubes 3 are adapted to receive the cutting-points 7, which are removable or renewable at will and of which any number may be employed, suitable to the particular character of the work in hand.

Within each of the hollow tubes or pipes 3 is arranged an internal conveyer-screw 8, whose function is to remove the core as it is crumbled down or broken on its way into the tube or pipe and to convey the said broken-down material to the rear of the machine.

The drills 4 may be any of the ordinary twist-drills employed for boring coal or their equivalents. They are preferably provided on their exterior surfaces with spiral flanges, serving as conveyers to remove the broken-away ridges and convey the broken material to the rear of the machine.

The operation of the invention will be well understood. The motor being started will advance the pipes 3 and drills 4 simultaneously into the face of the coal. During this forward movement the pipes or tubes 3 will cut out a series of cores from the coal, which cores, as they are broken up or crumbled within the pipes or tubes, are conveyed to the rear of the machine by the conveyers 8 and are discharged thereat. Simultaneously the drills cut away the ridge portions between the cores thus excavated, thereby practically reducing said ridge portions at every place whereat a drill is located. The resultant cut leaves the floor of the mine substantially level, the ridge portions being practically reduced. At the termination of the cutting operation the motor is reversed and the tubes and drills withdrawn, whereupon the coal or other sub-

stance thus undercut may be broken down in the usual manner.

A particular advantage in employing the auxiliary rotatory cutters or drills in the triangular spaces between the primary rotatory tubes is that the auxiliary rotatory cutters or drills work through the bases of the ridges, and when the basal portions of the ridges are thus removed the upper portions of said ridges are undermined and broken up thereby without the exercise of additional power, substantially the only work performed by the auxiliary rotatory cutters being that necessary to drive them through the bases of the ridges. It will also be noted that the outer surfaces of the primary rotatory tubes co-operate with the external conveying spirals on the auxiliary drills to insure the prompt removal of the broken-down ridges.

Having thus described my invention, what I claim is—

1. A mining-machine comprising a plurality of hollow rotatory cutters arranged adjacent to each other and auxiliary rotatory drills located in the angles between said hollow cutters, substantially as described.

2. A mining-machine comprising a plurality of hollow rotatory cutters arranged adjacent to each other and auxiliary rotatory drills located in the angles between said hollow cutters, the said auxiliary drills having external conveying-spirals, substantially as described.

3. A mining-machine comprising a plurality of hollow rotatory cutters arranged adjacent to each other and containing interior conveyers and auxiliary rotatory drills located in the angles between said hollow cutters, the said auxiliary drills having external conveying-spirals, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE FRANCIS MYERS.

Witnesses:

H. WALTON MITCHELL,
EDWIN L. ALLEN.