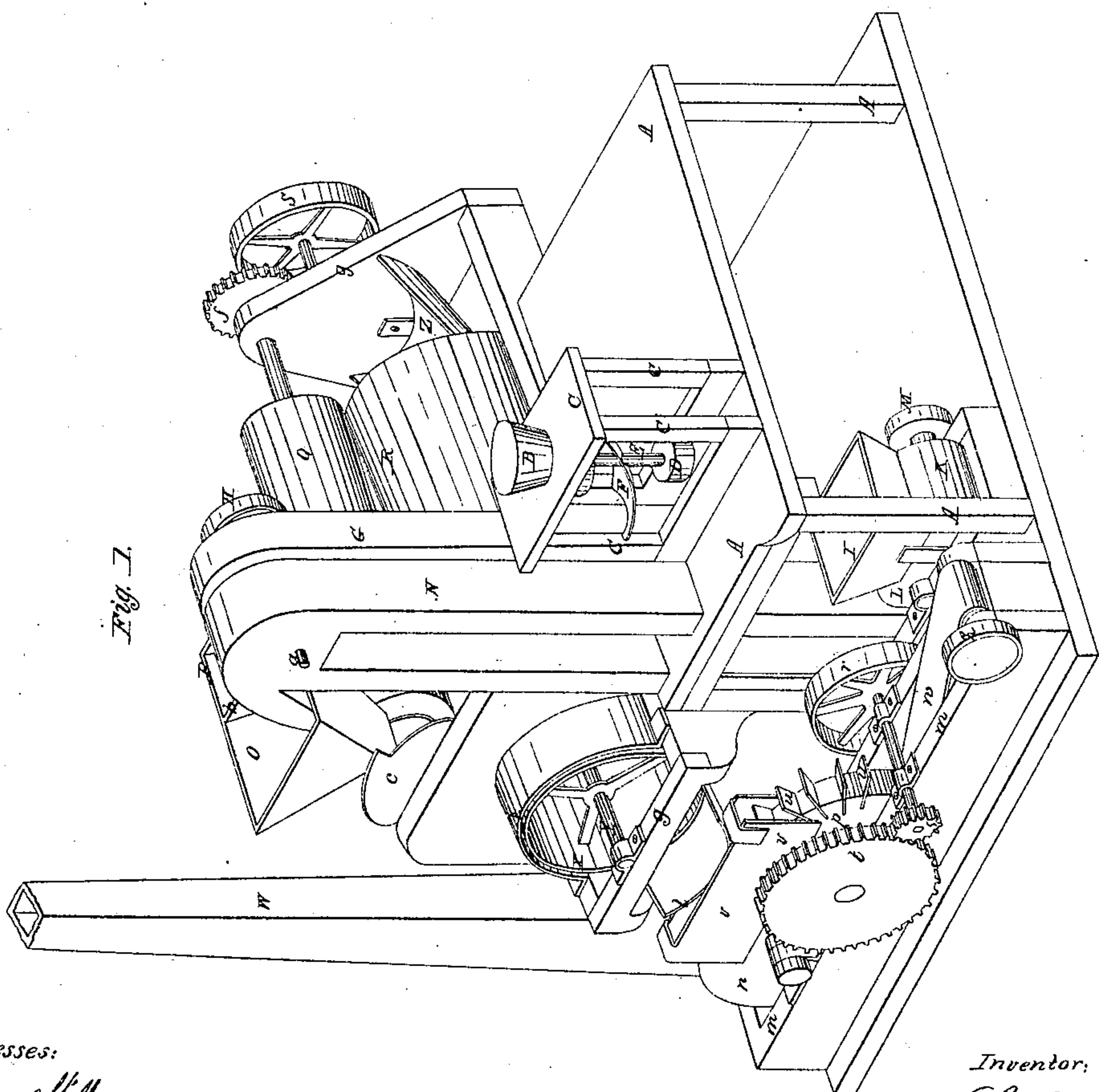
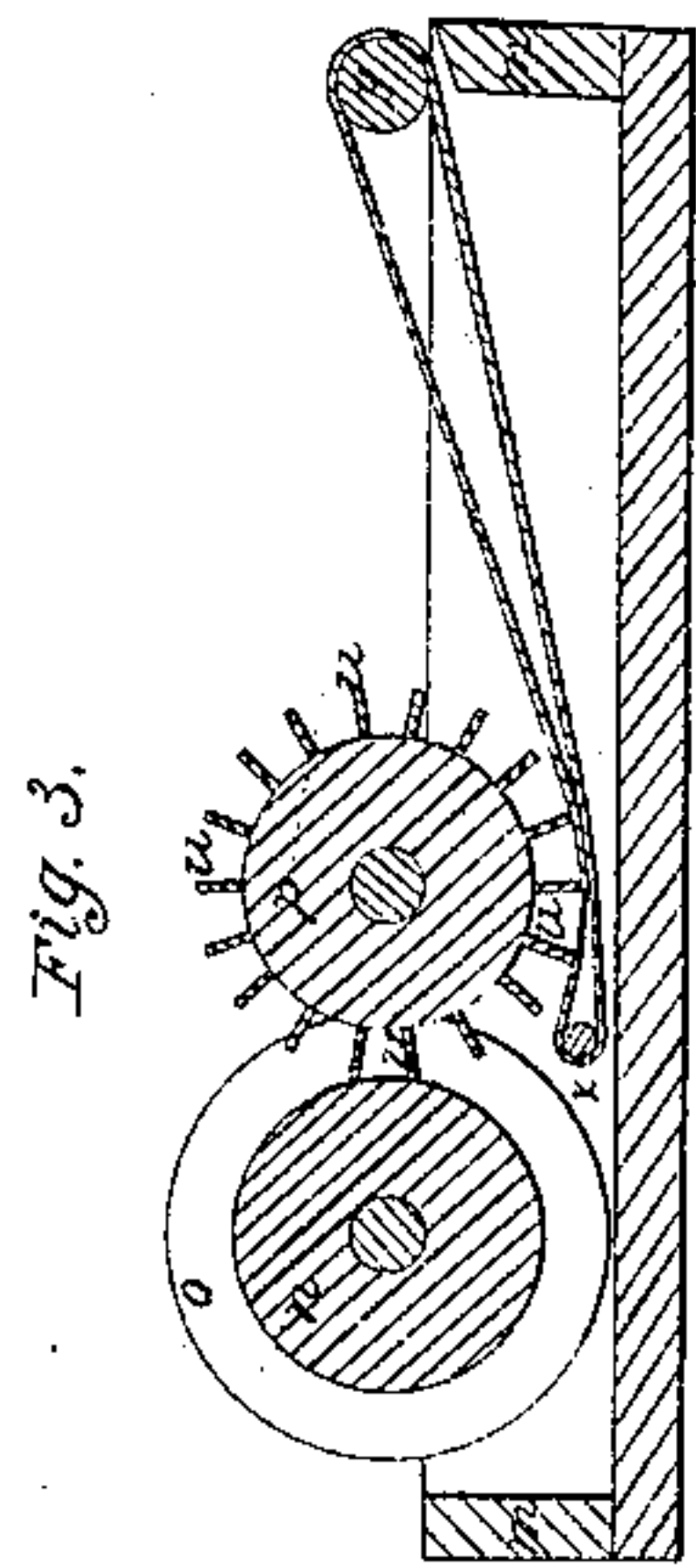
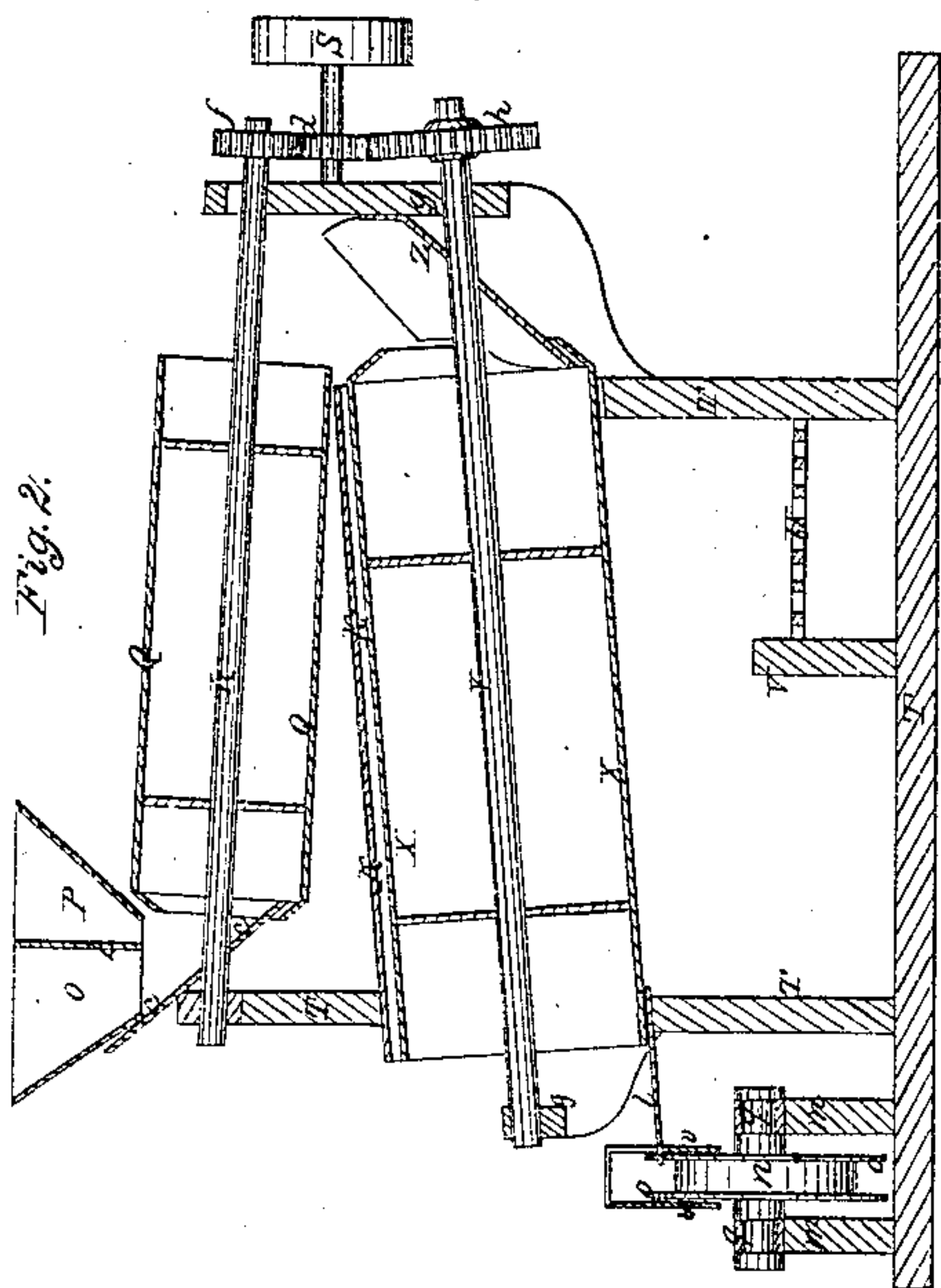


M. L. KEEN.
MACHINE FOR MAKING ARTIFICIAL FUEL.

No. 25,124.

Patented Aug. 16, 1859.



Witnesses:
Ephraim Miller
Henry Burgess

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UNITED STATES PATENT OFFICE.

MORRIS L. KEEN, OF ROYERSFORD, PENNSYLVANIA.

MACHINERY FOR MANUFACTURING ARTIFICIAL FUEL.

Specification of Letters Patent No. 25,124, dated August 16, 1859.

To all whom it may concern:

Be it known that I, MORRIS L. KEEN, of Royersford, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Machinery for the Manufacture of Artificial Fuel; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1, represents a perspective view of said machine. Fig. 2, represents a longitudinal section through the same. Fig. 3, represents a longitudinal section through the molding apparatus.

The nature of my invention relates to the manufacture of artificial fuel from fine waste or ground and prepared coal dust, and coal tar pitch, or other carbonaceous matter, whereby the entire operation of grinding or crushing when necessary, mixing, molding, and delivering the article is automatically performed by a system of machinery hereafter described.

It further relates to the manner of molding the fuel while in a plastic state in a trough or tank, which is filled with water to prevent it from adhering to the molding machine, and for the purpose of cooling the fuel, whereby the operation is greatly facilitated.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A, represents the frame of the machine.

B, represents a mill which is intended for grinding or reducing the coal tar pitch; it is mounted on the frame C, which is supported by the frame A. The mill B, is driven by means of the pulley D, on the shaft E, and the ground pitch drops onto an, inclined, hopper F, and thence down onto the elevator box G, whence it is carried by the elevator up into the hopper P.

I, represents a hopper which is to receive the coal to be crushed. The coal passes down onto the crushing rollers K, and L, that are driven by the pulley M, and by which it is reduced to coal dust. The coal dust is thence carried by the elevator in box N, into the hopper O. The elevators N, G, are both driven by the pulley H, on shaft a. The hoppers O, and P, are divided into two compartments by the partition b, in such a manner that the opening at the bottom is

common to both through which the material can pass.

Q, represents a cylinder which is properly secured to the shaft R. It has an inclined position as represented in Fig. 2, and is open at both its ends.

c, is an inclined shield, which is secured to the frame of the machine in such a manner that the material escaping from the hoppers O and P, may be properly guided into the cylinder Q, which latter receives its rotary motion from the driving pulley S, and by means of the pinions d, and f.

T, represents the brick work of a furnace.

U, is the fire grate; V, the fire bridge, and W, the chimney, by which the smoke escapes.

X, represents a cylinder which is secured to the shaft Y, and which is inclined in a direction opposite to that of the cylinder Q. The bearings of the shaft Y, are in the iron frame g, which is secured to the brick-work T, and the cylinder X, receives its rotary motion by means of the pulley S, and through the pinions d, h.

Z, represents an inclined hopper which is secured to the frame g, and which reaches into the upper end of the cylinder X, for the purpose of conducting the material into said cylinder, as it drops from the cylinder Q. The cylinder X, is surrounded on its upper side by a brick arch k, to prevent it from cooling, and to keep up sufficient draft toward the smoke stack W.

l, represents an inclined hopper which guides the material onto the molding apparatus, as it escapes from the cylinder X. The molding apparatus is mounted upon a trough or tank m, which is filled with water.

n, represents a wheel which is formed at its sides and circumference with two high flanges o, and the material as it drops off the cylinder X, is conducted on said wheel, and between the flanges o.

p, represents the molding wheel, which has its bearings at q, and which is operated by means of the pulley r, and through the pinions s, and t. The molding wheel is provided at its circumference, with radial arms u, the edges of which bear upon the circumference of the wheel n, and between the flanges o, o, and which thus mold the plastic material into bricks of suitable size for burning. The wheel n, receives its motion by the friction of the radial arms u, upon it.

v , represents a shield which is hung over the sides of the wheels n , and p , to prevent the material from falling over their edges prior to the operation of molding.

5 w , represents an endless apron which passes around the rollers x , and y , Fig. 3, and on which the formed bricks are deposited, and by which they are delivered from the machine. It is operated by means
10 of the pulley z . The points of the radial arms u , press tightly on the apron w , and the bricks or blocks drop easily from the molding wheel, by reason of the radial position of the shovels u , whereby the outer edge
15 of the cake is larger than the inner edge.

The operation of the entire apparatus is as follows:—The pitch being fed into the mill B, and the coal into the crusher K, in the requisite quantities, the different
20 pulleys of the machine are set in motion and the ground pitch and coal dust is carried up by the elevators G, and N, and the hoppers P, and O, whence they both drop onto the hopper c , and into
25 the revolving cylinder Q, whence the material by the motion of said inclined cylinder is properly and thoroughly mixed, carried downward, and discharged through the open end of said cylinder, onto the shield
30 Z, and thence into the cylinder X; the latter being heated by the fire on grate U. In this cylinder, the pitch is melted and thus forms a soft and plastic mass with the coal dust and is discharged at the lower end
35 thereof onto the inclined shield l , and thence passes onto the wheel n , between its flanges o . As the wheels n , and p , run within the water trough m , the material is prevented

from sticking or adhering while said wheels are cooled by the water, and as the shovels 40 u , of the wheel p , actuate the wheel n , they cut the material, which has accumulated thereon in blocks or bricks which are eventually dropped on the apron w , and conveyed by the same to any desirable place. The 45 bearings of the wheels n , and p , are lubricated with water to prevent them from becoming heated by the heat of the material, while the water also cools the apron w , and prevents the material from adhering 50 thereto.

Having thus fully described the nature of my invention, what I claim therein as new and desire to secure by Letters Patent is—

1. The combination and arrangement of 55 the mills, conveyers, mixing and heating cylinders, molding and conveying apparatus, substantially in the manner and for the purpose herein described.

2. I also claim the combined use of the 60 molding apparatus and of the tank or reservoir of water for the purpose of receiving and molding the heated and plastic material in said tank of water for cooling the machinery and fuel, and for preventing the 65 material from adhering to the machine, substantially as herein described.

3. I also claim the combination of the endless apron with the molding apparatus, operating in a tank, or reservoir of water, 70 substantially in the manner and for the purposes described.

MORRIS L. KEEN.

Witnesses:

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