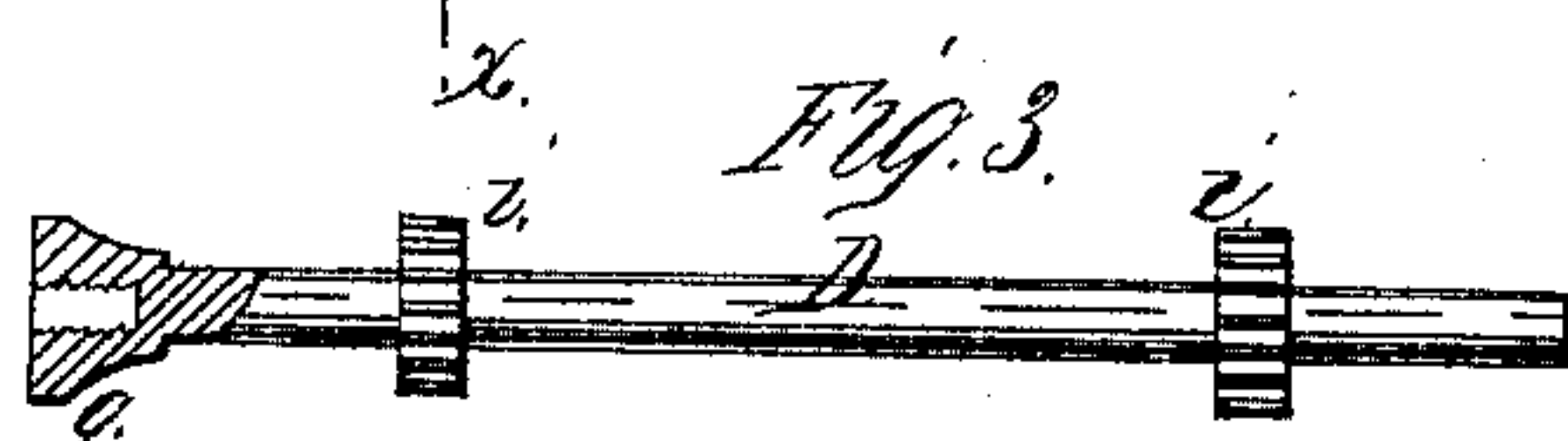
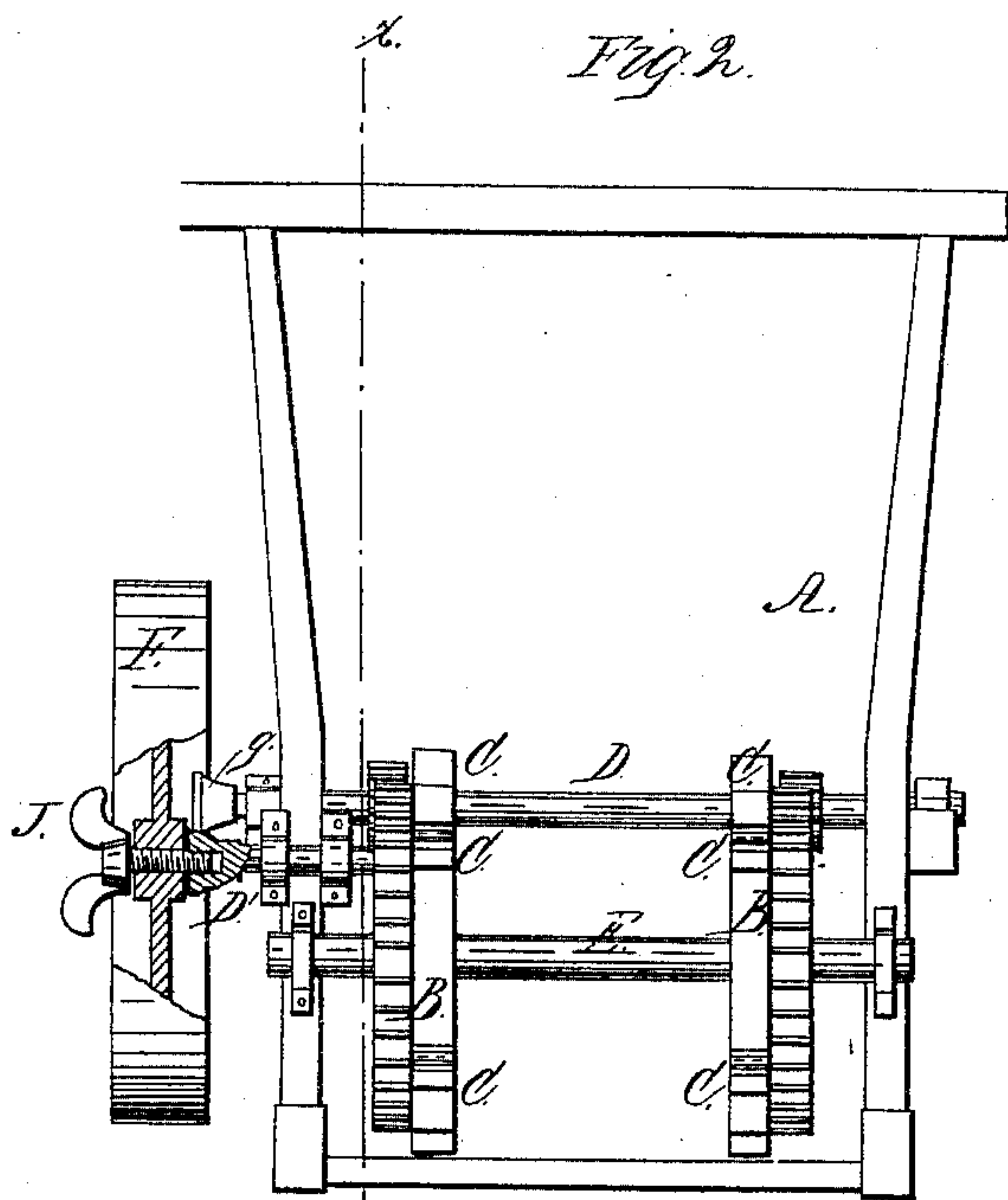
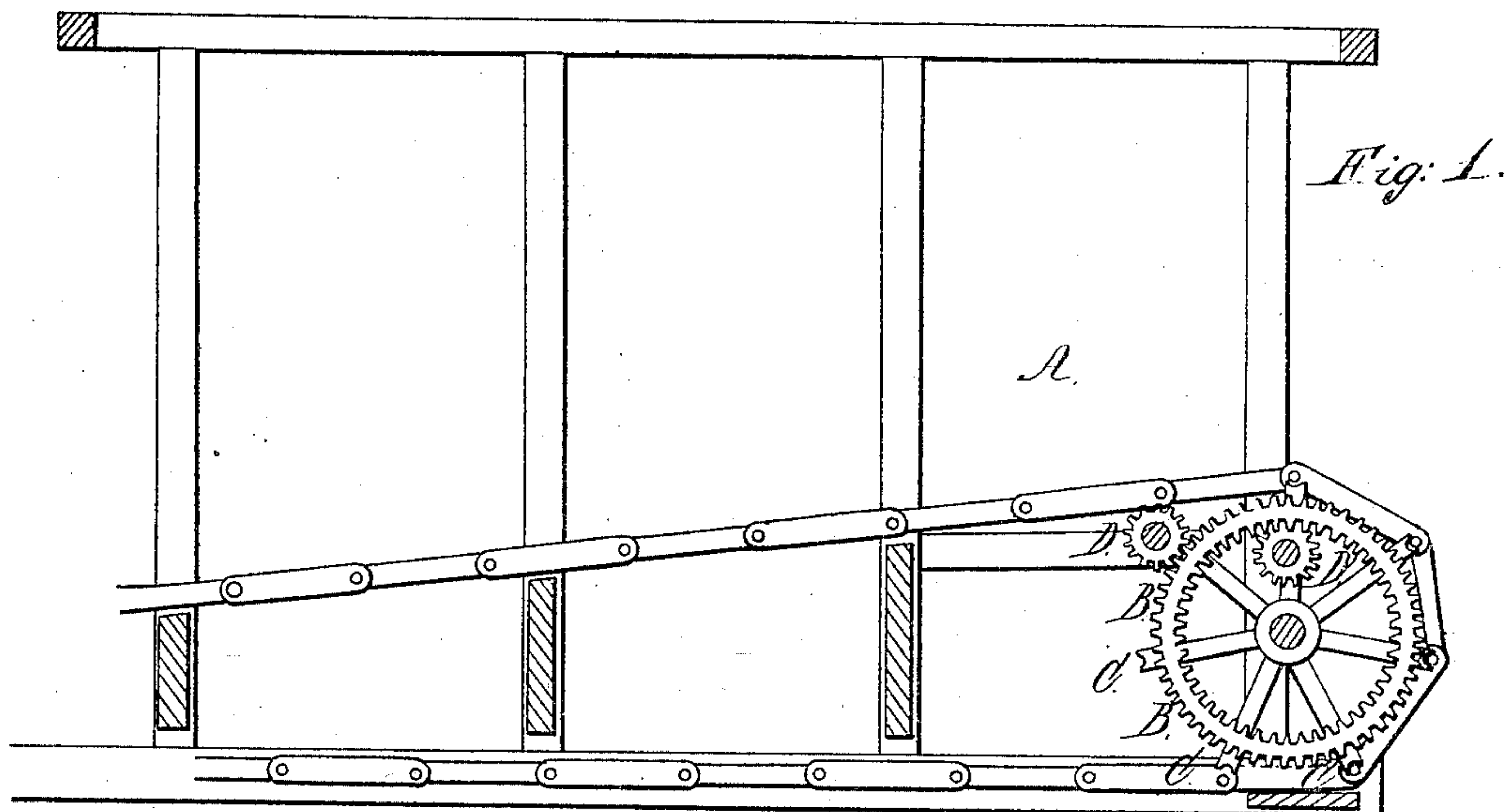


*H.L. & J.A. Buckwalter,*

*Horse Power.*

*N<sup>o</sup> 56,302.*

*Patented July 17, 1866.*



*Witnesses:*

*Wm. Green*

*Geo. Lusk*

*Inventor:*

*H.L. & J.A. Buckwalter*

*By Munn & Co*

*Attys*

# UNITED STATES PATENT OFFICE.

H. L. BUCKWALTER AND J. A. BUCKWALTER, OF KIMBERTON, PA.

## IMPROVEMENT IN HORSE-POWERS.

Specification forming part of Letters Patent No. 56,362, dated July 17, 1866.

*To all whom it may concern:*

Be it known that we, H. L. BUCKWALTER and J. A. BUCKWALTER, of Kimberton, in the county of Chester and State of Pennsylvania, have invented a new and useful Improvement in Horse-Powers; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of a vertical longitudinal section through the frame of the machine taken on the line *x* of Fig. 2. Fig. 2 is an end view. Figs. 3 and 4 are detailed views of the counter-shafts D and *h*.

The object of this invention is to simplify the construction of horse-powers, and increase their usefulness and lessen their cost, by combining in the same wheel the gear-wheel, by which motion is imparted to the belt-wheel, and the sprocket-pulley, which receives the chain; also, by providing two counter-shafts with pinions, one running on the inner circumference and the other on the outer circumference of the cog-wheels, to either of which the belt-wheel may be connected. When it is connected to the counter-shaft D its motion is in a direction contrary to the motion of the cog-wheels, and when it is connected to the counter-shaft *h* its motion is in the same direction with them. By this means the direction of motion of the belt-wheel is reversed and the speed is varied.

A designates the frame of the machine. B B are combined cog and sprocket wheels, mounted on a shaft, E, that runs in bearings in the sides of the frame.

Instead of having the cog-wheels and sprocket wheels or pulleys separate, and driving the former by means of intermediate gearing, we have combined the sprocket and cog wheels in one wheel, formed and made in one casting, that part of the wheels which carries the sprockets C being on the inner side, and the other part being provided with cogs both on the inner and outer circumference of the rim. The spokes or arms of the wheels are set within that part of the rim which carries the sprockets, so as to give room for the

pinion *i* of the counter-shaft D to work. The counter-shaft D is set in front of the cog-wheels B, and low enough to clear the chain that engages the sprockets. It has two pinions, *i i*, which are engaged by the cog on the peripheries of the wheels B.

F is a belt-wheel, which is connected to the end *g* of the counter-shaft D by means of a screw, J. The counter-shaft D' is placed within one of the cog-wheels B, its pinion *i* engaging with the cogs formed on its inner circumference, as seen in Fig. 1. The outer end of this shaft D' projects as far as the end of the shaft D, and is formed, like that shaft, to fit the hub of the belt-wheel.

It will be observed from this construction that when it is desired to reverse the motion of the belt-wheel it is to be changed from one counter-shaft to the other, and also that, since the pinions of the counter-shaft D are engaged by the cogs formed on the peripheries of the wheels B, it will, when the belt-wheel is connected with it, drive the belt-wheel at a higher speed than when said belt-wheel is connected to the counter-shaft D', for the reason that the latter shaft is nearer the center of motion of the driving-wheels B—that is, to the shaft E. In this way an easy mode of reversing the motion of the belt-wheel is placed within the reach of the operator by merely changing it from one counter-shaft to another.

We claim as new and desire to secure by Letters Patent—

1. In the construction of horse-powers, the combination, in one wheel, of the sprockets which engage the shafts of the chain and the cogs which communicate motion to the counter-shaft, substantially as described.

2. In horse-powers, placing two counter-shafts in gear with the cog-wheels of the machine, one within and one without their rims, in combination with the belt-wheel, the same being so made and arranged that the belt-wheel may be changed from one to the other at the pleasure of the operator, substantially as described.

H. L. BUCKWALTER.  
J. A. BUCKWALTER.

Witnesses:

P. G. CAREY,  
E. PRICE.