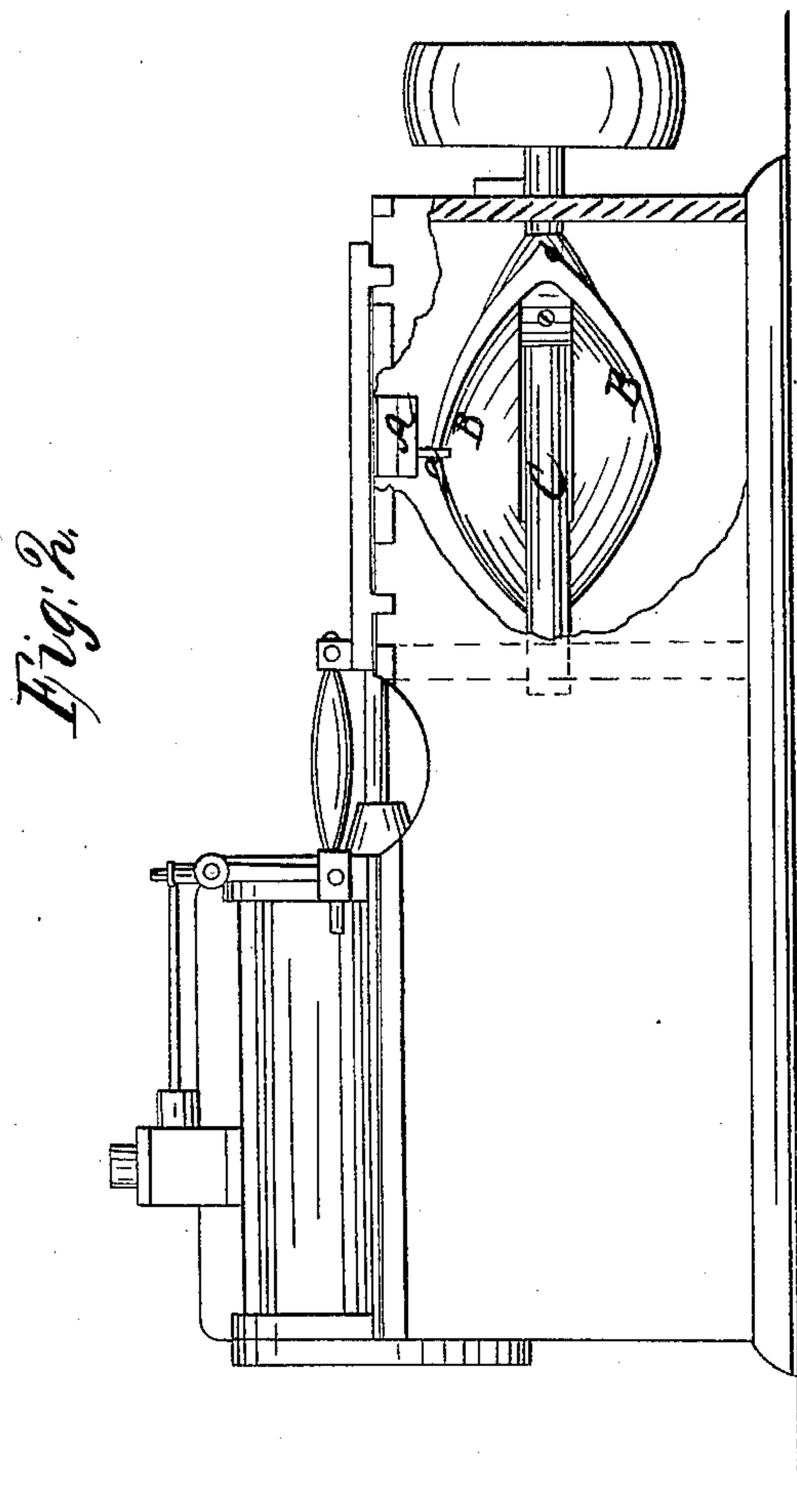
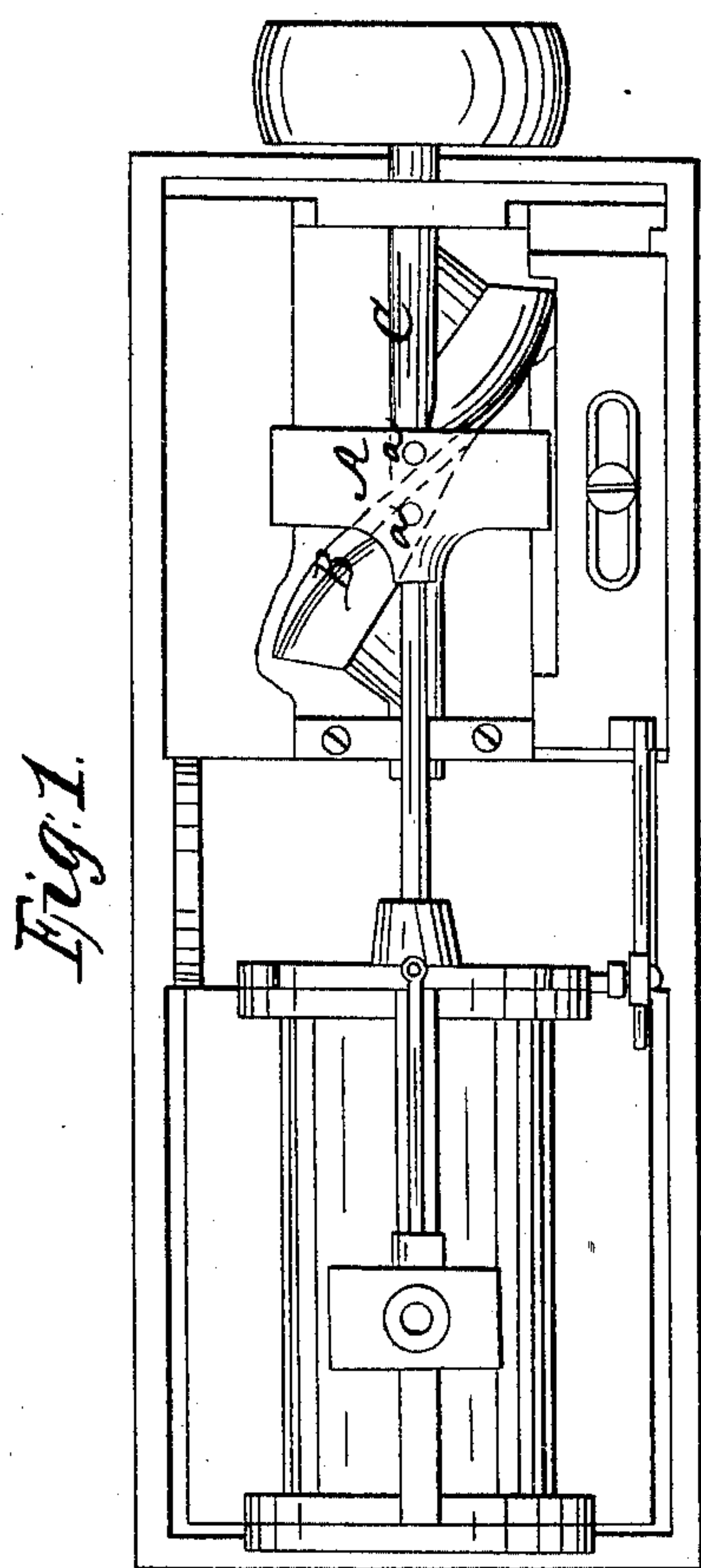


W. H. Hurlbut,
Converting Motion.
N^o 63254. *Patented Mar. 26, 1867.*



Witnesses,
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WILLIAM H. HURLBUT, OF ELGIN, ILLINOIS.

Letters Patent No. 63,254, dated March 26, 1867.

IMPROVEMENT IN CONVERTING MOTION.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM H. HURLBUT, of Elgin, Kane county, State of Illinois, have invented a new and useful Improvement in Converting Motion; and I 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 drawing, forming part of this specification, in which—

Figure 1 represents a plan or top view of this invention.

Figure 2 is a side sectional elevation of the same.

Similar letters of reference indicate like parts.

This invention consists in the employment or use of a spiral flanged cam, in combination with the cross-head of a steam engine, or other equivalent part of another motor, and with a shaft to which a revolving motion is to be imparted in such a manner that by the action of the cross-head or other equivalent part on the spiral flanged cam the reciprocating motion of the piston of a steam engine or the reciprocating motion of an equivalent part of another motion is converted into a continuous rotary motion of the shaft, said spiral flanged cam acting as a substitute for the crank.

A represents the cross-head of a steam engine, to which a reciprocating motion is imparted by the action of the steam on the steam piston. From the lower surface of this cross-head project two pins, *a*, which straddle one of the wings of the spiral flanged cam B. This cam is mounted on the main shaft C, and as the cross-head receives its motion a continuous revolving motion is imparted by its action to the shaft C. The spiral flanged cam is made by turning a block of wood or other material the length of stroke required and of the same diameter. On this block I strike parallel lines through the centre on both heads, and by connecting the ends of these lines on the circumference of the block I obtain two lines, which, when the diameter of said block is ten inches, will be ten inches apart and parallel to each other. I then open the dividers somewhat less than half the diameter of the block and describe arcs from the opposite ends of each of the side lines, and then I open the dividers to the full half width of the diameter of the block and describe two other arcs, the distance between the two arcs described from the end of each side line forming the thickness of the flanges or wings of the cam. After repeating this operation on the opposite end of the block, I remove the wood or other material to the centre of the block, leaving those parts between the arcs intact, and by these means a spiral flanged cam is formed which produces the desired effect. This flanged cam takes the place of the crank, and it has the great advantage that the power is applied always at the same distance from the centre of the shaft, and under the most favorable circumstances, so that no dead-centre exists, and a continuous revolving motion will be imparted to the shaft without requiring a fly-wheel. It is obvious that my spiral flanged cam can be applied in all cases where a reciprocating rectilinear motion is to be converted into continuous rotary motion. It will be seen that the spiral flanged cam B B is so constructed at each end as to avoid dead-points at the change of stroke for the back or reverse motion of the piston-rod. This is accomplished by so constructing the cam at its ends that when the outside pin passes the point *o*, (see fig. 2,) at the extreme outer end of the cam, the inside pin at this moment being the propelling power, passes on to *o'*, and does not pass the point *o*, or dead-point, until the outside pin passes the point *o*, when the reverse motion of the piston-rod takes place, and the outside pin then becomes the propelling power until it reaches the opposite end of the cam.

I do not claim converting reciprocating into rotary motion by means of the employment of a shaft and cross-head, the former having a spiral flanged cam arranged upon the shaft, irrespective of the peculiarly-shaped ends of the cam to obviate dead-points, as this change of motion may be seen in the patent of Nathan Atherton, dated October 31, 1854; but what I do claim as my invention, and desire to secure by Letters Patent, is—

The spiral flanged cam B, having its ends constructed as described, in combination with the cross-head A, and pins *a a*, of a steam engine, or with an equivalent part of any other motor, and with the shaft C, the whole being constructed, arranged, and operated substantially in the manner and for the purpose set forth.

WILLIAM H. HURLBUT.

Witnesses:

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