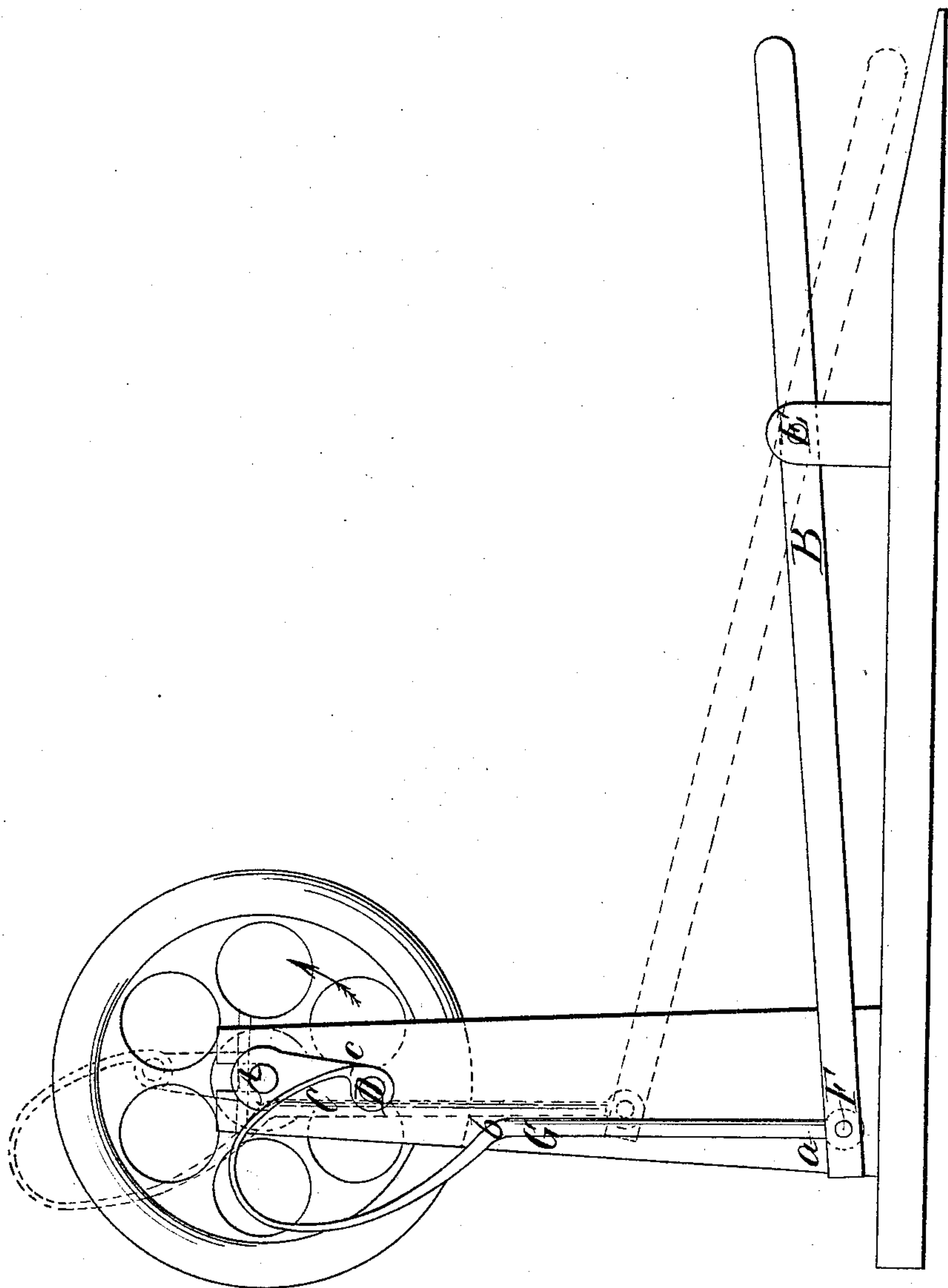


R. Boeklen,

Treadle.

N^o 25,716.

Patented Oct. 11, 1859.



Witnesses;
Mr Tusch
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UNITED STATES PATENT OFFICE.

REINHOLD BOECKLEN, OF JERSEY CITY, NEW JERSEY.

CONNECTING-ROD APPLIED TO CRANKS.

Specification of Letters Patent No. 25,716, dated October 11, 1859.

To all whom it may concern:

Be it known that I, REINHOLD BOECKLEN, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Connecting-Rods Applied to Cranks for the Purpose of Converting Reciprocating into Rotary Motion; 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, forming part of this specification, said drawing representing a side view of a crank and treadle connected by a rod with my improvement.

My invention is more particularly designed for treadle connections, but is applicable, with more or less advantage, to all connecting-rods employed as means of converting reciprocating into rotary motion.

It consists in giving the rod elasticity both longitudinally and in a lateral direction parallel with the planes of revolution of the crank by extending it in the form of a bow or arc beyond the crank pin or wrist, the curvature of such bow being in planes parallel with the planes of revolution of the crank, and the said bow being made sufficiently elastic to yield to the force necessary to be transmitted through it to turn the crank.

The object of the improvement is to facilitate the "passing of the centers", and to enable the crank to be started by the rod in case of its having "stopped on the center".

To enable others to apply my improvement to use, I will proceed to describe its construction and operation.

A, is the crank-shaft to which rotary motion is to be given by the treadle, B.

C, is the arm of the crank, and D, the wrist.

E, is the fulcrum of the treadle, and F, the pin attaching the treadle to the connecting-rod, G. The portion, *a*, *b*, of the connecting-rod, commencing at the treadle and extending the greater portion of the direct distance between the treadle and the crank wrist, may be either straight or crooked, but, as this part should be rigid, it should preferably be straight; the remaining portion, or bow, *b*, *c*, may have almost any curve, but it should extend so far beyond the wrist as to return toward the treadle, as shown in the drawing. The whole of the rod may be of steel, or the portion, *a*, *b*, may be of iron

and the bow, *b*, *c*, of steel, or for light machinery the bow or the whole rod may be made of hard-rolled brass; but in any case the bow must have sufficient flexibility to bend and unbend with the force necessary to drive the crank.

The rod should preferably be applied to the crank in such manner that its curvature toward the wrist, D, is in the opposite direction to the direction in which the crank is to rotate, as is illustrated by the arrow in the drawing, indicating the direction of the rotation. The effect of the elastic bow when the rod is thus applied is as follows: Suppose the crank to be on the lower center the pressure of the foot being at that instant changed from the part of the treadle nearest the rod to the part on the other side of the fulcrum, E, the force applied upwardly to the rod, which, if the rod were rigid, would have no influence on the crank, tends to contract the bow laterally, and so develops a force therein which exerts itself on the wrist in the direction of the arrow, and so starts the crank. This action of the bow is also aided by the change of position of the center, F, which is permitted by the longitudinal elasticity of the rod before the crank is started, and which brings the said center, F, slightly out of line with the center of the wrist and the shaft, and so causes the force that is applied directly to the rod to exert an influence on the crank in the same direction as that exerted by the elasticity of the bow. Again when the crank is on the upper center, as shown in red outline, the force applied downwardly to the rod by the change of direction of the pressure of the foot on the treadle tends to open the bow and so develop its elasticity in a direction to pull the crank around in the direction of the arrow, and this effect is aided by the change of position of the center, F, that is permitted before the crank starts, which brings the said center out of line with the centers of the wrist and shaft, and enables the direct pull of the rod to act effectively on the crank. These effects produced by the elastic bow also aid in bringing the crank past the centers while the crank has a continuous motion; and besides this the longitudinal elasticity of the rod prevents the jarring which is common to treadles on the change of direction in their motion taking place, more especially when operated by persons not practiced in their

use, as is the case of ladies first using sewing machines, and permits a freer and easier motion.

I do not claim broadly the making of connecting-rods for crank movements, elastic, as I am aware that such rods have been made elastic in the direction of their length; but

What I claim as my invention and desire to secure by Letters Patent, is:—

10 Giving the rod elasticity, both longitudi-

nally and in a lateral direction parallel with the plane of revolution of the crank, by extending it in the form of a bow or arc beyond the crank pin or wrist, and making such bow elastic, substantially as and for the 15 purpose specified.

R. BOEKLEN.

Witnesses:

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