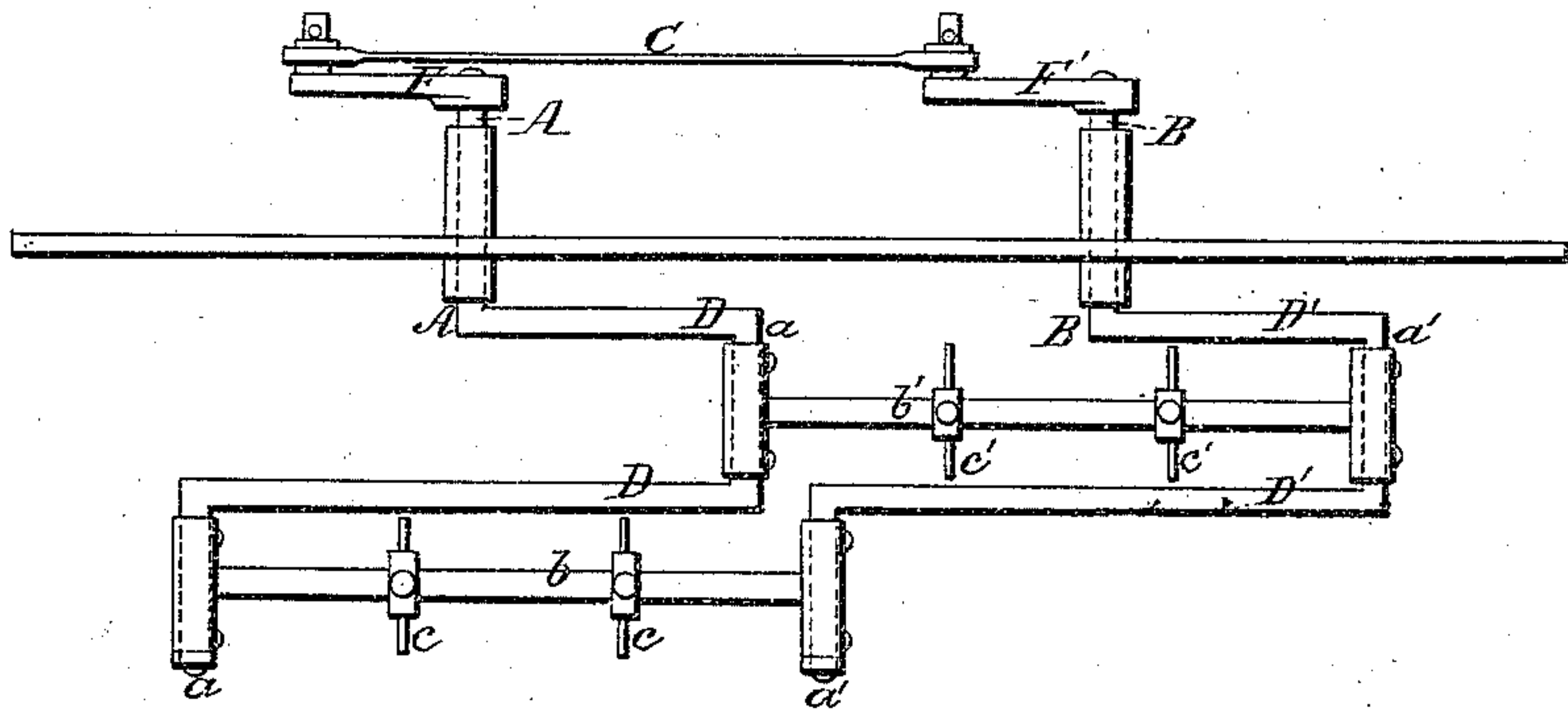
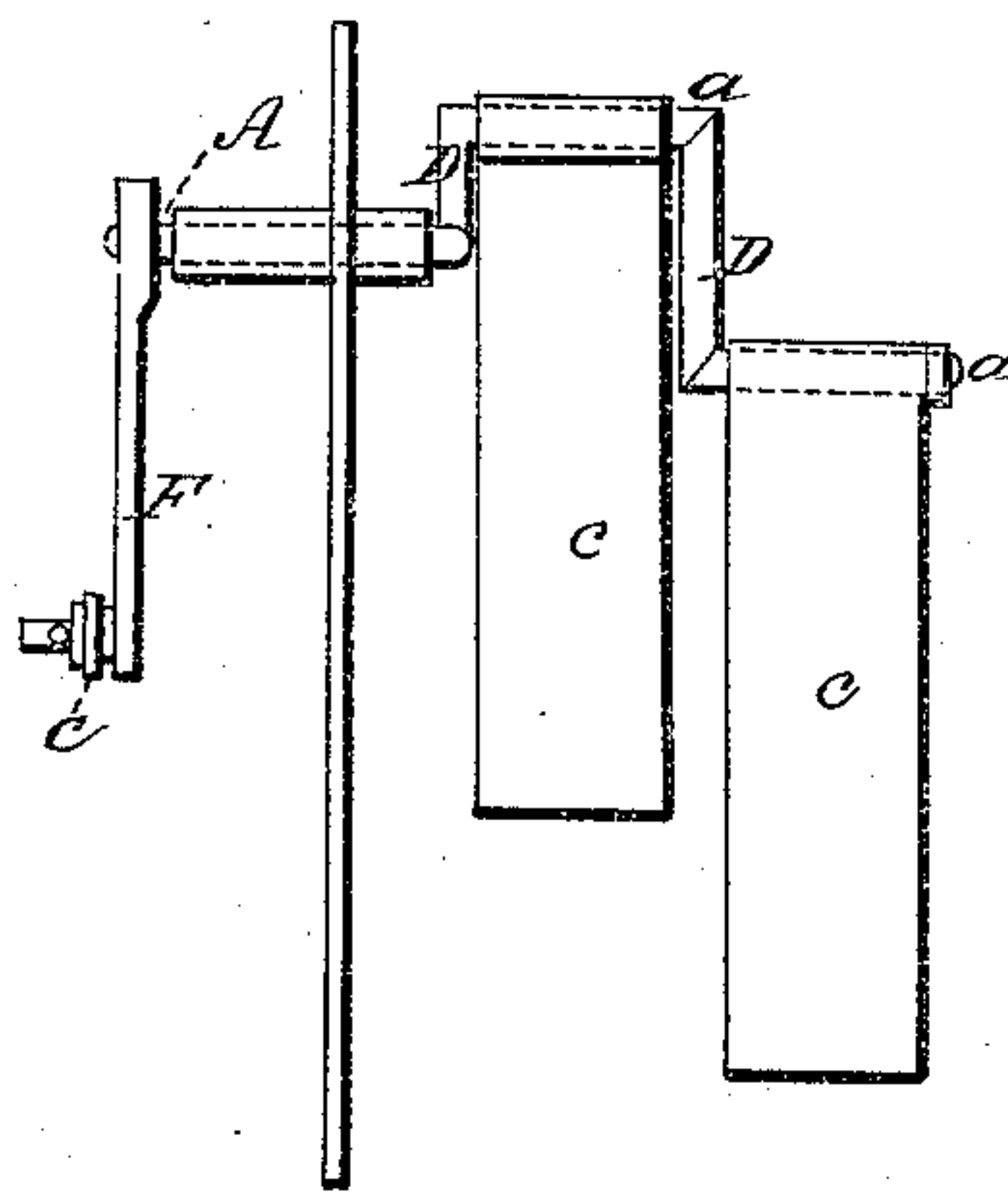


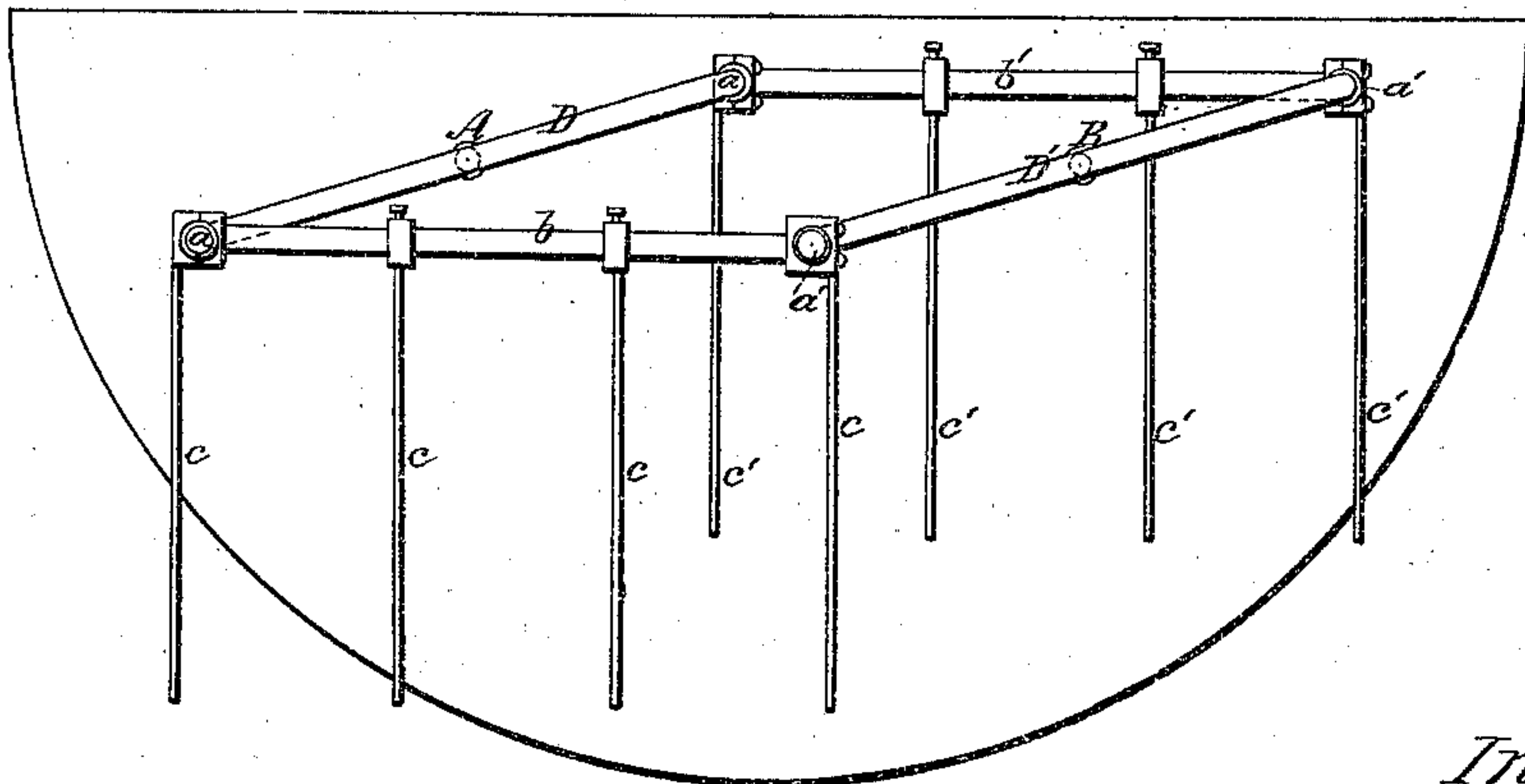
*H. Rolle.*  
*Crank Paddle.*  
*N<sup>o</sup> 66,742. Patented Jul 16, 1867.*  
*Fig. 1.*



*Fig. 3.*



*Fig. 2.*



*Witnesses.*  
*Chas. H. Griffin.*  
*C. W. Baldwin*

*Inventor:*  
*Henry Rolle.*  
*by his Attorney*  
*Frederick Curtis*

# United States Patent Office.

HENRY ROLLE, OF BOSTON, MASSACHUSETTS.

*Letters Patent No. 60,742, dated July 16, 1867.*

## IMPROVED PROPELLER.

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

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Be it known that I, HENRY ROLLE, of Boston, in the county of Suffolk, and Commonwealth of Massachusetts, have invented an Improved Propeller for Steamships, &c.; and do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, and in which—

Figure 1 is a plan.

Figure 2, a side elevation; and

Figure 3, an end elevation of my invention.

The object of the invention is to construct in a strong and simple manner a propeller for navigable vessels, by which all back pressure or weight of the water is avoided, and thus gain the full amount of propelling power of which a water motor is susceptible.

The invention consists in one or more series of vertical paddles or blades, fixed to horizontal bars, supported by cranks upon each side of the vessel, and operated by cranks, so arranged as to cause reciprocating movements of the paddles in an elliptical or oblong path, essentially as hereinafter explained.

In the accompanying drawings, A B denote two horizontal shafts properly supported, extending through the side of a vessel, and having a crank, F or F', formed upon their inner ends, these two cranks F F' being connected by a parallel rod, C. The outer ends of the shafts A B are formed into double throw-cranks D or D', the wrists *a a a' a'* of these cranks being in the same vertical plane, and connected together by parallel horizontal rods *b b'*. Each of these parallel rods *b b'* has a series of paddles or blades, *c c c c* or *c' c' c'*, affixed to and pendent from them, as shown in fig. 2 of the drawings, the number of these floats being increased or diminished as may be determined to be best. The two shafts A B, with their cranks, connecting-rods, and paddles, arranged as described, are to be applied to each side of the vessel, as is the case with the ordinary paddle-wheel. The cranks F or F' are disposed upon the shafts A B, "quartering," as it is termed, and well understood by engineers, the object being to carry the cranks D D and D' D' by their dead-centres. The revolutions of the shafts A and B cause the series of blades *c c c* or *c' c' c'* to dip into the water in nearly a vertical line, until immersed therein, and then to describe a nearly horizontal direction for about one-quarter of a revolution of such cranks, and subsequently to rise out of the water in the same direction with which they entered it, and this whether the vessel be advancing or "backing water."

It will be seen by the above description that, as before stated, there is no back pressure or weight of water upon the floats as they rise out of the water; and, further, owing to the line of movement described by the floats while in the water and propelling the vessel, that is nearly in a horizontal movement for some distance, much more power is obtained than if the floats described a circular movement. The accompanying drawings represent two series of cranks, rods, and propelling-blades on one side of the vessel; the number of these may be increased, if found necessary or desirable in practice, but one series to a side will probably be found preferable. The inner cranks F F' are to be suitably connected to the main driving-shaft of the vessel.

The invention is strong, durable, and effective in operation, and cheap of construction, and it is believed will be of great public utility. It will need little or no water-guard over it, and can be applied to small boats to good advantage, as the water is not thrown or scattered about by it.

I claim the combination with the blades *c* and bars *b* of the long and short-armed double cranks D D', and cranks F F', the whole being arranged for operation as and for the purposes set forth.

HENRY ROLLE.

Witnesses:

HENRY S. COOK,

CHAS. H. GRIFFIN.