

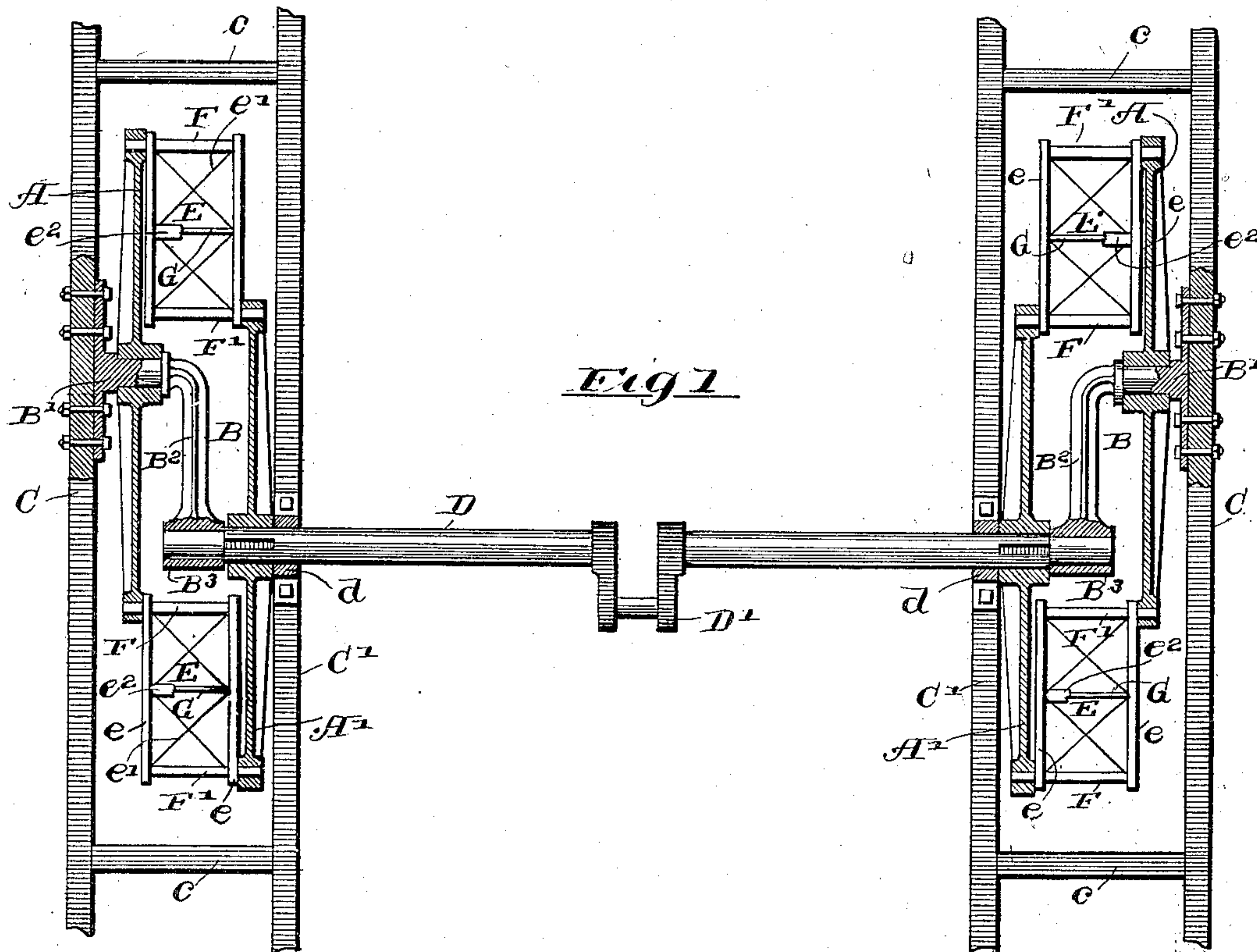
No. 735,958.

PATENTED AUG. 11, 1903.

F. EXLINE.  
PADDLE WHEEL.

APPLICATION FILED NOV. 3, 1902.

NO MODEL.





# UNITED STATES PATENT OFFICE.

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## PADDLE-WHEEL.

SPECIFICATION forming part of Letters Patent No. 735,958, dated August 11, 1903.

Application filed November 3, 1902. Serial No. 129,827. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK EXLINE, of Geddes, in the county of Charles Mix and State of South Dakota, have invented certain new and useful Improvements in Paddle-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to paddle-wheels for steamboats and other navigable vessels; and it consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a plan view showing two like wheels embodying my invention applied to a side-wheel boat. Fig. 2 is a side view of one of the wheels shown in Fig. 1.

First describing the wheels shown in Figs. 1 and 2, both wheels shown in Fig. 1 being alike, A A' designate two rotative lateral wheel members which are arranged eccentrically with respect to each other. The exterior side member A is mounted on the outer end portion of a supporting-bar B, which is shaped or bent to give it an angular shape or L form and consists of a part B', which is parallel with the axes of rotation of the wheel members, and a transverse part B<sup>2</sup>, which is arranged at right angles to said axes of rotation. The said part B' is rigidly attached at its outer end to a horizontal support or beam C and is adapted to form a horizontal journal, axle, or bearing for the said wheel member A.

D indicates a transverse rotative driving-shaft located in the same horizontal plane with the bearing portion B' of the bar B. Said shaft is shown as mounted at the end adjacent to the wheel in a bearing-box d, attached to a rigid horizontal supporting beam or member C', arranged inside of and parallel with the beam C, to which the bar B is attached. As herein shown, the driving-shaft D gives movement to both of the paddle-

wheels illustrated, and for this purpose is provided with a central crank D', through which motion is transmitted thereto from any suitable engine or motor. The horizontal supports or beams C C' are located outside and inside of the paddle-wheel and preferably closely adjacent to the outer and inner members A A' of said wheel. Said beams are shown as connected by cross-pieces c c, so as to form therewith rectangular frames, which latter may, if desired, form part of the structure or framework of the boat on which the paddle-wheels are used.

The inner wheel member A' is mounted upon and rigidly attached to the driving-shaft D outside of and preferably adjacent to the bearing d, said inner member A' in this instance constituting the driving member of the wheel. The transverse member B<sup>2</sup> of the supporting-bar B is arranged horizontally and extends from the part B' to a point in alignment with the shaft D, where it is provided with a bearing B<sup>3</sup>, which engages the end of said shaft D, which projects past or beyond the inner wheel member A' far enough to enter said bearing. Said bar B, through the rigid attachment of its outer end to the frame member or supporting-beam C and its engagement at its inner end with the outer end of the shaft D, serves to maintain the end of said shaft D accurately in position with respect to the outer part B' of said supporting-bar, on which the outer member A of the paddle-wheel turns.

E E designate connecting members, herein shown as bearing the form of paddle frames or trusses, which are located between the outer parts of the wheel members A A' and have pivotal connection at their outer and inner ends with said wheel members by means of oppositely-directed pivot-rods F F'.

The pivot-rods F are rigidly secured to the outer margins of the wheel member A and project therefrom toward the wheel member A', while the pivot-rods F' are rigidly attached to said wheel member A' and project toward the opposite wheel member A. Said pivot-rods are arranged parallel with the axes



of rotation of the wheel members and extend along the inner and outer ends of the paddle frame or trusses, which latter are arranged horizontally or parallel with the part B<sup>2</sup> of the supporting-bar B and are always held by the pivot-rods in a horizontal position. Attached to the paddle frames or trusses E E are paddle-blades G G, which extend downwardly from the same. The drawings show but one blade on each paddle-frame, but a greater number may be used, if desired.

The paddle frames or trusses E are herein shown as made of rectangular form and as formed by means of side bars *e e*, the ends of which are provided with bearing-apertures for engagement with the pivot-rods F F', which pivot-rods are adapted to turn freely in said bearing-apertures. The said side bars *e e* are shown as joined to each other by a rigid cross-bar *e*<sup>2</sup>, connecting them above the paddle-blades G and also by oblique braces or struts *e'*.

The distance between the axes of the two pivot-rods engaging any one of the paddle frames or trusses is equal to the distance between the pivotal axes of the wheel members A and A', and the pivot-rods for each frame are located in a plane parallel with a plane passing through the axes of said wheel members. It follows from this construction that when one of the side members A' is revolved the other member A will turn with it, and the two members will maintain the same relative position and all of the blades will remain in planes parallel with each other.

The paddle frames or trusses being provided with vertically-depending blades it will be manifest that the said blades on the descending side of the wheel will enter the water in a vertical position, while those on the ascending side of the wheel will leave or emerge from the water also in a vertical position, so that said blades will not tend to lift the water when leaving the same, but will act horizontally upon the water or in a manner to give a direct rearward pressure on the same as the wheel revolves. It will of course be understood that the outer wheel member A turns freely on its bearing on the outer part of the supporting-bar B, and that rotary motion is transmitted thereto from the driving shaft to the paddle frames or trusses connecting the two wheel members. This will be made clear from an inspection of Fig. 2, from which it will be seen that when the member A' is rotated the paddle-frames at the top and bottom of the wheel will exert a pull or push upon the member A, so as to

give to the two members exact correspondence of rotative movement.

An important advantage gained by the employment of the supporting-bar B when so arranged is to afford a bearing for one of the eccentric wheel members and when provided with a bearing for the driving-shaft on which the other wheel member is mounted, for the reason that the said bar B thus arranged operates to afford a rigid connection between the part of said supporting-bar which carries one of the wheel members and the end of the shaft to which the other eccentric wheel member is attached, thereby maintaining the parts on which said two eccentric wheel members respectively turn rigidly and accurately in position with their axes parallel with each other and preventing frictional resistance and unequal wear, which would result if the supports for the two wheel members were not thus rigidly held in position with respect to each other.

I claim as my invention—

1. A wheel comprising two rotative members arranged eccentrically with respect to each other, parallel connecting members located between and having pivotal connection with said rotative members, a stationary supporting-bar on which one of said two rotative members is mounted, and a rotative shaft on which the other member is mounted, said supporting-bar having a rigid extension provided with a bearing which is engaged by the said shaft.

2. A paddle-wheel comprising two wheel members arranged eccentrically with respect to each other, parallel connecting members located between and pivotally connected with said wheel members, a stationary supporting-bar on which one of said wheel members is mounted, a driving-shaft to which the other member is attached, said supporting-bar having a rigid extension provided with a bearing which is engaged by the said shaft, and supporting-beams or frame members at opposite sides of the wheel, one of which is provided with a bearing for said shaft and to the other of which said supporting-bar is rigidly secured.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 27th day of October, A. D. 1902.

FRANK EXLINE.

Witnesses:

H. C. TICKER,  
W. A. LAMSON.