E. H. Bailey,

Paddle Wheel.

No. 40,896. Patented Dec. 15, 1863.

Fig. 1

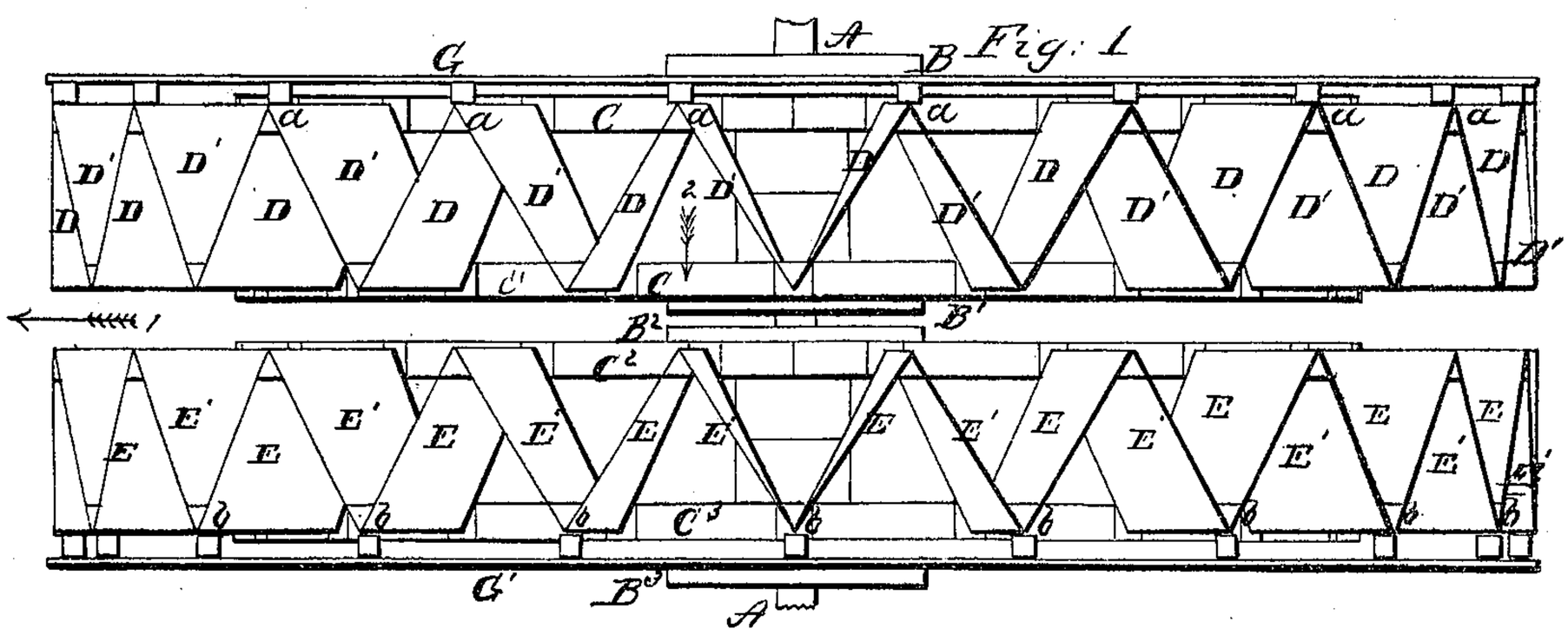
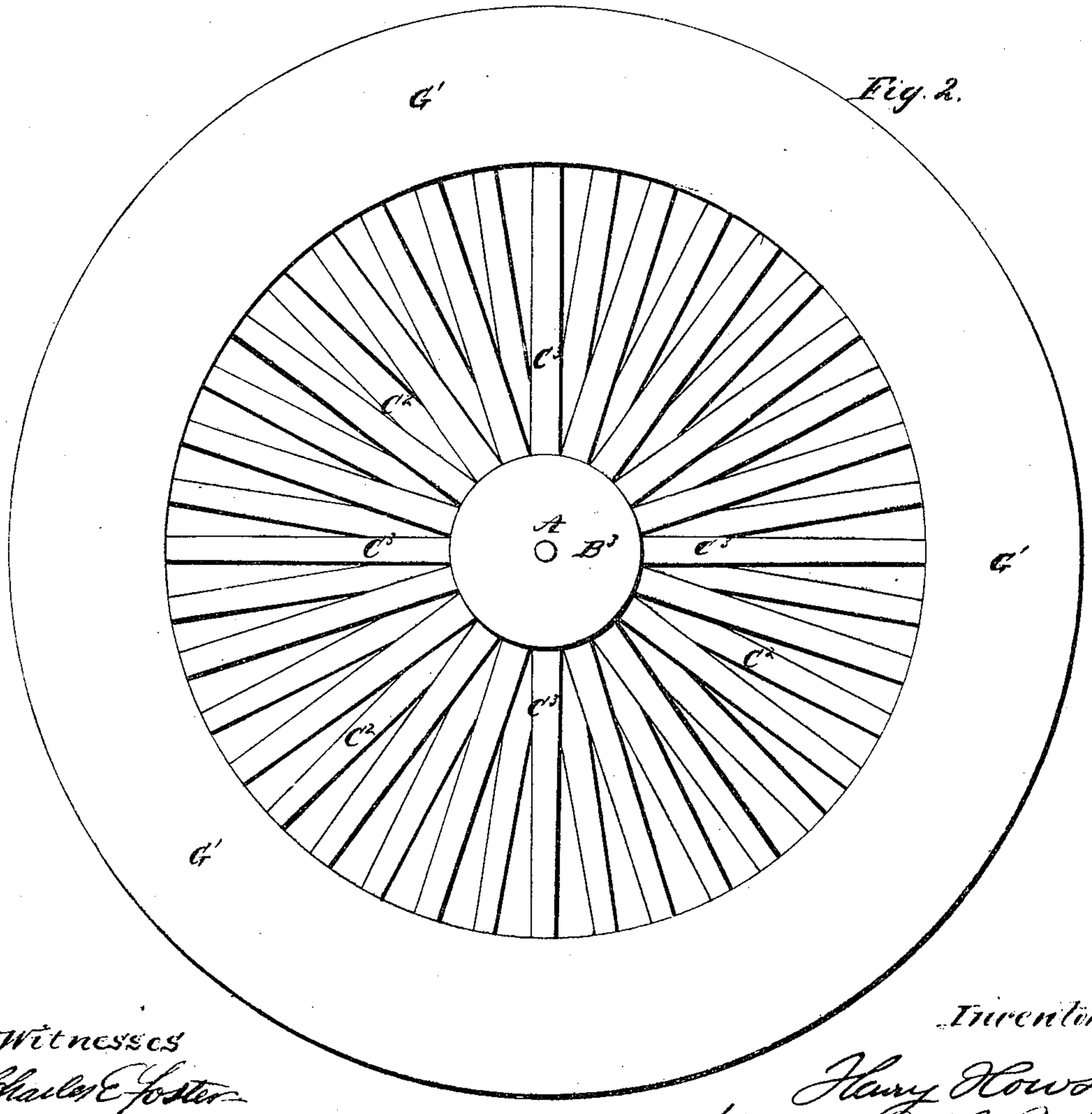


Fig. 2.



Witnesses
Charles E. Foster
Chas Howson

Inventor
Henry Howson
Atty for E. H. Bailey

UNITED STATES PATENT OFFICE.

E. H. BAILEY, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVED PADDLE-WHEEL.

Specification forming part of Letters Patent No. **40,896**, dated December 15, 1863.

To all whom it may concern:

Be it known that I, E. H. BAILEY, of Philadelphia, Pennsylvania, have invented certain new and useful Improvements in Paddle-Wheels for Steam-Vessels; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists of a paddle-wheel having inclined floats, arranged in the peculiar manner described hereinafter, and also having certain annular plates combined with the said floats.

The object of my invention has been to retain all the advantages and obviate all the disadvantages of a paddle-wheel with inclined floats arranged in the usual manner.

In order to enable others to carry out my invention, I will now proceed to describe the manner of conducting the same.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a plan view, and Fig. 2 a side view, of my improved paddle-wheel for steam-vessels.

A represents a portion of the crank-shaft of a marine engine, and to this shaft are secured the four hubs B, B′, B², and B³. From the hub B project a number of radial arms, C, from the hub B′ a similar number of like arms, C′, from the hub B² a similar number of arms, C², and from the hub B³ a like number of arms, C³.

To the outer ends of the arms C and C′ are secured the inclined floats or paddle-boards D D,′ and to the outer ends of the arms C² and C³ are secured the inclined floats or paddle-boards E and E′.

On the opposite sides of the wheel are two annular plates, G and G′, the plate G being secured to the series of floats D and D′ at the points *a*, where the outer ends of each pair of the said floats meet each other, the plate G′ being secured to the floats E and E′ at the points *b*, where the outer ends of each pair of the latter floats meet each other. It will be seen that the wheel consists of two separate parts, secured side by side to the same shaft—namely, the part composed of the floats D and D′ and arms C and C′, and that composed of the floats E and E′ and arms C² and C³. It will also be seen that the inclined floats are so arranged in respect to each other that there is a continuous zigzag space between the two parts of the wheel and throughout its circumference.

It is well known to those versed in marine engineering that paddle-wheels with inclined floats cause less tremor to the vessel than wheels with floats parallel with the paddle-shafts, as the inclined floats both enter and leave the water more gradually, and consequently with a less sudden shock than the straight floats. The inclined floats, however, have this disadvantage, that they impart such a lateral movement to the water as to diminish the effective power of the wheel, the resisting body or channel of water, which should be retained as near as possible in a line with and so as to be acted directly on by the wheel, being more or less dispersed by the inclined floats.

My invention has been designed with the special view of retaining all the advantages and of obviating the disadvantages of a side wheel with inclined floats. Supposing the wheel to be turning in the direction of the arrow 1, Fig. 1, whatever tendency the floats D′ D′ have to move the water laterally in the direction of the arrow 2 will be counteracted by the tendency of the opposite floats, E E, to move the water in a contrary direction, and the water moved outward by the action of the floats E′ will be arrested by the annular plate G′, and the water moved outward by the floats D D will be arrested by the annular plate G. It will be seen, therefore, that although my improved side wheel possesses all the advantages of a wheel with inclined floats as regards a gradual and easy entrance into the water and a ready exit from the same, the water which resists the action of the inclined floats is maintained in a comparatively narrow channel instead of being unduly dispersed laterally, as in ordinary paddle-wheels with angular floats, and consequently that the water affords a greater amount of resisting force, thereby allowing the wheel to exercise a greater power.

I wish it to be understood that I do not desire to claim the use of oblique floats with angles reversed, nor rims for preventing the escape of water laterally, nor inclined floats

arranged in two sets. In other words, I do not desire to claim any of the within-described parts, viewed separately from the whole; but

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

The two sets of inclined floats D and D′ and E and E′, in combination with the annular plates G and G′, when the two sets of floats and when the whole of the parts are constructed and arranged as set forth, for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

E. H. BAILEY.

Witnesses:

HENRY HOWSON,

M. S. ALEXANDER.