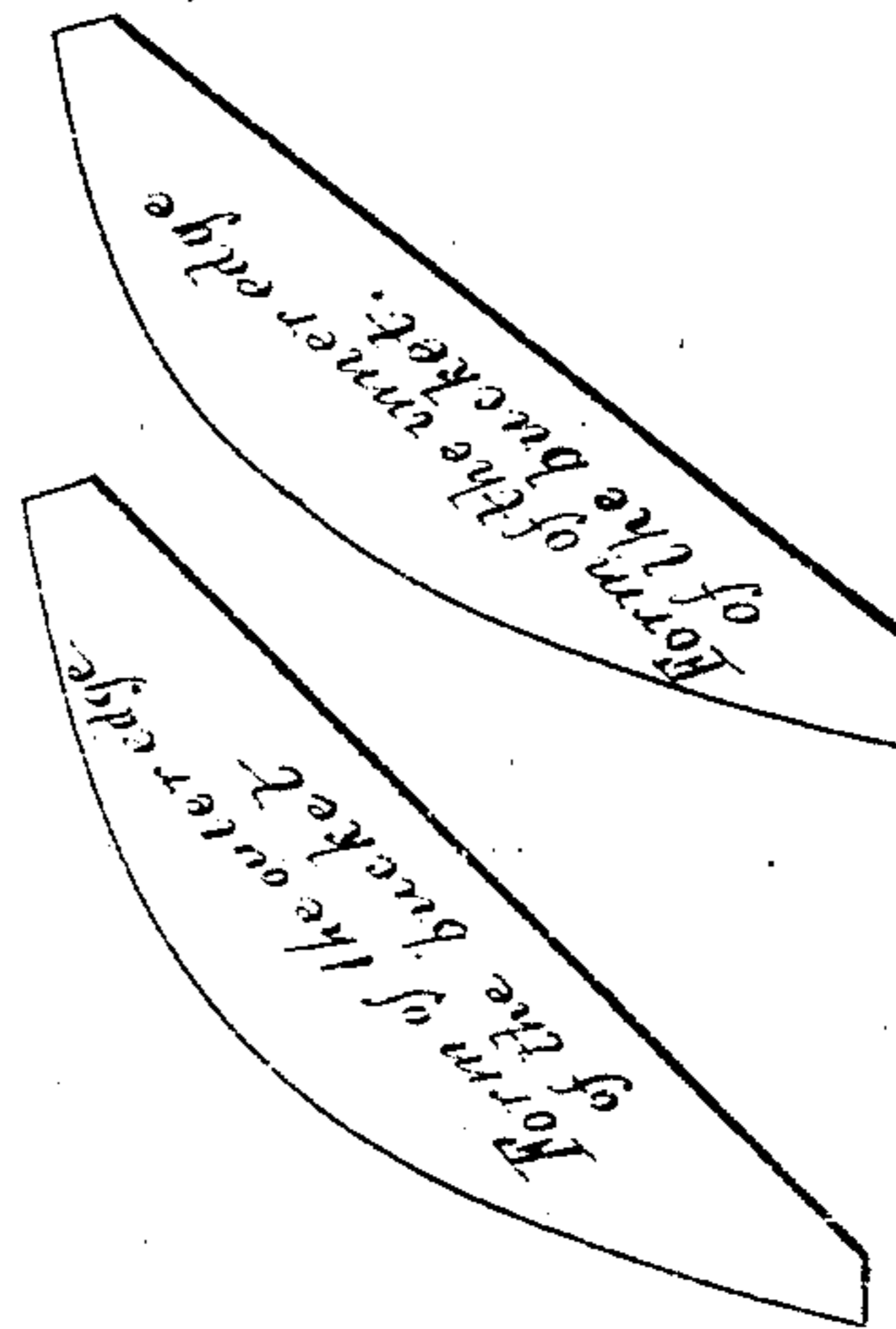
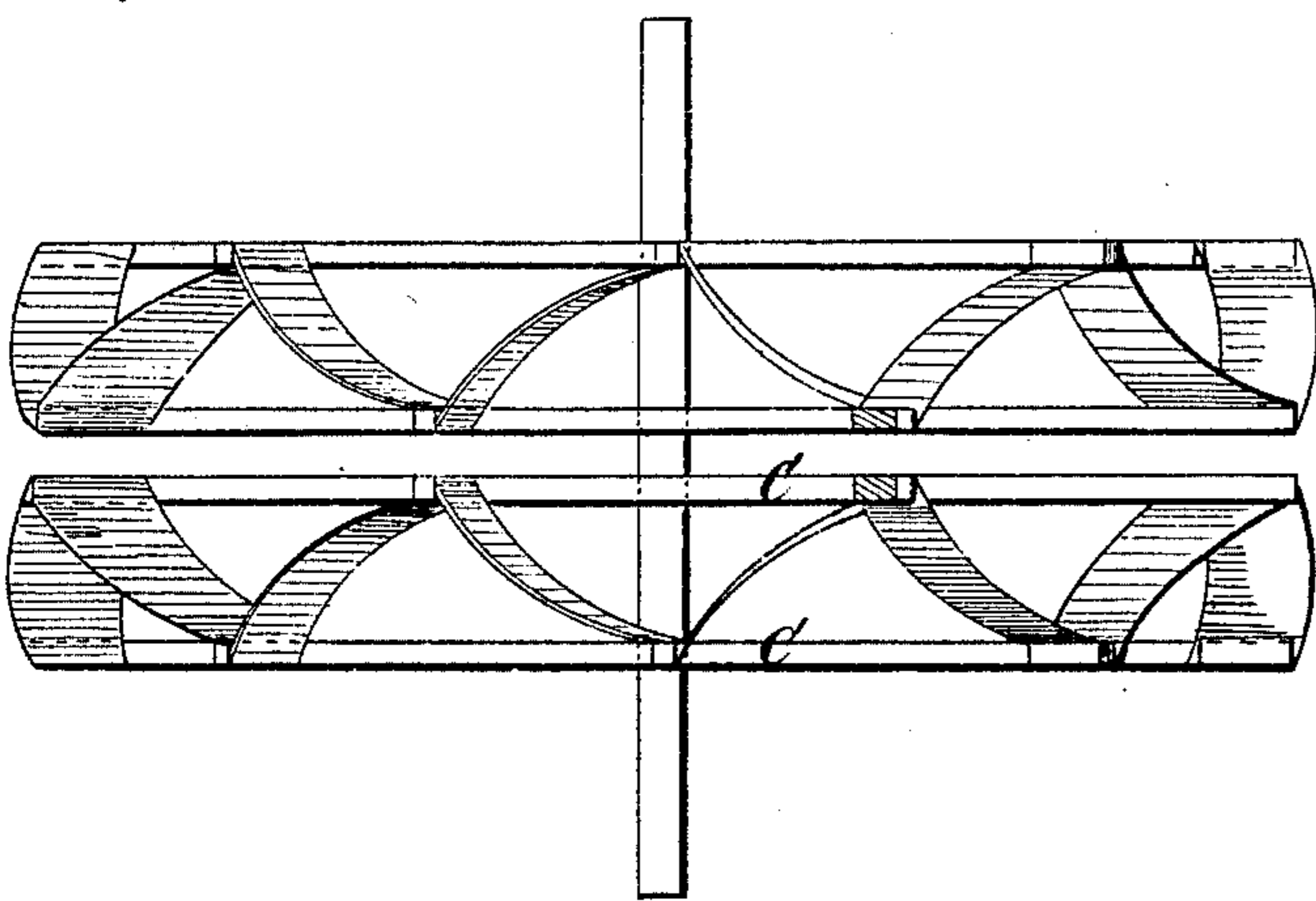


*A. Chapman,  
Paddle Wheel.*

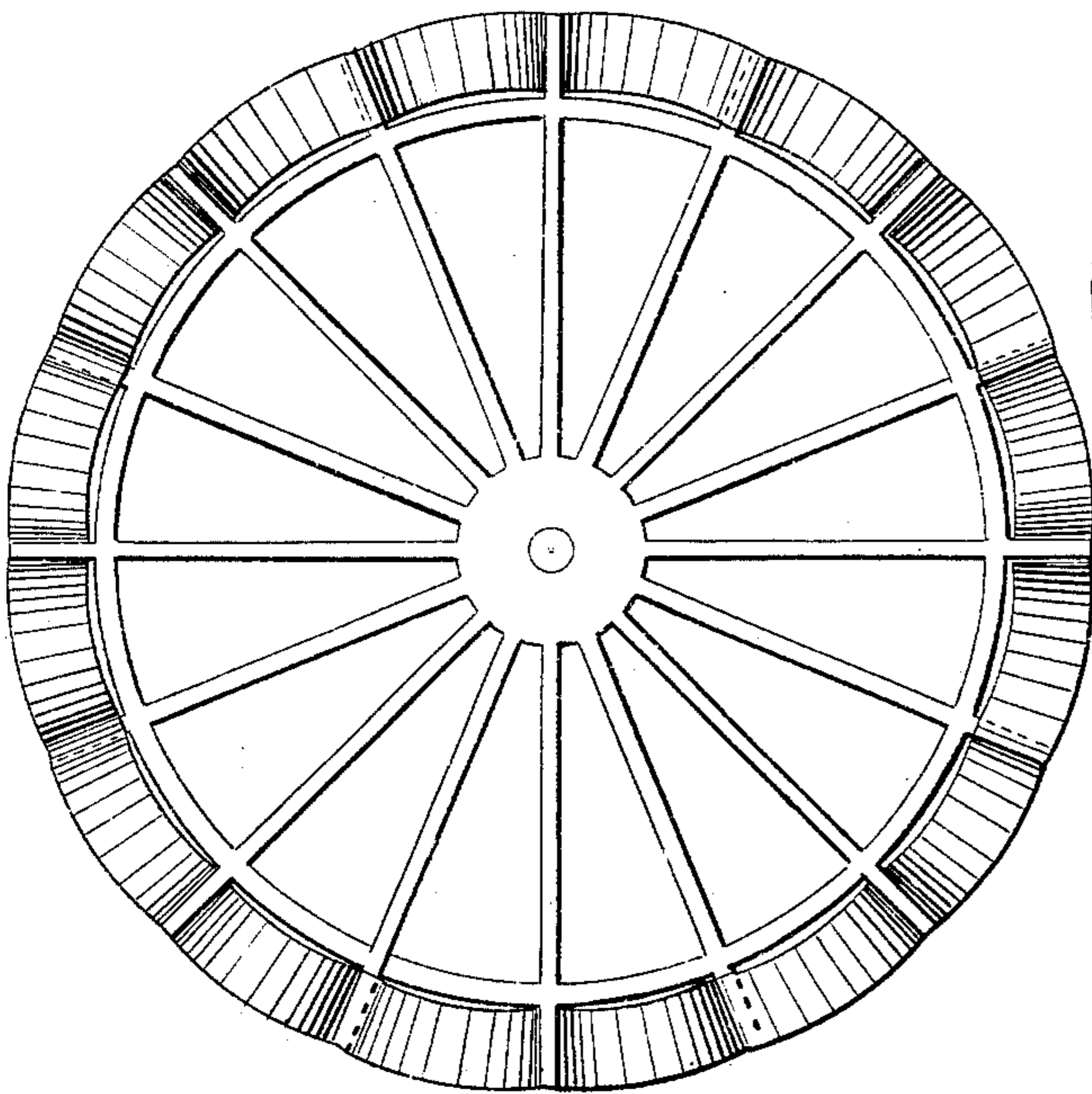
*Nº 11,741.*

*Patented Oct. 3, 1854.*

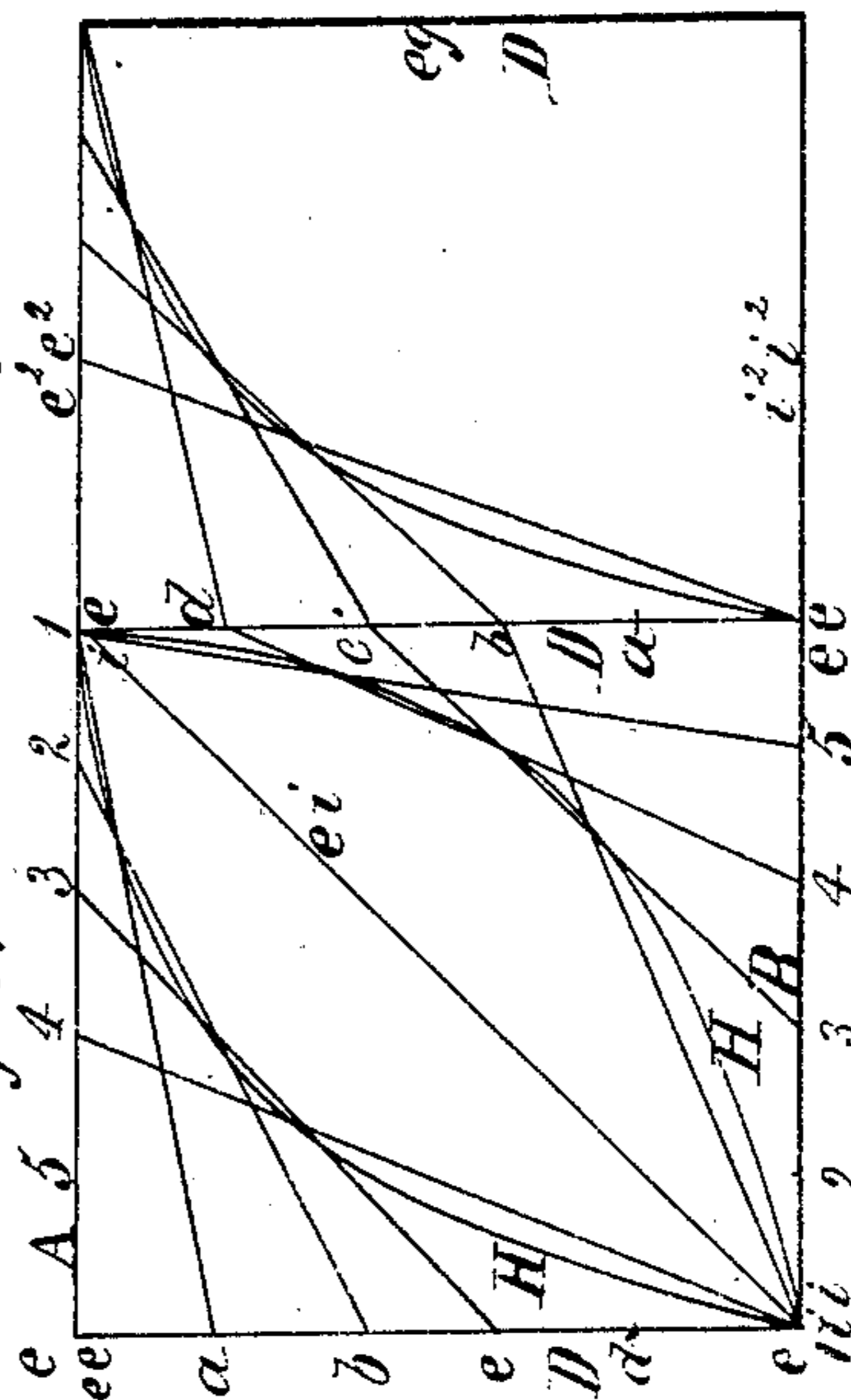
*Fig: 2*



*Fig: 1.*



*Fig: 4.*



*Fig: 3.*

# UNITED STATES PATENT OFFICE.

ABNER CHAPMAN, OF FAIRFAX, VERMONT.

## PADDLE-WHEEL.

Specification of Letters Patent No. 11,741, dated October 3, 1854.

*To all whom it may concern:*

Be it known that I, ABNER CHAPMAN, of Fairfax, in the county of Franklin and State of Vermont, have invented a new and Improved Paddle-Wheel; 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 and to the letters marked thereon.

10 In the drawings Figure 1, is a side elevation. Fig. 2, is a face elevation.

Like letters refer to like parts in the different figures.

15 The nature of my invention relates to a paddle wheel, composed of a double series of segments curved in opposite directions, and so arranged as to form continuous waved lines, when combined with the open space between said series—the whole being arranged in the manner, and for the purpose hereafter to be described.

20 In order to describe the curves for my particular wheel when the breadth of the face and the diameter are given, I commence by dividing the face into four rings of equal width, exclusive of the open space in the center from six to seven inches. I then divide the rings into an even number of equal segments the length of each of which are as near as possible, five eighths of the half breadth of the face. Thus for example, if the wheel is to be ten feet in breadth and twenty five feet in diameter, the half breadth or rings, Fig. 2, will be each five feet wide, five eighths of this measure is thirty-seven and a half inches, which divided into the circumference of the 25 foot wheel, or 78 ft, 6½ inches will give 24 equal parts, as the number of parts must necessarily be equal, in order that the buckets may be continuous and symmetrical the number in the present case is 24 each of which will be 39¼ inches long. When the breadth and length of the sections are thus 45 determined, the buckets may be laid out in the following manner. Draw the two parallel lines A, B, at a distance from each other equal to the breadth of the rings C, C, or 5 feet; divide the line A, into a series of 50 equal parts equal in length to the length of the segments, or 39¼ inches from the

points of division thus obtained, draw the lines  $d, d, d$ , perpendicular to A and B. Now divide the spaces  $e, i$  into five equal parts and number the points of division 55 alternately from the right and left,  $a, b, c, d, e$ . Then divide the spaces  $e, e, i, i$  also into 5 equal parts alternately on the lines A, and B, and designate the points of division 1, 2, 3, 4, 5; draw the lines  $a^1, b^2, c^3, e^4$ . When this is done draw the curved lines H H tangent to the lines  $a^1, b^2$  &c. The curves thus obtained form the continuous wave line of half the bucket of the wheel. The wave line of the other half of 65 the bucket is identical with the first but the lines  $e' i', e' i'$ , are intermediate between those of the first. The lines thus obtained give the form of the wheel or bucket at the periphery of the wheel. 70

In order to obtain the form of the inner edge of the bucket a second diagram Fig. 4, must be made in the same manner as the first, and the spaces  $e^2, e^2, i^2, i^2$  must be equal to the distance between the radial lines  $e, g$ , 75 (drawn from the divisions of the circumference of the wheel at the inner edge of the buckets). When the curves of the outer and inner edges of the buckets are thus obtained, the section of which the bucket is formed 80 may be readily bent to a proper shape upon a mold of a proper form. Such a mold may be made by constructing two templates the one of the same curve as the outer edge of the bucket, obtained as described above. 85 The other of the same curve as the corresponding inner edge thereof. These two templates must be connected by cross ties of a length equal to the breadth of the bucket. Their corresponding curved edges 90 should then be connected by staves, to form the curved surface upon which the sheet of iron, or other material of which the bucket is to be formed, may be bent. The bent section may then be attached to the 95 radial arms in the usual manner to form the wheel with the space in the center. The radial arms on which these curved buckets are secured are arranged as seen in the drawings Figs. 1, and 2. 100

Having thus fully described the nature of my invention, I would state that, I am

aware that paddle wheels with zig-zag buckets, having sharp quick turns, have been made. These I do not claim, but

What I do claim as new and desire to secure by Letters Patent, is—

A paddle wheel composed of a double series of segments, curved in opposite directions, and so arranged as to form continu-

ous waved lines, when this is combined with the unbroken open space between said series—the whole being arranged in the manner, and for the purpose set forth.

ABNER CHAPMAN. [L.S.]

Witnesses:

H. F. WILLSON,  
SAML. GRUBB.