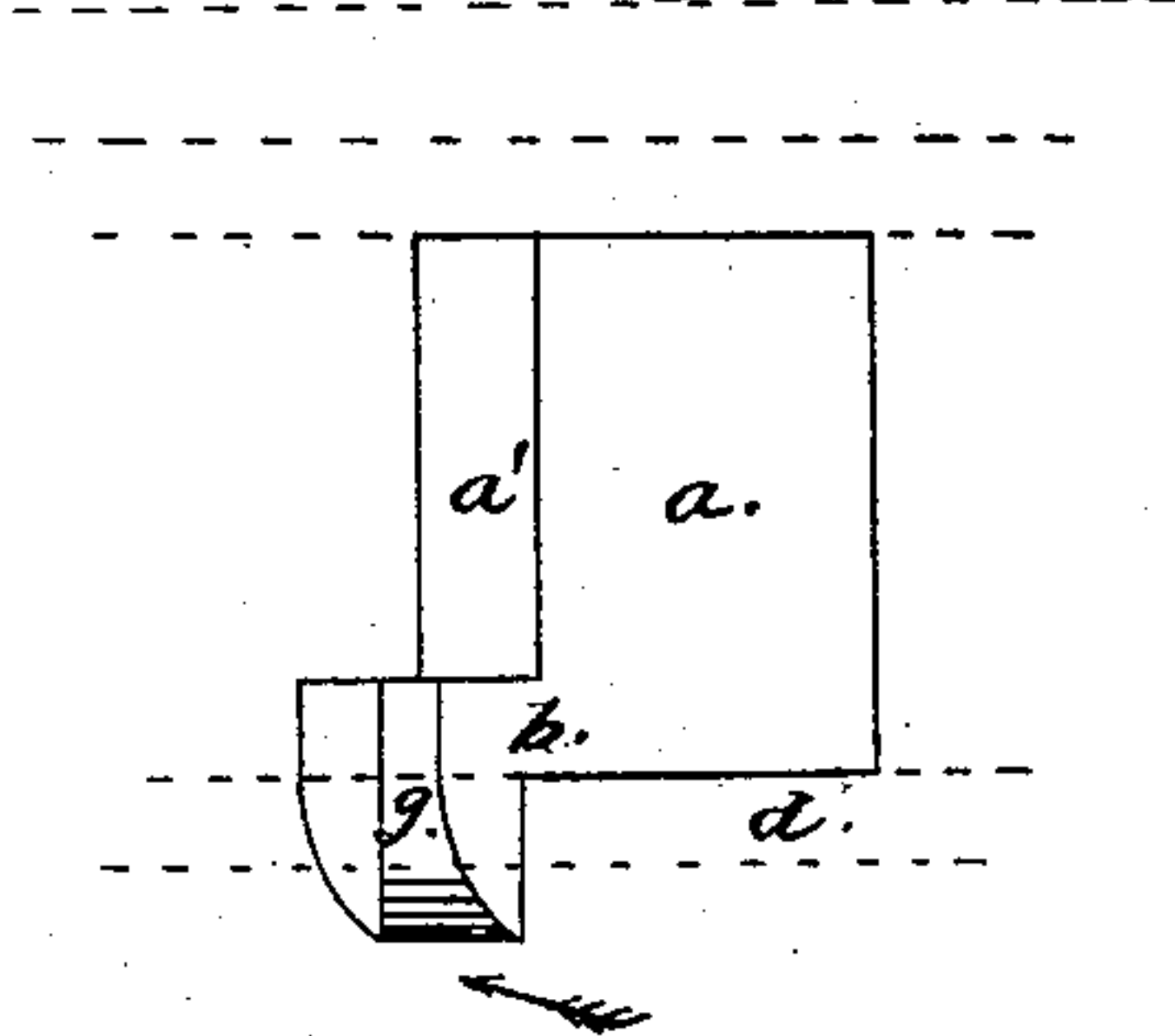


*F. Swatzel,*  
*Water Wheel,*

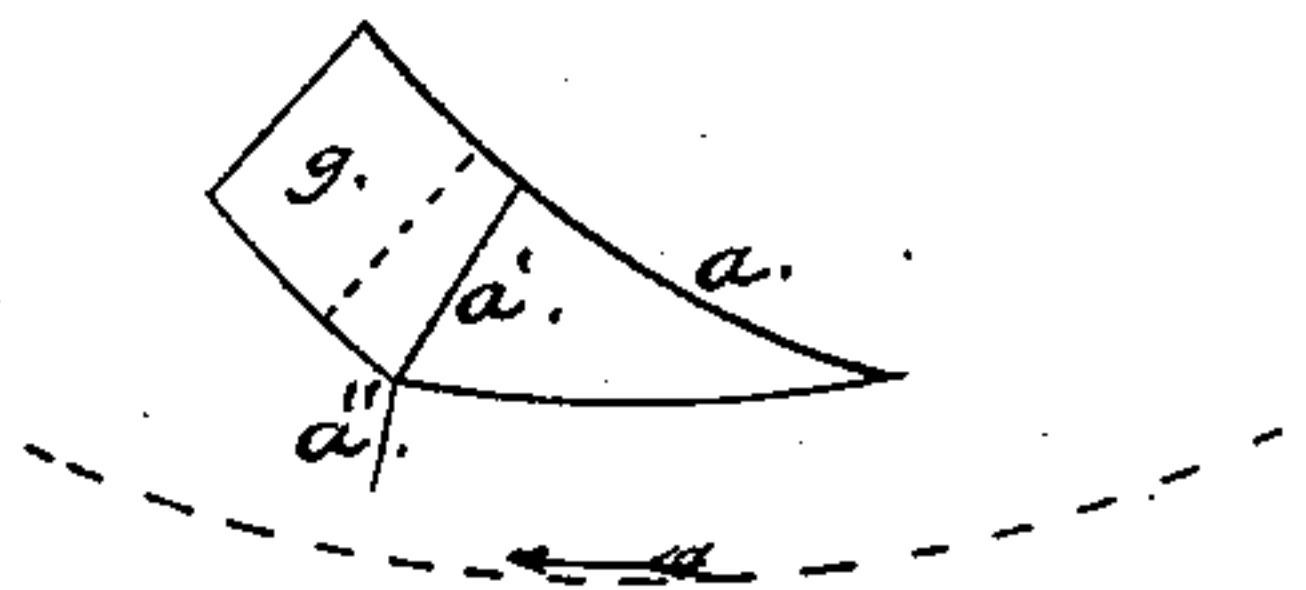
*N<sup>o</sup> 52,224,*

*Patented Jan. 23, 1866.*

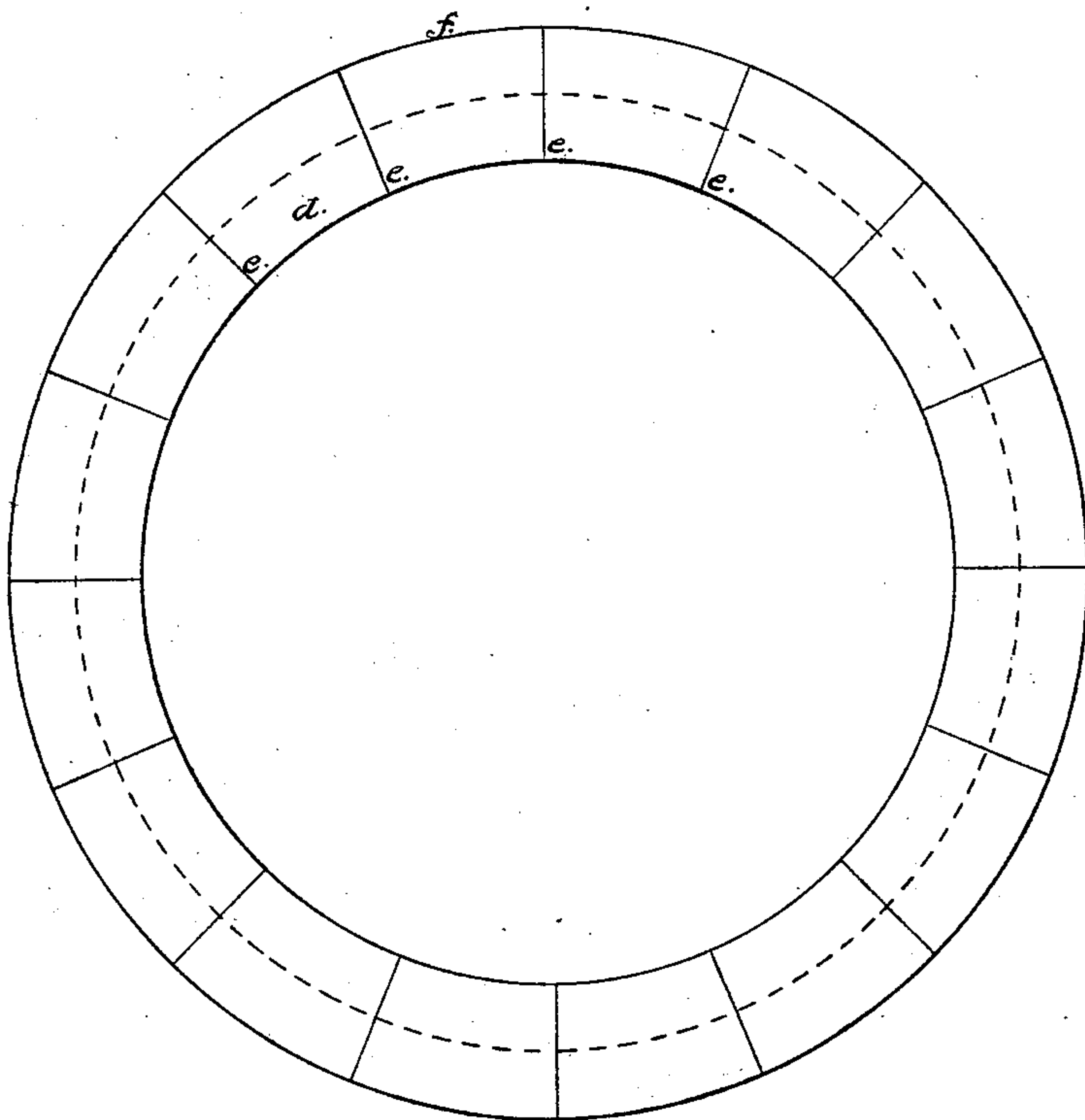
*Fig. 2.*



*Fig. 1.*



*Fig. 3.*



*Witnesses;*  
*H. P. K. Peck*  
*Theodore Lang*

*Inventor;*  
*Fred Swatzel*

# UNITED STATES PATENT OFFICE.

FREDERICK SWATZEL, OF GERMANTOWN, OHIO.

## IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 52,224, dated January 23, 1866.

*To all whom it may concern:*

Be it known that I, FREDERICK SWATZEL, of Germantown, in Montgomery county, and State of Ohio, have invented a new and useful Improvement in Water-Wheels; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference thereon.

Figure I is a sectional view of one of the buckets, showing the top part of the spout. Fig. II is a side elevation of one of the buckets with its spout detached from the wheel. Fig. III is a reversed view of the auxiliary buckets and the top flange detached from the flange *d*, shown in dotted line at the top of the wheel.

To enable others to construct and use my improved wheel, I will proceed to describe it with reference to the accompanying drawings.

My wheel is designed to revolve horizontally and to discharge the water at the bottom of each bucket. The buckets *a a' a''* are formed at an angle of about forty-five degrees, with an opening at the bottom, as represented at *b*, for the discharge of the water. Each bucket is extended by a flange at the periphery of the wheel, (denoted by the letter *a''*.) This extension or flange of the bucket stands at an obtuse angle with the two sides of the bucket, and is upon nearly the radius-line of the wheel and projects beyond the two angular flanges, *d d*, (one not seen in the drawings,) at the top and bottom of the buckets *a*, and by which flanges the buckets are held to constitute the body of the wheel. Upon the top flange, *d*, there are auxiliary buckets *e e* projecting outwardly two inches beyond flange *d*, and these auxiliary buckets are capped and held in position by the angular flange *f*, as represented in Fig. III.

The discharge-vent *b* is provided with a curved spout or mouth, *g*, with its open side backward in relation to the motion of the wheel, as seen in the drawings. This spout or mouth is connected with the inner side of the face *a'* of the bucket and extends downward in a curved form below the bottom flange of the wheel about two and one-half inches. The discharge-opening *b* communicates with

the spout or mouth *g*. The distance from the discharge-opening *b* to the back of the spout *g* is about two inches and its width is about four inches, and corresponds in width with the width of the face of the bucket, exclusive of the flange *a''*. Its length, as above stated, is about two and one-half inches. The back of the spout *g* is curved, or it may be inclined at an angle of forty-five degrees, more or less. This form serves as an inclined plane, upon which the gravity of the water will act in its passage down from the buckets until it is discharged, and thereby assists, while being discharged, in propelling the wheel.

When in operation the wheel will revolve in the direction of the arrow, the water being conducted tangentially upon the face of the buckets by means of a continuous scroll-spout. This spout may extend entirely round the wheel. The spout will be fitted to the flanges *d d* at the periphery of the wheel, and the auxiliary buckets *e e* are designed to receive the action of all the waste water which may escape between the scroll-spout and flange *d*. A similar arrangement of buckets may be arranged at the bottom of the wheel to receive the action of the escaping current of water at that point.

This improved wheel is designed to be used where the amount of water is comparatively small. It is the intention to conduct the water from near the bottom of the forebay upon the entire series of buckets through the scroll-spout, and it is believed that this is the most economical way of using the water.

I have found by experiment with my invention that it has great advantages over such of the submerged wheels as I have used.

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

1. The buckets *a a' a''*, in combination with the inclined or curved spout *g*, operating in the manner substantially as described.

2. The auxiliary buckets *e e*, in combination with the wheel, as described.

FRED. SWATZEL.

Witnesses:

H. P. K. PECK,  
SHEM. THOMAS.