

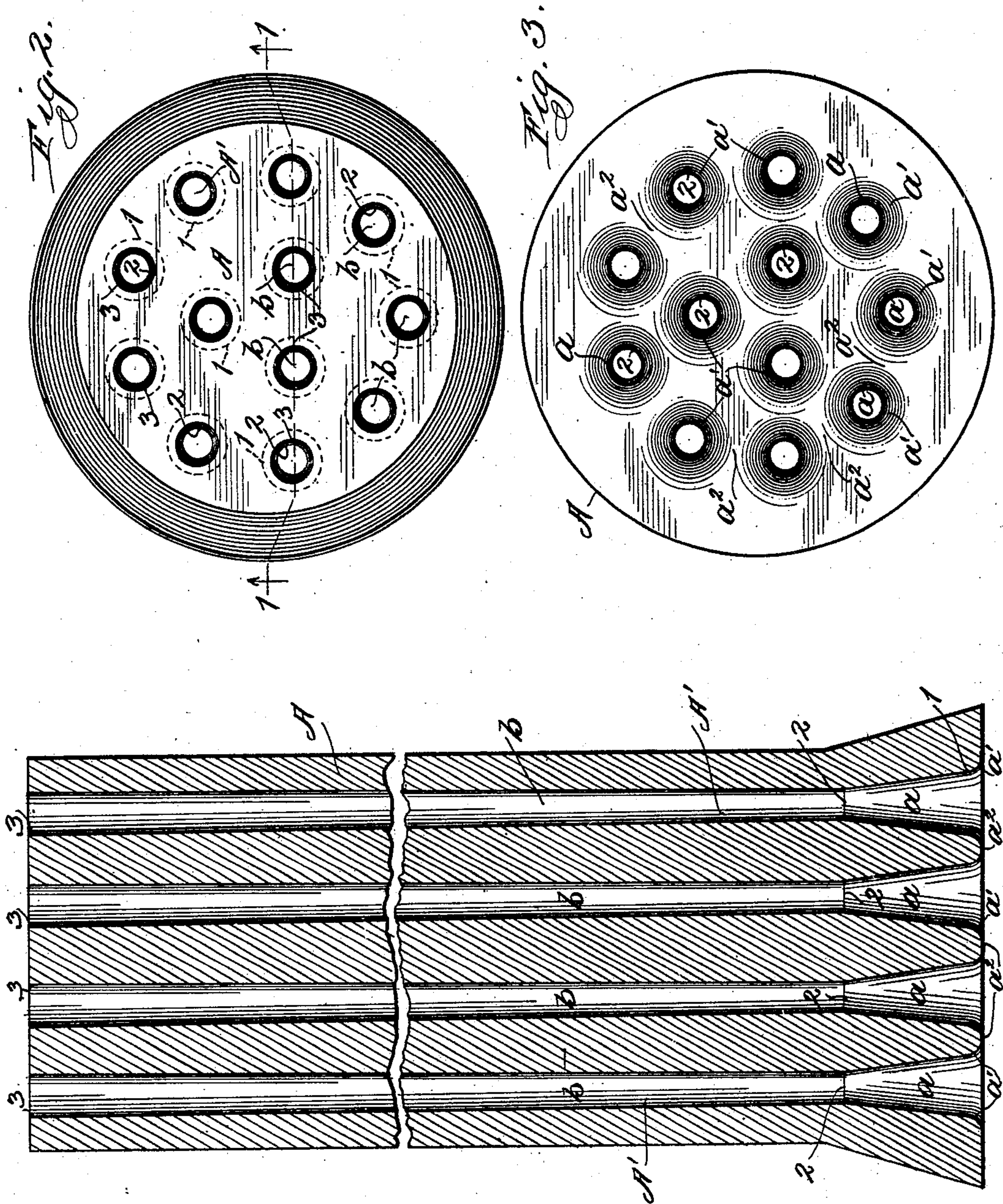
No. 712,053.

Patented Oct. 28, 1902.

W. A. FIELD.
CONVERTER TWYER.

(Application filed Mar. 27, 1902.)

(No Model.)



Witnesses:
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Fig. 1.

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UNITED STATES PATENT OFFICE.

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CONVERTER-TWYER.

SPECIFICATION forming part of Letters Patent No. 712,053, dated October 28, 1902.

Application filed March 27, 1902. Serial No. 100,201. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. FIELD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Converter-Twyers, of which the following is a specification.

This invention relates to converter-twyers; and its purpose is to provide a new and improved form of twyer by the use of which with a given pressure in the wind-box a greater volume of air will be supplied and delivered than by twyers having other forms of openings, or a required constant volume of air may be furnished at reduced pressure in the wind-chest, whereby the wear and tear of the blowing-engines and their steam consumption will be materially reduced, and the "blowing time" will be diminished to increase the output of the converter.

In twyers as now generally employed the twyer openings or channels are of uniform diameter. In the employment of such twyers the column of air is contracted at the bottom near the inlet of the channel by reason of the fact that the jets or currents of air are deflected inwardly from opposite points of the mouth or inlet by the angular formation of the end of the mouth and impinge upon each other to produce a contracted column. Also the uniform diameter of the channels prevents any expansion of the air, so that the volume of air delivered at the outlet is restricted to the amount that is received at the mouth of the channel from the wind-chest or air-chamber. By employing twyers of my invention both of these disadvantages are obviated. By reason of the shape of the inlets or intake portions of the openings or channels of my twyer I am able to provide an unrestricted column of air which passes into the channel in a substantially uniform direction, so as to gain the full benefit of the channel and utilize its entire area. By reason of the shape of the outlet portions of the openings or channels I am enabled to provide for the expansion of the air, whereby an increased volume is delivered.

To accomplish these ends my invention contemplates a twyer provided with openings or channels of novel construction and arrangement, as will be fully described in the speci-

fication and pointed out in the appended claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a vertical sectional view of my improved twyer to show the longitudinal openings or channels, the view being taken on the line 1 1 of Fig. 2. Fig. 2 is a top plan view, and Fig. 3 is a bottom plan view, of the twyer of Fig. 1.

Referring to the drawings, the reference-letter A indicates the body of my improved twyer, which, it is understood, is to be employed as a converter or vessel bottom and is to be associated with a suitable wind-chest or air-chamber for the supply of air under pressure to the twyer channels or openings.

The reference-letter A' indicates the twyer channels or openings extending longitudinally through the twyer and arranged in any suitable disposition and relation. The openings or channels are provided with flaring intakes or inlets a , as clearly shown in Fig. 1. These inlet portions of the channels, as shown, are formed or developed by the revolution of a straight line about its axis, and it is to be understood that they may be of any desired downwardly-opening shape, such as would be developed by the revolution of a line, straight or curved, about its axis. The mouths of the intakes or inlet portions of the channels or openings are bell-shaped, as at a' . By reason of this construction and formation an unrestricted column of air ascends each channel, and the capacity of the lower portion of the channel is fully utilized, as the incoming currents of air fill the entire area of the channel, all being forced into the channels in substantially uniform directions. In the preferred form of my device the flares of the bell-shaped mouths of the openings produce intervening bevel edges at the bottom of the intermediate body portions, as indicated at a^2 in Figs. 1 and 3. The channels or openings A' are developed above the inlets into the shape of inverted frustums, as clearly shown at b in Fig. 1. This formation allows the ascending currents of air to expand from the point of smallest diameter to the top or outlet of the twyer-openings to increase the volume of air delivered. In practice it is preferred to have the larger and smaller diameters of the intake portions or

inlets in about the relation of one inch at the bottom to one-half an inch at the top and with the flare increasing at any desired degree or angle, the entire inlet part being preferably from one-twelfth to one-fifth the length of the entire opening. Above the intake portions the openings are increased in diameter toward their outlets or are in the form of inverted frustums of cones, the outlets being approximately five-eighths of an inch in diameter when the other dimensions described are employed. The approximate relative diameters of the different points of the openings are clearly indicated in Figs. 1 and 2, where 1 shows the diameter of the intake or inlet portion just within the mouth, 2 the common diameter of the top of the inlet *a* and the bottom of the conical upper portion *b*, and 3 the diameter of the outlet. It is of course understood that these dimensions are not arbitrary, but may be varied as desired and that they are given merely as descriptive of proportions satisfactory for practical use as demonstrated by experience and actual work.

From a consideration of the construction and arrangement described it is apparent that with a given pressure in the wind-chest a greater volume of air will be delivered by employing twyers of my invention than when the old form is employed, as the shape of the intakes provides for utilizing their entire area, and the outlet provides for the expansion of the air to increase the volume delivered.

In twyers having openings of uniform diameter it is necessary in practical use for the operator to control by suitable valve mechanism the supply of air to one vessel or con-

verter in order to equalize the delivery where two vessels are in operation when the openings in one have been worn down or when one has a new bottom. By employing my improved form of twyer the throttling of the supply by the operator is unnecessary, as the openings act to automatically regulate the delivery. For example, when the twyers of my invention are worn down in one vessel more than in the other the openings in the shorter bottom are of a decreased total area, whereby the delivery through the short bottoms is but slightly increased. In the old form the decreased length of the worn openings allowed a largely-increased volume to be delivered, thereby taking away from the other vessel. In my form the decrease in the area of the short or worn openings does not tend to increase the volume disproportionately.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A twyer provided with channels or openings whose inlet ends are flared and have bell-shaped mouths and whose outlet ends are in the form of inverted frustums.

2. A twyer provided with channels or openings whose inlet portions are flared and have bell-shaped mouths and whose discharge portions are of increasing diameter toward the outlets, the flare of adjacent inlet-openings forming beveled intermediate portions.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM A. FIELD.

Witnesses:

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