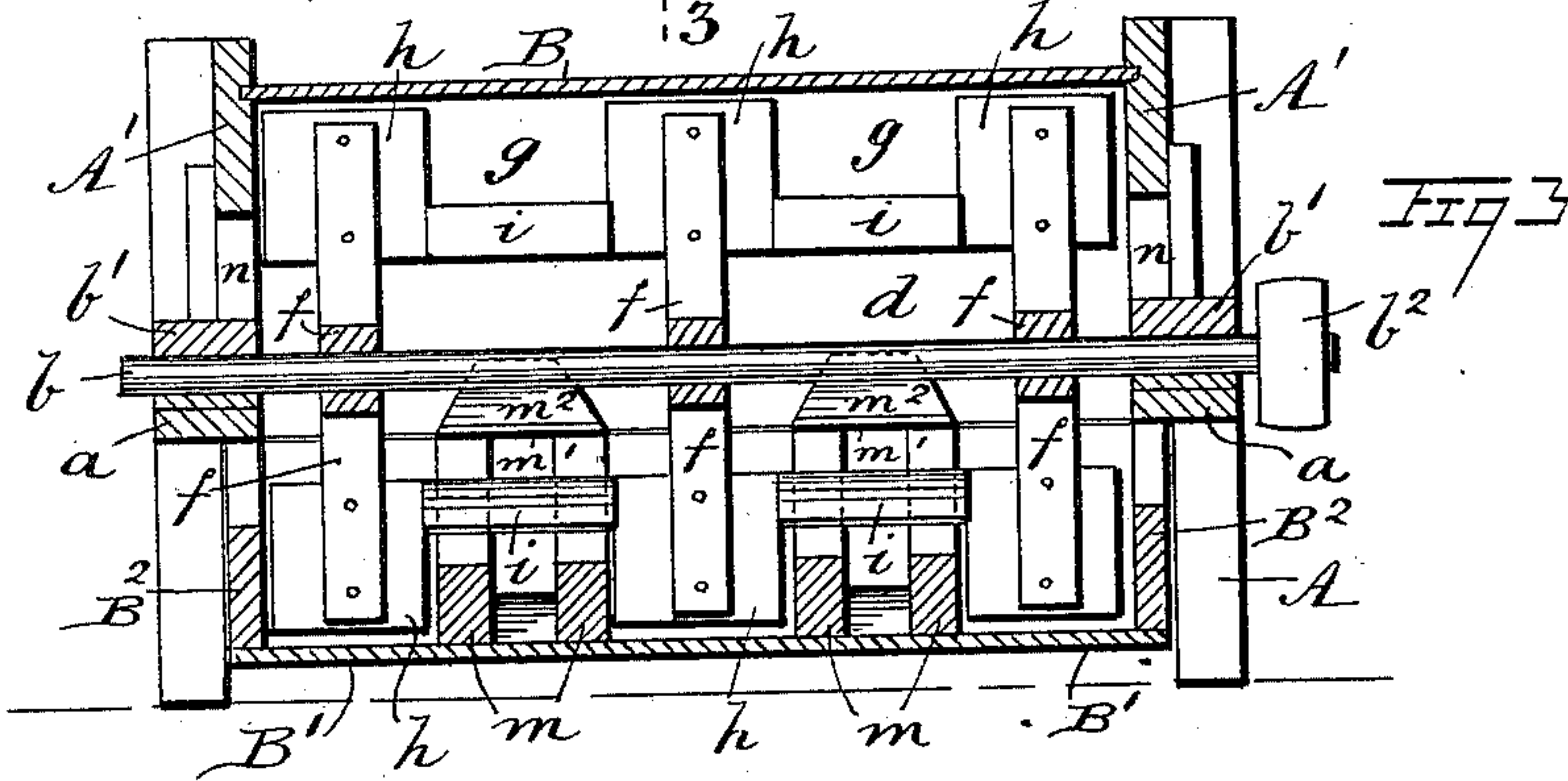
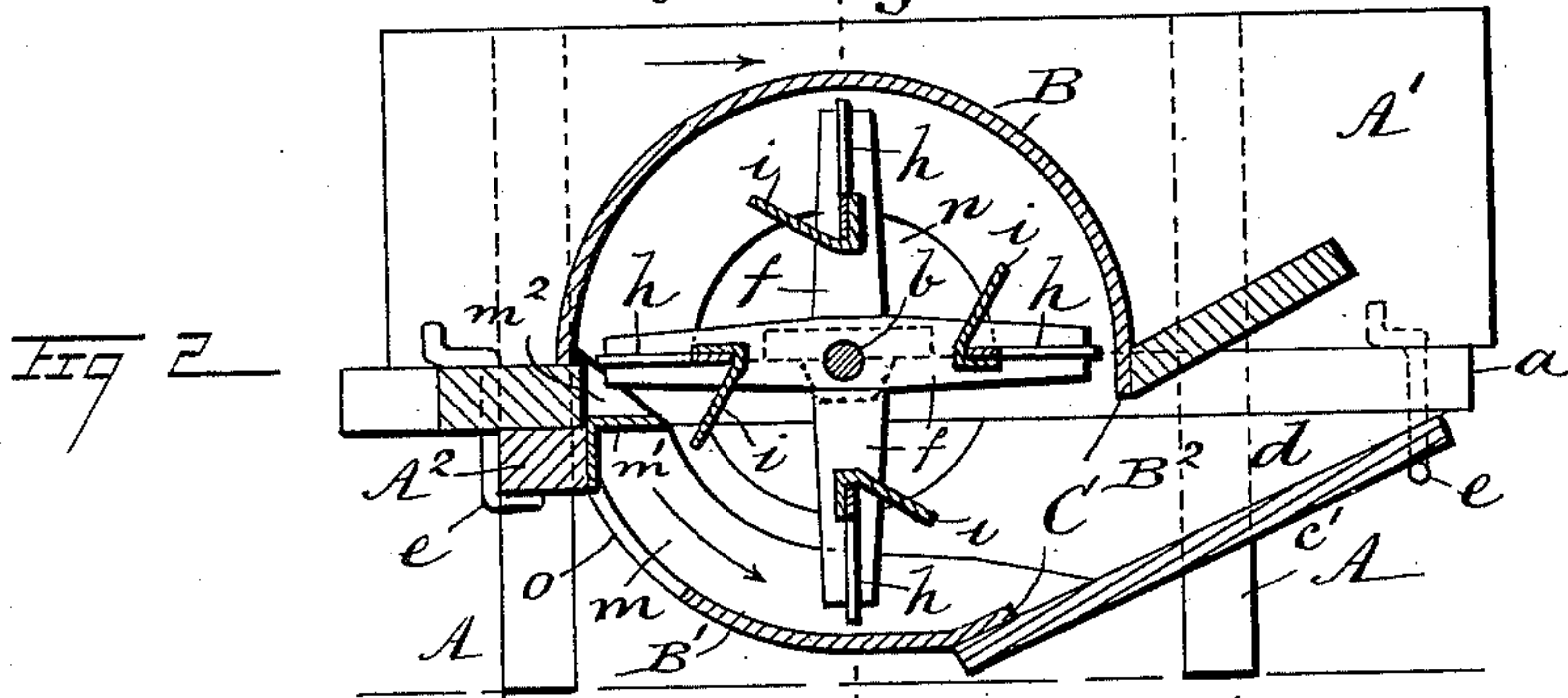
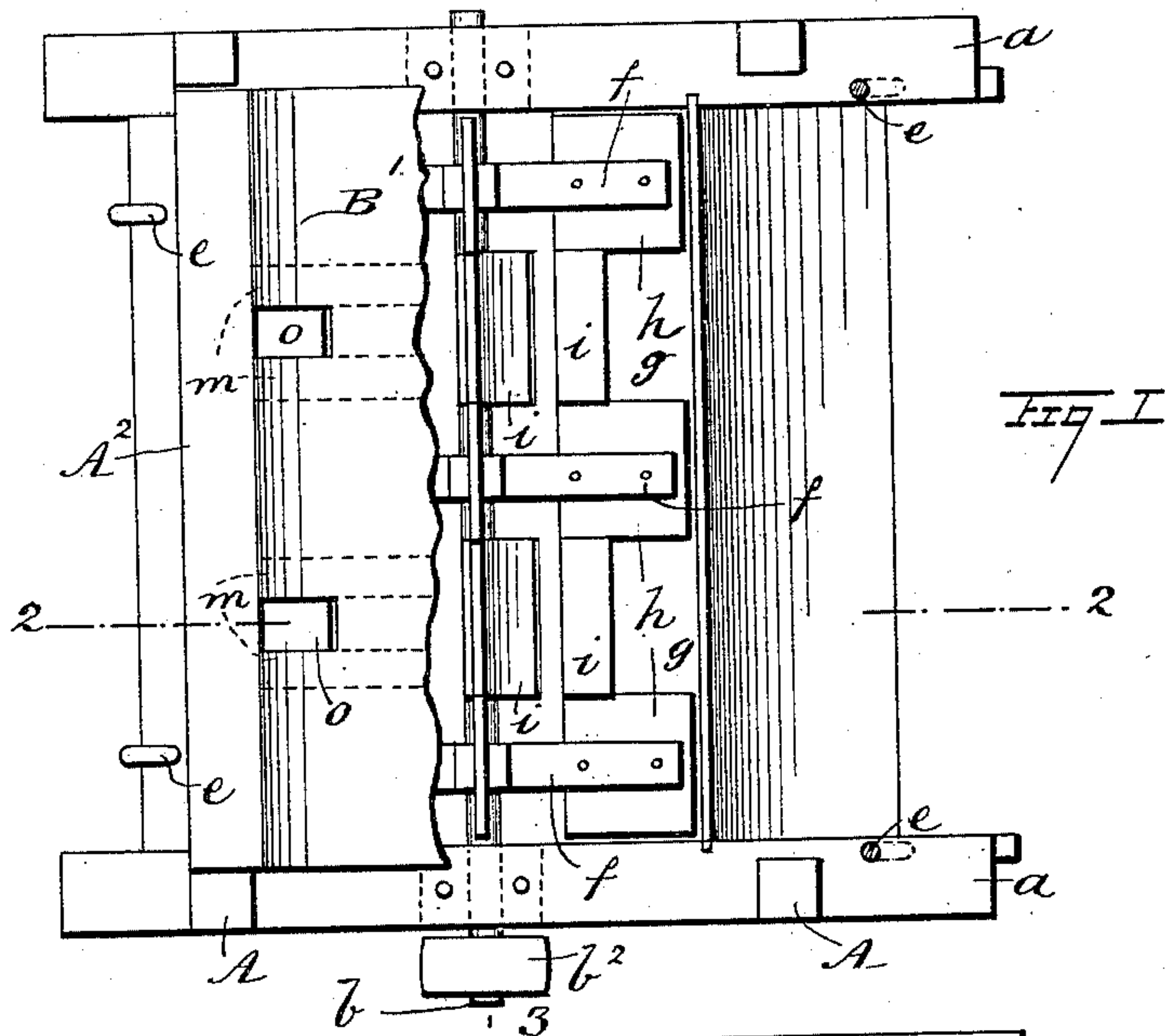


(No Model.)

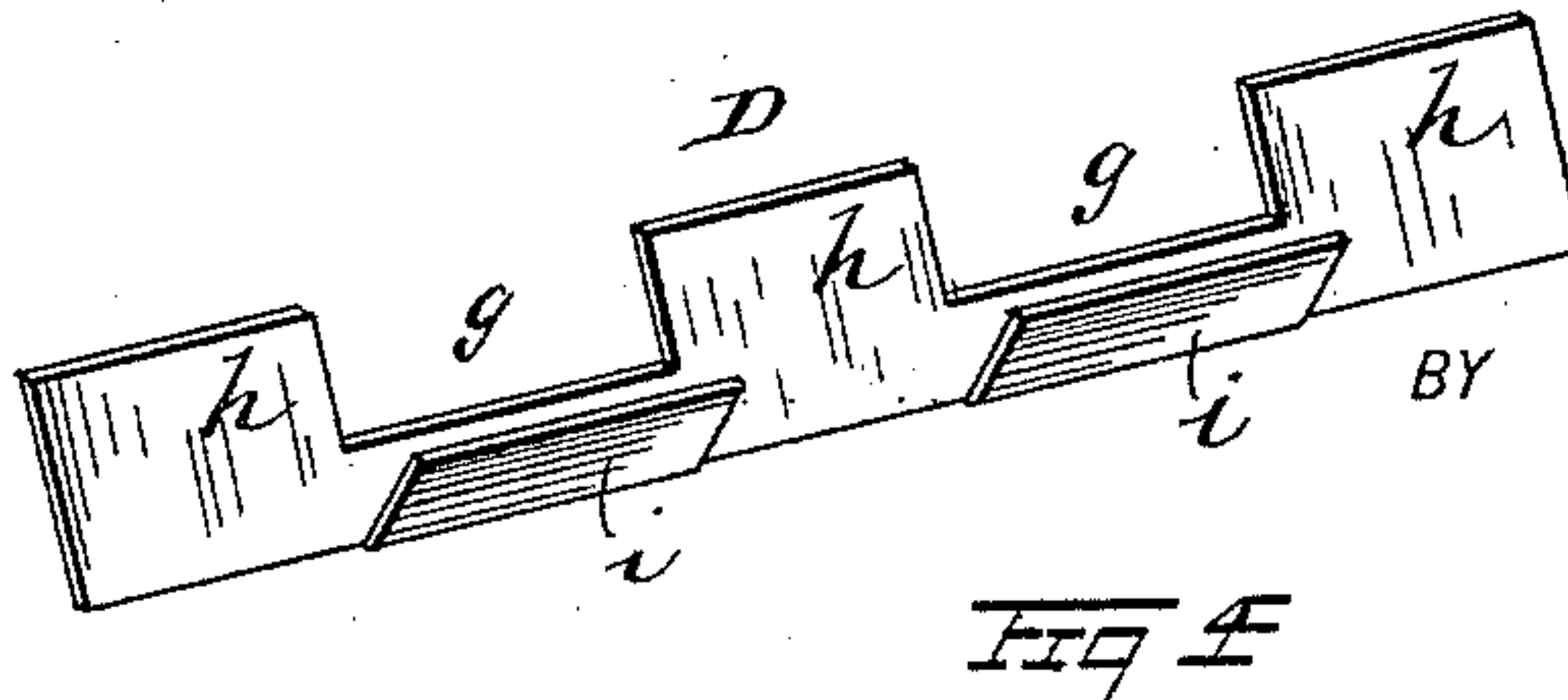
M. WILLIAMS.
FAN BLOWER.

No. 424,696.

Patented Apr. 1, 1890.



WITNESSES:
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INVENTOR:

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UNITED STATES PATENT OFFICE.

MARTIN WILLIAMS, OF ST. JOHNSVILLE, NEW YORK.

FAN-BLOWER.

SPECIFICATION forming part of Letters Patent No. 424,696, dated April 1, 1890.

Application filed February 1, 1890. Serial No. 338,903. (No model.)

To all whom it may concern:

Be it known that I, MARTIN WILLIAMS, of St. Johnsville, in the county of Montgomery and State of New York, have invented a new and useful Improved Fan-Blower, of which the following is a full, clear, and exact description.

This invention relates to improvements in a type of air-blast producers in which a shaft with radial blades is revolvably supported within a cylindrical case having a discharge-throat for air-blast in the direction of revolvable movement of the blades, and particularly to such fans as are employed in connection with grain thrashers and cleaners.

The object to be attained is to provide a copious supply of air at one or more points between the ends of the blower-shaft, which will re-enforce the usual supply afforded at the sides of the casing of the fan around the shaft ends.

To this end my invention consists in the peculiar construction of the fan-casing and the radial wings or blades of the fan proper, as is hereinafter described, and indicated in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is an inverted plan view of the device, the casing being broken away. Fig. 2 is a side elevation in section taken on the line 2 2 in Fig. 1. Fig. 3 is a vertical transverse section taken on the line 3 3 in Fig. 2, viewed in the direction of the arrow in said figure; and Fig. 4 is a perspective view of one of the fan-blades removed.

A represents the frame of the machine, made of timber in the usual rectangular form, having side boards A' oppositely secured thereto, which are suitably grooved on their inner faces above the horizontal center bars a of the frame to receive the ends of the upper section of the cylindrical casing or shell B of the fan-blower.

Upon the horizontal center bars a a transverse shaft b is supported to revolve by engagement with the boxes b', that are secured to these frame-bars, said shaft being the axial

center of the cylindrical shell B, which latter is transversely apertured at C, upwardly-inclined parallel walls c c' being joined to the edges of the shell, whereby a tangential discharge-throat d is produced, and a band-pulley b² being secured on the projecting end of the shaft b to rotate it. The shell B is divided horizontally below the center bars a, the rear edge of the lower section being secured to a bar A² and its ends being secured to end pieces B², fitting against the lower side of the center bars a, the wall c' being also secured to the end pieces B². By this construction the lower section may be removed to permit an introduction of the fan-shaft and its radial blades. The lower section B' is adjustably held in place by the turn-latches e, attached at the four corners of the machine and engaging the bar A² and wall c'.

On the fan-shaft b three spaced spiders are secured, equal distances being allowed between the outer spiders and the ends of the shaft, each spider consisting of four radial arms f and a hub, the arms being at right angles to each other and of a length to freely revolve in the shell B. On the arms f, that align in series, four fan-blades are secured parallel with the shaft b and cylindrical wall of the shell B. The fan-blades D are of similar form and dimensions, and each has two rectangular notches g cut in the outer edge, for a purpose to be hereinafter explained, said notches equaling in length the blade-sections h which remain. Referring to Fig. 4, that exhibits the form of the several fan-blades, two blade-sections i are shown, which are attached to the inner edge of the blade opposite the rectangular notches g, these blade-sections being inclined at an angle to the general surface of the blade.

On the inner surface of the portion B' of the fan-shell, at such points as will permit the radial blade-sections h to revolve freely near to and between them, two sets of parallel curved ribs m are secured, which ribs extend from the bar A² forward to the wall c' of throat d and the space between which at the tops or inner ends thereof is closed by a plate m', above which is a tapering cap m², which plate and cap may be integral, if pre-

ferred. The ribs *m* and space therebetween are opposite the notches *g* and inclined sections *i* of the blades *D*. Induction-ports *o* are made in the shell-section *B'* beneath the cap-plates *m'*.

In operation, by the revolution of the blades *D*, air is drawn in at the end openings *n* and driven forward by the sections *h* of the blades *D*, which current of air is increased in volume by air drawn in through the ports *o* by reason of the air being driven forward by sections *h* of the blades *D* and the passage of the inclined sections *i* of the blades along the ribs *m*.

By the methods of construction herein described a fan-blower of small radial diameter and increased length is provided, which are features of advantage in a fan attachment for a grain thrasher and cleaner, and a more powerful blast is secured by the same speed and area of blade-surface than can be otherwise attained, owing to the induction of air into the fan-shell at points intermediate of the ends, where the usual circular air-inlets *n* are formed around the shaft *b*, whereby the general efficiency of the fan-blower is greatly increased.

There may be an increased number of induction air-ports *o* provided, if found desirable, with a corresponding change in the number of blade-sections.

The device, as shown, is adapted to have the fan revolve in the direction of the curved arrow in Fig. 2, as an "undershot" fan; but if the direction of the blast is preferred to lead differently it may be changed to the upper side of the fan and the angular set of the blade-sections *i* be reversed to produce an "overshot" fan in an obvious manner.

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

1. In a fan-blower, the combination, with a fan-shell, of a revoluble shaft therein and inclined blade-sections alternating with radial blade-sections secured as blades on the fan-shaft, substantially as set forth.

2. A fan-blower having its fan-blades constructed with alternate inclined and radial

blade-sections on each complete fan-blade, substantially as set forth.

3. A fan-blower having its shell *B* provided with re-enforcing air-induction ports *o*, located between the end air-inlets *n*, substantially as set forth.

4. In a fan-blower, the combination, with a shell having air-apertures at its ends and air-ports in its wall between the ends, of a revoluble shaft within and radially-supported blades on the shaft, each having alternate inclined blade-sections and radial blade-sections thereon, substantially as set forth.

5. In a fan-blower, the combination, with a frame and a cylindrical shell having end air-inlets and air-ports on the side between the end air-inlets, of an axially-central transverse shaft which is revoluble, radially-supported blades on the shaft, each blade having radial blade-sections and intervening inclined blade-sections, which inclined blade-sections are opposite the air-ports in the shell, substantially as set forth.

6. In a fan-blower, the combination, with a shell having air-apertures at its ends, air-ports in its wall between the ends, and parallel ribs on the inner face of its wall, of a revoluble shaft and radially-supported blades on said shaft, each blade having alternate radial and inclined sections, substantially as set forth.

7. In a fan-blower, the combination, with a frame and a cylindrical shell having end air-inlets, intervening air-ports, a discharge-throat opposite the air-ports, and parallel ribs on its inner surface that form air-passages from the air-ports, of a central transverse shaft, means to revolve the shaft, and radially-supported fan-blades on the shaft, each blade having spaced radial blade-sections and intervening inclined blade-sections, which inclined sections are opposite the air-ports and revolve near to the ribs on the shell, substantially as set forth.

MARTIN WILLIAMS.

Witnesses:

C. MUNK,

OTIS WILLIAMS.