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PATENTED DEC. 6, 1904.

C. E. POPE.
PAPER PULP BRUSHING ENGINE.
APPLICATION FILED OCT. 26, 1903.

NO MODEL.

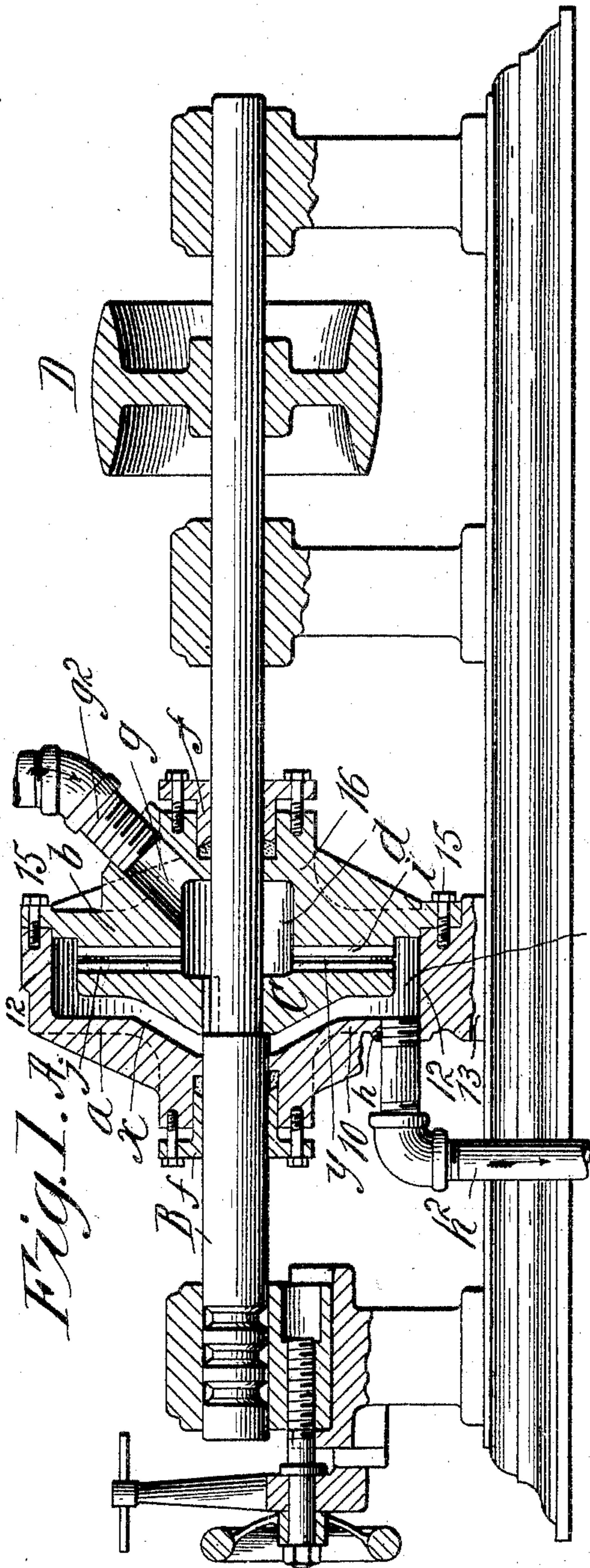


Fig. 3.

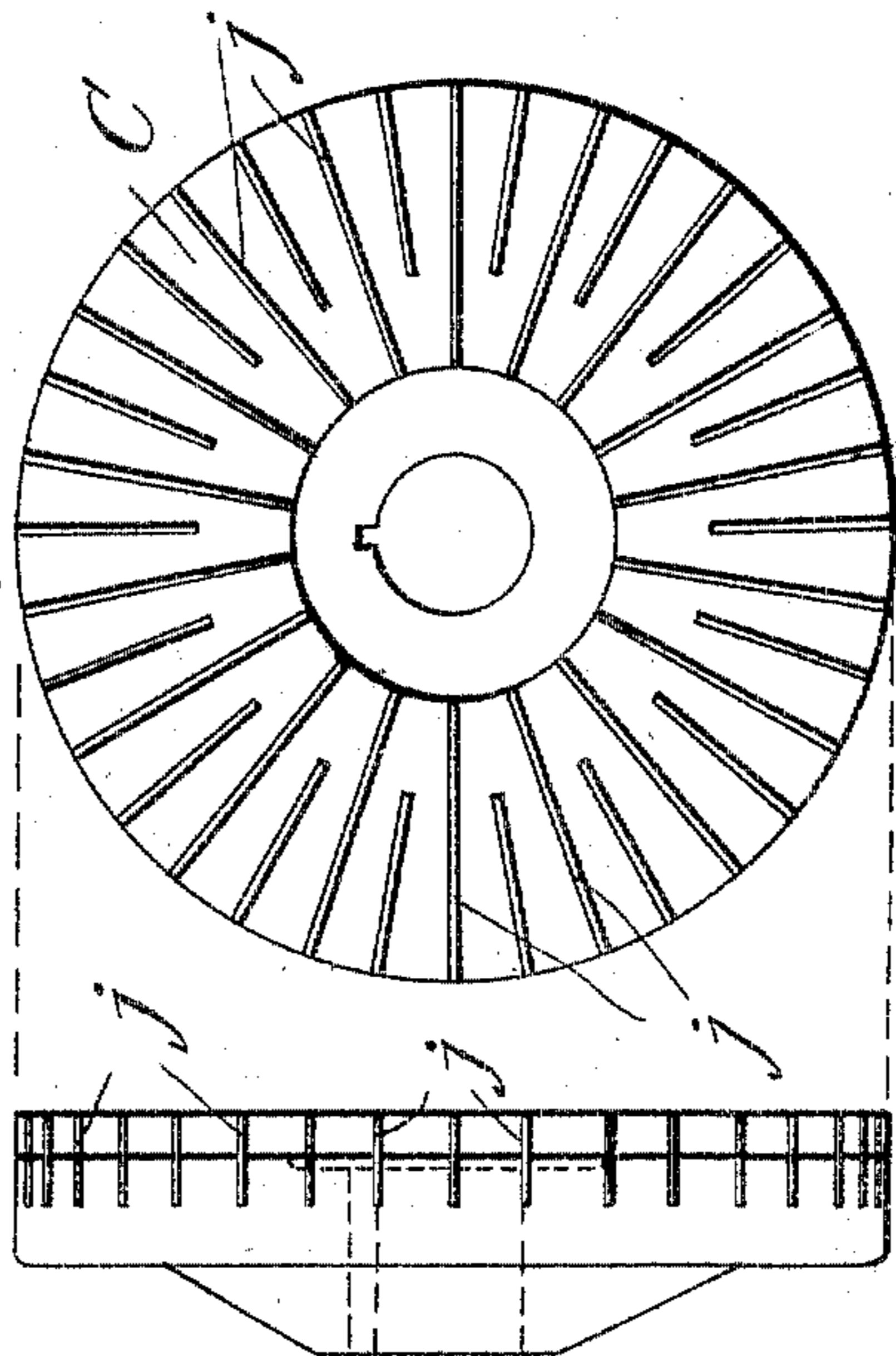


Fig. 4. C

Fig. 2.



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UNITED STATES PATENT OFFICE.

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PAPER-PULP-BRUSHING ENGINE.

SPECIFICATION forming part of Letters Patent No. 776,755, dated December 6, 1904.

Application filed October 26, 1903. Serial No. 178,496. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. POPE, a citizen of the United States of America, and a resident of South Hadley, in the county of Hampshire and State of Massachusetts, have invented certain new and useful Improvements in Paper-Pulp-Brushing Engines, of which the following is a full, clear, and exact description.

This invention relates to an improved machine or engine for operating on stuff or pulp for paper, which is subjected to the action thereof whereby the pulp is in a manner "brushed" and "evened," all lumps and hard or bunched portions of the pulp being converted to the desired uniform and impalpable quality required for the making of good paper. A primary requisite is that the engine will act to brush and render the pulp entirely even without grinding or breaking up the fiber.

The invention has for its object to produce an engine having the stated capability which is of extremely simple construction, embodying but comparatively few easily and economically constructed parts, which, however, have such novel arrangements and coöperative relation as to be entirely practicable and efficient.

The invention consists in the combination and arrangement of parts and the constructions of certain of the parts, all substantially as hereinafter fully described in connection with the accompanying drawings and set forth in the claims.

In the drawings, Figure 1 is a central longitudinal sectional view through the engine. Fig. 2 is a face view of a fixed part or section of the chambered body of the engine, showing a series of blades or ribs with which its inner face is provided. Fig. 3 is a face view of a circular or disk-like blade-provided part carried by the rotary shaft of the engine and rotatable within the chambered engine-body. Fig. 4 is an edge view of Fig. 3.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the chambered body of the engine, and, as shown, the same comprises an axially-horizontal cup-shaped section *a*, the same including the circular wall forming back 10 and the annular flange or rim 12, and said section is provided

with a suitable supporting-base 13, and said body, furthermore, comprises the second section *b* of circular form, marginal portions of which are bolted at 15 to the flange-like portion 12 of section *a*, this said section *b* having the axially-extended hub-like integrally-formed part 16, within which is a centrally-located space or pocket *d*, inwardly opening to the inner face of said section *b*, which is plane and perpendicular to the axis of the engine-body and the shaft B extended therethrough, stuffing-boxes *f f* being provided in the outwardly-endwise hub-like extensions of the section *b* and the said section *a*. The section *b* has, through the hub-like extension 16 thereof, the obliquely downwardly extended passage *g*, connected with which is a pulp-supply pipe *g*².

A circular or disk-like part C is located within the chamber created within the engine-body formed as described, the outer edge of this part being at some distance, as shown, within the inner surface of the annular flange 12 of engine-body section *a*, and its back is separated by a little distance and substantially as shown from the inner substantially vertical face of the section *a*, so that there is created an annular space *x*, corresponding to the conformation of a cup, such space surrounding the edge and back of the rotary part C and communicating with the centrally-located pocket radially by way of the space *y*, between the inner face of part C and the relatively adjacent inner face of engine-body section *b*.

h indicates a passage for outlet of the brushed pulp leading from the outermost and concentric annular wing of the aforementioned space *x*, said outlet having connected therewith and extended therefrom the pulp-delivery conduit *h*².

The inner face of section *b* has a series of ribs or blades *i i* extending in approximately radial lines, which, however, as shown in Fig. 2, are tangential to an imaginary circle intermediate between the axis and an outer portion of the circular section *b*, said blades or alternate ones thereof extending to or about to the aforementioned centrally-located pocket in the one direction and in the other or outward direction to or about to coincident with

a circle corresponding to the periphery of the shaft-carried disk-like part C. Within the outwardly-divergent spaces between the longer ribs are alternating shorter ribs, as shown. The rib-provided section *b* of the engine-body may with practicability be produced by making saw-kerfs within the inner face of the section, providing the ribs or blades in the form of straight metallic strips of uniform thickness and preferably with their edges square and of widths greater than the depths of the kerfs, forcing such strips edgewise and partially of their widths into the kerfs, and calking or inwardly forcing the margins of the kerfs against the sides of the strips. The disk-like part C is provided with a series of radial ribs *j j*, arranged within an annulus corresponding to and opposite that in which the ribs *i i* are comprised, these ribs *j* being confined in kerfs and projecting edgewise beyond the space of the disk C in substantially the same manner as described for the ribs of the stationary section *b*. As shown in Fig. 1, the edges of one set of ribs are in a plane parallel to and slightly separated from that in which the edges of the other set of ribs have their location.

The shaft B has the pulley D thereon, whereby such shaft and the rib-provided disk C may be rotated at suitable speed.

The pulp being introduced through conduit *g*² and passage *g* into the centrally-located pocket *d* is crowded or flows more or less outwardly and is subjected to the brushing and evening action of the fixed and rotary sets of blades between which it is brought, and the centrifugal tendency which the pulp acquires causes it to have a progression outwardly into the cup-shaped annular chamber *a*, and the evened and brushed pulp may be discharged and delivered through the passage and conduit *h h*².

Both sections *a* and *b* of the engine-body, the disk-like part C, and the blades *i* and *j* may advantageously be composed of brass, the use of iron or magnetic metal being avoided, so that from use, wear, or abrasion of the parts in the engine no particles of metal of a character to stain and impair the pulp and paper made therefrom will be incorporated in the latter, and, furthermore, the use of brass or similar material which is unlike steel, iron, or other refractory metal for the blades enables in the employment of the engine the production of a pulp which as to the fiber thereof is longer and more silk-like than usually attained, and in this connection it may be explained that the blades of brass or analogous metal or metallic composition cannot initially or in use have imparted thereto or acquire sharp cutting edges or corners, so that instead of a chopping or shearing action on the stuff or pulp there is a wiping, brushing, or drawing effect thereon.

Having thus described my invention, what

I claim, and desire to secure by Letters Patent, is—

1. In a machine of the type set forth, the combination with a chambered body member having a suitable base and provided with a horizontally cup-shaped section, of horizontally-extended, integral rims formed upon said member, a second stationary member provided with an enlarged rearward extension having an angularly-disposed feed-passage therein and a pocket centrally located within the same in communication with said passage, marginal flanges having seats therein adapted to receive the said rims of the first-named body portion, non-rotatable blades composed of brass radially mounted in the inner face of the second body member, a shaft extending through both members, a circular member carried by the shaft at a distance from the inner face of the first-named body member adjacent the blade-carrying face of the second member, and a series of rotatable, brass blades, mounted in the face of said circular member extending toward the blades of the stationary member, substantially as described.

2. In a machine for brushing stuff or pulp for paper, in combination, a chambered body comprising an axially-horizontal cup-shaped section, provided with a supporting-base, and a second section marginal portions of which are bolted to the flange-like rim of the first section, having a centrally-located pocket therein, an outwardly endwise-extended enlargement provided with an angularly-disposed rearwardly-extending feed-passage therethrough leading into said pocket, and having at its inner face a series of substantially radially arranged non-rotatable blades, all thereof outwardly terminating at a distance within the inner wall of the rim portion of said first-named cup-shaped section, a shaft extending axially through, and rotatable within, the chamber in said body and having a circular part affixed thereon and rotatable therewith, and provided with a series of blades rotatable therewith, extending edgewise from its face toward the blades of the said second section of the body, and said circular member having its location within the chamber of said body, edgewise inside of the aforementioned body-section flange-rim, and at a distance from the substantially vertical face of said section, whereby there is created an annular space beyond the outer ends of both sets of the blades, and at the back of the said circular blade-provided member, and an outlet-conduit leading through the wall of the chambered body from the annular chamber there-within, and means for rotating said shaft.

Signed by me at Springfield, Massachusetts, in presence of two subscribing witnesses.

CHARLES E. POPE.

Witnesses:

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A. V. LEAHY.