

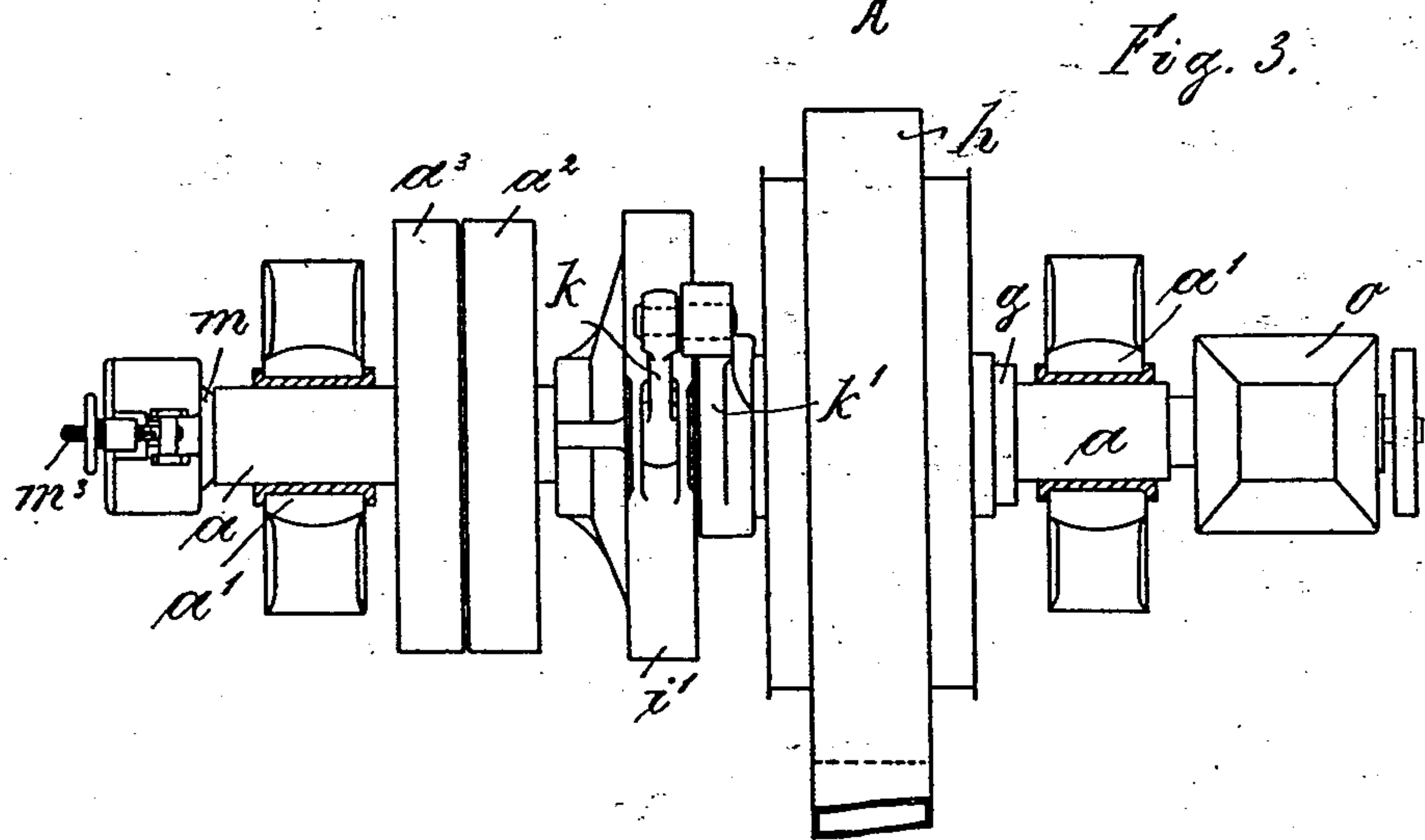
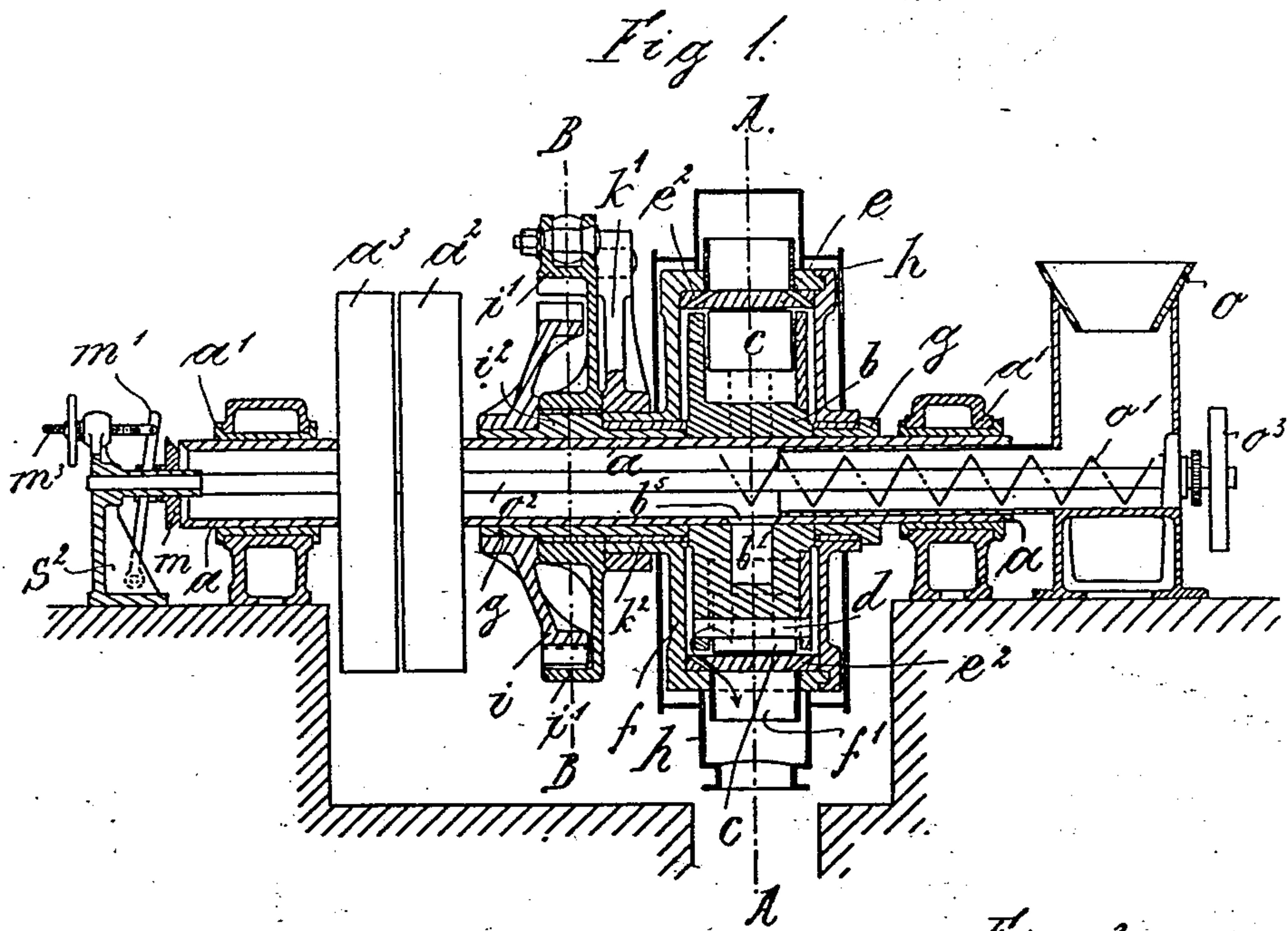
No. 855,602.

PATENTED JUNE 4, 1907.

J. WÜSTENHÖFER.
ROLLER MILL.

APPLICATION FILED FEB. 14, 1908.

2 SHEETS—SHEET 1.



Witnesses:
Arthur Scholz
Carl Reuss.

Inventor:
Julius Wüstenhöfer
by Robert Weipert
Attorney

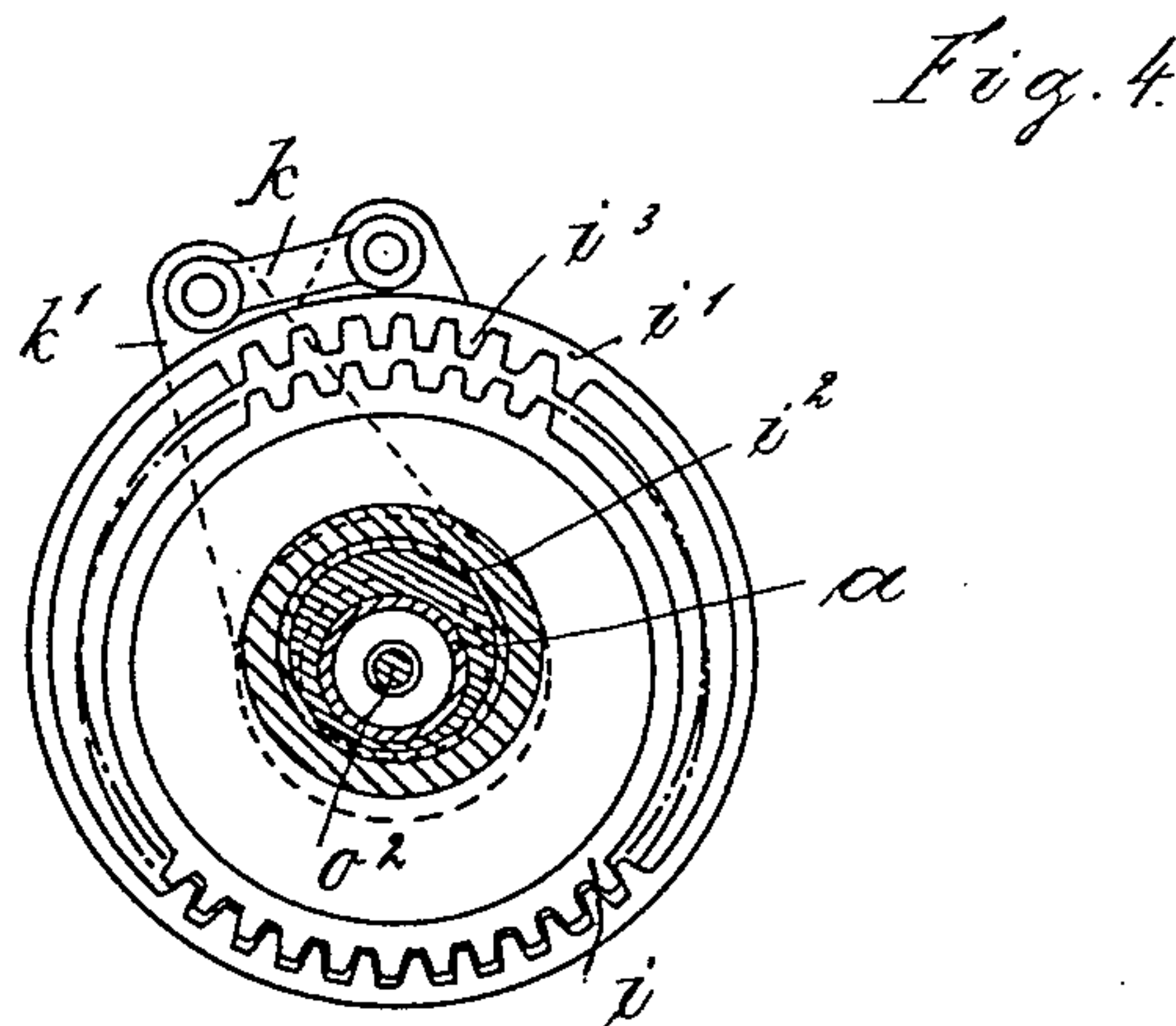
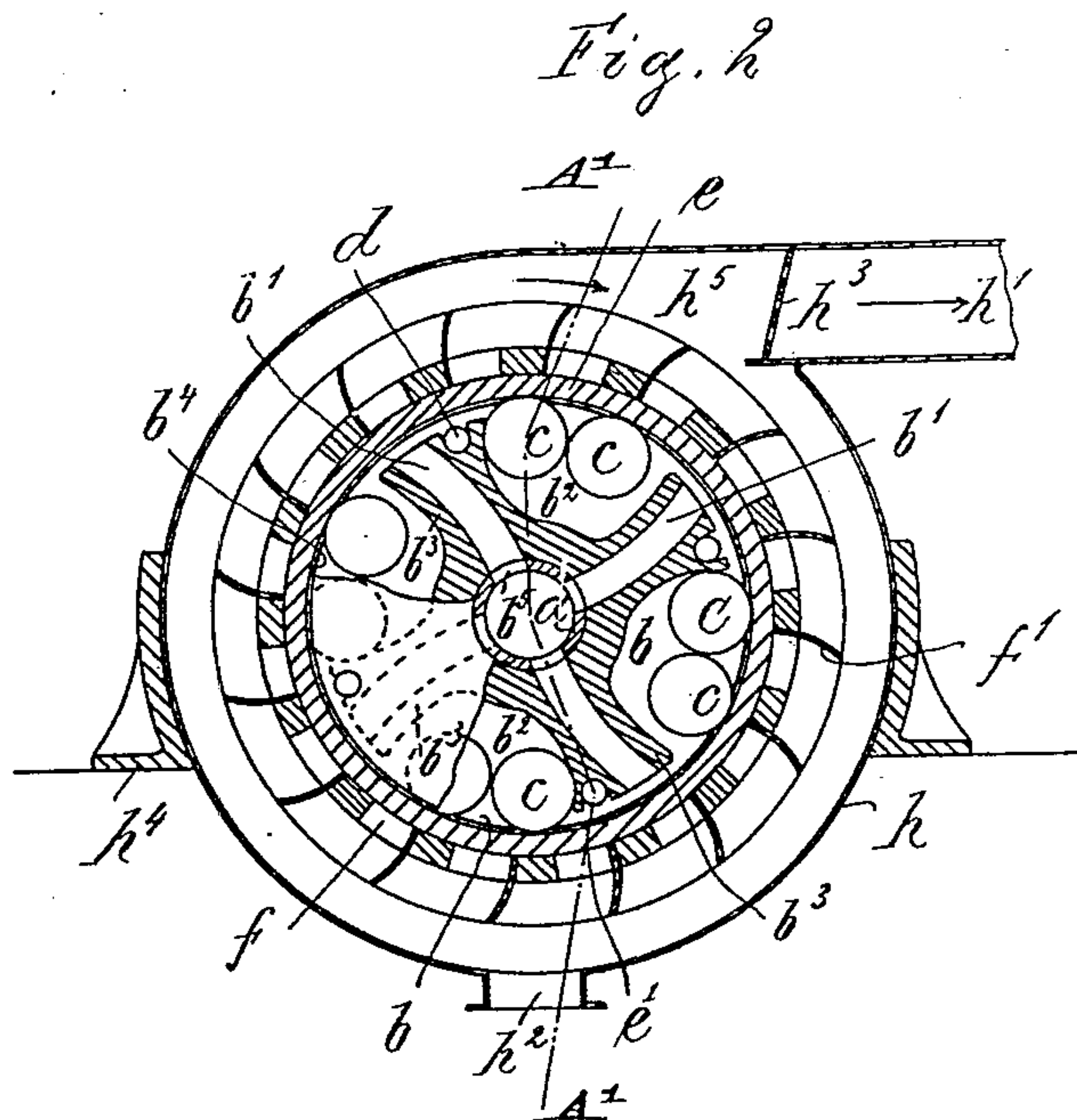
No. 855,602.

PATENTED JUNE 4, 1907.

J. WÜSTENHÖFER.
ROLLER MILL.

APPLICATION FILED FEB. 14, 1906.

2 SHEETS—SHEET 2.



Witnesses
Arthur Scholz
Carl Rupp.

Inventor:
Julius Wüstenhöfer
by [Signature]
Attorney

UNITED STATES PATENT OFFICE.

JULIUS WÜSTENHÖFER, OF DORTMUND, GERMANY.

ROLLER-MILL.

No. 855,602.

Specification of Letters Patent.

Patented June 4, 1907.

Application filed February 14, 1906. Serial No. 301,049.

To all whom it may concern:

Be it known that I, JULIUS WÜSTENHÖFER, a subject of the King of Prussia, and a resident of 56 Kronprinzenstrasse, Dortmund, in the Province of Westphalia, German Empire, have invented certain new and useful Improvements in Roller-Mills, of which the following is an exact specification.

My invention relates to roller mills and more especially to grinding mills in which the articles to be ground are disintegrated and powdered by the centrifugal power of rollers. These rollers travel over grinding surfaces and are operated by a wheel having a specific form, the so-called driver.

In order to make my invention clear, I refer to the accompanying drawing, in which:

Figure 1 is a longitudinal section of my improved grinding machine, on line A'—A' of the Fig. 2. Fig. 2 is a vertical cross section on line A—A of Fig. 1. Fig. 3 is a plan view of the machine, Fig. 4 is a vertical cross section on line B—B of the Fig. 1.

In the drawings *a* is a hollow shaft and *a'* bearings carrying said shaft *a*. On the latter the wheel *b*, the so-called driver, is mounted and secured thereto. The driver *b* is provided with channels *b'* and with chambers *b²*. In these chambers two rollers *c* are situated. More than two rollers can be employed according to the special requirements of the work. The arms *b³* of the driver do not project to the peripheral surface *b⁴* of the driver in order to have a communication between the channels *b'* and the chambers *b²*. In the driver *b* bores *d* are arranged near to its circumference lying parallel to its rotary axis and extending through the driver. The channels *b'* are in communication with the hollow shaft by openings *b⁵* provided therein. The driver *b* is surrounded by a grinding mantle *e* provided with the grinding surface *e'*. The mantle *e* is provided with openings *e²*, the purpose of which is hereinafter described. The mantle *e* is fixed to a casing *f*, loosely mounted on the hollow shaft *g* which is carried by the hollow shaft *a* and secured thereto. The casing *f* is provided with floats *f'* to form a fan and is put in motion in the manner as hereinafter described. The casing *f* is inclosed air-tight by an outer case *h* having two openings *h'* *h²*; the former being provided with a sieve *h³*. The case *h* is carried by supports *h⁴* mounted on the bottom of the working room.

In order to operate the casing *f* together

with the steel mantle *e* carrying the grinding surface, a differential mechanism and a truck crank is provided, as can be seen from Fig. 4. The toothed wheel *i* is stationary mounted on said hollow shaft *g*. The wheel *i'* is eccentrically mounted on the shaft *g* by means of the annular projection *i²* and being provided with an inner toothed boss *i³* with which the toothed wheel *i* engages. The wheel *i'* runs idle on the shaft *g*. For the purpose of transmitting the motion of the wheel *i'* to the casing *f* the wheel *i'* is connected by means of the rod *k* to the truck crank *k'* firmly attached at the hub *k²* of the casing *f*.

In order to impart to the casing *f* a number of revolutions somewhat increased over that of the driver *b* the driving mechanism as just before described is used. If for example the number of teeth of the toothed wheel *i* amounts to *n* and that of the inner toothed boss *i³* amounts to *n* + 1 the ratio of transmission between the casing *f* and the driver *b* is $\frac{n+1}{n}$.

The casing *f* and the mantle *e* carrying the grinding surface can be of course stationary arranged.

The hollow shaft is rotated by means of the pulley *a²* and for stopping the machine the pulley *a³* is provided running idle on the shaft *a*.

The hollow shaft *a* is closed at its left hand side by a valve *m* which can be adjusted by means of the lever *m'* hinged at the support *s²* and of the adjusting screw *m³*.

At the righthand side a feeding device is arranged consisting of the funnel *o* and the worm *o'* situated in the hollow shaft *a* and carried by the rod *o²* rotated by the belt disk *o³*.

The machine as before described operates in the following manner:—The articles to be ground or disintegrated are introduced by means of the hopper *o*, fed to the driver *b* by the worm *o'*, and enter the chambers *b²* through the openings *b⁵* of the shaft *a* and the channels *b'*. As the driver *b* rotates, the articles to be ground are pressed against the grinding surface *e'* and also the rollers *c* are taken along by the driver and thereby rotated. Owing to the centrifugal power these rotating rollers are forced with a considerable pressure against the grinding surface, thereby grinding the grains and the like. However not only on the grinding surface a disintegration takes place, but also between the

rollers c themselves and the rollers and the walls of the chambers b^2 . For obtaining a large centrifugal power at a small relative motion between the rollers and the grinding surface the latter is driven by the described differential mechanism.

Rollers of equal or different diameters or of varied shapes may be used and the grinding mantle adapted in form thereto. Rollers worn out by the operation of the mill may be readily replaced by new ones.

Owing to the arrangement of the floats f' the rotating casing f acts like a fan and the ground articles, say the finished product, is sucked up and conveyed through the openings d traveling together with the driver over the grinding surface, and the apertures e^2 of the mantle e to the space h^5 and therefrom to the opening h' in order to be led away. The quantity of air, from which the largeness of the grain sucked up depends, is regulated by adjusting the valve m .

The material not sufficiently ground is separated from the finished product by the sieve h^3 and is discharged from the machine through the opening h^2 .

Having now fully described the nature of my invention, what I desire to secure by Letters Patent of the United States is:—

1. A roller mill comprising in combination, a driver provided with chambers, a plurality of rollers, in each of said chambers being mounted several rollers, a grinding mantle having a grinding surface, a casing to which said grinding mantle is fixed, floats secured to said casing, means for rotating said casing and grinding mantle, a hollow shaft carrying said driver, a hollow shaft co-axially arranged

with said first shaft and supporting said casing, an outer case inclosing said casing and means for feeding the articles to be ground.

2. In a roller mill as described, a hollow shaft for feeding the material to be ground, a plurality of rollers, a driver having chambers for locating several rollers therein, and hollow arms for feeding the material to be ground, and channels lying parallel with said hollow shaft for discharging the ground material, and a grinding mantle cooperating with said rollers and having bores, through which the material passes when ground.

3. In a roller mill as described, a differential mechanism, a casing operated by said differential mechanism, a hollow shaft carrying the latter which consists of a toothed wheel (i) firmly attached to said shaft, a wheel (i') eccentrically and freely mounted on said shaft, and being provided with an inner toothed boss engaging with said wheel (i), a rod (k), a truck crank connected with the wheel (i') by said rod, and firmly attached at said casing.

4. In a roller mill, the combination with a driver, of a hollow shaft, a rod axially arranged in said hollow shaft, a feeding worm carried by said rod, a hopper at one end of said hollow shaft, and discharging therein, a regulating disk at the other end of the hollow shaft mounted on said rod, and means for adjusting the disk.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JULIUS WÜSTENHÖFER.

Witnesses:

PETER LIEBER,
WILLIAM ESSENWEIN.