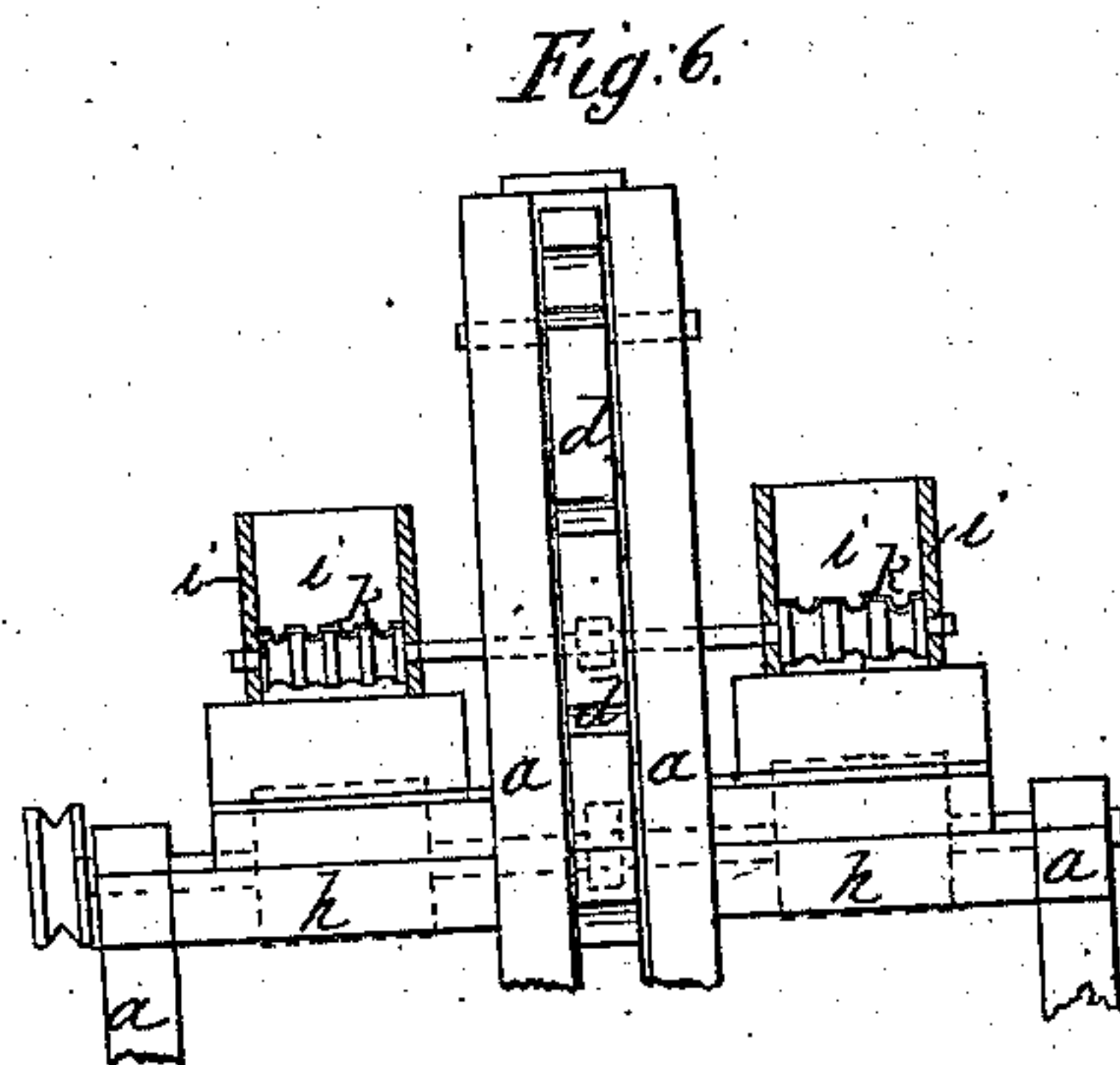
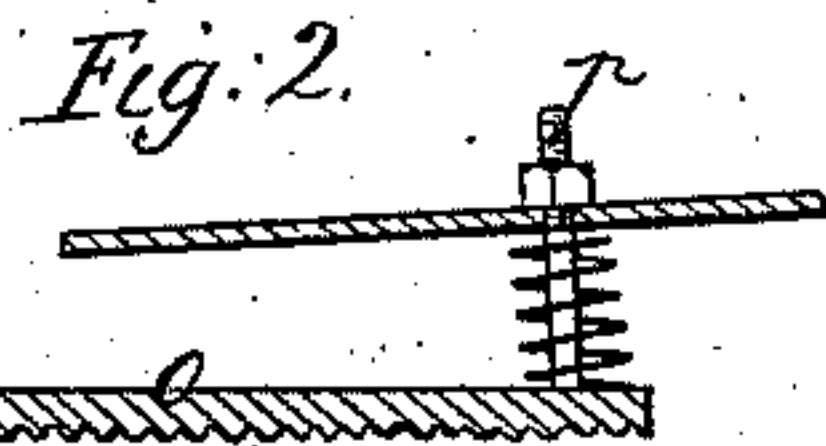
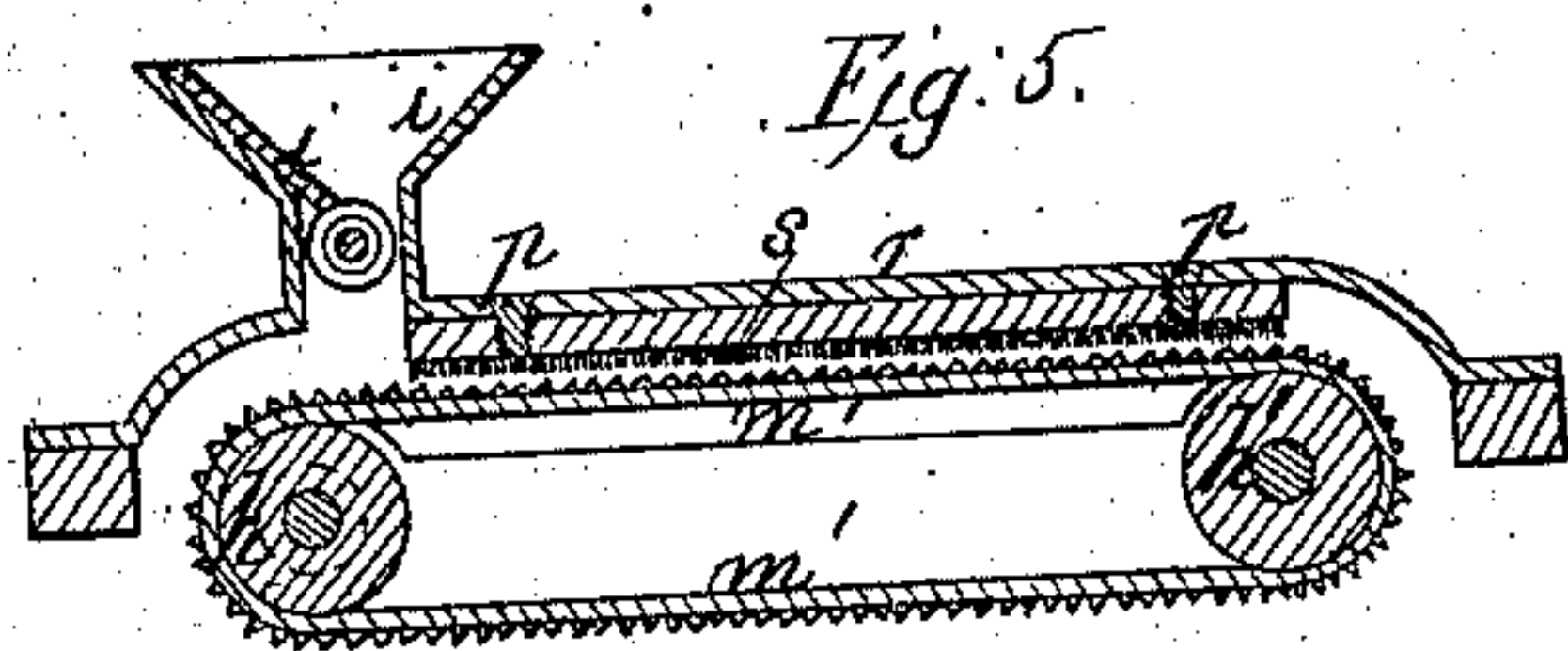
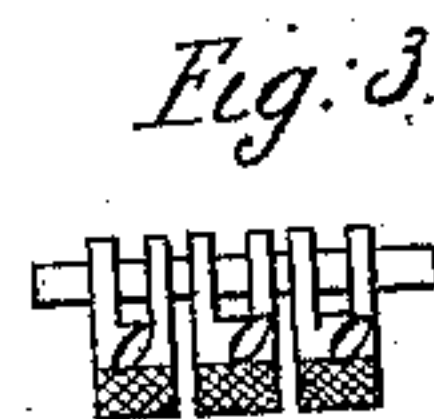
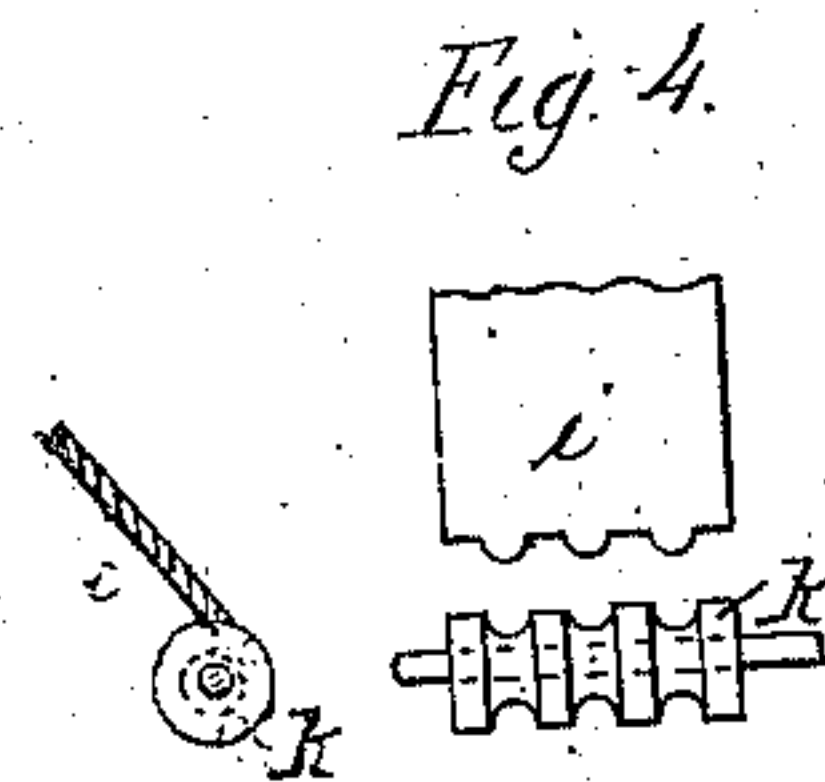
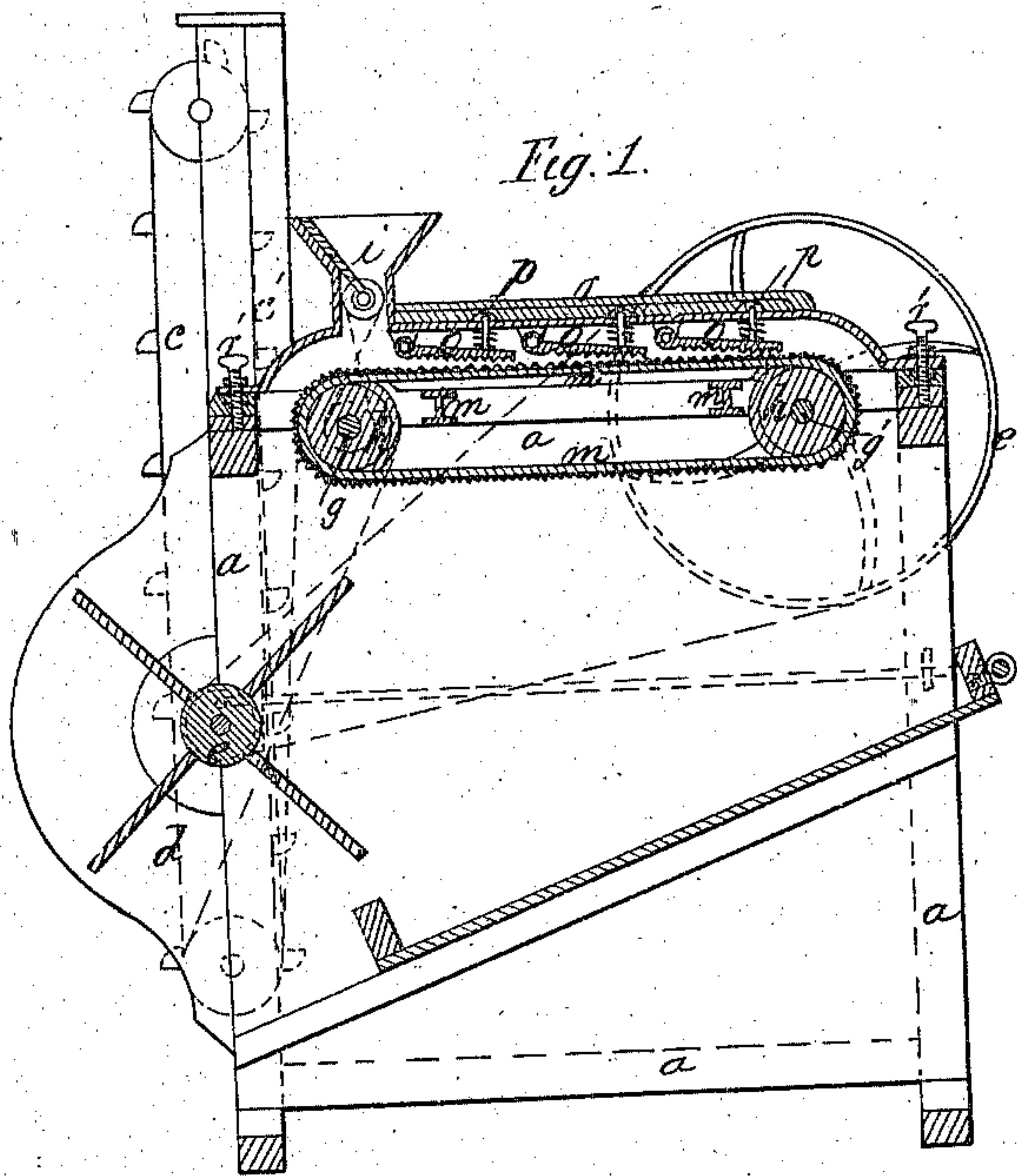


A. Angell.

Hulling Mach.

N^o 87,388.

Patented Mar. 24, 1869.



Witnesses:
M. S. G. Wilde.
E. L. Dyer.

Inventor:
Albert Angell
by J. H. Adams Atty

United States Patent Office.

ALBERT ANGELL, OF NEWBURG, NEW YORK.

Letters Patent No. 87,388, dated March 2, 1869.

IMPROVEMENT IN HULLING-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

Be it known that I, ALBERT ANGELL, of Newburg, in the county of Orange, and State of New York, have invented a new and improved Machine for Hulling and Cleaning Coffee, Rice, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical longitudinal section of a hulling-machine embodying my invention.

Figure 2 is a side view of one of the metal spring-strippers.

Figure 3 is an end view of the same.

Figure 4 represents views in detail of the feed-roller and guards.

Figure 5 is a vertical longitudinal section of my device for cleaning and polishing the kernels after they have been hulled.

Figure 6 represents the arrangement of the hulling and polishing-devices.

The object of my invention is to furnish a machine by which coffee, rice, &c., may be hulled, cleansed, and polished thoroughly, rapidly, and without that large loss of crushed and broken grain which renders machines now in use so inefficient.

By the winnowing and polishing-process to which the grain is subjected, the remnants of the broken hulls are entirely removed.

By my arrangement of the feeding-device, crushing and compacting of the kernels is prevented.

By an adjustment easily made, the same machine may be adapted to all fruits or berries having hulls.

The invention consists in a combination of metallic adjustable-spring strippers, and an endless belt, composed of serrated or roughened plates.

It further consists in the arrangement, in one machine, of a hulling and polishing device, whereby the operations of hulling and polishing the berries may be successively performed while the machine itself is in operation.

Referring to the drawings—

a represents the frame of the machine, *c c'*.

d is an elevating band, for raising the hulled grain to the hopper *i*, from which it is fed to the polisher *s*.

Inclined shaking-tables conduct the grain in the winnowing-chambers to the front part of the machine.

The parts thus far referred to are substantially of the same construction as those in ordinary use.

Upon the shafts *g* are cylinders, or drums *h* and *h'*, by which the endless belts *m* and *m'* are supported.

The endless belts *m* and *m'* are composed of corrugated or serrated metallic plates, which cause the grain to advance with them, and co-operate with the strippers *o* in stripping off the husks or hulls.

The endless belts *m* and *m'* alike, while they are carrying grain under the strippers and polisher, are kept from yielding or sagging, by plane horizontal tables,

placed between the cylinders over which the belts pass, and are supported in any suitable manner.

The strippers *o* are narrow, long bars, having a metallic roughened or corrugated under surface, and are arranged above the belts *m*. They are secured by a pin, passing through a bearing at one end, which permits the other end to be raised or lowered.

A spring, regulated by the bolt *p*, presses the free end of the strippers downward, but does not maintain it so rigidly in one position as to bruise or crush the kernels, but only to remove their hulls.

The covering-plate *r*, to which the springs and screws *p* are attached, can be raised or lowered by means of the screws *r'*, thus diminishing or increasing the force which presses the strippers and the endless belt toward each other.

The adjusting-screws *p* permit a variation of the tension of the pressing-springs, thus adapting the same hullers to grain of various sizes.

The elastic yielding of the strippers *o* enables the machine to run at a considerable speed, without danger to the grain.

Within the throat of each of the hoppers *i* and *i'* is arranged a cylinder, *k*, provided with transverse grooves, so as to allow of the passage of only one kernel or grain at a time.

Guards *j*, of some flat, thin substance, are fastened at one edge to the hopper, while the opposite edge is provided with projections fitting in the grooves of the rollers, or cylinders *k*. These guards are so arranged as only to allow the passage of the grain through the intervals between one edge of the cylinders and the wall of the hopper-throat.

When the machine is in operation, the cylinders *k* so revolve that the part in contact with the current of grain is moving in a contrary direction to it, thus continually relieving the compacted kernels, and maintaining an unobstructed flow of the feed, delivering it uniformly over the advancing belts *m* and *m'*.

While the belt *m* is in motion, the hulled grain falls from it, down through the back part of the winnowing-chamber, upon the shaking-table *a*.

A blast of air from the fan *O*, winnows the falling grain. The back of the winnowing-chamber being open, the course of the blast is unobstructed.

The winnowed grain slides down the inclined shaking-table, and is then elevated by the band *d*, delivered into the hopper *i*, and fed, by the method before described, upon the belt *m'*, which carries it under the stiff brush *S*, by which it is cleansed and polished. Falling from the belt *m'*, it is winnowed again, just as before, and is then delivered from the machine.

I am aware that endless belts, composed of corrugated or roughened plates, are not new, the same being shown in the patent of D. Lombard; and also that spring-pads or strippers have been used, the same

being shown in a patent granted me on the 13th November, 1866. These, therefore, I do not claim; nor do I claim a polishing-device of itself; but

What I do claim, and desire to secure by Letters Patent, is--

The arrangement of an endless belt and springs-trippers, constructed as described, with the elevator *d*, and a polishing-device, composed of the stationary brush

S and endless serrated belt *m'*, operating substantially as set forth.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

Witnesses: ALBERT ANGELL.

J. H. ADAMS,
AUGUSTIN JONES.