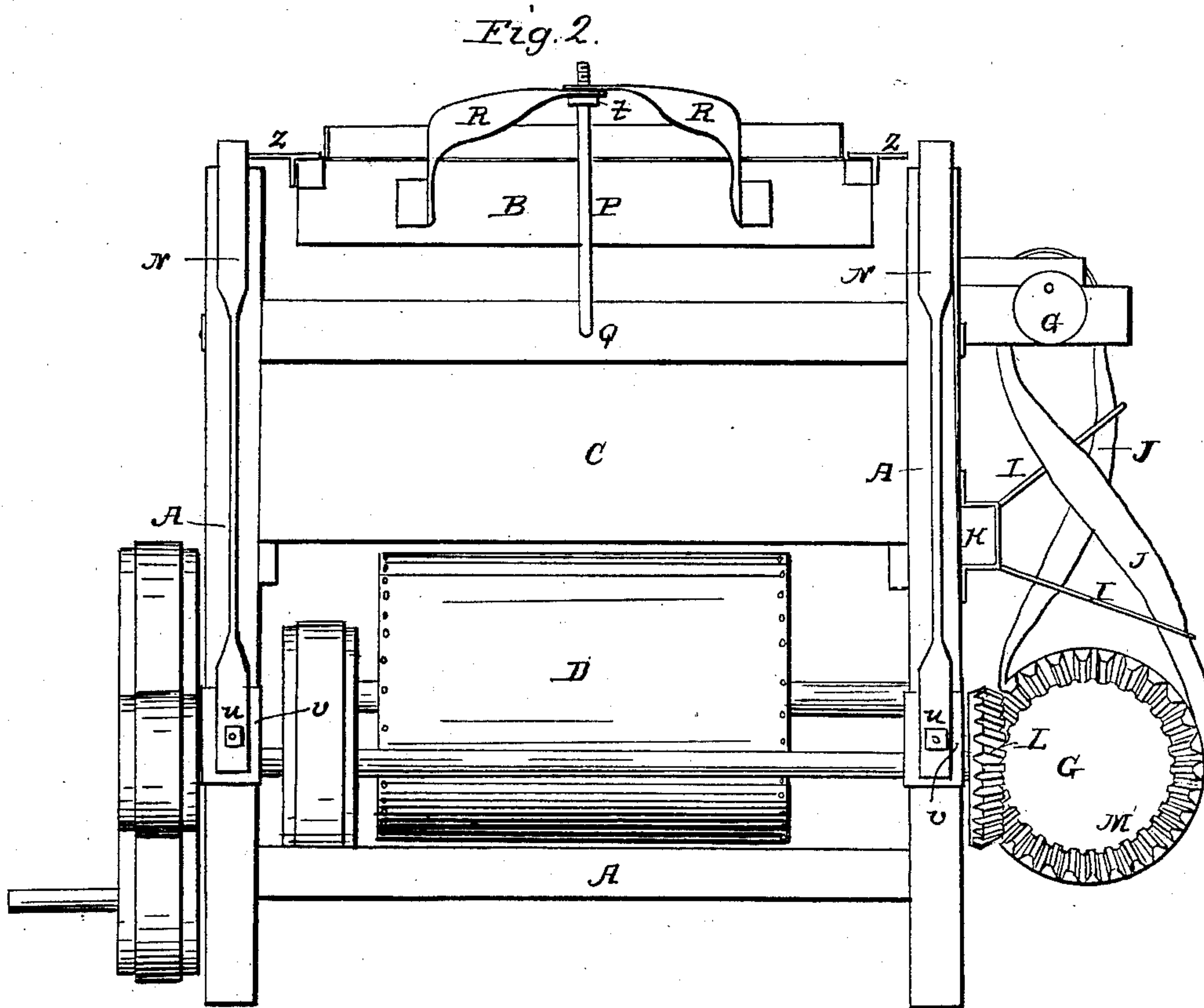
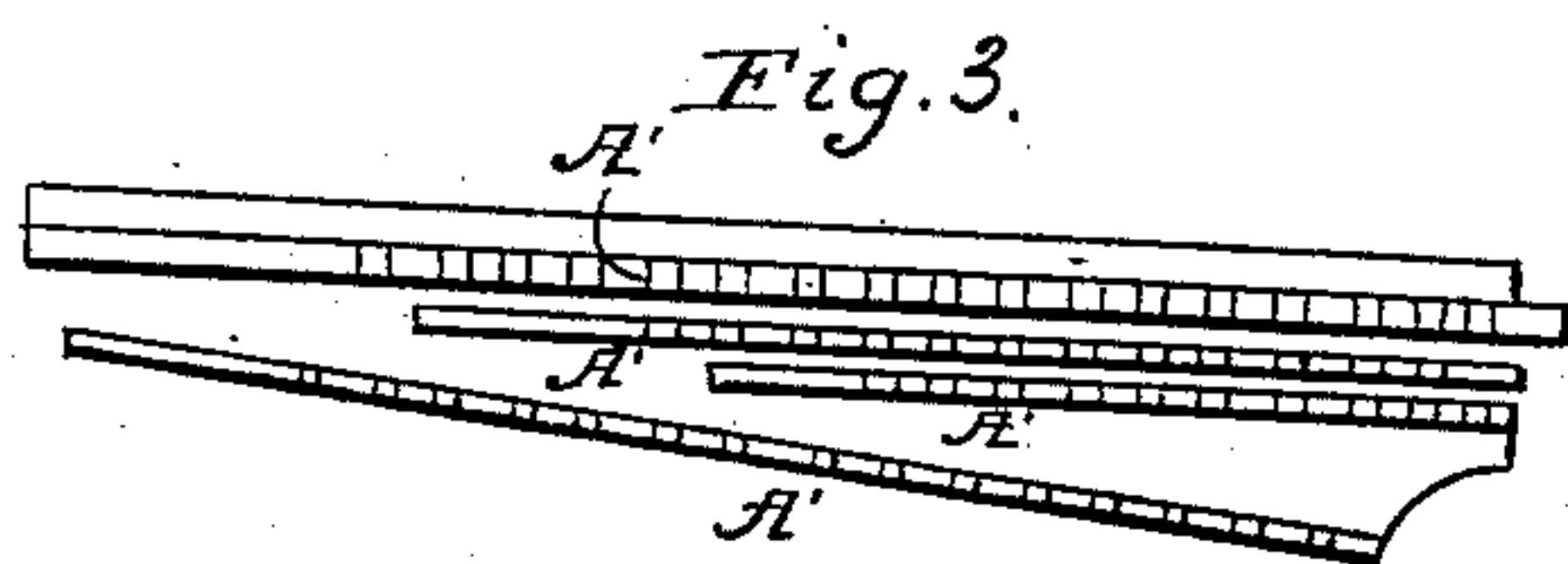
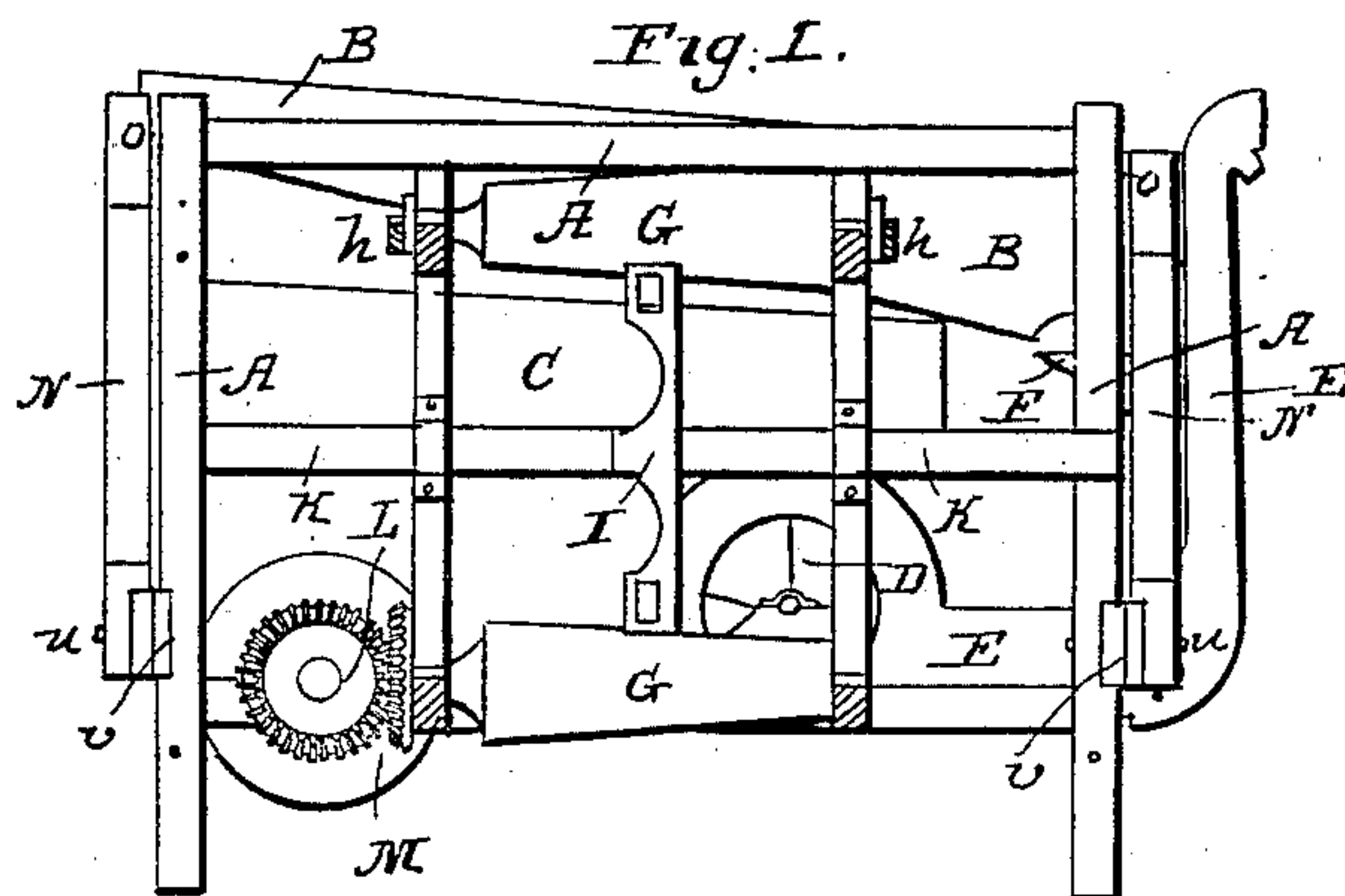


ANGEL & COFFEEN.

Grain Separator.

No. 21,057.

Patented Aug. 3, 1858.



UNITED STATES PATENT OFFICE.

W. H. ANGEL AND M. COFFEEN, OF WATERTOWN, NEW YORK.

WHEAT-SEPARATOR.

Specification of Letters Patent No. 21,057, dated August 3, 1858.

To all whom it may concern:

Be it known that we, W. H. ANGEL and M. COFFEEN, of Watertown, in the county of Jefferson and State of New York, have invented certain Improvements in Wheat-Separators; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference thereon, like letters and marks indicating like parts in all the figures thereof.

Of the drawings Figure 1 is a side view of the separator; Fig. 2 an end view, and Fig. 3 a longitudinal view of the perforated plates.

A large portion of the wheat brought to the mills in this section of the country contains oats, shrunken grains, spurned grains and rat and mice droppings. All of these it is very difficult to separate from the plump and perfect grains of wheat, and unless they are entirely separated the quality of the flour is deteriorated.

The object of our invention is to separate the perfect grains of wheat from all impurities, and this we effect by an arrangement of perforated plates, and in this arrangement, mainly, consists our invention.

To enable others skilled in the art to make and use our invention we will proceed to describe its construction and operation.

In general the structure of our separator is shown by Figs. 1 and 2 of the drawings; (A) indicating the frame; (B) the box containing the perforated plates; (C) the box or drawer underneath the plates, and which is intended to receive the shrunken grains and such other small matter as may pass through all the plates; (D) the fan-blower; (E) the air passage from the blower; (F) the chute to convey the wheat into the air passage; (G) conical shafts to the ends of the upper one of which, on a crank or eccentric pin (*x*), are attached rods (*h*) which extend to and are also attached to the box containing the perforated plates, which rods by the rotation of the conical shafts give motion to the perforated plate box; (I) guide to the roller-band (J); (K) sliding-bar for controlling the guide and band; (L) beveled wheel on the end of a shaft which derives its motion from a main shaft, on which is the fan-blower, and to which it is connected by bands or other means for conveying motion; (M) beveled wheel on the end of the lower conical shaft; (N) spring bars, upon pins (*o*) of which each corner of the plate box rests

there being small plates, having slits in which pins (*a*) fit, attached to each corner of the plate box. These plates are so attached to the box that by unscrewing the front one of the two screws the plates may be turned on the other screw. This provision allows the rear end of the box of perforated plates to be freed from the spring bars and to be suspended from a central point as shown in Fig. 2, where (P) marks a spring rod or bar inserted through the frame bar (Q), and (R) is a yoke affixed to the rear part of the plate-box.

(*t*) marks an adjusting nut on the spring-rod, which permits the plate-box to be adjusted vertically, the same provision also existing in the bars (N) by nuts (*u*) and guide plates (*v*).

By the means here recited the box of perforated plates may be raised or lowered at either end and thus the inclination of the plates be varied; while the speed of the separator may be changed by the bar (K) sliding the band along the conical shafts.

It will be readily seen that the means here recited will give such motions to the perforated plate box as are due to the use of the one or the other set;—thus when the plate-box is resting at each corner upon the pins (*a*) of the spring bars (N) the motions of the box will be lateral each end traveling in lines parallel to the other, but when the upper or rear end of the box is connected with the yoke and spring-rod the plate-box as a whole has somewhat of a rotary motion, while the rear end, by virtue of the play of the spring-rod, has an upward and downward motion also. Either of the set of means may be used as may be deemed most desirable, as the arrangement of both allows of the use of the one or the other as may be for the time preferred.

The holes of the three upper perforated plates are of the same diameter or area and each plate has the same inclination. These holes should be a little larger than the diameter or transverse section of a perfect grain of wheat. The holes of the fourth or lower plate are of less diameter or area than those of the other plates, being less than the diameter of a perfect grain of wheat, and this fourth plate is placed at a greater inclination than the other plates. The holes and the relation of the upper plates to the lower are fully shown in Fig. 3 of the drawings (A', A', A', A'). This arrangement

of the plates is a marked feature of our invention as by it the separator is enabled to perform the same duty that would be performed by three separators when all the
 5 plates have holes of different diameters, as is common, or the same duty as would be performed by one separator, the grain being passed through it three times,—the perfect grains in one separator necessarily pass
 10 through three plates the functions of each plate being the same.

When our separator has been put in motion, either of the set of means set out being used, if the grain as received at the mill be
 15 fed upon the upper part of the upper plate, it has a regular and continuous motion forward or downward, the oats, rat droppings and large pieces of the spurned grain passing down and into a trough at the lower end
 20 are conducted in one direction, while the full grains of wheat with all the shrunk grains and mice droppings pass through the three upper plates to the fourth or lower plate, where the perfect grains slide on down into
 25 the air passage of the fan-blower and the shrunk grains and droppings go on through the holes of the fourth plate into the box beneath. An entire and perfect separation of the full grains of wheat from

the other matters named takes place, and 30 this is fully evidenced by the flour made from the wheat thus separated; every instance of the use of our separator demonstrating its efficiency and superiority.

Having thus fully set forth our invention 35 and described its construction and operation, what we claim as of our invention and desire to secure by Letters Patent is—

1. The arrangement of the three perforated plates, having holes of the same diameter or area and placed at the same inclination, with the fourth perforated plate, having holes of a less diameter or area than the other plates and at a greater inclination, as
 40 herein set forth. 45

2. We claim the spring bar or rod (P) and yoke (R) in connection with the plates (Z) and bars (N) at the other end of the plate-box for giving to the plate-box the compound motion as herein described. 50

This specification signed at Watertown, N. Y., this 24th day of June, 1858.

WM. H. ANGEL.
 M. COFFEEN.

Witnesses:

N. A. PERKINS,
 G. R. MORSELL.