

No. 711,134.

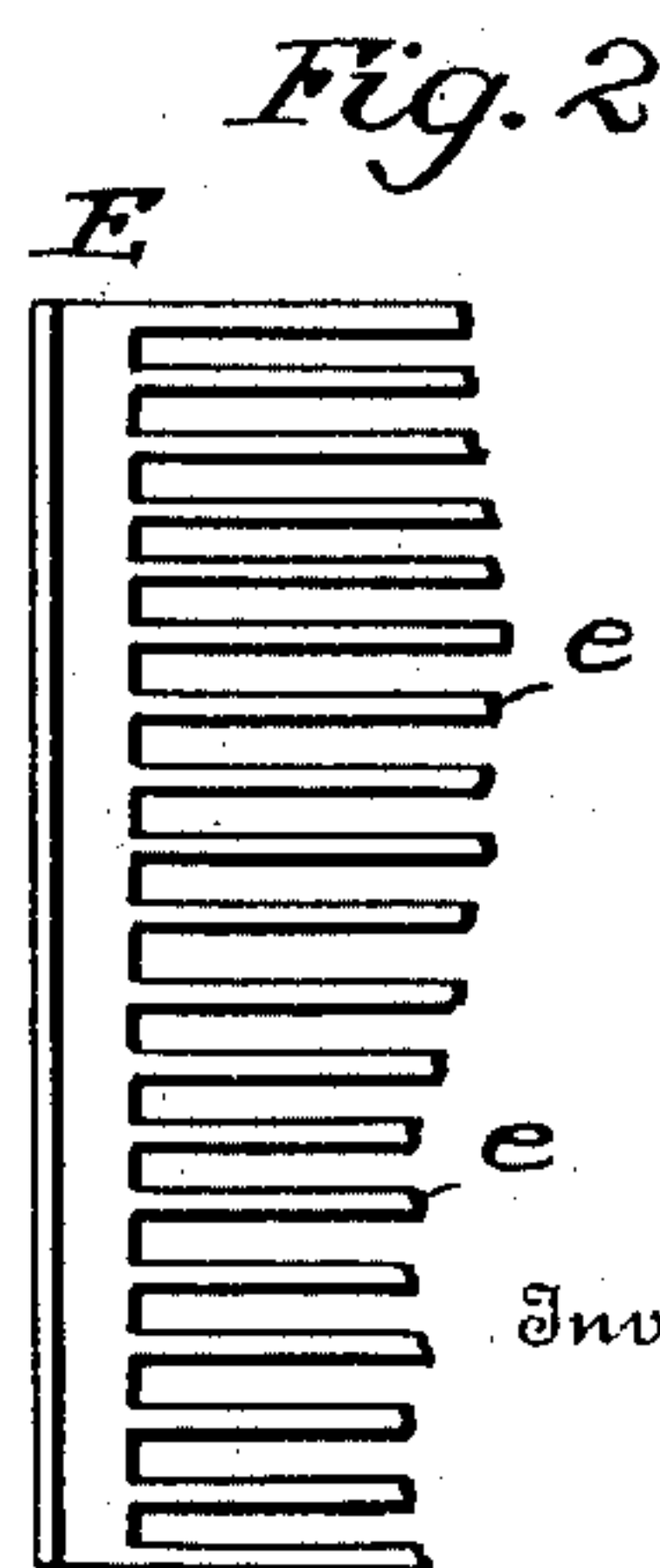
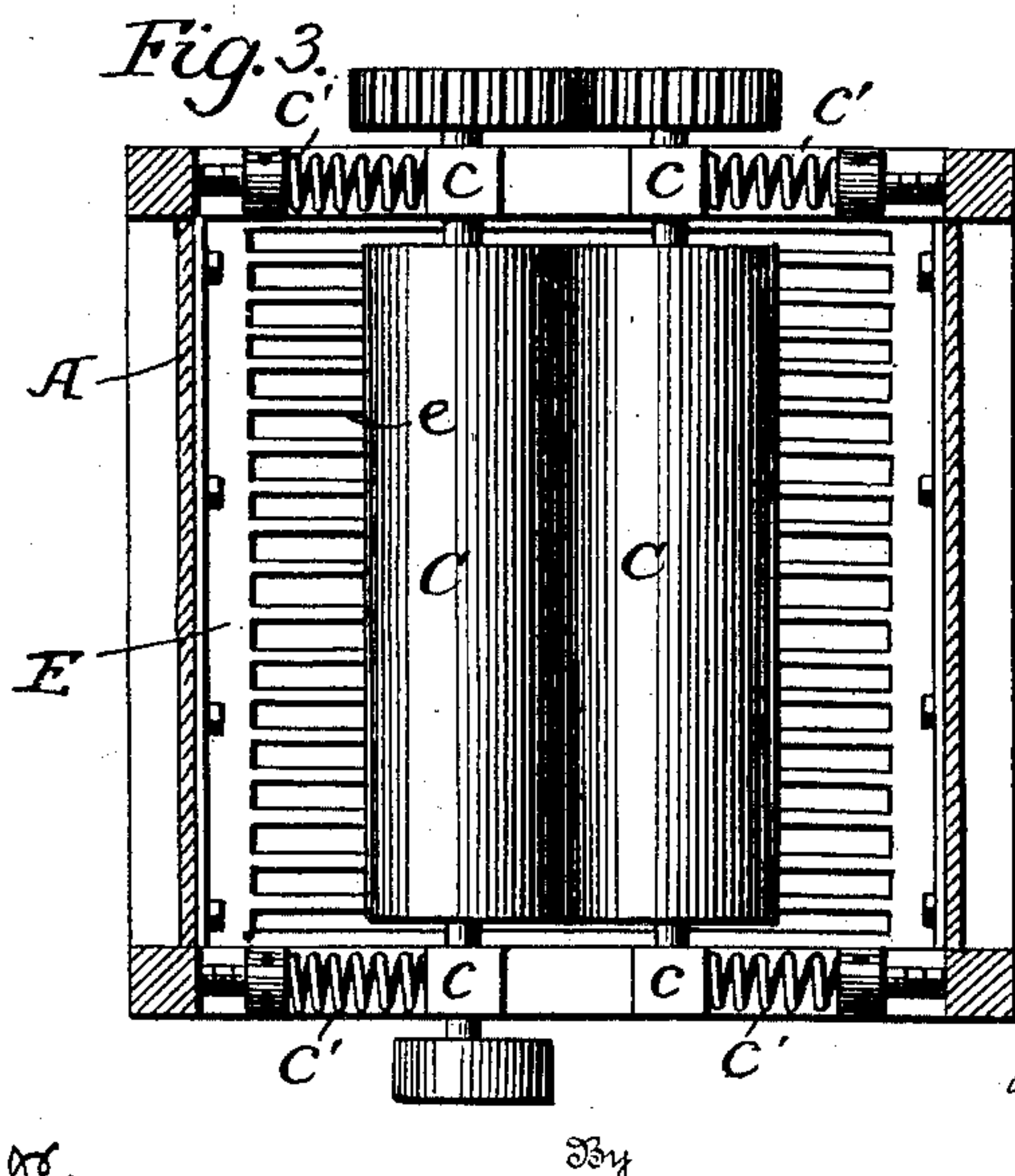
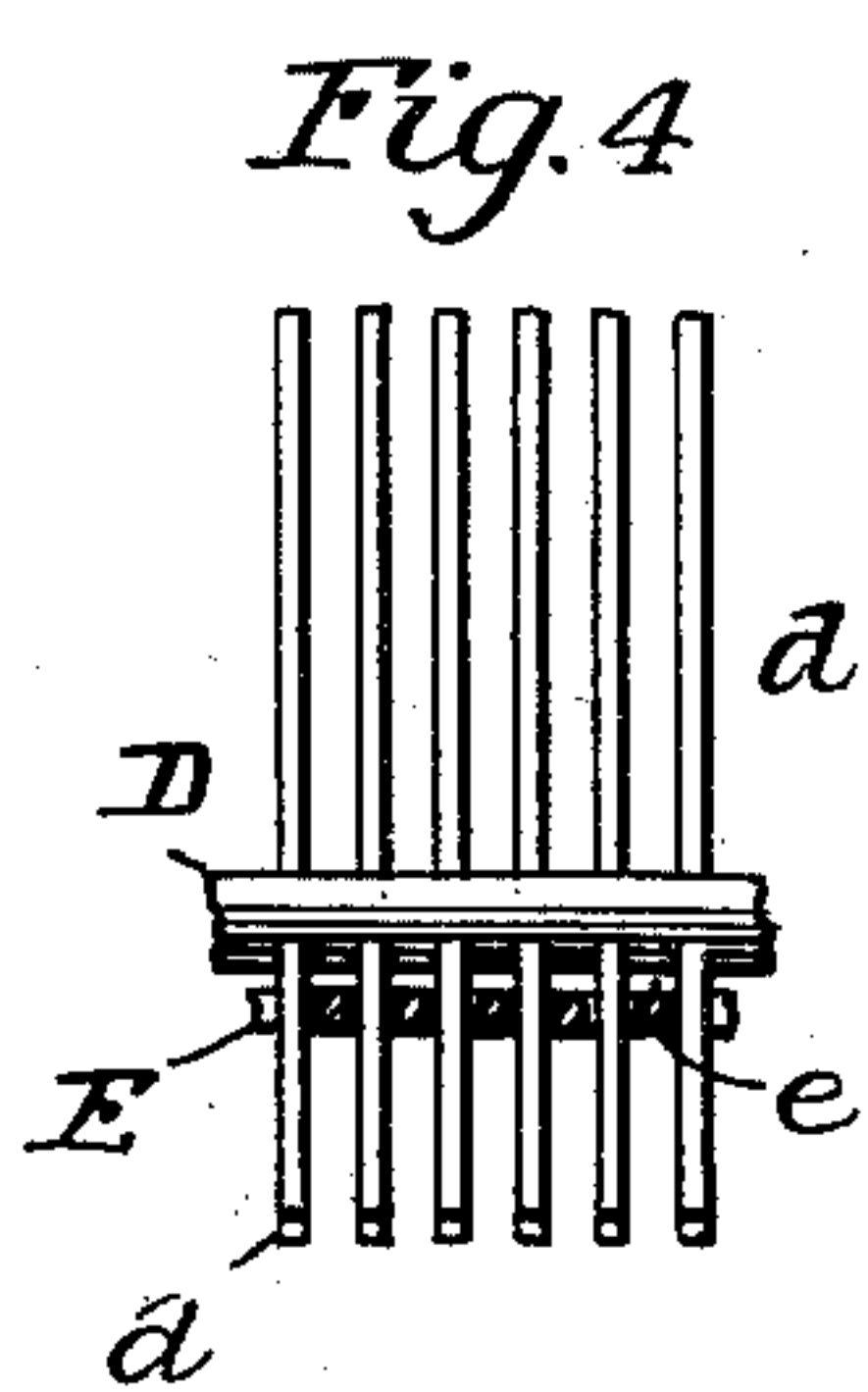
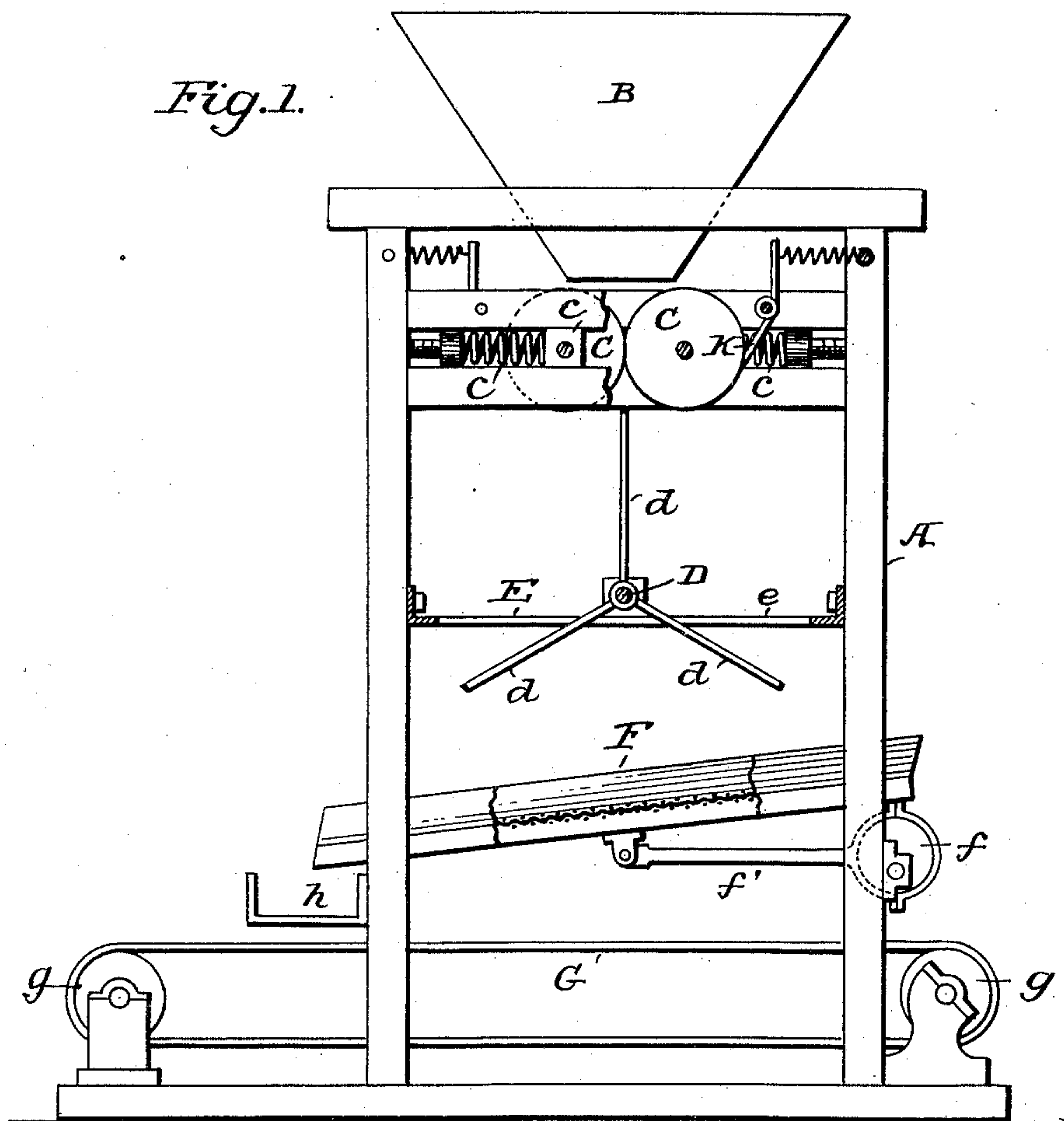
Patented Oct. 14, 1902.

J. C. W. STANLEY.

MECHANISM FOR CRACKING AND DISINTEGRATING COTTON SEED.

(Application filed July 13, 1900.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

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MECHANISM FOR CRACKING AND DISINTEGRATING COTTON-SEED.

SPECIFICATION forming part of Letters Patent No. 711,134, dated October 14, 1902.

Application filed July 13, 1900. Serial No. 23,546. (No model.)

To all whom it may concern:

Be it known that I, JOHN CHARLES WILLIAM STANLEY, a subject of the Queen of England, residing at London, England, have invented certain new and useful Improvements in Mechanism for Cracking and Disintegrating Cotton-Seed, of which the following is a specification.

This invention relates to mechanism for cracking and disintegrating cotton-seed, its object being to provide a simple and improved mechanism for this purpose the operation of which will effect the separation of almost all the kernels from the cracked hulls and the cotton adhering to them and the kernels will be pulverized or broken up into small fragments and be mixed with only a minimum of the fragments of the hull and a little free cotton.

The invention will be fully described hereinafter, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional elevation of the machine embodying my invention. Fig. 2 is a plan view of the grating forming part of the disintegrating mechanism. Fig. 3 is a plan view, partly in section, of the cracking-rollers. Fig. 4 is a view, partly in section, showing the arrangement of the grating and the threshing-arms.

One of the greatest difficulties which has been encountered in attempting to separate the hull and fiber from the oil-bearing kernel of cotton-seed has been the matting together of the kernel and fiber in the preliminary crushing or grinding of the seed, which is necessary to break the hull and expose the kernel. The most common method in practice at the present time is to subject the cotton-seed to the action of rolls with teeth or knives or to some one of many forms of grinding mechanisms, and the usual result is that very much of the kernel becomes matted in the fiber and cannot be separated from it except by chemical treatment. It has also been proposed to pass dried or desiccated seed between cylindrical rolls for the purpose of cracking the hulls, liberating the kernel therefrom, and grinding the latter to a powder and then subjecting the mixed mass of hull and fiber and powdered kernel to agita-

tion within a perforated cylinder, which is closed except for the inlet for the mass and the perforations for the escape of the powdered kernel. Obviously much of the powdered kernel will become matted in the fiber under such treatment, and there is a further objection to this method of treating the seed, which is the preliminary drying or desiccating of the seed, on account of the additional expense if for no other reason. By the apparatus which I have invented and which forms the subject-matter of this application I am enabled to treat damp cotton-seed as well as that which is comparatively dry without crushing the seed into a matted mass of fiber, hull, and kernel, and almost all of the latter can be separated from the hull and fiber by the mechanical means illustrated in the drawings and now to be described.

A indicates a casing which is closed except for the necessary openings for the ingress of the cotton-seed and the egress of the separated parts thereof.

B is a hopper, to which the cotton-seed is conveyed and which delivers it continuously between a pair of cylindrical cracking-rollers C. The journals of these rollers are mounted in boxes c, which are slidably supported in the casing, and springs c' tend to force them toward each other. Both rollers will be positively driven in any suitable manner, which it is not necessary to describe.

K indicates scrapers which engage the rollers C to remove such parts of the cotton-seed as may adhere to them during the operation of cracking the hulls.

E represents a grating rigidly supported within the casing below the rollers C and forming a perforated floor therein, and D indicates a shaft which is journaled in the casing transversely of the bars e of the grating and preferably parallel to the rollers. The shaft D is provided with a series of rows of radiating whipping-arms d, which preferably will be angular in cross-section and, as shown in the drawings, are rectangular and which are so arranged that when the shaft is rotated they will move through the spaces between the bars e of the grating, and preferably there will be a clearance of about one-eighth of an inch, more or less, varying according to the

size of the seed treated, between the sides of the bars and the sides of the spaces between the bars *e*. Preferably also the ends of the arms will work in close proximity to the ends of the spaces between the bars *e*. The shaft *D* may be driven in any suitable manner, and in practice it should have a speed of about five hundred revolutions per minute. The arms *d* and the bars *e* of the grating constitute a mechanism for disaggregating and further reducing the cracked seed, and the angular shape of the bars greatly facilitates the breaking up of the kernels.

Below the grating a reciprocating screen *F* is supported and receives its reciprocating movement from eccentrics *f*, the eccentrics being connected to the screen by rods *f'*. An endless belt *G* is mounted upon rollers *g* to travel through the casing below the screen, and on this belt the material which passes through the screen will fall and may be conveyed to any suitable apparatus for further treatment. The tailings from the screen *F* will be collected in a receptacle *h*, from which they may be removed for further treatment.

As shown, the casing *A* incloses the rollers *C*, and while this is preferable it is not essential, for it is only necessary that the casing *A* shall form a confining space or chamber for the seed while being subjected to the action of the beater-arms *d*.

The operation of the machine is as follows: The cotton-seed having been previously freed from debris is fed into the hopper *E*, from which it passes through the cracking-rollers *C*. These rollers are designed simply to crack the hulls and will not be permitted to exert sufficient pressure on the seed to crush the hull and kernel into one mass or to express the oil into the fiber. The rapidly-revolving threshing or whipping arms *d* will pass through the falling stream of cracked seed as the latter drops from the rollers and will drive it with great force against the sides of the casing, and this violent beating and concussion will shake or separate the heavier kernel from the lighter hull, and the separated parts will then fall onto and pass through the grating and drop freely onto the screen *F*. The threshing of the seed will not result in crushing the kernel and hulls and fiber into a mass nor in expressing the oil into the fiber, but as the kernel is comparatively brittle it will be broken into small fragments. The hulls are comparatively tough, and this combined with the cotton which adheres to their outer surface renders them extremely difficult to break

up into small fragments. Nevertheless small fragments will be broken off the hulls, and some of the cotton fibers will be liberated from the hulls. When the material passes through the grating and falls onto the screen, the fragments of kernel, together with the small fragments of hull and some free cotton, will be sifted through; but the larger pieces of hull and the cotton adhering to them will tail off the screen. Some small fragments of kernel will still adhere to the larger pieces of hull and will also be matted in the cotton on them; but the proportion of kernel carried off in this way is very much less than is the case with the apparatus in use at the present time. Also the proportion of hull and free cotton which passes through the screen with the kernel is very small, and the separation of the hulls and the kernel by this machine is almost perfect and the kernel is in a good condition to be subsequently crushed to form kernel-meal.

Without limiting myself to the precise details of construction shown, I claim—

1. In a mechanism for cracking and disintegrating cotton-seed, the combination of a casing, means for cracking the seed and delivering it into said casing, means for enabling a continuous feed to the cracking devices, and a mechanism for disaggregating and still further reducing the cracked seed in its fall from the cracking devices, comprising a grating forming a floor in said casing extending across the field of fall of the cracked seed, a revolving shaft having radiating whipping-arms which intercalate with the bars and operate through substantially the whole perforate area of the grating, substantially as set forth.

2. In apparatus for cracking and disintegrating cotton-seed, the combination with means for cracking the seed, of a casing into which the cracked seed is fed in a continuous stream, a grating forming a floor in the casing and extending across the field of fall of the cracked seed, a shaft having radiating whipping-arms which intercalate with the bars and operate through substantially the whole perforate area of the grating, and means to operate the arms to strike the falling seed above the grating, substantially as set forth.

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

JOHN C. W. STANLEY.

Witnesses:

EDWIN CRUSE,
H. G. OGDEN, Jr.