

No. 637,411.

Patented Nov. 21, 1899.

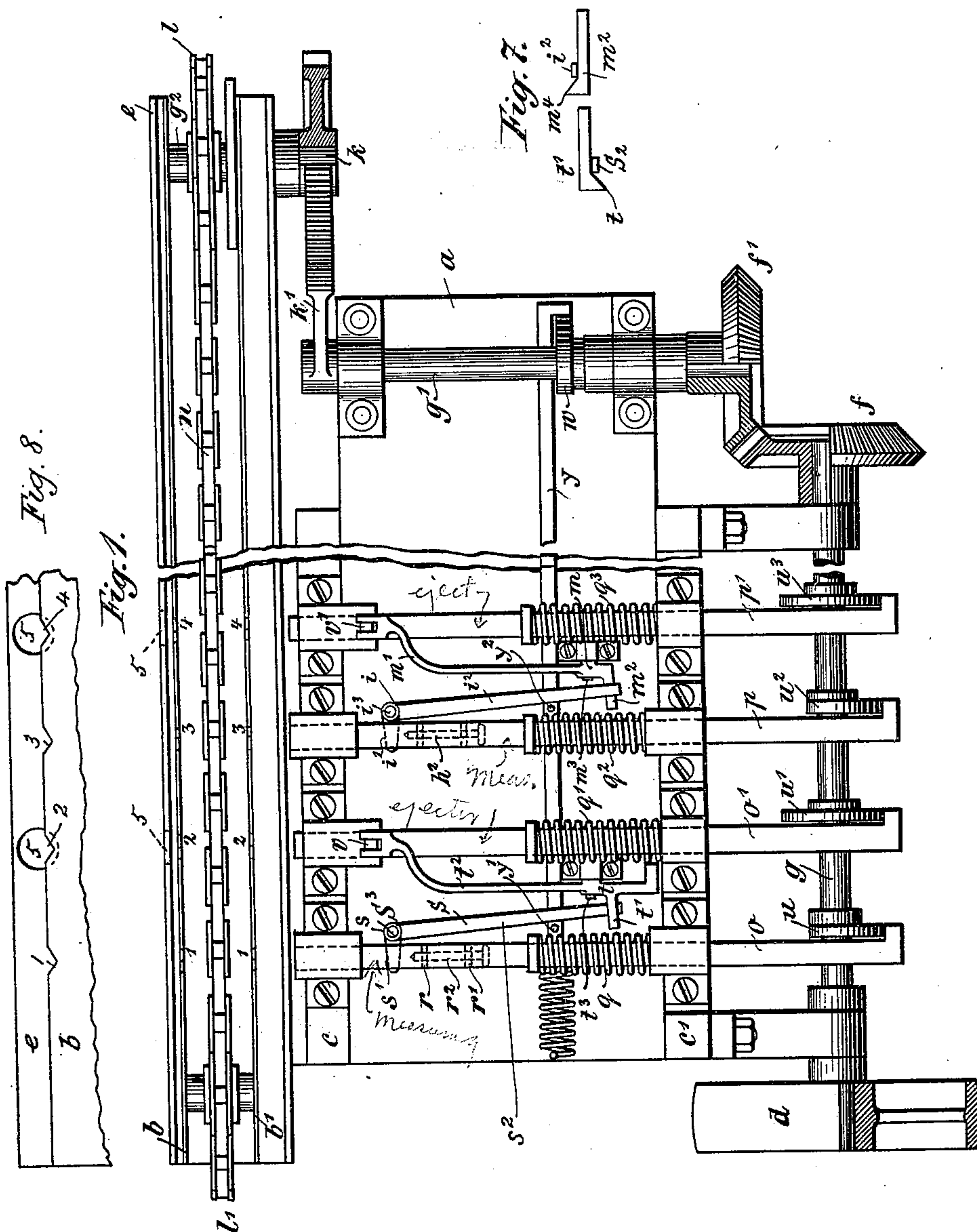
P. PONDORF.

MACHINE FOR SORTING BODIES ACCORDING TO SIZE.

(Application filed Apr. 11, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

D. V. For arm an
A. Ball

Inventor

Paul Pondorf.
by Herbert W. Jenner.
Attorney.

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P. PONDORF.

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2 Sheets—Sheet 2.

Fig. 2.

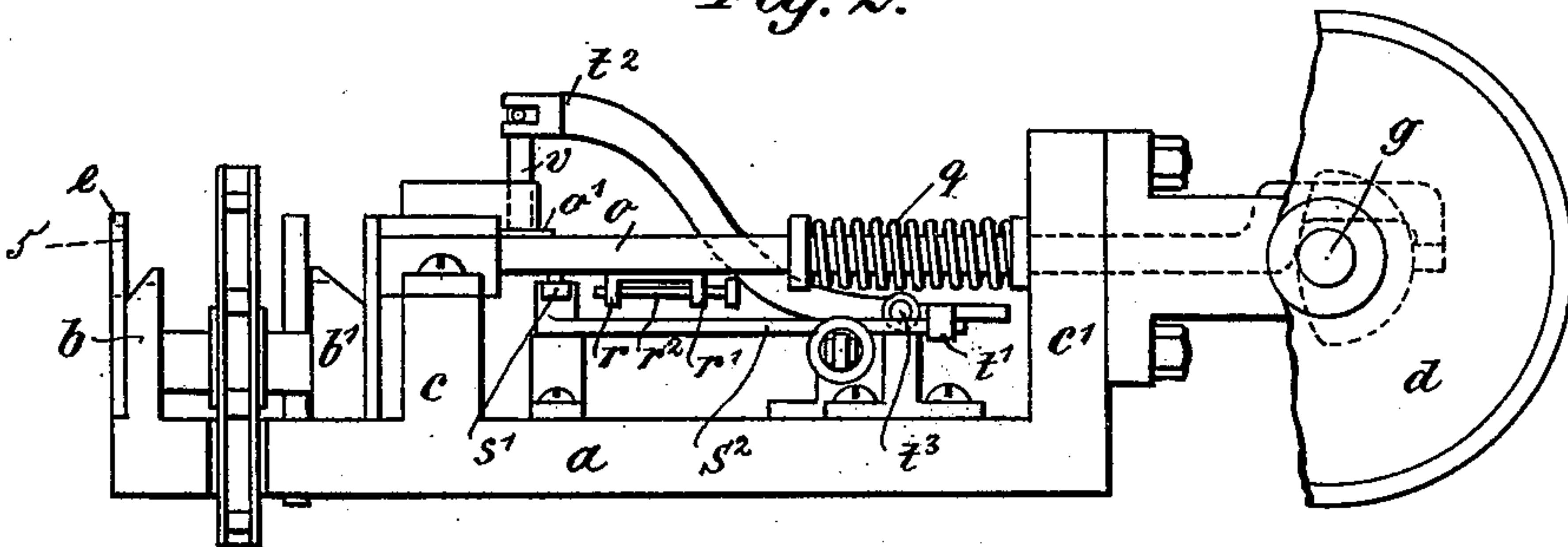


Fig. 3.

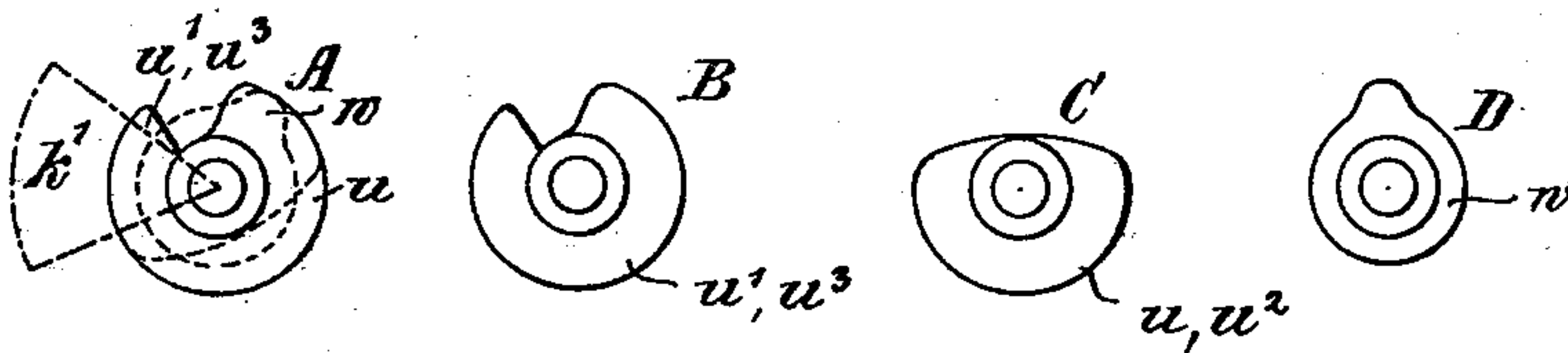


Fig. 5.

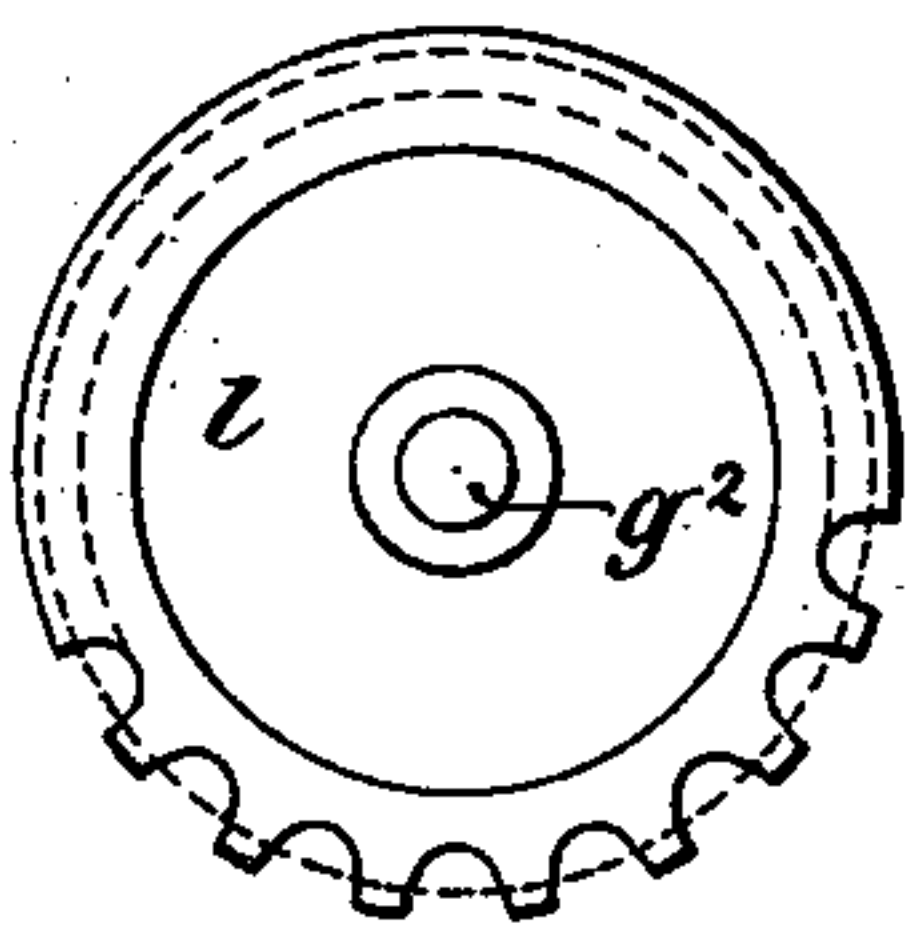


Fig. 6.

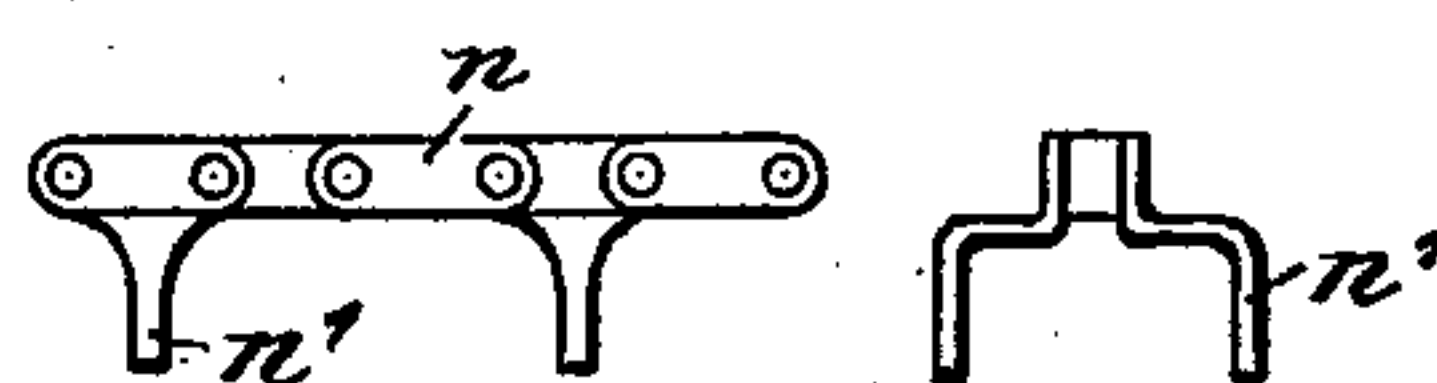
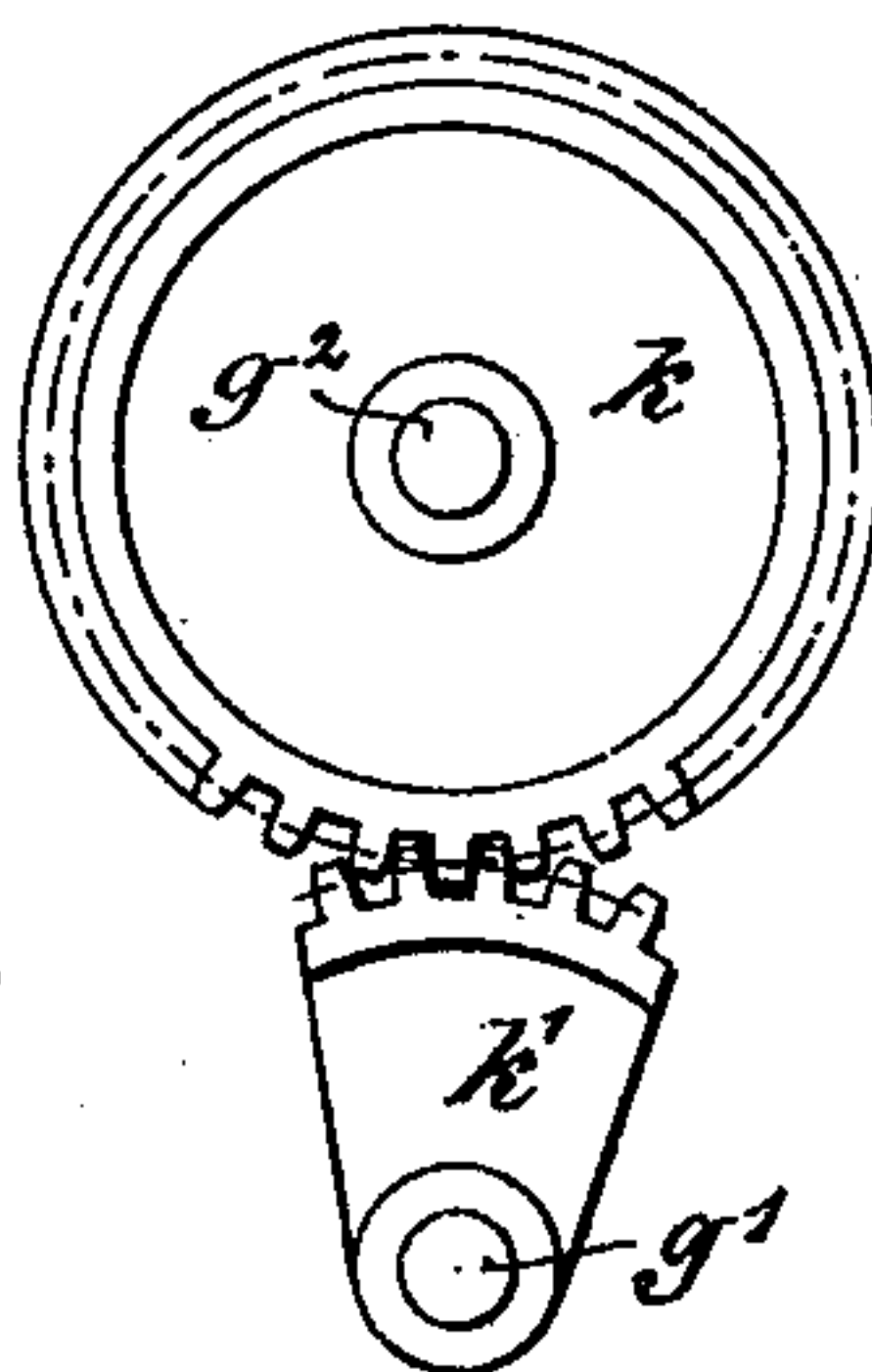


Fig. 4.



Witnesses:

D. P. Ponder
A. Ball

Inventor.

Paul Pondorf.
by *Herbert W. Jenner.*
Attorney.

UNITED STATES PATENT OFFICE.

PAUL PONDORF, OF GOESSNITZ, GERMANY.

MACHINE FOR SORTING BODIES ACCORDING TO SIZE.

SPECIFICATION forming part of Letters Patent No. 637,411, dated November 21, 1899.

Application filed April 11, 1899. Serial No. 712,581. (No model.)

To all whom it may concern:

Be it known that I, PAUL PONDORF, manufacturer, a subject of the Emperor of Germany, residing at Goessnitz, Dukedom of Saxony-Altenburg, German Empire, have invented certain new and useful Improvements in Machines for Sorting Bodies According to Size; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In the accompanying drawings, Figure 1 is a plan or top view, partly in section, representing a machine constructed according to the present invention. Fig. 2 is a side view thereof. Fig. 3 represents diagrammatic views showing the various cams and their relation to some other parts. Fig. 4 is a separate view of the toothed segment and coacting wheel. Fig. 5 is a separate view of the driven chain-wheel. Fig. 6 represents respectively a side view and end view of a portion of the feed-chain; and Fig. 7 represents detail views of parts. Fig. 8 is a detail view of portions of the support *b* and the stop-plate *e*.

The machine represented in the accompanying drawings has for its object to separate or sort articles of the same kind according to size, metal cartridge-cases being here taken as an example, and its method of sorting consists in eliminating all articles that do not come within the limits of a predetermined standard size.

The construction and operation of the machine are as follows:

Upon a foundation or bed-plate *a* are erected four parallel walls *b b'* and *c c'*, arranged in pairs, one pair, *b b'*, Figs. 1 and 2, constituting a support or rest for the bodies to be measured or gaged, while the other pair, *c c'*, serve to guide the measuring instruments and ejectors.

The machine is driven by means of a strap (not shown) and a pulley *d*, fast upon the shaft *g*, as shown in Figs. 1 and 2, which shaft thereby receives rotary motion from any suitable source of power. This rotary motion is transmitted to the shaft *g'* by means of the bevel-wheels *f f'*, Fig. 1, and upon said shaft *g'* is rigidly secured a toothed segment *k'*, Fig. 1, which revolves therewith. At a

given point in each revolution of the shaft *g'* the toothed segment *k'* comes into gear with the toothed wheel *k*, as shown in Figs. 1 and 4, which is fixed upon the shaft *g²*, Fig. 1, thereby causing said wheel and shaft *g²* to move through one-sixth of a revolution together with the chain-wheel *l*, Figs. 1 and 5, also mounted upon the said shaft *g²*, by which means the endless chain *n*, Figs. 1 and 6, is each time the segment *k'* gears with the wheel *k* moved longitudinally forward a predetermined distance. A chain-wheel *l'* is arranged at the end of the machine opposite to *l* for the purpose of properly guiding the chain in its movement. The chain *n* carries forks *n'*, Fig. 6, arranged vertically at suitable distances apart, each space corresponding to the distance traversed by the chain at each movement caused by the one-sixth revolution of the wheel *k*, the chain *n* and forks *n'* serving to convey the bodies to be sorted, which are assumed to be cartridge-cases in the present instance, from one holder to another. The holders are small triangular notches formed in the supporting-walls *b b'* and numbered 1, 2, 3, and 4, Fig. 1.

Each cartridge-case is first placed in the holder 1 by hand or by any approved feed mechanism horizontally and transversely of the chain *n*, after which the operations proceed as follows: Mounted upon the shaft *g*, Fig. 1, and rotating therewith are cams *u u' u² u³*, and so on, the cams *u u²* being formed as shown in Fig. 3^C, while the cams *u' u³* take the shape indicated in Fig. 3^B. The cartridge is inserted as the pusher or slide *o*, and concurrently with it the parts *o'*, *p*, and *p'* are retracted by the cams *u*, *u'*, *u²*, and *u³*. The springs *q q' q² q³* cause the pushers or slides to advance, Fig. 1, at the moment when the depressed parts of the cams come into action with the pushers. The pushers *o* and *p* advance gradually, whereas the ejectors *o'* and *p'* move forward quickly, the two kinds of motion resulting from the shapes of the cams *u u'*, Figs. 3^B and 3^C, the said pushers *o* and *p* being measuring instruments, while *o'* and *p'* are ejectors. The pusher *o* moves forward slowly and with a certain amount of resiliency, and in so doing pushes the cartridge-case toward the stationary stop or wall *e*, Fig. 2, rising above the wall *b*. To the pusher or

slide *o* are fixed lugs *r r'*, which are perforated and threaded and carry a small screw *r²*, Figs. 1 and 2. If the cartridge-case is of the proper length or less than that length, the pusher or slide *o* will advance sufficiently far for the point of the screw *r²* to strike the arm *s'* of the double-armed lever *s*, which is pivotally mounted at *s³* with capability of horizontal movement, thereby causing the arm *s'* to move a short distance. The end of the other or long arm *s²* will consequently be moved from the right to the left, and inasmuch as the proportion of the length of the arm *s'* to that of the arm *s²* is as one is to ten such movement of the arm *s²* will be ten times greater than the movement of the arm *s'*. The end of the arm *s²* is situated under the lever *t*, which is pivotally mounted at *t³* with capability of vertical movement, and the short arm *t'* of which terminates in an incline *t⁴*, Figs. 1 and 2, and left-hand view in Fig. 7. Owing to the movements of the arms *s'* and *s²*, the latter of which ascends the incline *t⁴* just mentioned, the short arm *t'* is raised and the long arm *t²*, Figs. 1 and 2, depressed. The arm *t²* carries a vertical pin *v*, which descends together with said arm and takes up its position in front of a nose or projection of the ejector pusher or slide *o'*, Figs. 1 and 2. This pin *v* thus serves to retain the pusher *o'*, which is drawn back in its place in opposition to the spring *q'*, even after the cam *u'* has released said pusher *o'*. In the meantime the pusher *o* has been drawn back by the rotating cam *u* and the chain *n* performs a longitudinal movement and in so doing carries the cartridge-case from holder 1 to holder 2 by means of the forks *n'*, the cartridge-case remaining at rest in such holder 2 until the chain advances it farther—namely, to holder 3. If, however, the cartridge-case should be too long, the pusher *o* as it moves up to holder 1 comes against the cartridge-case, and therefore cannot advance sufficiently to enable the screw *r²* to actuate the arm *s'* of the lever *s*, so that the arms *s²* of the lever *s* and *t'* and *t²* of the lever *t* in that case remain in their initial positions. In other words, the pin *v* does not hinder the ejector slide or pusher *o'* from springing forward. Accordingly the sudden forward movement of the ejector slide or pusher *o'*, caused by the spring *q'*, takes place, said movement being permitted by the position which the cam *u'* then occupies at the moment when the cartridge-case has been transferred from holder 1 to holder 2, and said case is thereby expelled from the machine through an aperture provided in the wall *e*, coinciding with holder 2. It will thus be seen that cartridge-cases which are too long cannot move past the ejector *o'*, whereas cases of normal or less than normal length are carried along to holder 3. Here they are again measured by the pusher *p*, and the position of the ejector *p'* is so adjusted that it expels those of the cases reaching holder 4 which are too short. The measuring-pusher

p advances to the cartridge-case exactly as did the pusher *o* in the preceding instance, and if the length thereof be normal the small screw *h²* will not engage the arm *i'* of the lever *i*. Should, however, the cartridge-case be too short, then the pusher *p* will advance far enough to enable the screw *h²* to engage the arm *i'*, whereby the lever *i* is swung around upon its axis *i³* in a horizontal plane, Fig. 1. The arm *i²* is now situated over the arm *m²* of lever *m*, Figs. 1 and 7, so that as said arm *i²* runs up the incline *m⁴* of the arm *m²* it depresses the same, Fig. 7, turning the lever *m* upon its axis *m³* while it raises the arm *m'* and with it the pin *v'*, which up to now retained the ejector slide or pusher *p'* by means of a nose or catch, from which it has been released by the cam *u³*, Fig. 1. The pin *v'* therefore has now released the ejector *p'* by reason of the cartridge-case being too short; but the cam *u³* still keeps back the ejector *p'* until the cartridge-case which is being measured reaches holder 4. At this juncture the ejector pusher or slide *p'* is liberated, and it accordingly springs forward and drives out the cartridge-case found wanting in length through an aperture provided in the wall *e* opposite the holder 4.

A variety of measurements may be taken in the same way, the cartridge-cases, the size of which is found to be in conformity with the standard, being in all cases carried farther along and brought in front of fresh measuring devices, while those which prove deficient in size are expelled, the same deficiencies of size always causing them to be thrown out at the same places, so that cartridge-cases which are too long, too short, too wide, too narrow, or otherwise inaccurate are received at the same time in suitable receptacles provided for each kind, respectively. If the cams *u u'* on the shaft *g*, the cam *w* on the shaft *g'*, and the toothed segment *k* come into operation successively, as illustrated in Fig. 3^A—that is to say, at the moment when the toothed segment *k'* has performed its operation—fresh cartridge-cases take up their positions in front of the measuring pushers or ejectors, as the case may be, and the depressions in the cams *u' u³*, Figs. 3^A and 3^B, instantly permit the ejectors *o' p'* to spring forward, if such ejectors are not held back by the pins *v v'*, so that cases of a wrong size are at once ejected. The ejectors *o' p'* are then drawn back again by cams *u' u³* and the levers *s t i m* are restored to their initial positions in the manner hereinafter described. This is accomplished by means of the cam *w* on the shaft *g'*, draw-rod *y*, and pins *y' y²*, Fig. 1, and the cams *u* and *u²* then allow the measuring-pushers *o* and *p* to advance. The cam *w* draws the resilient or spring-controlled rod *y* from left to right, so that the pins *y' y²* strike the levers *s i* and restore them to their initial positions. This occurs immediately after the ejectors have sprung forward and as they are receding again, but before the

measuring-pushers begin to advance. By these means the machine is enabled to operate in a continuous manner.

What I claim is—

- 5 1. In a sorting-machine, the combination, with a support for the bodies to be sorted, and a stop arranged on one side of the support; of means for moving the bodies step
10 by step longitudinally of the said support, a reciprocatory measuring-plunger arranged on the other side of the support from the said stop, a reciprocatory ejecting-plunger arranged behind the measuring-plunger, and
15 venting the ejector-plunger from pushing the bodies off the support, said catch mechanism being operatively connected with the said measuring-plunger, substantially as set forth.
- 20 2. In a sorting-machine, the combination, with a support for the bodies to be sorted, and

a stop arranged on one side of the support; of means for moving the bodies step by step longitudinally of the said support, reciprocatory measuring-plungers and reciprocatory ejecting-plungers arranged in pairs on the 25 other side of the support from the said stop, and releasable catch mechanisms normally preventing each ejector-plunger from pushing the bodies off the support, each ejector-plunger being arranged behind the measuring-plunger to which it pertains and having 30 its catch mechanism operatively connected with its said measuring-plunger, substantially as set forth.

In testimony whereof I affix my signature 35 in presence of two witnesses.

PAUL PONDORF.

Witnesses:

FRITZ MERTZ,
OTTO KOLBE.