

F. STRECKEL.
PADDY SEPARATOR.
APPLICATION FILED JUNE 8, 1909.

932,594.

Patented Aug. 31, 1909.

3 SHEETS—SHEET 1.

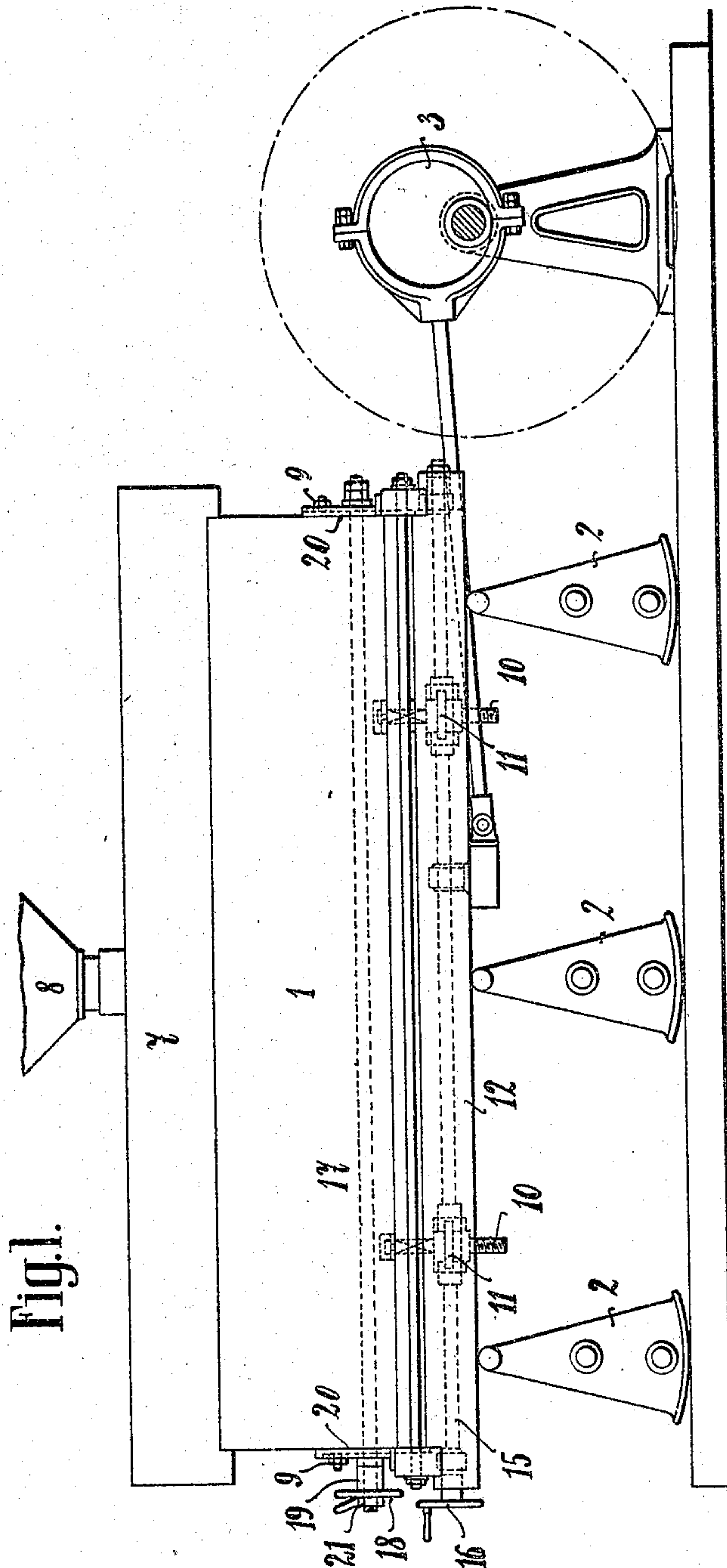


Fig. 1.

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Inventor:
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3 SHEETS—SHEET 2.

Fig. 2.

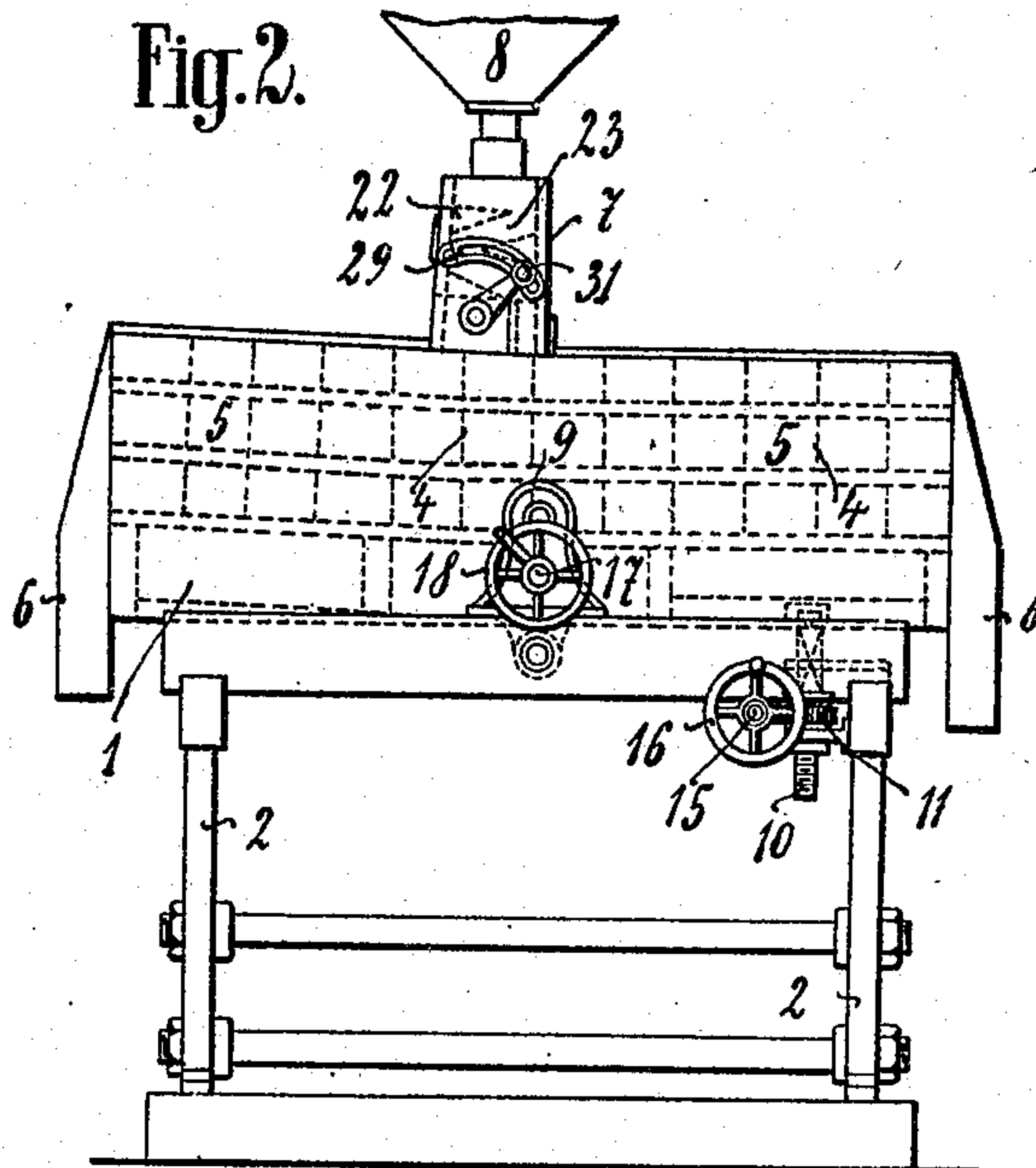


Fig. 5.

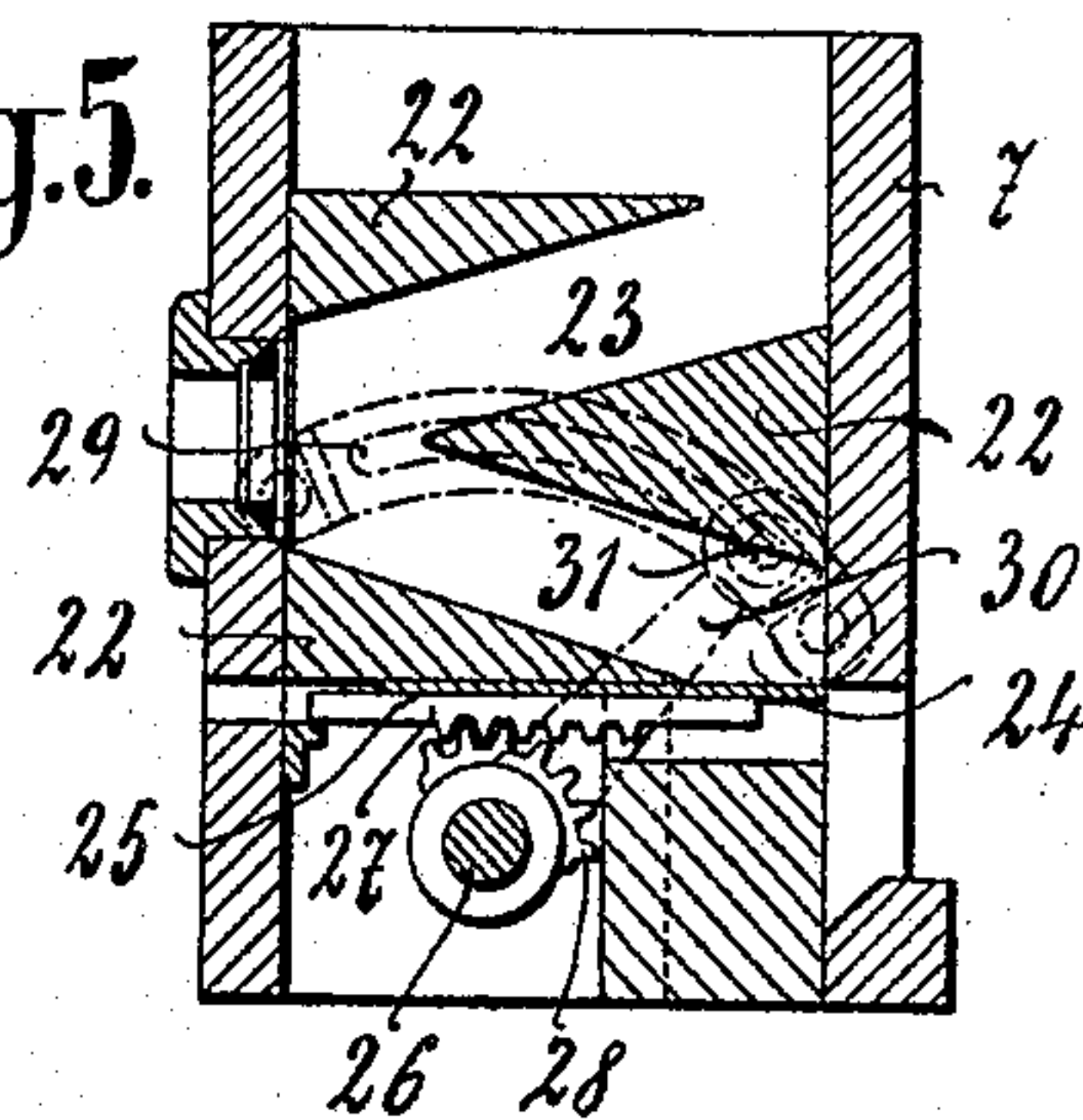
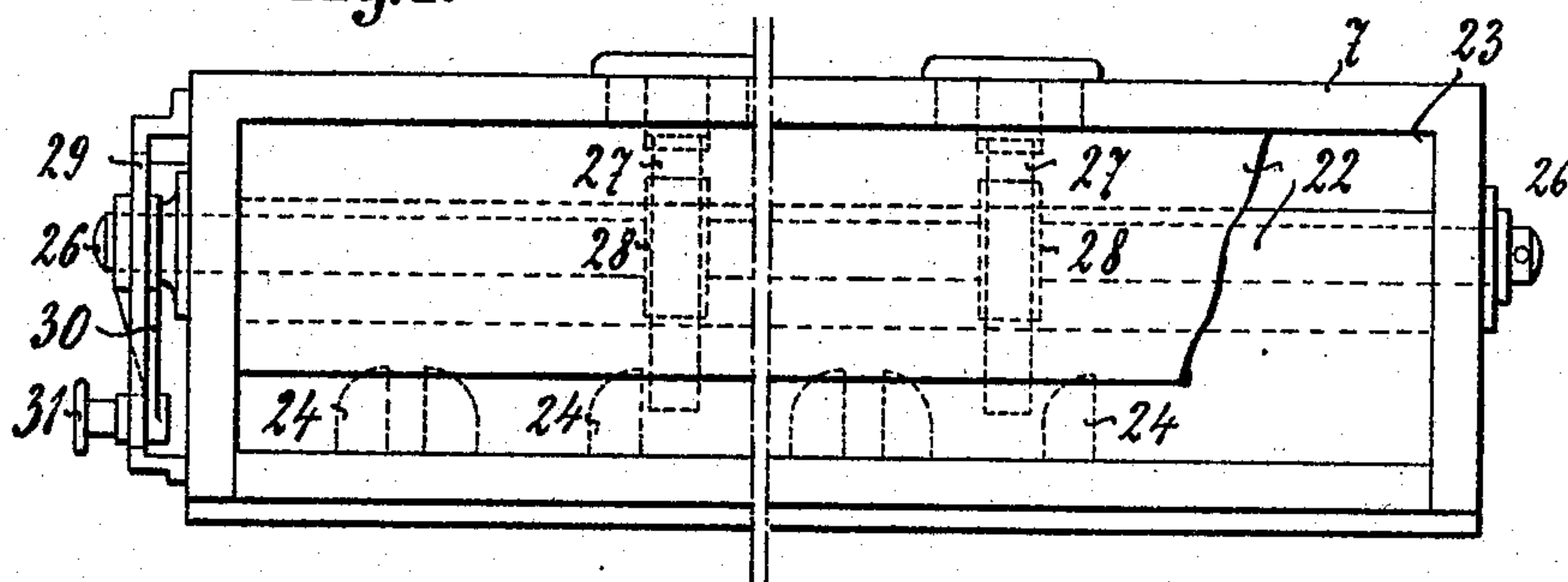


Fig. 4.



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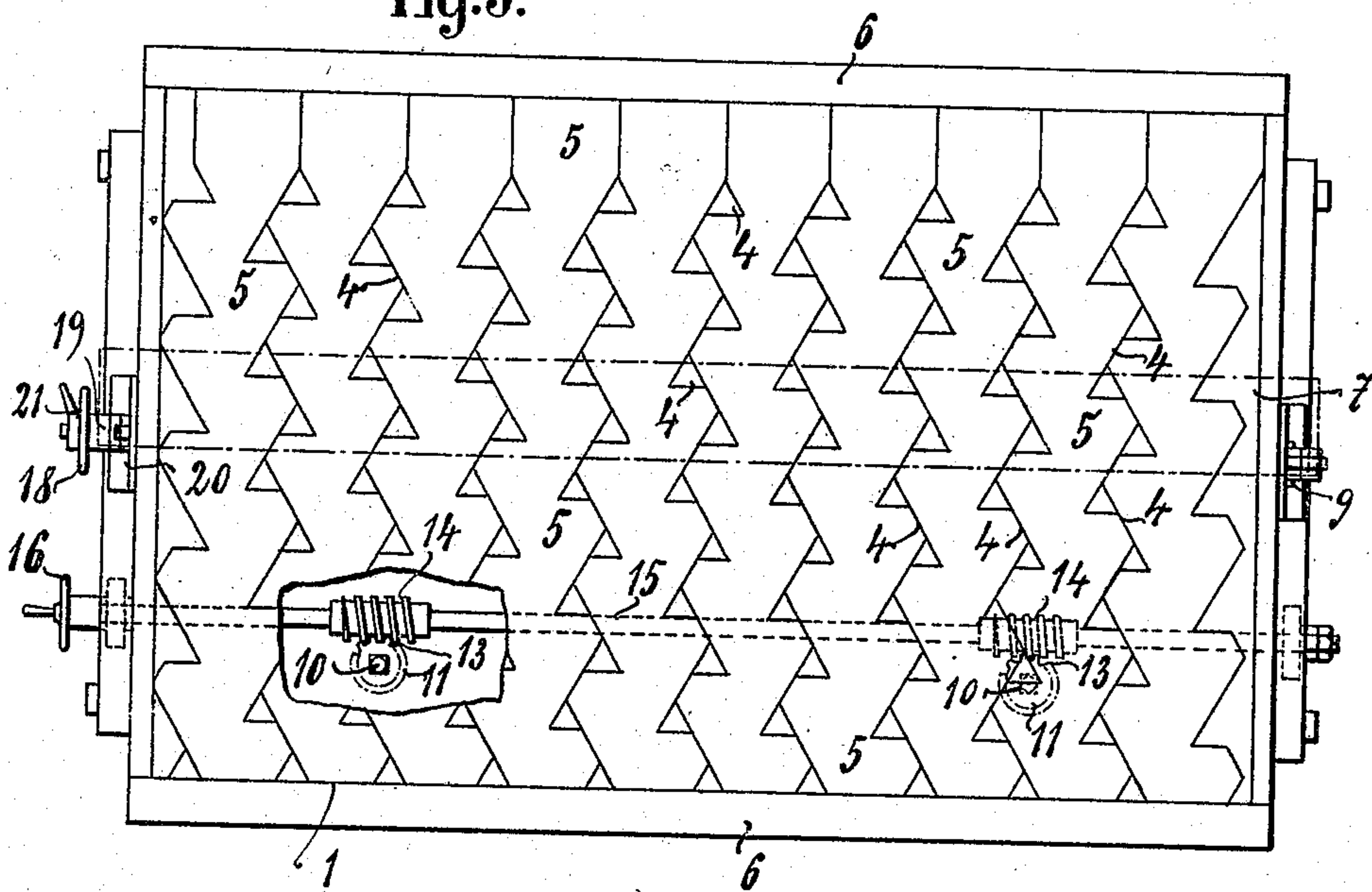
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3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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PADDY-SEPARATOR.

932,594.

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To all whom it may concern:

Be it known that I, FRANZ STRECKEL, chief engineer, a subject of the German Emperor, residing at Barmbeckerstrasse 4/8, Hamburg, Germany, have invented certain new and useful Improvements in or Relating to Paddy-Separators, of which the following is a specification.

This invention relates to the machines which are known in the grain-shelling industry under the name of paddy separators and are chiefly utilized for separating shelled grain from unshelled grain, for instance in the case of rice. According to this invention, such machines are provided with an improved adjustment device for inclining the separator table, and with a separate feed trough.

The working of the paddy separators to which this invention relates, is based to a certain extent on the principle of throwing. The material to be separated, that is to say, the mixture of shelled and unshelled grains, is introduced into the separate chambers arranged on a table, the so-called separating table, from a feeding trough through feeding holes distributed over the whole length of the trough. The table is in an inclined position and is kept continuously vibrating transversely of the longitudinal direction of the chambers. In the chambers are arranged zig-zag-shaped throwing or projecting plates. The grains are continuously thrown against the said plates when the table is vibrating, and then recoil from the projecting plates with a force partly depending on their specific gravity and partly on their more or less great elasticity. In that way the shelled grains (the grains of greater specific gravity) gradually reach the lowest side of the table, and the unshelled grains (or the specifically lighter bodies) travel upward on the inclined plane. Thus the shelled and the non-shelled grains arrive separately from each other at the two longitudinal sides (the lowest and the highest edge) of the table and can be collected at those places. The satisfactory working of these machines, which have been known for years, depends on the inclination of the table being adjusted to suit exactly the nature of the material to be treated (the proportion of mixture of shelled and unshelled grains, or, generally speaking, of specifically heavier and lighter, or more or less elastic bodies) and also on the care being

taken that the feed trough extending throughout the whole length of the table should supply the material to the single chambers of the table, arranged transversely of the trough, in exactly the same proportion of mixture. In order to comply with the first condition, the table must be arranged in such manner as to enable it to be inclined at any desired angle. This adjustment must be, however, easy and convenient to effect, if it is desired to make sure that the miller should really keep changing the inclination after starting the work and noticing the result of the mixture, until the best result is obtained and that was impossible to obtain with the devices hitherto known for adjusting the inclination of the said tables. Nor is it possible to comply with the second of the above mentioned conditions in well known machines, as, for certain reasons more fully specified later, the arrangement of the feeding troughs is not such as to insure a uniform introduction of the material into the single chambers.

This invention relates, therefore, to a paddy-separator of well known kind, which: 1, is provided with an adjustment device for the table, which can be adjusted at any moment in simple manner, and 2, is provided with a feed device, the use of which enables the second condition as to the distribution of the material among the single chambers, to be complied with.

A paddy separator according to this invention with the improved adjustment device and an improved feeding trough, is illustrated by way of example in the accompanying drawings, in which:—

Figure 1 shows the machine seen from one side; Fig. 2 is a view seen from the left hand side of Fig. 1; Fig. 3 is a plan with the lid removed and the bottom partly cut out, and Figs. 4 and 5 show, on an enlarged scale, a longitudinal and cross section through the feeding trough.

1 is the table of the paddy-separator supported in an oscillating and well known manner on supports 2 caused to vibrate by means of the eccentric 3, or in any other desired manner, and provided with throwing or projecting plates 4 which throw to and fro the material getting into the single chambers 5 and thus separate it so that it falls out from the outlet openings 6 separated in accordance with its specific gravity. The material gets

into the chambers 5 from a feeding trough 7 into which it is introduced by means of a funnel or hopper 8 or in some other manner. At the front ends, the table is supported on pins 9, so as to be rotatable about its longitudinal axis.

By turning the table about its longitudinal axis, the inclination of the surface of the table is adjusted, as already stated. To that end, the paddy separator is provided at the longitudinal sides, under the table, with vertical screws by turning which, after loosening the set screws, the inclination of the table can be altered as required, whereupon the set screws are again tightened. The adjustment of the table is, therefore, a fairly complicated one. It is necessary first of all to loosen the set screws, then to adjust the set screws distributed at both longitudinal sides of the table, and finally to tighten again the single set screws. The miller has therefore, to walk from one of these set-screws to the other around the whole of the table, which takes a great deal of time, as the table for large machines is three meters long, or even still longer. The adjustment can, moreover, be effected only when the table is standing still.

According to this invention, the device for adjusting the inclination of the table is very considerably simplified and carried out in such manner that the adjustment of the table can be effected even during its working. The turning of all the set screws is, namely effected from a spindle which can be turned from the front side of the table and is connected to the single screws in a suitable manner, for instance by means of a worm wheel gear. The securing after the adjustment is also effected no longer by fixing the separate screws, but by tightening one single screw.

To the table are namely secured two or more (two in the construction illustrated) set screw bolts 10. They are provided with nuts 11 mounted in the frame 12 of the table in such manner that they can be turned, but not moved in the longitudinal direction. At the outer circumference these nuts are provided with a helical screw-thread 13 with which engage worms 14 mounted on one and the same spindle. The latter is rotatably supported in the longitudinal direction of the table, and provided at the free front end with a hand-wheel 16. When the hand-wheel in question and, therefore, the spindle 15, is turned, the worms 14 bring about a rotation of the worm-wheels 13 or of the nuts 11, and as the said nuts cannot be moved in the longitudinal direction, they raise or lower, according to the direction of rotation, the screw bolts secured to the table and thus alter the inclination of the table. For modifying the inclination in question, it is therefore merely necessary to turn the

hand-wheel 16, which is arranged in a freely accessible manner at the free front end of the table, and this adjustment can be effected also during the working of the table.

For fixing the table after the adjustment has been effected, a rod 17 passing through it in the longitudinal direction is provided with a nut 19 provided with a hand-wheel 18. If the nut is tightened by means of the hand-wheel, the two brackets 20, in which are mounted the pins 9 of the table, are tightened together and thus pressed against the front side of the table. For altering the inclination of the table, it is therefore merely necessary to loosen the nut 19, then to adjust the rotation by turning the hand-wheel 16, and thereupon to retighten the nut 19. A lock nut 21 is preferably provided for securing the nut 19. In that way the miller, as soon as he notices that the separation does not take place quite as desired, can alter the movement of the table without interrupting the working, in order to continue to see whether the result is better, or otherwise to adjust the table again. As already pointed out, however, a satisfactory working of the separator does not depend only on the inclination of the table, but also on the material being introduced into the single chambers 5 in a uniform manner, and that cannot be done in well known tables. The reasons for it is that a certain preliminary sorting of the grains or other bodies takes place already in the feeding trough extending throughout the whole length of the table, and participating in the rocking oscillations of the table, in such manner that at one end of the trough, for instance, preferably shelled, and at the other end preferably unshelled grains collect. In that case, however, in those chambers of the table which are nearest to the first mentioned end of the feed trough, there will collect a mixture in which the shelled grains predominate, and in the chamber at the other side, a mixture in which the non-shelled grains will predominate. The inclination of the table at one side would therefore have to be different from that on the other side, and as that is practically impossible, the miller can choose in well known devices only a mean position relatively to the inclination of the table, in which the best possible, but not absolutely the best, separation takes place.

In order to avoid the above mentioned disadvantage the feeding trough according to this invention is arranged in such manner that a preliminary sorting of the material before it is introduced into the chambers of the table, cannot take place. This is effected in such manner that in the feeding trough there are arranged special guide surfaces between which the material gradually passes from the inlet opening to the distributing holes leading into the single chambers, and is inclosed on all sides in such manner that it

cannot be thrown to and fro in the feeding trough. Under the outlet opening of the trough, leading to the feed holes, is further arranged one slide valve for all the feeding
5 holes, by moving which all the holes are opened and closed in the same manner.

The drawings, more particularly the longitudinal section in Fig. 4 and the vertical section in Fig. 5, show a construction of the
10 feeding trough. The feeding trough 7 according to this invention is not arranged in such manner that the material can freely pass from the top downward, but there are provided guide surfaces 22 which form together a
15 winding conduit 23. In the latter the separating material is guided in such manner that it travels toward the feeding holes 24 in a comparatively slow manner and in a connected stream, without being able to make move-
20 ments of its own when the table with the trough are vibrating. The said feeding holes are distributed throughout the whole length of the table or of the trough in accordance with the arrangement of the chambers. Fig. 4
25 shows, dotted, some of these feed holes. For adjusting the feed holes 24, there is provided a joint slide valve 25 which can be moved from the outside by means of a spindle 26. This is effected in such manner that the slide
30 valve is provided at one or more points with tooth racks 27, with which engage the toothed rims 28 of the spindle 26. When the spindle is rotated, which can be effected by means of a crank 30 guided in a slot 29 and provided
35 with a handle 31, the valve 25 is moved and closes or opens all the feed holes 24 in a similar manner. Owing to the arrangement of the winding conduit in the feed trough, not only premature separation of the material is
40 prevented, but the feed holes at the bottom of the trough are relieved, so that the material separated falls through the holes only with a small pressure.

That what I claim is:—

45 1. A paddy separating machine for separating bodies of different weight or elasticity,

comprising a support, an inclined table having a rocking movement on the support, baffle plates on the table, the table having a supporting portion on which it is movable, 50 means for adjusting the inclination of the table on said portion comprising pivotal members on which the table can swing on said portion, screw rods connected with the table, end members rotatably carried on the 55 supporting member and engaging said screws by the rotation of which ends the screws are elevated and depressed to swing the table, a longitudinal shaft carrying worm portions, and worm wheels on the ends engaging said 60 worm portions by which the ends are simultaneously rotated.

2. A paddy separating machine for separating bodies of different weight or elasticity, comprising a support, an inclined table hav- 65 ing a rocking movement on the support, baffle plates on the table, the table having a supporting portion on which it is movable, means for adjusting the inclination of the table on said portion comprising pivotal mem- 70 bers on which the table can swing on said portion, screw rods connected with the table, end members rotatably carried on the supporting member and engaging said screws by the rotation of which ends the screws are ele- 75 vated and depressed to swing the table, a longitudinal shaft carrying worm portions, worm wheels on the ends engaging said worm portions by which the ends are simultane- 80 ously rotated, a rod by which the table is pivotally supported and having a threaded portion, and an end member on said rod arranged to clamp the table in adjusted position.

In witness whereof I have hereunto set my 85 hand this 25th day of May 1909 in the presence of the two subscribing witnesses.

FRANZ STRECKEL.

Witnesses:

ERNEST H. L. MUMMENHOFF,
EDWARD HOPF.