No. 799,450. PATENTED SEPT. 12, 1905.

E. CLUSS.

CONTROL ARRANGEMENT FOR MALT DRUMS.

APPLICATION FILED FEB. 19, 1904.

Fig. 1.

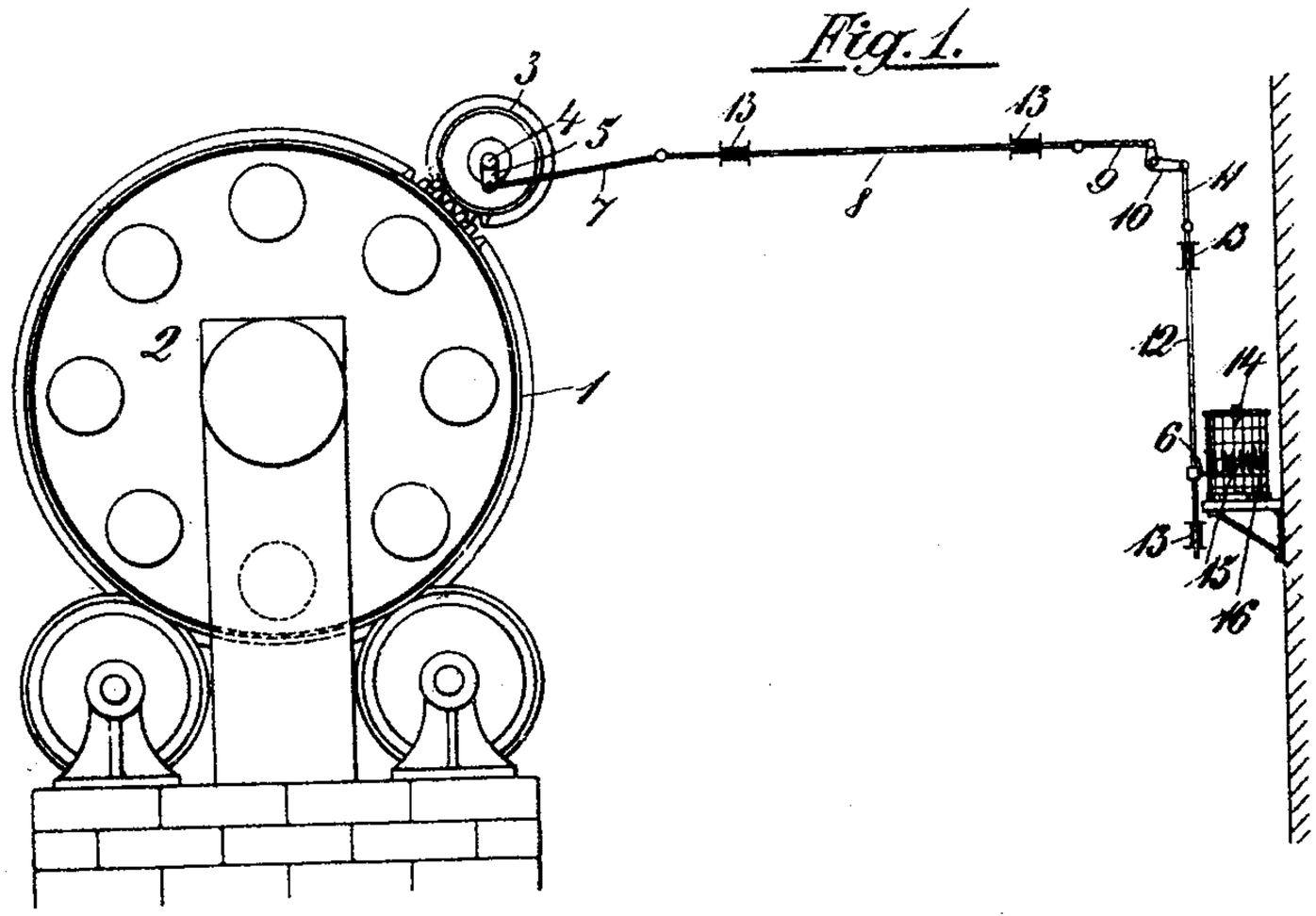


Fig. 2.

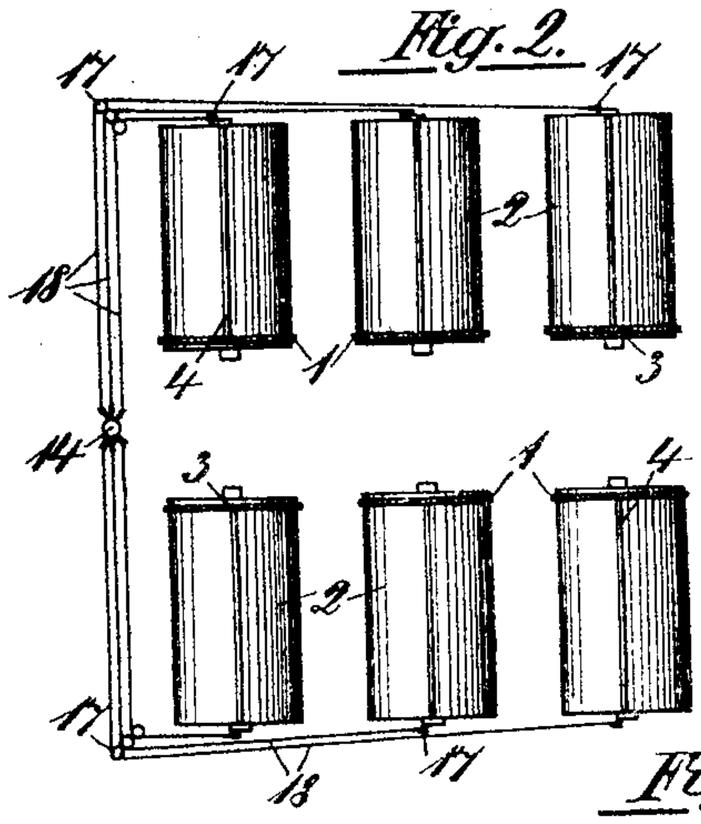


Fig. 3.

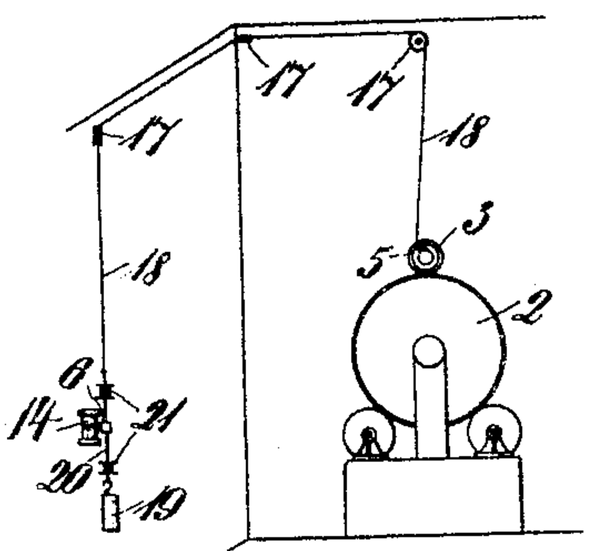
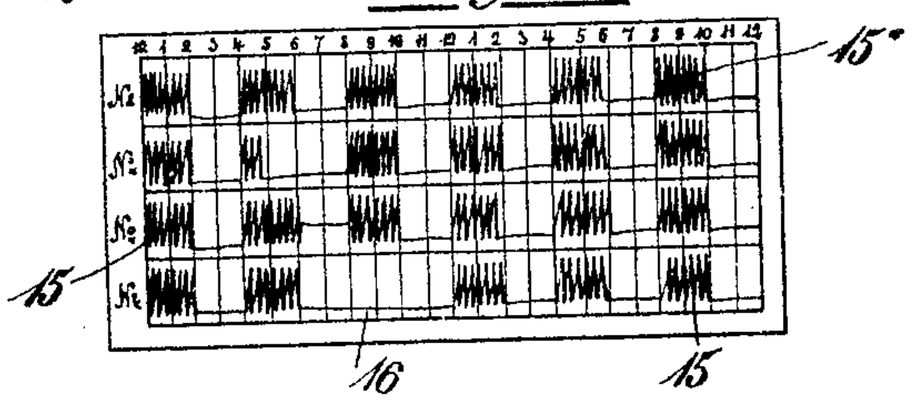


Fig. 4.



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CONTROL ARRANGEMENT FOR MALT-DRUMS.

No. 799,450. Specification of Letters Patent. Patented Sept. 12, 1905.

Application filed February 19, 1904. Serial No. 194,413.

To all whom it may concern:

Be it known that I, EUGEN CLUSS, a citizen of the German Empire, residing at Heilbronn, in the Kingdom of Würtemberg, Empire of Germany, have invented certain new and useful Improvements in Control Arrangements for Malt-Drums, of which the following is a description, reference being had to the accompanying drawings and to the figures of reference marked thereon.

The present invention relates to a device by means of which in working with drum-malting the whole drum movement and the drum position can be controlled. This is attained by arranging on a rotating paper-drum, driven by an ordinary control clock-gear, a pencil which is actuated in suitable manner—for example, by means of linkage, bell-crank lever, cam, and toothed wheel—from the malt-drum rotating at determined intervals. The pencil traces a diagram, from which can be taken number of rotations, the duration of each rotation, the point of time of its beginning and its standing at rest, as well as the position of the malting-drums during same. The suitably-regulated turning of the drum and the continually-requisite difference of drum position are both of extreme importance in drum-malting, since on them depends the correct issue of the germ process. An exact control in reference to the above points was hitherto not possible, so that it was easy for the attendants to be deceived and the germ material to be destroyed.

The essential part of this invention consists in this, that a toothed wheel journaled over the malt-drum in gear with its toothed driving-wheel drives a cam, crank, or such like keyed on its shaft, which in suitable manner—for example, by means of linkage and bell-crank lever—moves a pin up and down as long as the malt-drum rotates, whereby said pin traces a diagram acccording to the amount of the rotation of the malt-drum on a rotating paper-drum driven by the clockwork of the control-gear, from which diagram the rotation, the point of time of beginning of same, its duration, as well as the position of the malt-drum while standing, still can be ascertained.

In the following description, with reference to the accompanying drawings, the subject of the invention is more fully explained.

Figure 1 is a front view of the whole arrangement. Fig. 2 illustrates the subject of the invention with control clock-gear for six malt-drums. Fig. 3 is the perspective view of the actuating arrangement for the apparatus illustrated in Fig. 2. Fig. 4 shows a control-sheet of the control-clockwork with the diagrams taken from four malt-drums in twenty-four hours.

According to this invention a toothed wheel 1, secured on the circumference of the malt-drum 2, drives a toothed pinion 3, journaled above the same. The pinion 3 drives a crank 5, secured on its shaft 4, arranged parallel to the axis of the malt-drum. This moves the pin 6 of the control clock-gear 14 in any desired manner. In the present form of apparatus this is effected by the crank 5 actuating the connecting-rod 7, which by means of the links 8 9 11 and the bell-crank lever 10 causes the rod 12 to move up and down, the rod 12 sliding in guides 13. The rod 12 carries an adjustable pin 6 and is compelled by the guide 13 to reciprocate at such a distance from the paper-drum 16 that the pin 6 is always in light contact with the paper for the purpose of tracing the diagram. The paper-drum 16 is caused to slowly rotate by the clockwork-controller 14, which in familar manner corresponds to a twelve or twenty-four shift and is correspondingly divided.

The treatment of the germ material requires the drum, with the barley, to stand still for a determined time—for example, two hours—and then to be turned for a certain time—for example, one hour—whereupon it again, as in the quoted example, has to stand still two hours, and so on. Now when at any time the drum stands still the barley should not lie a second time at the same place in the drum. Thus the drum should be turned through a determined angle with regard to its previous position of rest. Now the control-clockwork effects a triple control—once whether the malt-drum was turned at the correct time, then whether it has performed the prescribed turning, and, furthermore, whether in its position of rest it has taken up a new position each time. These three points may be ascertained from the diagram. This arises from the fact that the pin 6 traces a determined number of zigzag lines 15 in consequence of its reciprocation at each movement of the malt-drum 2 and the simultaneous rotation of the paper-drum, whereas when the malt-drum stands still the pin traces a straight line 16, due to the rotation of the paper-drum, the bundle of zigzag lines 15 being repeated on further rotation of the drum. Now in or-

der to be able to ascertain from the diagram the point of time for the beginning of the turning of the malt-drum, as well as of its standing still, a scale with hour-divisions, Fig. 4, is applied on the paper strip of the paper-drum 16. Accordingly, as may be seen from Fig. 4, it may be easily determined by the position of the zigzag lines 15 from whence and how far the malt-drum 2 has rotated. Similarly, from the length of the straight line 16 there is easily shown the time during which the malt-drum 2 stood still. In order to be able to ascertain the position of the malt-drum 2 during the individual times of standing still, the horizontal strokes on the paper strip between the different bundles of zigzag lines 15 must be constantly at the same height, since the relation of the two toothed wheels 1 and 2 is so chosen that after the completed turning of the malt-drum 2 around a determined constantly-similar angle the crank 5 in the position of rest always assumes the same position of at least a diametral position.

The diagrams in Fig. 4 show that only the drum of the uppermost diagram was correctly turned. The drum of the second diagram was only turned from four to five o'clock instead of from four to six and stood still from five o'clock to eight—thus for three hours. The drum of the third diagram was not kept in the right position at six o'clock and the drum of the lowest diagram was not turned at all from six to twelve. Of course several malt-drums 2 can be controlled by only one control-clockwork.

An installation with six malt-drums 2 is represented, by way of example, in Fig. 2, in which arrangement a wire 18 is employed for transmitting the rotating movement of the malt-drums 2 from the crank 5 to the pin 6. Any other suitable arrangement, however, may be adopted without difficulty. In the present example the wire 18 is secured to the crank 5 by means of a loop, the wire running over the rollers 17 to the clockwork 14. A guide-rod 20, which carries the adjustable pin 6 for tracing the diagram, is suspended from the wire 18 in the guides 21. On this rod 20 hangs a weight 19, so that the pin 6 is raised by the turning of the malt-drums 2 and again guided down by the weight 19, whereby, as above explained, the zigzag lines 15 of the diagram are traced.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination with an intermittently-revoluble drum, of a recording means including an actuating device and a marker operated from the drum, the operating mechanism being arranged to hold the marker in the same stationary position when the drum stops at consecutively-different angular positions.

2. The combination with a malt-drum having a gear, of a pinion intermittently rotated therewith, a crank-pin operated by the pinion, a marking means operable by the crank-pin, and a clockwork-actuated record-carrier adjacent to the marker.

3. The combination with a malt-drum having a gear, of a pinion intermittently rotated therewith, a crank and crank-pin driven by the pinion, the gear and pinion being of such relative proportions that the drum may stop at different angular positions with the crank in the same position, and means for recording the movement of the crank.

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

EUGEN CLUSS.

Witnesses:

RUDOLF BRECHT,

WALTER SCHWAEBSCH.