Feb. 24, 1925. 1,527,630

R. S. COWAN

NUT CRACKING MACHINE

Filed July 11, 1924

Fig. 1.

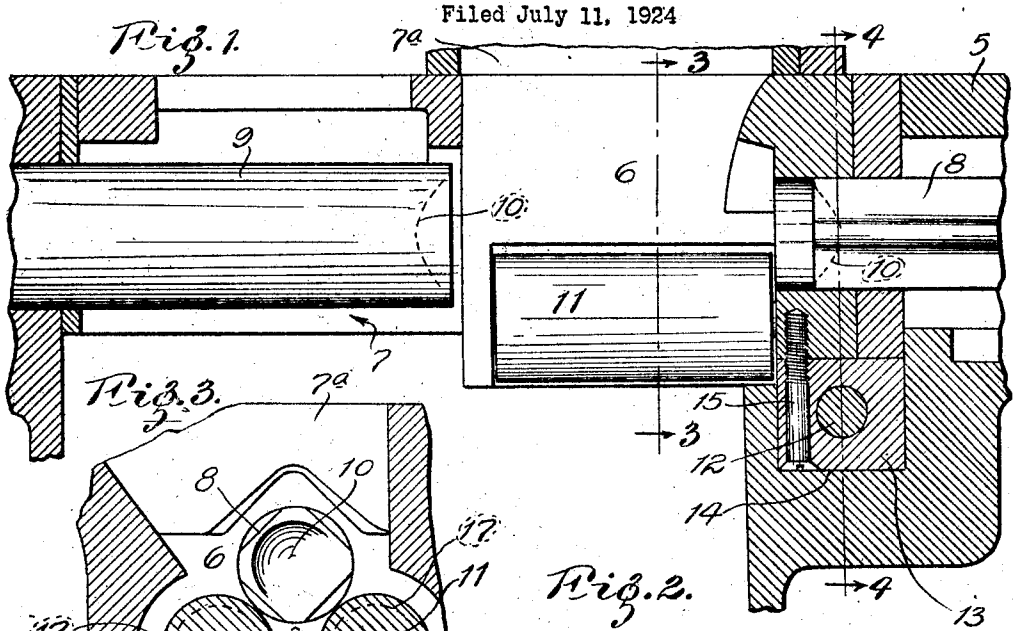



Fig. 3.

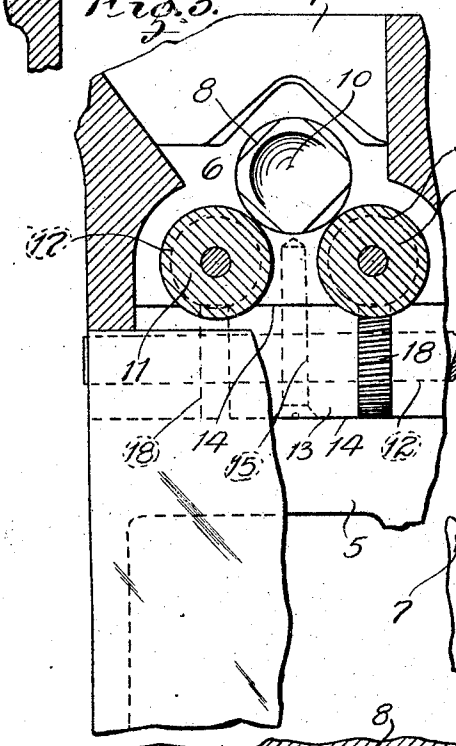



Fig. 2.

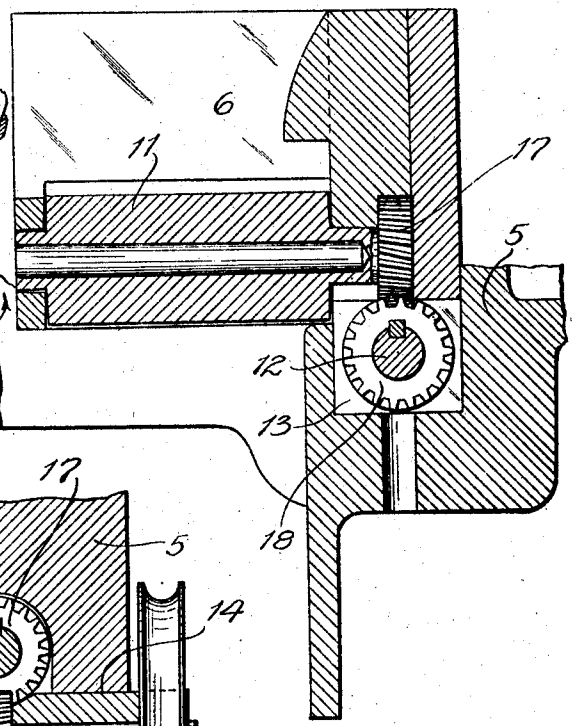
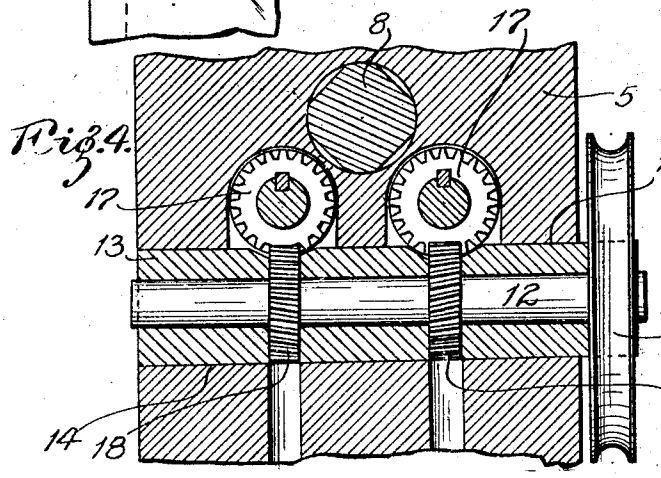



Fig. 4.




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# UNITED STATES PATENT OFFICE.

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## NUT-CRACKING MACHINE.

Application filed July 11, 1924. Serial No. 725,340.

*To all whom it may concern:*

Be it known that I, RICHARD S. COWAN, a citizen of the United States, and a resident of the city of St. Louis and State of Missouri, have invented a new and useful Improvement in Nut-Cracking Machines, of which the following is a specification.

This invention relates to improvements in nut-cracking machines, wherein the nuts are fed between the opposed ends of cooperating nut engaging plungers to be cracked therebetween. In the operation of such machines, nuts are sometimes fed between the opposed ends of the nut engaging plungers in positions transverse or oblique thereto with the result that such nuts are improperly cracked and are liable to interfere with the operation of the machine.

The principal object of the present invention is a nut-cracking machine wherein provision is made for overcoming the disadvantages hereinbefore mentioned. Other objects are simplicity of construction and operation and compactness of design. The invention consists principally in the improved means for properly positioning the nuts between the opposed ends of the nut engaging plungers; and it also consists in the combinations and arrangements of parts hereinafter described and claimed.

In the accompanying drawing, which forms part of this specification and wherein like symbols refer to like parts wherever they occur.

Fig. 1 is a vertical central longitudinal section through a portion of a nut-cracking machine embodying my invention,

Fig. 2 is a vertical longitudinal section taken along the axis of one of the supporting and positioning rollers,

Fig. 3 is a vertical cross section on the line 3—3 in Fig. 1, and

Fig. 4 is a similar section on the line 4—4 in Fig. 1.

The present nut-cracking machine, of which only a portion is shown, comprises a suitable bed or table 5 provided with a nut receiving pocket 6 which opens into an enlarged cracking or discharge space or opening 7 that extends through the bottom of said table. The nut receiving pocket 6 has downwardly converging side walls and has its lower portion enlarged to accommodate the nut supporting and positioning means. The nut receiving pocket communicates with the lower end of a vertical passageway or chute $7^a$ adapted to receive the nuts, which are fed thereto in any desired manner.

Mounted in a horizontal bore provided therefor in the table 5 is a reciprocatable hammer-plunger 8. The hammer-plunger 8 is adapted to move through the nut receiving pocket 6 and thus force nuts deposited therein out of said pocket into engagement with the end of an axially yieldable cylindrical anvil-plunger 9. As shown in the drawing, the hammer-plunger 8 is of substantially polygonal section and is preferably disposed with one of its corners uppermost. The anvil-plunger 9 is mounted in a cylindrical bore formed in the table 5 and is disposed in axial alinement with the hammer-plunger 8. The opposing ends of the hammer-plunger 8 and the anvil-plunger 9 are provided with conical depressions 10 adapted to engage the pointed ends of the nuts.

Rotatably mounted in the enlarged lower portion of the nut receiving pocket or recess 6, below the nut engaging plungers 8 and 9, is a pair of horizontally disposed nut supporting and positioning rollers 11. The guide-rollers 11 extend from side to side of the nut receiving pocket 6, parallel with the nut engaging plungers, and have reduced end portions journaled in suitable bearings provided therefor in the walls of said pocket. The rollers 11 are spaced apart equal distances on opposite sides of the longitudinal axis of the hammer-plunger and are arranged with their respective surfaces in close proximity to the downwardly converging lower side faces of said plunger.

The parallel nut supporting and positioning rollers 11 are driven in opposite directions by means of a horizontal drive shaft 12 preferably arranged at right angles to said rollers. The shaft 12 is journaled in rectangular bearing blocks 13 adapted to fit within a rectangular opening or passageway 14 in the bed of the machine. The bearing blocks 13 are removably held in place in the opening or passageway by means of screws 15; and the drive shaft 12 is driven by means of a belt pulley 16 secured to its outer end. The nut supporting and positioning rollers 11 are driven from the shaft 12 by means of two sets of spiral or helical gears,

one gear 17 of a set being secured to one end of a roller 11 and the other gear 18 of said set being keyed to the drive shaft 12. The gears of one set are provided with right-hand spirals and the gears of the other set are provided with left-hand spirals, whereby said rollers are driven in opposite directions.

The nuts are fed into the passageway 7[a], preferably one at a time, and are deposited upon the oppositely rotating nut supporting and positioning rollers 11 at the bottom of the nut receiving pocket 6. The hammer-plunger 8, at the beginning of its forward movement through the pocket 6, engages the nut supported on the rollers 11 and causes the adjacent pointed end of said nut to seat in the conical depression in the forward end of said plunger. The engaged nut is then forced along the rollers until its opposite end seats in the depression formed in the end of the anvil-plunger 9, whereupon a continued forward movement of the hammer-plunger forces the nut out of the nut receiving pocket 6 into the enlarged discharge opening 7. The anvil-plunger is then locked against further movement, by means of suitable mechanism (not shown), and the engaged nut is then cracked between the opposing ends of the hammer-plunger and the anvil-plunger by a continued movement of the hammer-plunger to the end of its forward stroke. After the nuts have been cracked between the ends of the pair of cooperating plungers the hammer-plunger is retracted while the anvil plunger remains locked, thereby permitting the cracked nuts to fall through the discharge opening 7. In the event of the deposit of the nut in the nut receiving pocket while the hammer-plunger is moving therethrough, the nut will roll down one or the other of the downwardly inclined upper side faces of said plunger and thus be guided into a position longitudinally thereof. Upon withdrawal of the hammer-plunger, the nut supported thereon will be deposited upon the opposite rotary rollers 11 in position to be engaged by the advancing hammer-plunger.

The hereinbefore described pair of oppositely driven nut supporting rollers operate to guide into the desired cracking position nuts that are deposited on said rollers in positions crosswise thereof. In the event that a nut is deposited upon the oppositely rotating nut supporting rollers in a position transverse or oblique thereto, said rollers, by reason of their rolling contact with said nut, will cause the nut to be guided into a position longitudinally of and in endwise alinement with the nut engaging plungers.

Obviously, the hereinbefore described arrangement admits of considerable modification without departing from the invention; therefore, I do not wish to be limited to the precise construction shown and described.

What I claim is:

1. A nut-cracking machine comprising a pair of axially alined nut engaging plungers, and rotatable nut supporting and positioning means below the adjacent ends of said nut engaging plungers.

2. A nut-cracking machine comprising a pair of axially alined nut engaging plungers, and rotatable nut supporting and positioning means below the adjacent ends of said nut engaging plungers, said means comprising a pair of parallel rollers arranged to turn in opposite directions.

3. A nut-cracking machine having a nut receiving pocket, a reciprocating nut engaging plunger working through said pocket, and rotatable nut supporting and positioning means in said pocket below said nut engaging plunger, said means comprising a pair of parallel rollers arranged to turn in opposite directions, said rollers being disposed on opposite sides of said nut engaging plunger in close proximity thereto.

4. A nut-cracking machine having a nut receiving pocket, a reciprocating nut engaging plunger working through said pocket, and rotatable nut supporting and positioning means in said pocket, said means comprising a pair of parallel rollers arranged to turn in opposite directions, said rollers being disposed with their axes below and on opposite sides of the longitudinal axis of said nut engaging plunger and with their surfaces in close proximity thereto.

5. A nut-cracking machine having a nut receiving pocket, a reciprocating nut engaging plunger working through said pocket, rotatable nut supporting and positioning means in said pocket, said means comprising a pair of parallel rollers arranged to turn in opposite directions, said rollers being disposed with their axes below and on opposite sides of the longitudinal axis of said nut engaging plunger and with their surfaces in close proximity to the lower portion thereof, and means for driving said rollers, said driving means comprising a drive shaft journaled in said machine and intermeshing gears on said shaft and said rollers.

6. A nut-cracking machine having a nut receiving pocket, a reciprocating nut engaging plunger working through said pocket, rotatable nut supporting and positioning means in said pocket, said means comprising a pair of parallel rollers arranged to turn in opposite directions, said rollers being disposed with their axes below and on opposite sides of the longitudinal axis of said nut engaging plunger with their surfaces in

close proximinity to the lower side portions thereof, and means for driving said rollers, said means comprising a drive shaft journaled in said machine and sets of mating spiral gears on said rollers and said drive shaft.

7. A nut-cracking machine having a nut receiving pocket, a reciprocating nut engaging plunger working through said pocket, rotatable nut supporting and positioning means in said pocket, said means comprising a pair of parallel rollers arranged to turn in opposite directions, said rollers being disposed with their axes below and on opposite sides of the longitudinal axis of said nut engaging plunger with their surfaces in close proximity to the lower portion thereof, and means for driving said rollers, said means comprising a drive shaft journaled in said machine at an angle to said rollers and sets of mating spiral gears on said rollers and said drive shaft, the gears of one set having right-hand spirals and the gears of the other set having left-hand spirals.

8. A nut-cracking machine having a nut receiving pocket, a nut engaging plunger working through said pocket, said plunger being of polygonal shaped cross-section and being disposed with one corner uppermost, and rotating nut supporting and positioning means in said pocket below said plunger, said means comprising a pair of parallel rollers arranged to turn in opposite directions.

9. A nut-cracking machine having a nut receiving pocket, a nut engaging plunger working through said pocket, said plunger being of polygonal shaped cross-section and being disposed with one corner uppermost, and rotating nut supporting and positioning means in said pocket below said plunger, said means comprising a pair of parallel rollers arranged to turn in opposite directions, said rollers being disposed with their surfaces in close proximity to the lower side faces of said plunger.

10. A nut-cracking machine having a nut receiving pocket, a nut engaging plunger working through said pocket, said plunger being of polygonal shaped section and being disposed with one corner uppermost, rotating nut supporting and positioning means in said pocket below said plunger, said means comprising a pair of parallel rollers arranged to turn in opposite directions, said rollers being disposed with their respective surfaces in close proximity to the lower side faces of said plunger, a drive shaft journaled in said machine, and sets of intermeshing spiral gears on said drive shaft and said rollers.

Signed at St. Louis, Missouri, this 8th day of July, 1924.

RICHARD S. COWAN.