No. 772,127. PATENTED OCT. 11, 1904.

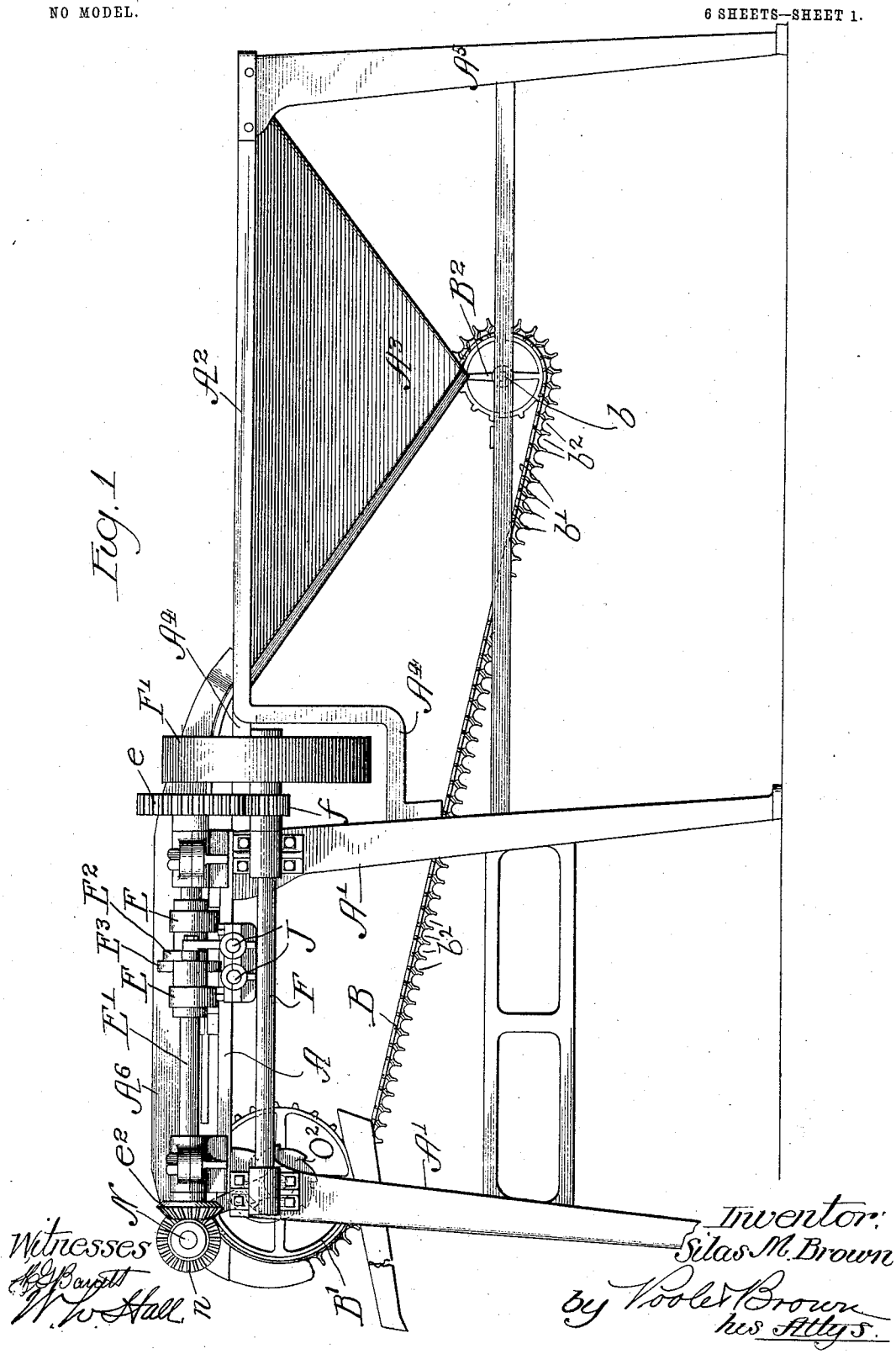
S. M. BROWN.

NUT CRACKING MACHINE.

APPLICATION FILED MAR. 22, 1904.

NO MODEL. 6 SHEETS—SHEET 1.

Fig. 1



Witnesses
H. G. Barrett
W. W. Hall

Inventor:
Silas M. Brown
by Wooster Brown
his Attys.

No. 772,127. PATENTED OCT. 11, 1904.

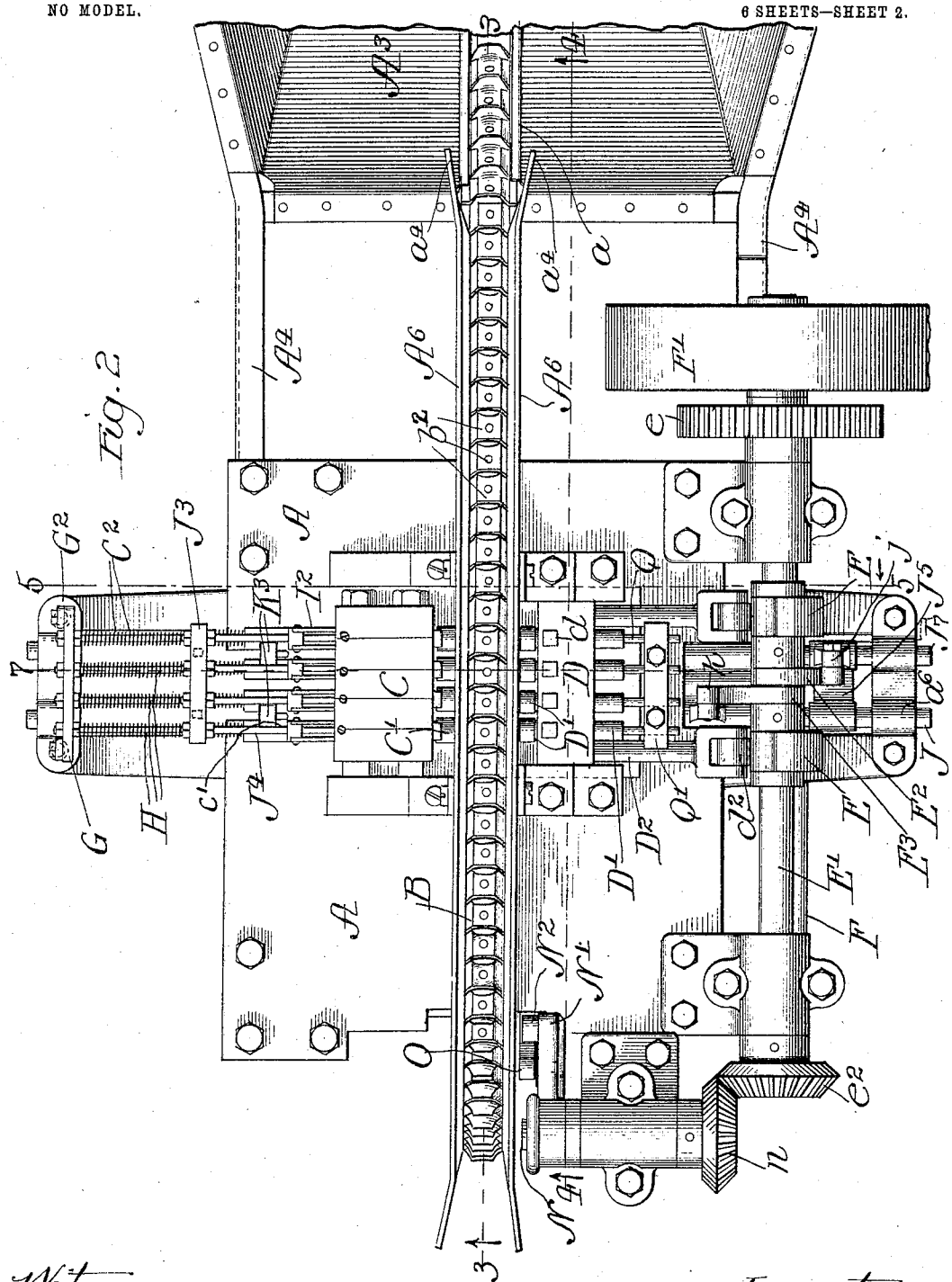
S. M. BROWN.

NUT CRACKING MACHINE.

APPLICATION FILED MAR. 22, 1904.

NO MODEL. 6 SHEETS—SHEET 2.

Fig. 2



Witnesses:
H. G. Barnett
W. L. Hall

Inventor:
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No. 772,127. PATENTED OCT. 11, 1904.

S. M. BROWN.

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NO MODEL. 6 SHEETS—SHEET 3.

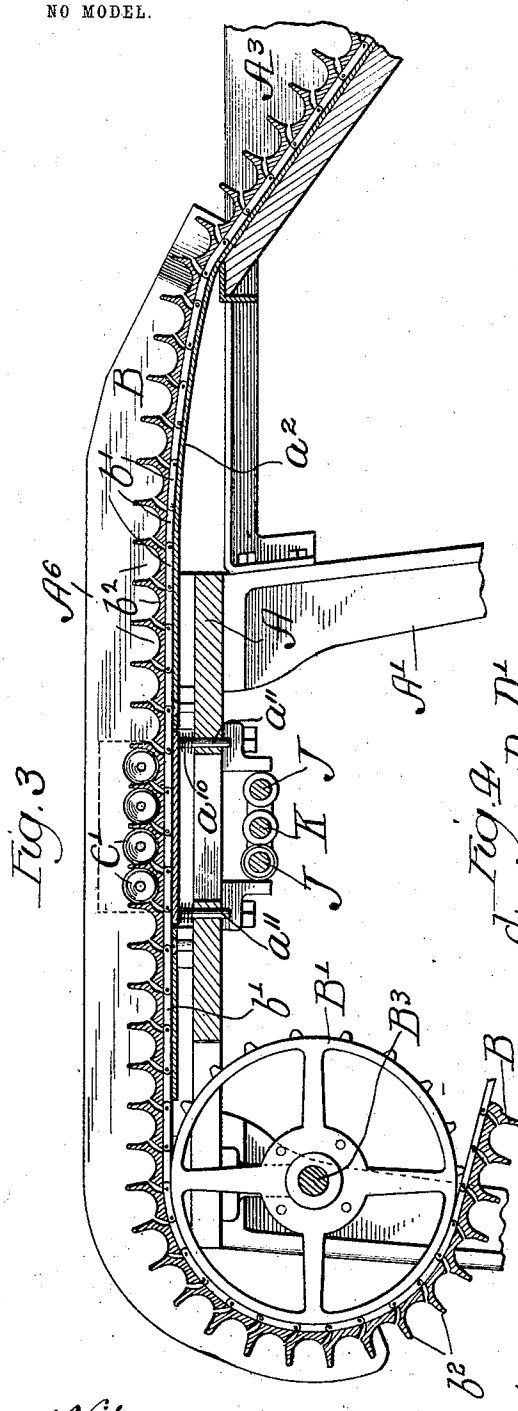


Fig. 3

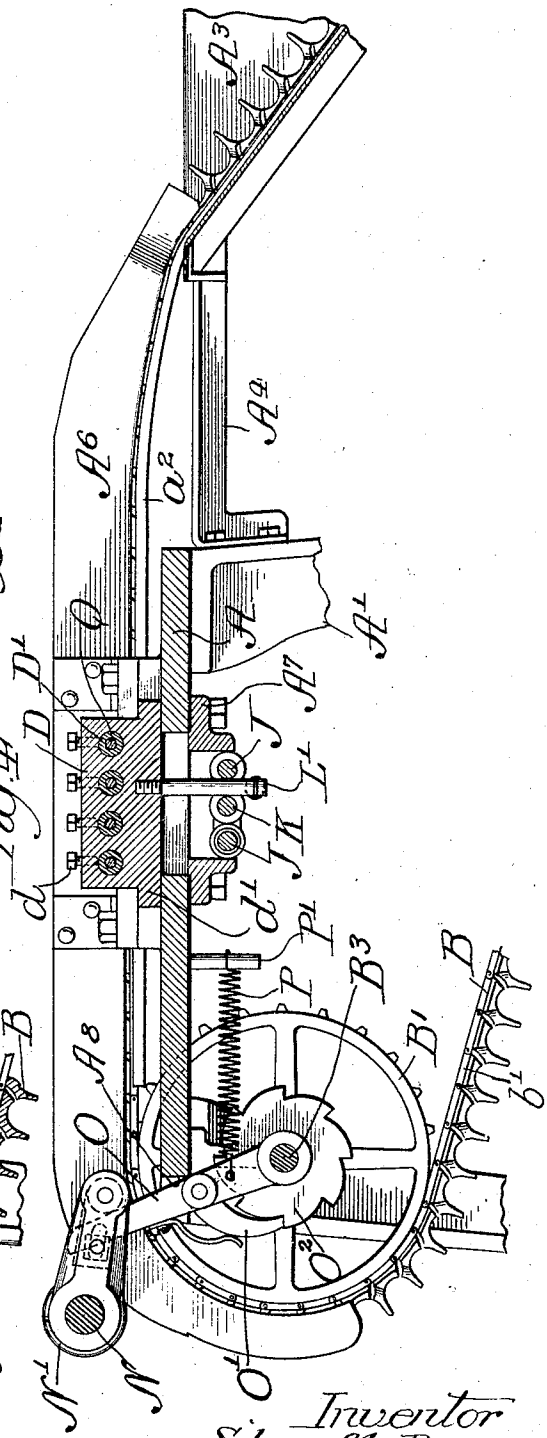


Fig. 4

Witnesses
H. G. Davitt
W. D. Hall

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No. 772,127. PATENTED OCT. 11, 1904.

S. M. BROWN.

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NO MODEL. 6 SHEETS—SHEET 4.

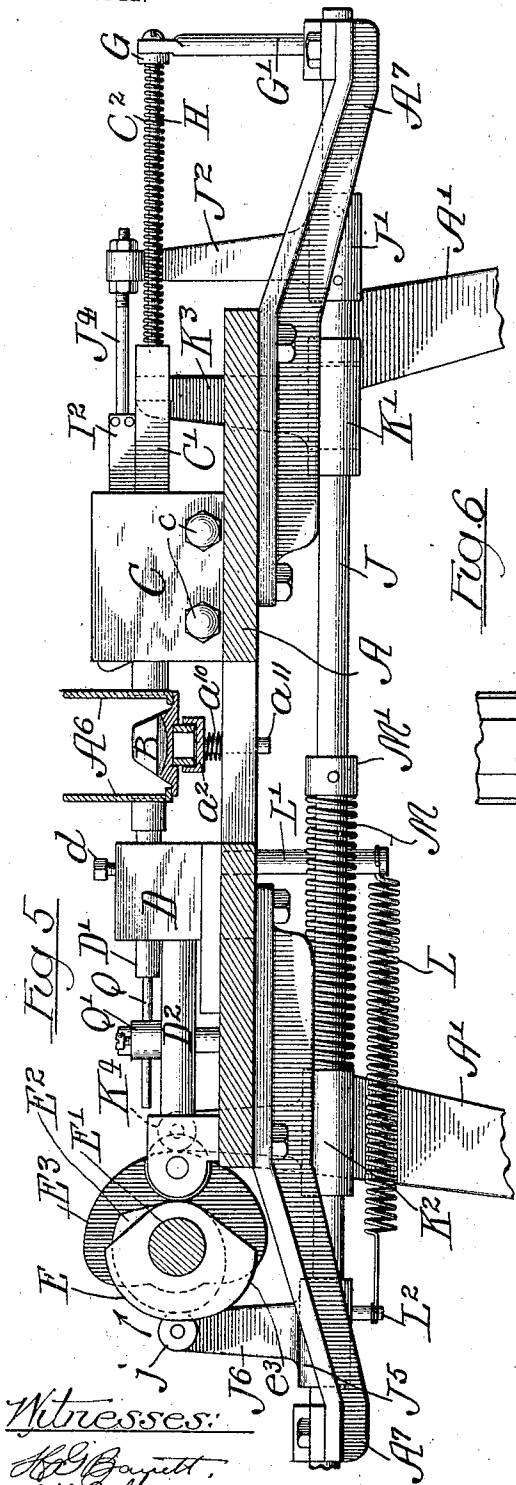


Fig. 5

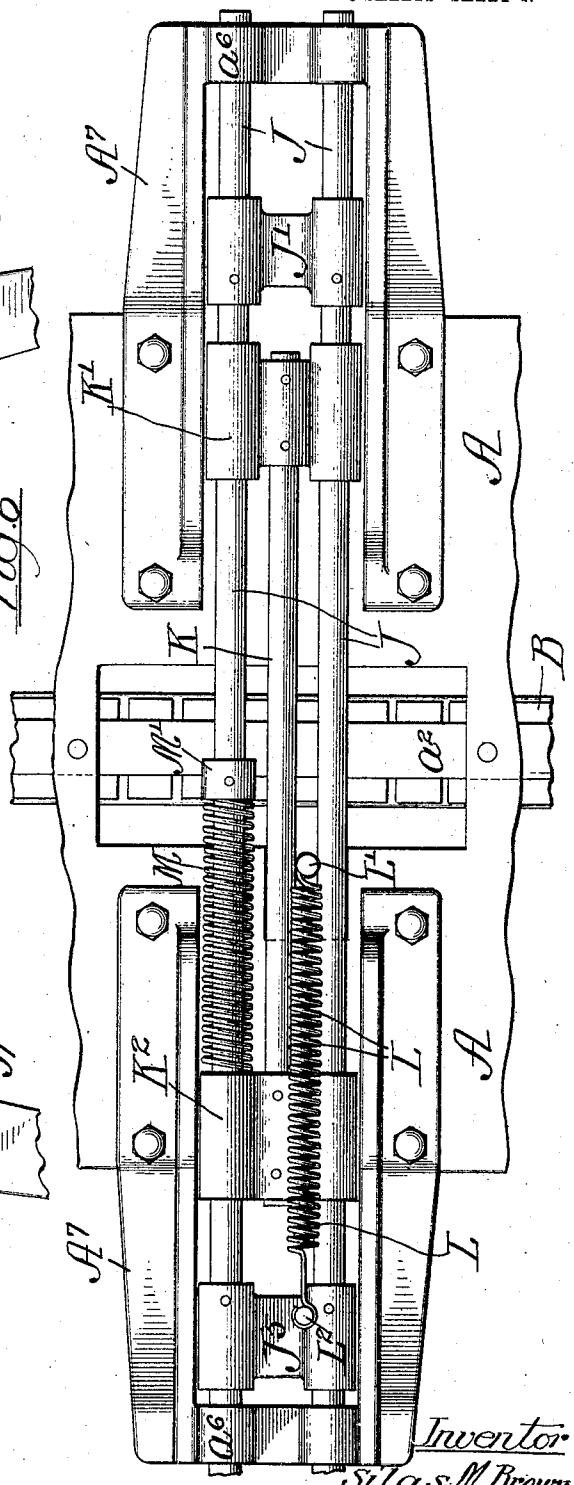


Fig. 6

Witnesses:
H. G. Bagnell.
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No. 772,127. PATENTED OCT. 11, 1904.

S. M. BROWN.

NUT CRACKING MACHINE.

APPLICATION FILED MAR. 22, 1904.

NO MODEL. 6 SHEETS—SHEET 5.

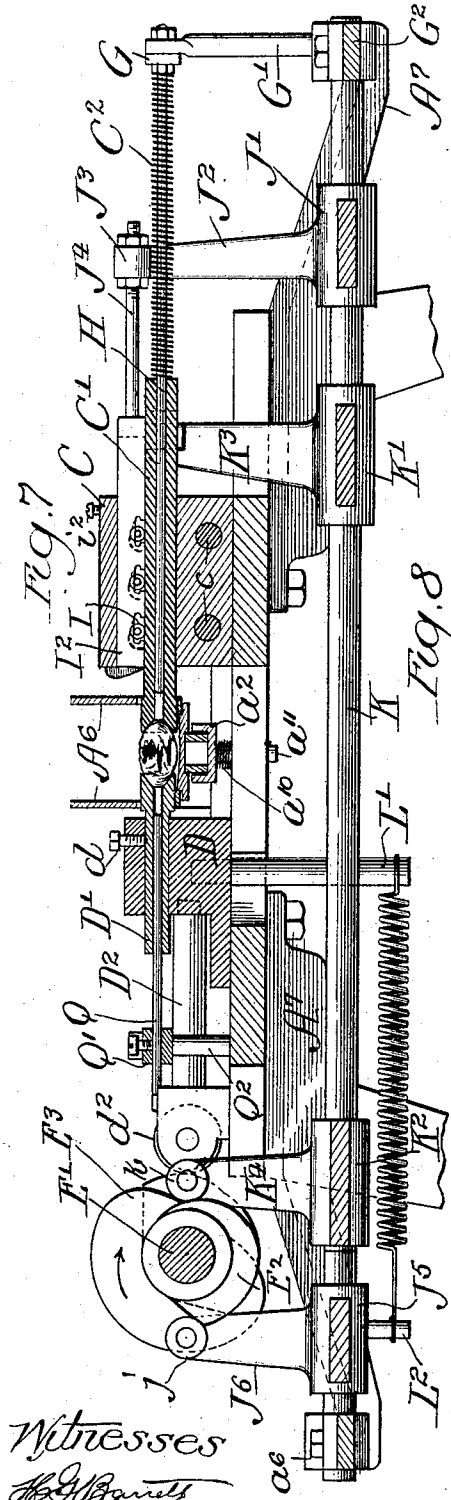


Fig. 7

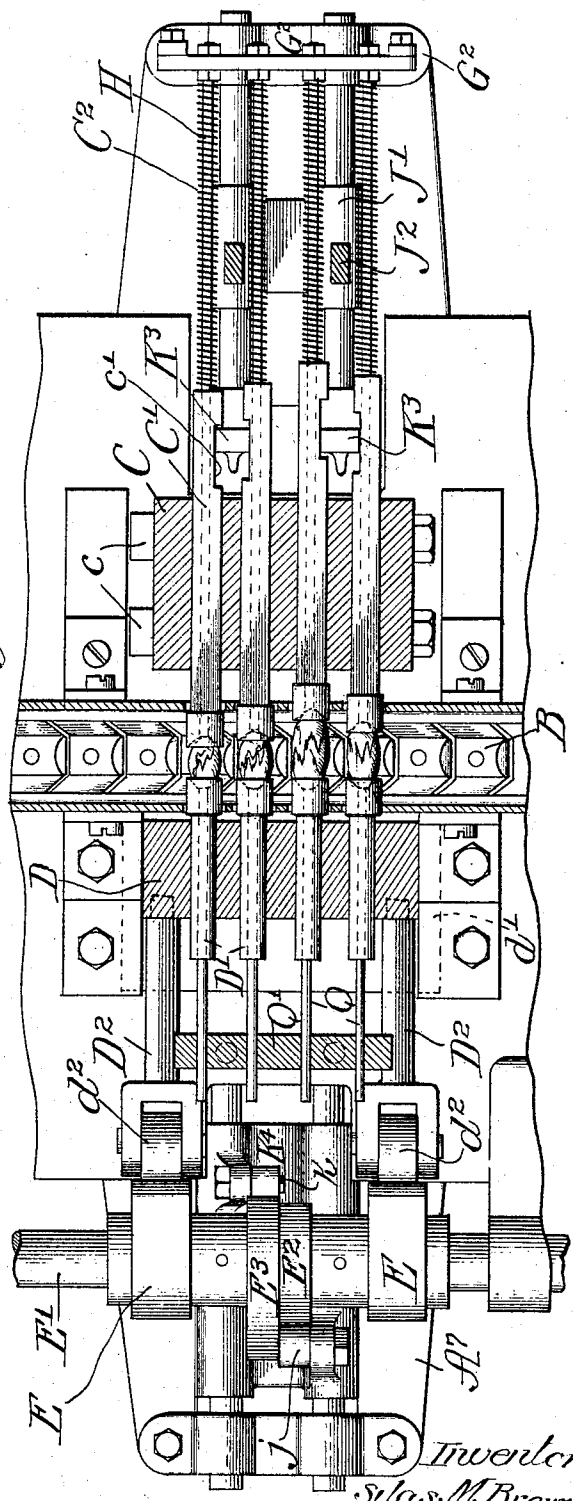


Fig. 8

Witnesses
H. G. Bagnell
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No. 772,127. PATENTED OCT. 11, 1904.

S. M. BROWN.

NUT CRACKING MACHINE.

APPLICATION FILED MAR. 22, 1904.

NO MODEL. 6 SHEETS—SHEET 6.

Fig. 9

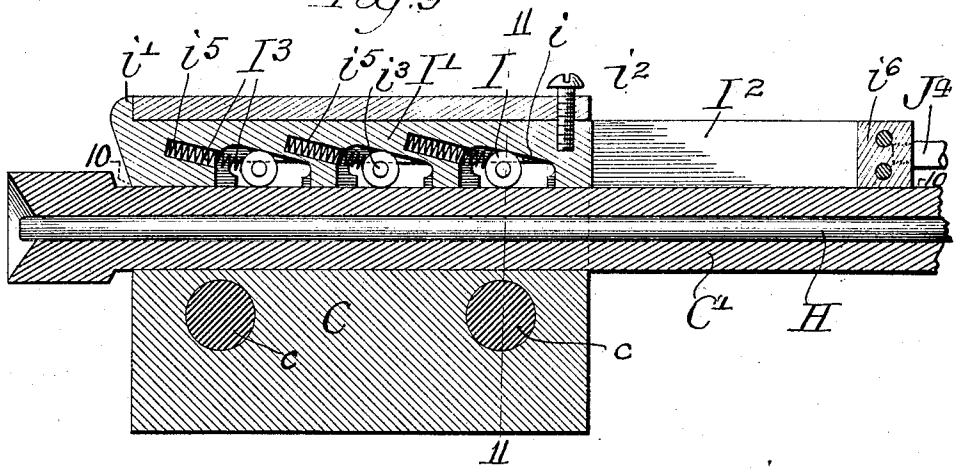


Fig. 10

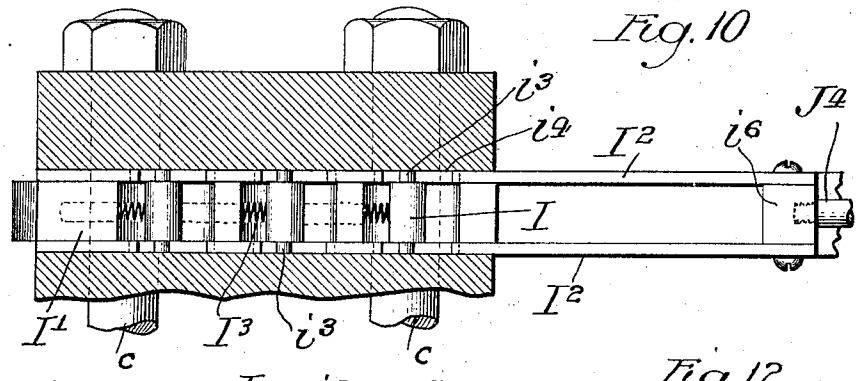


Fig. 11

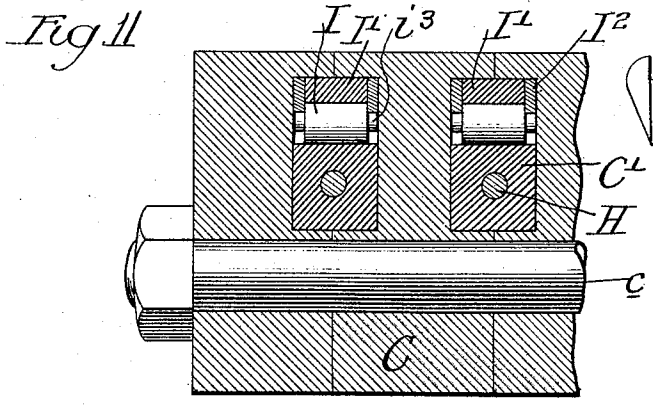
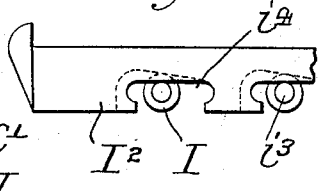


Fig. 12



Witnesses:
H. G. Bagnell.
W. L. Stall.

Inventor:
Silas M. Brown.
by Poole & Brown
his Attys

No. 772,127. Patented October 11, 1904.

UNITED STATES PATENT OFFICE.

SILAS M. BROWN, OF CHICAGO, ILLINOIS, ASSIGNOR TO REID, MURDOCH & CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

NUT-CRACKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 772,127, dated October 11, 1904.

Application filed March 22, 1904. Serial No. 199,372. (No model.)

To all whom it may concern:

Be it known that I, SILAS M. BROWN, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Nut-Cracking Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in nut-cracking machines; and the invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

Among the objects of the invention is to improve the construction of nut-cracking machines whereby the cracking operation may be made more certain; and a further object of the invention is to improve the action of the machine whereby the main operative parts thereof may be made more durable, and thus not likely to get out of repair.

In the drawings, Figure 1 is a side elevation of a nut-cracking machine made in accordance with my invention. Fig. 2 is a top plan view thereof. Fig. 3 is a longitudinal section taken on line 3 3 of Fig. 2. Fig. 4 is a similar section taken on line 4 4 of Fig. 2. Fig. 5 is a transverse section taken on line 5 5 of Fig. 2. Fig. 6 is a bottom plan view of the parts illustrated in Fig. 5 with the operative parts thereof in the same positions. Fig. 7 is a transverse section taken on line 7 7 of Fig. 2, showing the parts in positions different from that shown in Fig. 5. Fig. 8 is a top plan view of the parts shown in Fig. 7, showing the operative parts in the same positions as in Fig. 7. Fig. 9 is a detail section taken through one of the cracking-heads, showing in section one of the cracking-plungers and means for locking and releasing the plungers. Fig. 10 is a horizontal section taken on line 10 10 of Fig. 9 looking upwardly. Fig. 11 is a transverse vertical section of the cracking-head, taken on lines 11 11 of Fig. 9. Fig. 12 is a detail view of one of the clutch devices for locking the independently-movable plungers.

Without at this point attempting to limit or define the scope of the invention and in order that the detailed description of the mechanism which follows may be readily understood I will point out the salient features of the machine which is herein illustrated and will thereafter proceed with a detailed description of the machine.

The machine herein shown as embodying my invention embraces an endless traveling carrier, which travels through a suitable hopper or receptacle and provided with pockets which receive the nuts one by one, and two sets of opposing cracking mechanisms, one on each side of the path of the carrier and between which the belt travels to deliver the nuts thereto. The cracking mechanisms embrace a head on each side of the carrier, one of which is stationary and one of which is movable toward and from the carrier, and a plurality of plungers in one head opposing an equal number of plungers in the other head, the plungers of the movable head being stationary therein and those of the stationary head being independently movable thereon. The plungers carried by the movable head extend at equal distances from said head toward the carrier and are moved in a group toward the carrier, while the independently-movable plungers of the stationary head are projected from said head a distance dependent upon the length of the nut between the same and the opposing plunger—that is to say, the plungers fixed in the movable head approach the carrier as a group and always to the same transverse position, while the independently-movable plungers are advanced toward the carrier to varying extents, depending upon the lengths of the nuts, those engaging the longer nuts being first arrested and those engaging the shorter nuts extending farther in advance. The organization of the present machine is such that the group of plungers carried by the movable head are first moved toward the nuts in the carrier, after which the independently-adjustable plun-

gers are advanced to adjust themselves to the nuts—that is, to force the nuts against the opposing plungers—and thereafter the group of plungers carried by the movable head are given a final inward movement, by which the nuts are crushed or cracked between the opposing plungers.

Referring to the detailed construction as illustrated in the drawings, A designates a horizontal bed-plate upon which the principal operative parts of the machine are mounted. Said bed-plate is supported on legs or standards A′ A′.

A^2 designates an extension-frame which supports a hopper A^3, in which the nuts to be cracked are placed and from which they are withdrawn one by one by the carrier hereinafter described. Said extension or hopper-supporting frame is supported at one end from the machine-frame by means of extensions A^4 and at its other end by legs or standards A^5.

B designates an endless carrier, and C and D designate heads containing the plungers C′ D^2 of the cracking mechanism, located one at each side of the path of the carrier. Said carrier is trained about two sprocket-wheels B′ B^2, the former of which is affixed to a shaft B^3, that extends transversely across and is mounted in the rear end of the machine, and the latter of which is located beneath the hopper and is affixed to a transverse shaft *b*, which is mounted in the extension-frame. The said belt B consists of a plurality of connected links *b*′, to which are attached a plurality of peculiarly-shaped pockets b^2, constructed to receive the nuts transversely therein. Said carrier passes through a suitably-shaped guide-track *a* in the sloping bottom of the hopper A^2 and passes over a suitably-shaped track a^2, located over the bed-plate and which is made of channel form, as more clearly shown in Figs. 5 and 7, said track receiving the links while the nut-receiving pockets are located above the track. The part of the track a^2 located between the cracking-heads C D is made yieldingly depressible, so that in case a nut improperly engaged by the plungers shall press downwardly upon the carrier it will yield downwardly out of the way of the obstruction. For this purpose the said part of the carrier is mounted on springs a^{10}, which surround depending studs a^{11} thereof and are interposed between the yielding part of the track and the bed-plate A. The carrier travels between guide-plates A^6 A^6, located over the said bed-plate and suitably secured thereto and the purpose of which is to prevent the nuts from falling laterally from the carrier. The ends of said guide-plates at the hopper are inclined outwardly or away from each other, as shown at a^4 a^4, in order to properly position the nuts upon the carrier as they leave the hopper. Suitable means are provided, as will be hereinafter described, for intermittently driving the carrier and so timed as to give movement to said carrier when the cracking mechanism is out of action to deliver the nuts thereto and to arrest the carrier when the cracking mechanism is in action.

Referring now to the mechanism for cracking the nuts which are delivered thereto by said carrier, said parts are made as follows: Each of the heads C D is provided with a plurality of (four as herein shown) oppositely-acting cracking-plungers C′ D′, respectively, the plungers of the opposite heads being severally located in alinement with each other. The plungers D′ are located in transverse openings in the heads D and are fixed thereto by means of set-screws *d*, extending downwardly through the top of the head. The plungers C′ are independently movable in suitably-shaped transverse openings in the head C, and said openings are made of such size as to accommodate locking or clutch devices for independently locking the movable plungers from retraction. Preferably the head C is made of a plurality of vertically-divided parts, as indicated more clearly in Figs. 2 and 11, the several parts being divided through the openings through which extend the plungers C′ and their locking or clutch devices. Said several parts of the head are joined by means of bolts *c*. The head C is stationary, as before stated, while the head D is movable toward and from the carrier, said movable head D being provided with guide-flanges *d*′, having guiding engagement with suitable ways on the bed-plate, as shown in Fig. 4. Said movable head D is moved toward the carrier by means of two cams E E, fixed to a counter-shaft E′, mounted in suitable bearings at one side of the machine, said cams engaging rollers d^2 d^2 in the outer ends of short rods D^2 D^2, extending laterally from the moving head, one at each side of the head. The said head is retracted from the carrier by means of a suitably-applied spring, as will hereinafter be described. The counter-shaft E′ is rotated from the main driving-shaft F of the machine, located below and parallel with the counter-shaft, through the medium of a gear-wheel *e* on the counter-shaft and an intermeshing pinion *f* on the driving-shaft, and said driving-shaft is provided with a belt-pulley F′, by which it is driven from any suitable extraneous source of power. As before stated, the plungers D′ D′ move as a group or unit toward the carrier, being held immovably in the head D, while the plungers C′ are separately or independently movable in the head C, which latter is immovable and constitutes, in effect, a guide for the plungers C′. The guide-plates A^6 are provided with openings, Figs. 7 and 8, through which the plungers slide toward the carrier. The inner ends or heads of the plungers are integral and provided with concave recesses to receive the nuts. The machine is so constructed that after the

carrier is arrested with four filled pockets in line with opposing plungers the head D and plungers D′ are first advanced toward the carrier, so as to project the inner ends thereof beyond the guide-plates A^6, and the said plungers are then arrested. Thereafter the plungers C′ are severally and independently moved toward the carrier until their inner or cracking ends engage the adjacent ends of the nuts in the pockets of the carrier and force said nuts against the opposing or alined plungers D′, after which the advance movement of the plungers C′ is arrested. Inasmuch as the nuts are of unequal length, the plungers are advanced various distances inwardly, Fig. 8. Means are provided for locking the independently-movable plungers C′ from retraction when so engaged with the nuts and for thereafter imparting to the plungers D′ a final advance movement sufficient to crack the nuts against the locked independently-movable plungers. Next describing the means whereby said plungers C′ are moved independently to accommodate themselves to nuts of varying lengths and for locking the same from retraction while the plungers D′ are moving through their final cracking movement, said parts are made as follows: The independently-movable plungers C′ are free to advance through the head C under the action of springs C^2, except when restrained by the devices for retracting the plungers, as will hereinafter more fully appear. The springs C^2 are interposed between the rear ends of said plungers and a transverse bar G at the side of the machine carried on the upper ends of standards G′, extending upwardly from a supplemental frame A^7, extending laterally from the bed-plate A. Said springs C^2 surround rods H, which are attached at their outer ends to said bar G and extend at their inner ends through axial passages in said plungers for a purpose hereinafter to be described. Said independently-movable plungers are advanced by their springs C^2 when unrestrained until arrested by contact of the advance ends of the plungers with the nuts in the carrier, and the extent of advance movement depends upon the length of the nuts. The clutch devices for locking the independently-movable plungers at any position in which they are arrested are made as follows: I I, Figs. 7, 9, 10, and 11, designate cylindric rollers located in downwardly-facing notches in elongated blocks I^4, located in said openings in the head C above the plungers and interposed between the upper faces of said plungers and the downwardly and outwardly inclined upper walls i of said notches. Said notches are made of a length greater than the diameter of the rollers. The block I′ is provided with a lug i', which engages the front end of the head and prevents the block from being pushed outwardly through the head, and is additionally fastened by a screw i^2. Said rollers I are provided at their ends with trunnions i^3, which engage bearing-notches i^4 in parallel bars I^2 I^2, one at each side of the clutch-block I′ and which is slidable in the head independently of said block. Said bars are connected at their outer ends by blocks i^6. Said bearing-notches are made of greater length than the diameters of the trunnions, so as to provide for relative movement of the bars to the rollers. The rollers are forced into pinching engagement with the lower parts of the inclined bearing-surfaces i and the upper faces of the plungers by means of springs I′, herein shown as having the form of spiral expansive springs and interposed between the rollers centrally thereof and the bottoms of inclinced notches i^5, located in advance of said rollers, as clearly shown in Fig. 9. With this construction it will be obvious that so long as the rollers are forced into pinching engagement with the wedge-faces of the clutch-block and the upper faces of the plungers the said plungers cannot be moved outwardly, but will be locked from retraction, and thus constitute abutments against which the other set of plungers act to crush the nuts. Means are provided for releasing the clutch-rollers at the proper time to permit retraction of the plungers C′, and such proper time is just after the nuts are cracked. The means for so releasing the clutch-rollers and permitting the retraction of the independently-movable plungers consists of mechanism which coöperates with the parallel bearing-bars I^2 for the trunnions of the clutch-rollers in a manner to force said bars inwardly and by contact of the rear ends of the bearing-notches i^4 thereof with the trunnions i^3 to force the rollers inwardly toward the larger ends of the notches in the clutch-block and out of pinching contact with the coacting surfaces of the plungers and wedge or inclined surfaces. Such operative mechanism for this purpose may be variously constructed. As herein shown, it is operated from the counter-shaft E′ and is made as follows: J J, Figs. 5, 6, 7, and 8, designate two parallel bars extending transversely beneath the bed-plate and mounted to reciprocate at their ends in bearings a^6, formed in the extension-frames A^7. Extending between and attached to said shafts J at the side of the machine adjacent to the independently-movable plungers C′ is a yoke J′, from which rise vertical arms J^2, to the upper end of which is attached a cross-bar J^3, Fig. 2. Extending forwardly from said cross-bar are a plurality of rods equal in number to the pairs of bearing-bars I^2, and said rods have screw-threaded connection at their forward ends with the connecting-blocks i^6 of said bars. J^5 designates a yoke which extends between and is attached to the parallel reciprocating bars J at the opposite side of the machine, and rising from said yoke is an arm J^6, which is located in rear of the counter-shaft E′. Said arm is provided at its upper

end with a roller j', which has engagement peripherally with a cam E^2, affixed to the counter-shaft between the cams E E before referred to. Said cam E^2 is of such form that at the proper time in the rotation of the shaft it acts to force the arm J^6 away from the counter-shaft and through the bars or rods J, the arms J^2, and rods J^4 to force the bearing-bars I^2 toward the carrier. The extent of movement given to said parts by the cam E^2 is such that the rear ends of the bearing-notches of said bearing-bars strike the trunnions of the clutch-rollers I and force the rollers forwardly out of pinching engagement with the inclined clutch-faces of the block, and thereby permit the plungers to be retracted by the proper devices for that purpose hereinafter to be described. When said bearing or release bars I^2 are retracted, as they will be in the continued rotation of the counter-shaft E', the springs I^3 serve to force the rollers into pinching engagement with the upper and lower bearing-surfaces. The releasing movement of the clutch-rollers through the mechanism described takes place just after the cracking operation has occurred, and while said plungers are unlocked and free to retract they are retracted by means which will hereinafter be described. The rollers d^2 and j' are held against their respective cams E and E^2 by means of a contractile spring L, which is attached at one end to a stud L', depending from the head D through a slot in the bed-plate A, and at its other end to a like stud L^2, depending from the yoke J^5. With this construction it will be observed that when the rollers d^2 pass upon the lower parts of their cams E the spring retracts the head D, and when the roller j' passes upon the lower part of its cam E^2 the spring L serves, through the connections described, to retract the release or bearing bars I^2 to permit the rollers I to be again engaged with the inclined surfaces of the clutch-block I'.

The means for retracting the plunger C' when the clutch mechanism is released are made as follows: K designates an endwise-reciprocating bar located between the bars J and fixedly attached at its ends to yokes K' K^2, which have sliding engagement with said bars J, Fig. 6. Rising upwardly from the yoke K' are two arms K^3, one of said arms extending upwardly between two adjacent plungers C' C' and the other arm extending upwardly between the other two adjacent plungers, as more clearly shown in Fig. 8. Said plungers are provided on their inner faces with notches c' c' and the notches of each two pairs of plungers, between which extends one of the arms K^3, which face each other, so that a single arm is arranged to engage the notches of two plungers. The plungers are retracted by rearward movement of the arms K^3, which engaging the rear ends of said notches draw rearwardly said plungers. Such retractive movement is accomplished through the medium of a cam E^3 on the counter-shaft E', which engages a roller k on the upper end of a vertical arm K^4, rising from the yoke k^2. The roller k is held peripherally against the cam E^3 by an expansive spiral spring M, surrounding one of the bars J and interposed between a collar M' on said bar and the yoke K^2. Thus it will be seen that when the roller k rides upon the lower part of the cam the spring M acts upon the yoke K^2 and bar K to force the arms K^3 inwardly and permit the plungers C' to advance under the influence of the springs C^2. The cam E^3 is so shaped as to maintain the arms K^3 in their retracted positions, so as to hold the plungers C' retracted for the greater part of the movement of the machine, as will be clearly seen from an inspection of the cam E^3 in Figs. 5 and 7, and at the time when said parts are being held in their rearward position the arms K^3 restrain inward movement of the plungers C' under the action of the springs C^2, before referred to. Said spring M not only presses said roller k against its proper cam, but also, acting through the bars J and arm J^6, presses the roller j' against its cam. It will thus be seen that the roller j' is acted upon by both springs L and M in a manner to hold the same against its cam, and thereby follow the peripheral contour of the cam, while such springs respectively hold the rollers d^2 and k against their proper cams and causes the parts which are actuated thereby to follow the movements due to the peripheral contour of the cam.

Any suitable means may be employed for giving intermittent movement to the carrier to deliver the nuts between the cracking-plungers. There being four pairs of alined plungers employed the carrier is moved a distance at each intermittent movement thereof to pass four pockets past the cracking-heads, thereby moving four cracked nuts from the cracking-heads and delivering four cracked nuts thereto. The mechanism, as herein shown, for giving such intermittent movement to the carrier is made as follows: N designates a short rotative horizontal shaft mounted in suitable bearings at the rear end of the bed-plate and is rotated from the counter-shaft E' through the medium of intermeshing beveling-gears e^2 and n. Affixed to said shaft N remote from said gear-wheel n is a rigidly-attached wiper-arm N', Figs. 2 and 4, which is provided at its end with a short laterally-directed pin N^2, which is adapted to engage in each revolution of the wiper-arm an oscillatory arm O, which is rotatively mounted on the shaft B^3, which carries the driving-sprocket B' of the carrier B to rock or oscillate said arm O a partial revolution. Said arm O is provided with a pivoted spring-pressed pawl O', which engages a ratchet-

wheel or disk O^2, fixed to the shaft B^3, so that during the swing of the arm O said shaft is rotated the required angular distance to move the carrier a distance to deliver four uncracked nuts thereto and to remove the cracked nuts. The oscillatory arm O is returned to its upper position against a stop A^8, formed on the machine-base, by a spring P, which is attached at one end to said arm and at its other end to a depending stud P', attached to the base-plate, as shown in Fig. 4. In order to prevent the nuts from adhering to the hollow heads of the cracking-plungers, I provide ejecting devices consisting of the rods A, sliding in the plungers C', and other like rods Q, extending through axial passages in the plungers D' and attached at their outer ends to a cross-bar Q', attached to the upper ends of studs Q^2, rising from the base-plate, as shown in Figs. 7 and 8. Said rods H and Q project slightly into the hollow end of the plunger-heads when the latter are in their retracted positions, as clearly shown in Fig. 9, so that when said plungers are retracted they act to clear the plunger-heads should any parts of the nuts cling thereto.

The operation of the machine described is substantially as follows: The carrier as it passes through the lower part of the hopper A^3 receives thereon the nuts one by one, said nuts being arranged transversely thereacross, as shown in Fig. 8. The mechanism is so timed that the carrier stops with four pockets filled with nuts in line with the four pairs of coacting plungers. When the movement of the carrier is thus arrested, the positions of the parts are that shown in Figs. 5 and 6. By reference to Fig. 5 it will be noted that the rollers d^2 of the stems D^2 of the movable head are engaged with the lowest part of their actuating-cams E, so that said head is in its retracted position, while the rollers j and k are in contact with the highest parts of their respective cams. In the continued rotation of the counter-shaft E in the direction indicated by the arrows on Figs. 5 and 7 the roller d^2 rides upon the highest parts of the cams E and forces the movable head D and plungers D' inwardly. Just after this movement occurs the roller k passes to the lower part of its cam E^3 and the spring M acts on the yoke K^2 and bar K to move the arms K^3 forwardly, so as to permit the independently-movable plungers C' to advance under the action of their springs C^2 and adjust said plungers to the nuts in the holders opposite the same, said plungers being arrested at different points in their advance, depending upon the varying lengths of the nuts caught between the same and the other set of plungers D'. Owing to the shape of the inclined faces or wedges i^2 of the clutch-block I' it will be noticed at this time that said plungers C' may freely advance. The cams E, which actuate the head D, are provided at e^3 with short eccentric parts, which effect the final inward or cracking movement of the head D and plungers D'. When such movement is effected, the trunnions of the locking-rollers I are located intermediate the ends of the bearing-notches i^4 in the bars I^2, so that said rollers are free from restraint by said bars and are pressed by their springs I^3 against the lowest parts of the inclined clutch-surfaces i, and the plungers are therefore prevented from being retracted or forced outwardly by the cracking strain brought upon the parts at this time. Just after the cracking of the nuts is effected and the parts e^3 of the cams E are passing off the rollers d^2 the highest part of the cam E^2 passes into engagement with the roller j and acts to advance the bearing and release bars I^2 sufficiently for the ends of the notches thereof to engage the trunnions of the rollers and to force said rollers forwardly, thereby releasing the rollers from the inclined clutch-surfaces i and permitting the plungers to be returned. Such return of the plungers is accomplished at this time through the medium of the arms K^3, working in the notches c' of the plungers C', Fig. 8, such movement being effected by the highest part of the cam E^3 engaging the roller k of the arm K^4. When the plungers C' are being thus returned, the rollers d^2 pass to the lower parts of their cams E and the spring L returns the head D and plungers D'. During the retractive movement of the plungers C' D' the stationary ejecting-bars are projected into the hollow concave heads thereof and eject any part of the shells of the nuts which may adhere thereto. After the plungers have been thus retracted the carrier is again advanced to move the crushed nuts out of line with the plungers and to advance another set of pockets containing four nuts in line with the plungers, after which the operation just described is repeated. In this manner the movement of the carrier and cracking mechanism alternates, the carrier being operated while the cracking mechanism is stationary and the cracking mechanism being operated while the carrier is stationary.

It is to be understood that many parts of the mechanism may be variously constructed without departing from the spirit of the invention, and I do not wish to be limited to the illustrated details except as hereinafter made the subject of specific claims.

I claim as my invention—

1. In a machine for the purpose set forth, the combination with an intermittently-movable carrier and two heads, one at each side of the carrier, one of which is stationary and the other movable toward and from the carrier, of plungers immovably fixed to the movable head, plungers independently movable in the stationary head, springs for advancing the latter plungers toward the carrier, a clutch mechanism in said stationary head for locking said movable plungers from retraction, means

for releasing said clutch mechanism, and means for retracting said plungers when the clutch mechanism is released.

2. In a machine for the purpose set forth, the combination with an intermittently-movable carrier and two heads, one on each side of the carrier, one of which is stationary and the other movable toward and from the carrier, of plungers immovably fixed to the movable head, plungers independently movable in the stationary head, springs for independently advancing said movable plungers toward the carrier, a clutch mechanism for locking said movable plungers from retraction embracing rollers interposed between the movable plungers and fixed wedge or inclined parts in the stationary head, means for releasing said rollers from said wedge or inclined parts, and means for retracting said independently-movable plungers after the clutch-rollers are released.

3. A machine for the purpose set forth, comprising an intermittently-movable carrier, two sets of plungers, one on each side of the carrier, the plungers of one set being independently movable toward and from the carrier, a fixed head in which said last-mentioned plungers are guided, springs for independently advancing the plungers of the latter set toward the carrier, a clutch mechanism for locking said independently-movable plungers from retraction, embracing rollers interposed between said plungers and wedge or inclined parts in said fixed head, means for releasing said rollers from said wedge or inclined parts, and means for retracting the said independently-movable plungers after the clutch-rollers are released.

4. In a machine for the purpose set forth, the combination with an intermittently-movable carrier and two heads located one on each side of the carrier, one of which is movable toward and from the carrier and provided with a plurality of immovably-attached plungers, and the other of which is stationary and provided with a plurality of independently-movable plungers, of a counter-shaft at one side of the machine, a cam affixed to said shaft and acting to move said movable head toward the carrier, springs for advancing the independently-movable plungers toward the carrier, a clutch mechanism in said stationary head for locking said last-mentioned plungers from retraction, means for releasing said clutch mechanism, means for retracting said plungers after the clutch is released, and a cam affixed to said shaft and operating said clutch-releasing and plunger-retracting means.

5. In a machine for the purpose set forth, the combination with an intermittently-movable carrier, and heads located one on each side of the carrier, one of which is stationary and the other of which is movable, a plurality of plungers immovably attached to the movable head, a plurality of independently-movable plungers in the stationary head, and springs for advancing said independently-movable plungers, of clutch mechanisms for locking said plungers in their advance positions, comprising rollers interposed between said plungers and wedge or inclined parts in the stationary head and provided with oppositely-extending trunnions, bars located one on each side of each set of clutch-rollers and provided with bearing-notches engaged by the trunnions of said rollers, means acting through said bars for releasing the rollers from said inclined or wedge parts, and means for retracting the independently-movable plungers when said clutch-rollers are released.

6. In a machine for the purpose set forth, the combination with an intermittently-movable carrier, a head movable toward and from the carrier, a plurality of plungers immovably attached thereto, a fixed head provided with a plurality of through-openings, a plurality of plungers independently movable in said openings, and springs for independently advancing said plungers toward the carrier, of clutch mechanisms located in said openings comprising rollers which are interposed between the plungers and inclined or wedge parts stationary with said head, means for releasing said rollers from said inclined or wedge parts, and means for retracting the plungers when the rollers are released.

7. In a machine for the purpose set forth, the combination with an intermittently-movable carrier, of a head provided with a through-opening, a plunger located in said opening, a spring for advancing said plunger toward the carrier, a clutch for locking the plunger from retraction, comprising a roller interposed between said plunger, and an inclined or wedge part in the head and provided with oppositely-extending trunnions, bars, one at each side of said roller and provided with bearing-notches for the roller-trunnions, means for advancing said bars to release the rollers from said inclined or wedge part, and means for retracting the plunger when the rollers are released.

8. In a machine for the purpose set forth, the combination with an intermittently-movable carrier, of a head provided with a through-opening, a plunger located in said opening, a spring for advancing said plunger toward the carrier, a clutch for locking the plunger from retraction, comprising a roller interposed between said plunger and an inclined or wedge part in the head and provided with oppositely-extending trunnions, bars, one at each side of said roller and provided with bearing-notches for the roller-trunnions, means for advancing said bars to release the rollers from said inclined or wedge part, and means for retracting the plunger when the rollers are released, said notches of the bars being made of greater length than the diameter of the trunnions,

whereby the bars have lost motion relatively to the roller.

9. In a machine for the purpose set forth, the combination with an intermittently-movable carrier, a head movable toward and from the same and provided with a plurality of fixed plungers, a stationary head and independently-movable plungers therein opposing the said plungers of the movable head, of means for independently advancing said latter plungers, clutch mechanisms for locking the plungers from retraction comprising rollers interposed between the plungers and stationary inclined or wedge parts in the stationary head, and provided with trunnions, endwise-movable bars having notches in which said roller-trunnions have bearing, means for advancing said bars for releasing said rollers from said inclined or wedge parts, and means for retracting said plungers.

10. In a machine for the purpose set forth, the combination with an intermittently-movable carrier, a head movable toward and from the same and provided with a plurality of fixed plungers, a stationary head provided with a plurality of through-openings, independently-movable plungers in said openings opposing the plungers of the movable head, and springs for independently advancing the plungers in said head, of clutch mechanisms embracing rollers interposed between the plungers and inclined or wedge parts stationary with the head, trunnions on said rollers, parallel bars, one pair for each set of rollers and provided with openings which receive the trunnions of the rollers, said openings being made of greater length than the diameter of the trunnions, means common to all the bars for advancing the same to simultaneously release the rollers from said inclined or wedge parts, and means for retracting said plungers when said rollers are released.

11. In a machine for the purpose set forth, the combination with a stationary head provided with a plurality of through-openings, a movable head movable toward and from the stationary head and provided with a plurality of fixed plungers, independently-movable plungers in said openings of the fixed head, and means for independently advancing the plungers in said head, of clutch mechanisms for locking the plungers from retraction, means for releasing said clutch mechanisms, and means for retracting said plungers when the clutch mechanisms are released, comprising movable arms extending between said plungers and adapted to engage shoulders on the plungers in the outward or retractive movement of said arms.

12. A machine for the purpose set forth comprising an intermittently-movable carrier, two heads located, one on each side of said carrier, one of which is movable toward and from the carrier, plungers affixed stationary to said movable head, independently-movable plungers in the other head, means for independently advancing said last-mentioned plungers toward the carrier, clutch mechanisms in said stationary head for locking the plungers from retraction, means for releasing the said clutch mechanisms, means for retracting said movable plungers when free, a single rotative shaft, and cams on said shaft acting severally to advance said movable head, to release said clutch mechanisms and to retract the plungers upon the release of the clutch mechanisms.

13. A machine for the purpose set forth comprising an intermittently-movable carrier, two heads, one on each side thereof, plungers fixed in one of said heads, plungers independently movable in the other head, means for advancing said independently-movable plungers, clutch mechanisms for locking said independently-movable plungers from retraction, means for releasing said clutch mechanisms, means for retracting said plungers when the clutch mechanisms are released, a rotative shaft E′ provided with the cams E E^2 E^3, operative connections between the cam E for advancing one of said heads and its fixed plungers toward the carrier, operative connections between the cam E^2 and the said clutch-releasing device comprising the bars J J, the yokes J′ J^5 and the arms J^6 J^2, the former of which engages said cam E^2 and the latter of which is connected with said clutch-releasing device, and operative connections between the cam E^3 and the movable plunger-retracting device, comprising the rod K provided with the yokes K′ K^2 having sliding engagement with the bars J, said yokes being provided with the bars K^3 K^4, the latter being operated by the cam E^2 and the former being operatively connected with said plungers to retract the same.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 19th day of February, A. D. 1904.

SILAS M. BROWN.

Witnesses:
WILLIAM L. HALL,
GERTRUDE BRYCE.