(No Model.) 3 Sheets—Sheet 1.

A. RUGER.

CRACKER MACHINE.

No. 343,343. Patented June 8, 1886.

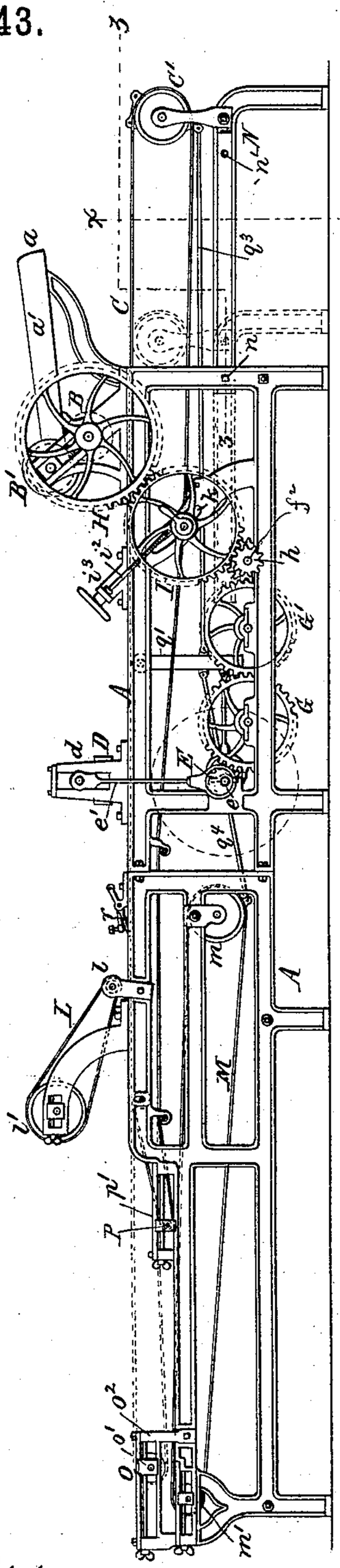


Fig. 1.

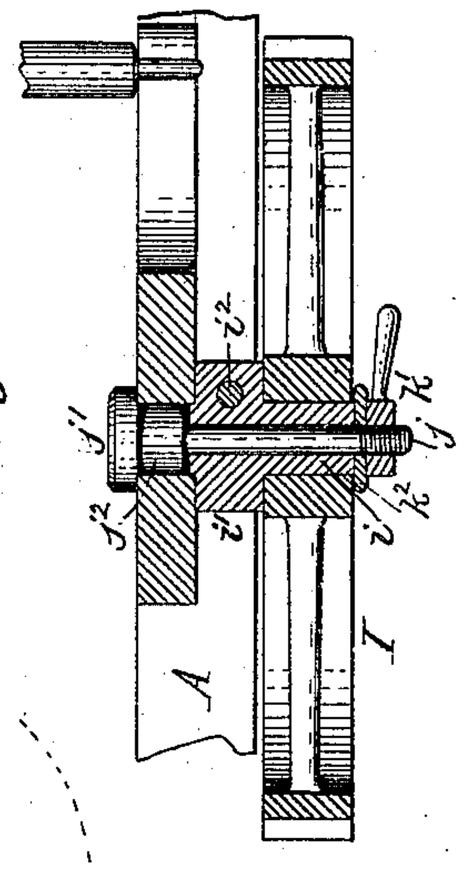
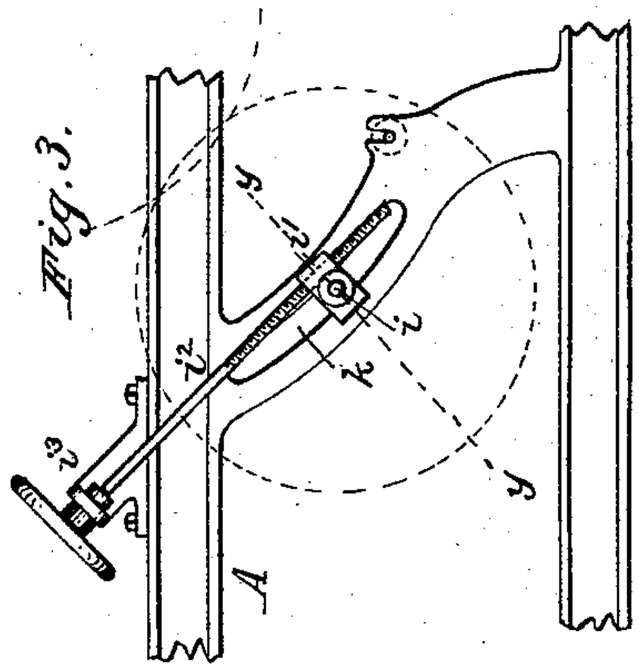


Fig. 4.



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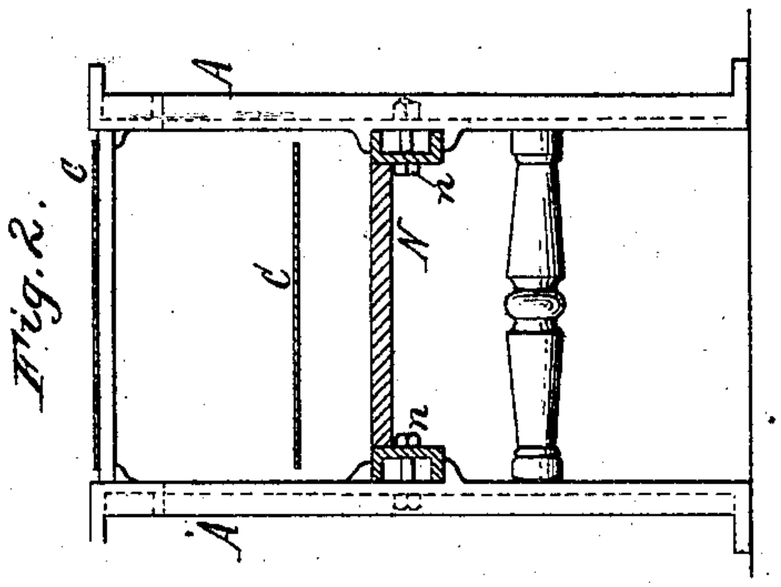

Fig. 2.

Witnesses.
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(No Model.) 3 Sheets—Sheet 2.

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CRACKER MACHINE.

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Fig. 5.

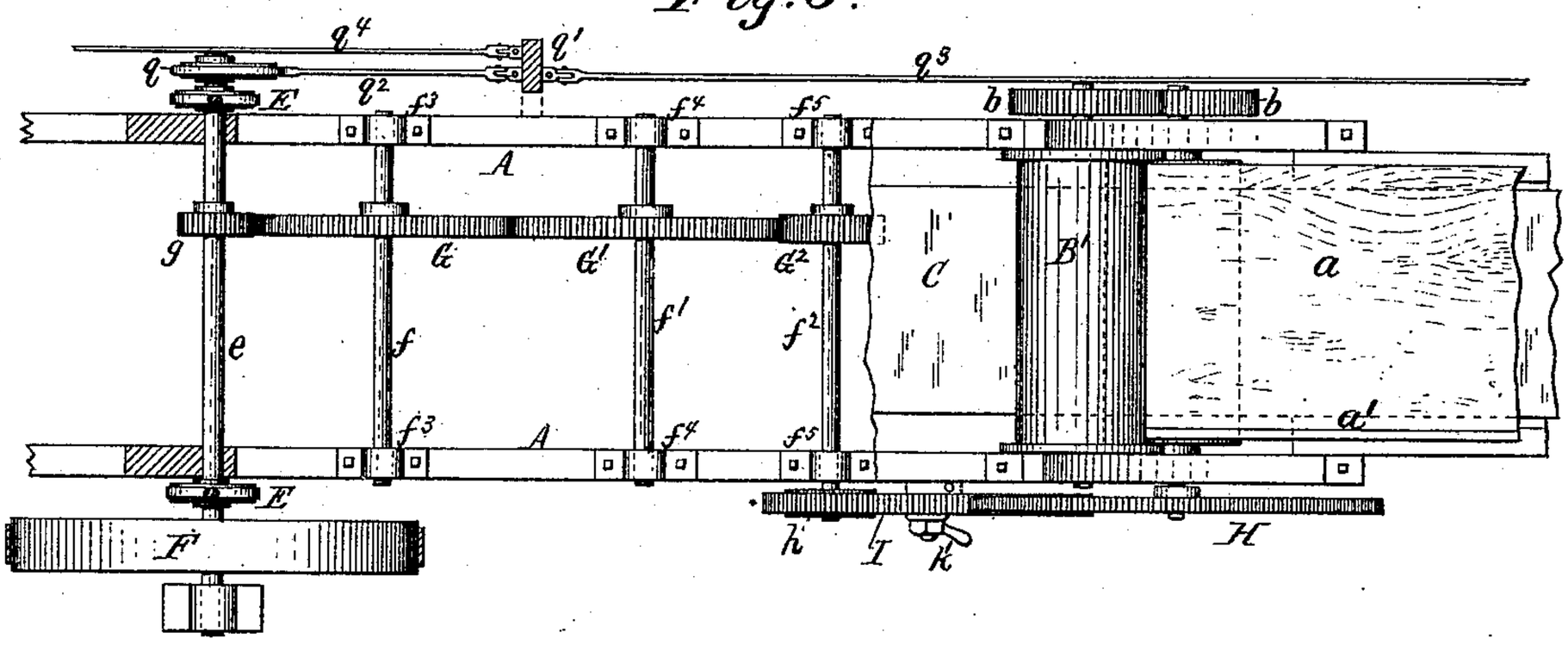


Fig. 6.

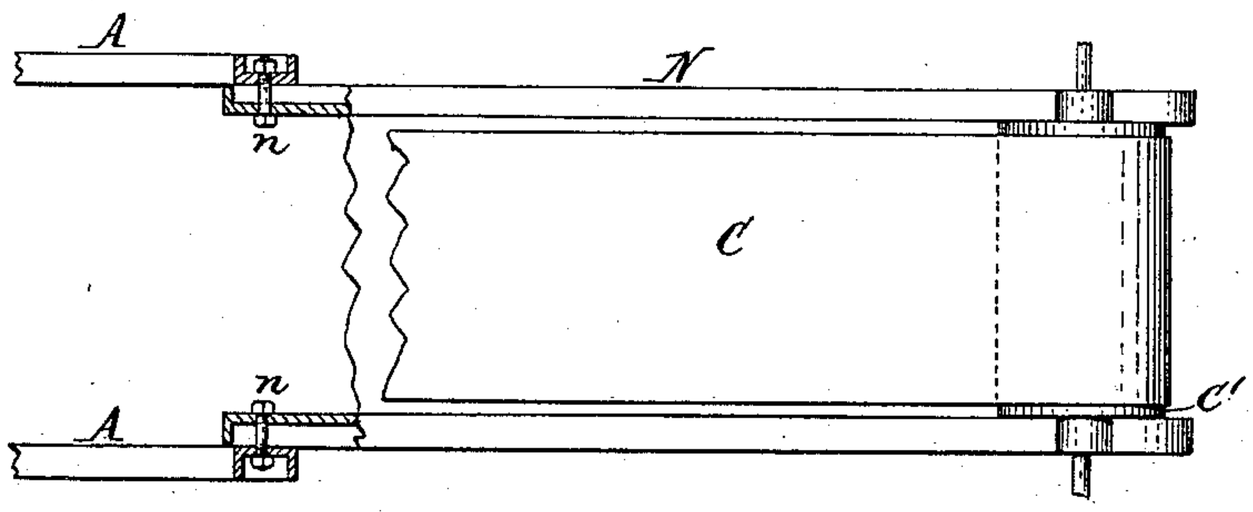
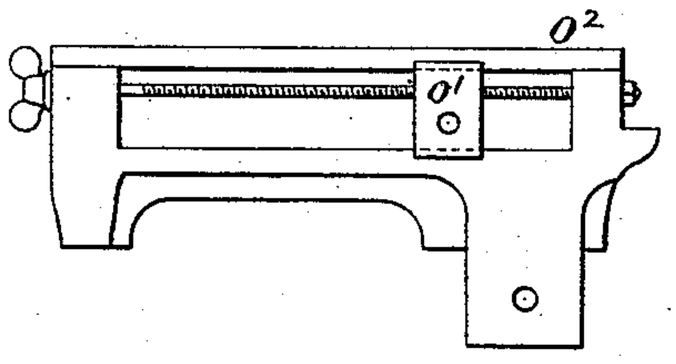


Fig. 7.



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CRACKER MACHINE.

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Fig. 8.

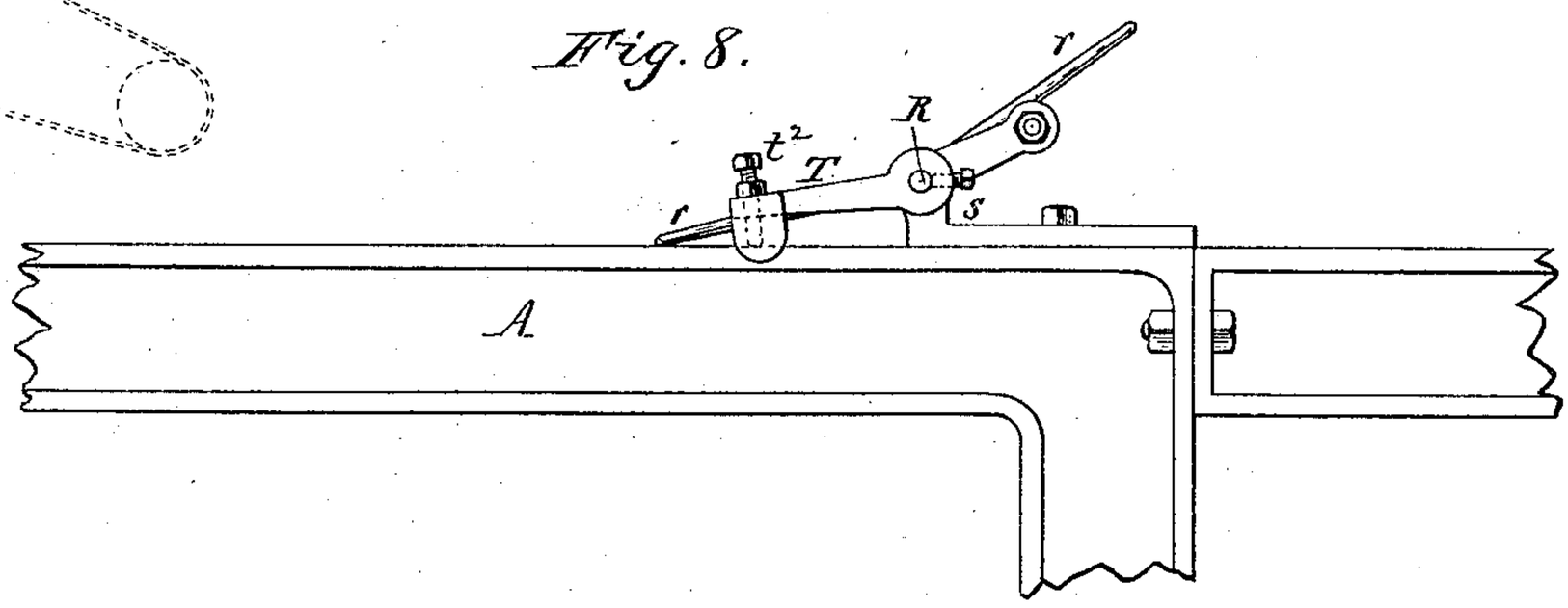


Fig. 9.

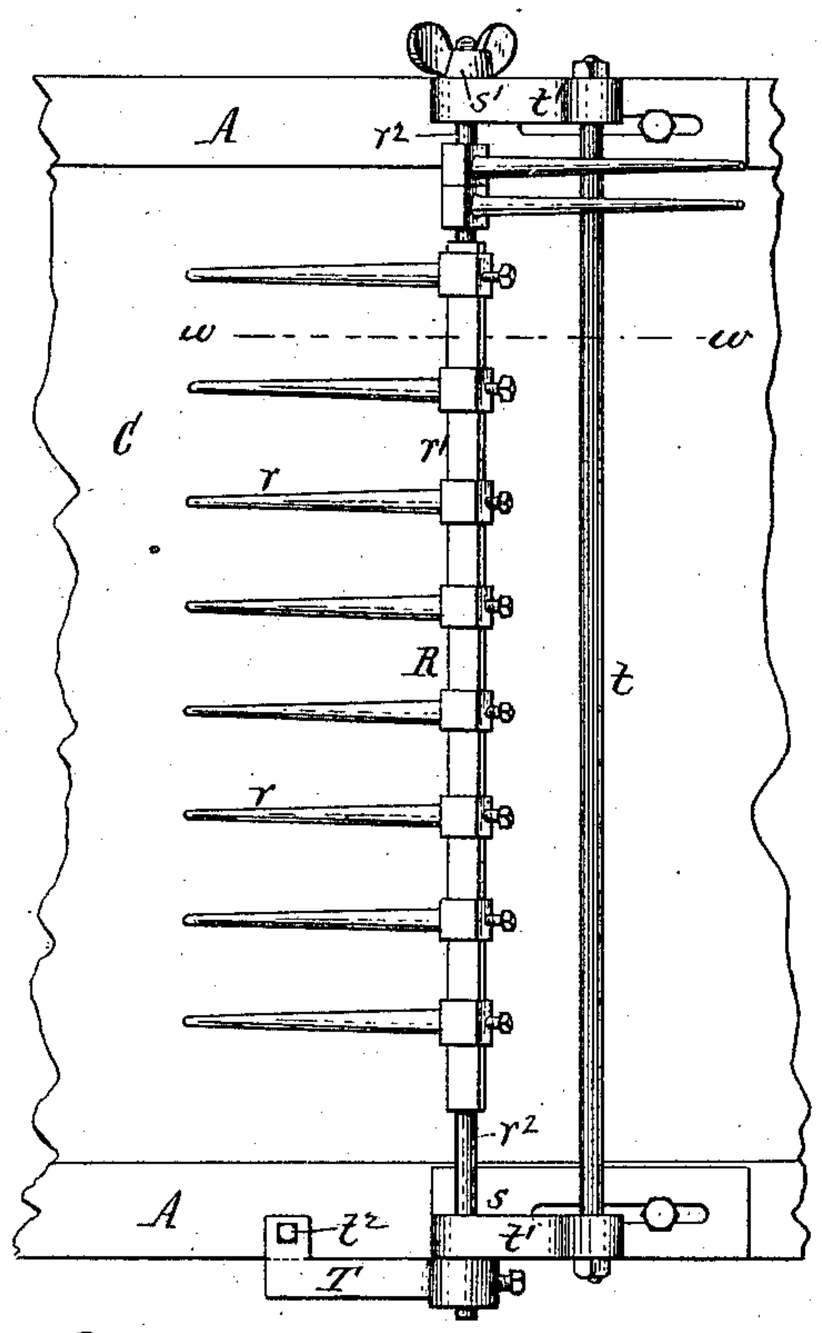
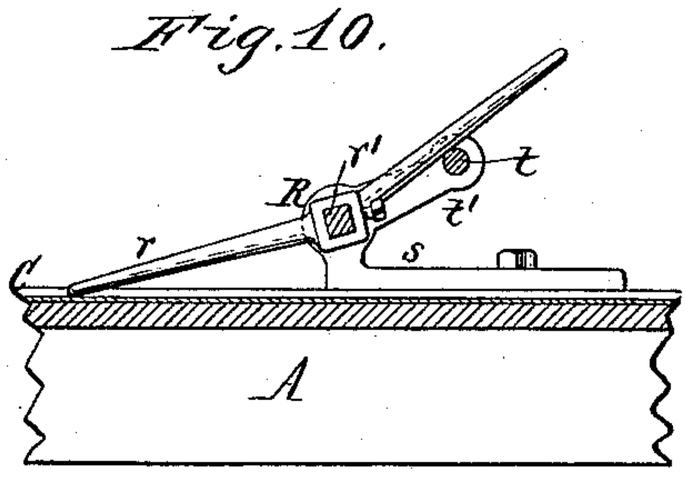


Fig. 10.



Witnesses.
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Geo. E. Pitman.

Inventor.
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By Wilhelm & Bonner.
Attorneys.

UNITED STATES PATENT OFFICE.

AUGUSTUS RUGER, OF BUFFALO, NEW YORK, ASSIGNOR TO J. W. RUGER & CO., OF SAME PLACE.

CRACKER-MACHINE.

SPECIFICATION forming part of Letters Patent No. 343,343, dated June 8, 1886.

Application filed August 8, 1883. Serial No. 103,110. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS RUGER, of the city of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Cracker-Machines, of which the following is a specification.

This invention relates to an improvement in that class of cracker-machines in which the sheet of dough passes from the feed-roller upon a feed-apron, by which it is presented to a reciprocating cutter.

The object of this invention is to provide a simple mechanism for readily changing the delivery of the machine for pan or peel goods at desire; also, to simplify the driving mechanism and render the same capable of easy adjustment, and to improve the construction of the finger-bar, whereby the scrap is separated from the crackers.

My invention consists of the improvements in the construction of the machine, which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of three sheets, Figure 1 is a side elevation of a cracker-machine provided with my improvements. Fig. 2 is a cross-section on an enlarged scale in line *x x*, Fig. 1. Fig. 3 is a detached side elevation, on an enlarged scale, of the gear-adjusting device. Fig. 4 is a cross-section, on an enlarged scale, in line *y y*, Fig. 3. Fig. 5 is a top-plan view, on an enlarged scale, of the driving mechanism. Fig. 6 is a horizontal section, on an enlarged scale, in line *z z*, Fig. 1. Fig. 7 is a side elevation, on an enlarged scale, of one of the removable roller-frames and connecting parts. Fig. 8 is a side elevation of the finger-bar. Fig. 9 is a top plan view of the same. Fig. 10 is a longitudinal section in line *w w*, Fig. 9.

Like letters of reference refer to like parts in the several figures.

A A represent the side frames of the machine, connected by suitable cross-stays.

a represents the inclined feed-board, upon which the dough is placed, and which is provided at one side with a raised flange, *a'*, the operator standing on the side of the feed-board, which is not provided with a raised flange.

B B' represent the feed-rollers, arranged at the lower end of the feed-board, and connected by gear-wheels *b b*, which are preferably inclosed in a protecting-casing.

C represents the endless feed-apron, arranged underneath the feed-rollers B B', and passing at the feed end of the machine around a roller, C'.

D represents the reciprocating cutter-head, arranged above the feed-apron, and moving between vertical guides *d*, secured to the side frames, A.

e represents the horizontal driving-shaft, arranged below the cutter-head D, and turning in bearings secured to the side frames, A.

E represents eccentrics secured to the driving-shaft *e* on the outer sides of the side frames, and connected with the cutter-head by rods *e'*.

F is the driving-pulley, secured to the driving-shaft *e*.

$f f' f^2$ are horizontal counter-shafts arranged below the feed-apron C, and supported, respectively, in bearings $f^3 f^4 f^5$, secured to the side frames.

g is a pinion secured to the driving-shaft *e*, and G G' G² are gear-wheels secured, respectively, to the counter-shaft $f f' f^2$, between the side frames, and meshing with each other, so that motion is transmitted by said gear-wheels from the shaft *e* to the shaft f^2.

h represents a pinion secured to one end of the shaft f^2 on the outer side of the side frame, A, on the same side of the machine on which the raised flange *a'* of the feed-board is arranged.

H represents a gear-wheel secured to the shaft of the lower feed-roller, B, in line with the pinion *h*.

I represents an adjustable gear-wheel arranged between the pinion *h* and gear-wheel H, so as to transmit motion from said pinion to said gear-wheel. The gear-wheel I turns on a stud or arbor, *i*, which rests against the outer side of the side frame A, and is constructed at its inner end with an enlargement, *i'*, through which passes an adjusting-screw, i^2. The stud *i* is attached to the side frame A, by a bolt, *j*, provided at its inner end with a head, *j'*, which bears against the inner side of the side frame A.

j^2 is an enlarged cylindrical neck formed on

the bolt *j* adjacent to the head *j'*, and fitting in a slot, *k*, formed in the side frame A, concentric with the wheel H.

k' is a screw-nut applied to the outer threaded end of the bolt *j*, for securing the stud *i* to the frame A and the wheel I to the stud *i*. The screw-nut *k'* is provided with a suitable handle, so that it can be easily tightened and released. A washer, k^2, is interposed between the screw-nut and the outer end of the stud *i*. The pinion *h* is removably secured to the shaft f^2 by a key or set-screw, so that it can be readily removed from the shaft and a smaller or larger pinion substituted for the same when it is desired to change the speed of the feed-rollers B B'. Upon changing the pinion *h* the position of the gear-wheel I is adjusted by the screw i^2 to mesh with the pinion and the gear-wheel H. The adjusting-screw i^2 turns in a bearing, i^3, which is secured to the side frame A, and in which the screw has sufficient play to follow the movements of the stud *i* and bolt *j*, as these parts are adjusted in the slot *k*. By this construction of the driving-gear the power is more directly applied to the cutter D than heretofore, and the gear-wheels, whereby the feed-rollers are driven, are located on the farther side of the machine from the operator, leaving the side of the machine on which the operator stands in placing the dough on the feed-board unobstructed, and thereby rendering the operation of feeding more convenient.

L represents the scrap-apron, arranged above the feed-apron C, and running around a roller, *l*, near the upper side of the feed-apron, and an elevated roller, *l'*, in a well-known manner.

M represents the pan-apron, arranged between the rear portions of the side frames, A, below the feed-apron C, and running around rollers *m* and *m'*. The roller C', around which the feed-apron C passes at the feed end of the machine, is supported in an adjustable frame, N, which is fitted between the side frames, A, at the feed end of the machine in such manner that the roller C' can be arranged near the ends of the side frames, A, as represented in dotted lines in Fig. 1, and so that the adjustable frame can be drawn out from between the side frames, A, and the roller C' be held at a distance from the ends of the side frames, as represented in full lines in Fig. 1.

O represents a roller around which the feed-apron *c* runs at the opposite end of the machine when the machine is used for manufacturing peel goods. The roller O is supported in bearings O', made adjustable longitudinally in frames O^2, which are removably secured to the side frames, A.

P represents a roller around which the feed-apron C runs when the machine is used for making pan goods. The roller P is supported in bearings *p'*, made adjustable in the side frames, in the usual manner, and the roller P is made removable, so that it can be detached from the machine when not required for use.

q represents an eccentric secured to the driving-shaft *e*, and connected with a rock-arm, *q'*, by a rod, q^2.

q^3 represents a connecting-rod, by which the rock-arm *q'* is connected with the ratchet mechanism, whereby the roller C' is operated.

q^4 represents a connecting-rod whereby the rock-arm *q'* is connected with the ratchet mechanism, whereby the roller M of the pan-apron is operated. These ratchet mechanisms are constructed in a well-known manner, and the connecting-rods q^3 q^4 are so connected with the rock-arm *q'* and ratchet mechanisms by removable bolts or otherwise that these connecting-rods can be detached at desire.

When the machine is used for manufacturing peel goods, the adjustable frame N is pushed back between the side frames, A, so that the roller C' stands in the position shown in dotted lines in Fig. 1, the adjustable frame N being held in this position by bolts *n*, passing through the side frames and through holes *n'* in the frame N. The roller P is removed, and the opposite end of the feed-apron is passed around the roller O, as represented in dotted lines in Fig. 1. The connecting-rod q^4, which operates the pan-apron, is detached, so that the pan-apron is not operated, and the long connecting-rod q^3 is replaced by a short connecting-rod having the proper length to connect the rock-arm *q'* with the ratchet mechanism of the roller C' in this position of the roller. The connecting-rod operating the scrap-apron L is also disconnected.

When the machine is used for manufacturing pan goods, the roller O is removed, together with one of the supporting-frames O^2, to expose one side of the pan-apron at the end of the machine and permit free access to the pan-apron for removing the pans therefrom. The roller P is placed in the machine within the bight of the feed-apron C, the frame N is adjusted so as to tighten the feed-apron and support the roller C' in the position shown in full lines in Fig. 1, and the connecting-rods actuating the feed-apron C, scrap-apron L, and pan-apron M are applied. In this manner the machine is by a very simple adjustment adapted for the manufacture of either pan or peel goods, and the necessity of employing two different machines for these purposes is avoided.

r represents the fingers which separate the scrap from the crackers, and R represents the transverse bar or rod to which these fingers are attached. The fingers are located between the cutter and the scrap-apron and press upon the crackers with sufficient force to detach them from the scrap as the latter is elevated by the scrap-apron. The rod R is supported in bearings *s*, secured to the side frames, A. The main body of the rod R is made square or angular in cross-section, as shown at *r'* in Figs. 9 and 10, to enable the fingers *r* to be firmly attached thereto. The end portions, r^2, of the rod R between the square body *r'* and the bearings *s* are round, to permit the fingers

to lie loosely on these portions when not required for use.

t represents a transverse rod secured to arms *t'*, formed on the bearings *s*, and arranged in front of the rod R, to support the fingers which are not required for use. When the cutters are changed, the fingers in most cases require to be adjusted close together or farther from each other to correspond with the number of crackers in a row. When the fingers are separated, the superfluous fingers may be placed on the round end portions, r^2, of the rod R and supported on the bar *t*, as represented in Figs. 9 and 10. More fingers can be added by releasing one end of the bar R from its bearing *s* upon removing the thumb-screw *s'*.

T represents an overhanging weighted arm secured to the rod *r'* and extending in the same direction as the fingers. The elevation of the ends of the fingers above the feed-apron is regulated by a set-screw, t^2, applied to the arm T and supporting the same upon the adjacent side frame A. By adjusting the set-screw the pressure of the fingers upon the crackers can be regulated.

I claim as my invention—

1. The combination, in a cracker-machine, of the stationary main frame, a pan-apron moving over rollers supported in said stationary frame, a main feed-apron arranged in the main frame with one end above the pan-apron, a movable frame and roller, whereby one end of the feed-apron is supported and made lengthwise adjustable in the main frame, and a movable roller, whereby the opposite end of the main feed-apron is supported above the pan-apron, substantially as set forth.

2. The combination, with the stationary frame and the journaled finger-bar, of a series of fingers secured to the said bar side by side, and a weighted arm secured to said bar and provided with a set-screw bearing upon the main frame, whereby the downward movement of the fingers is limited, substantially as set forth.

3. In a cracker-machine, the combination, with the fingers, of a finger-bar provided with an enlarged portion to which the working-fingers are secured, and having reduced end portions upon which the fingers not required for use are loosely supported, substantially as set forth.

Witness my hand this 23d day of July, 1883.

AUGUSTUS RUGER.

Witnesses:
JNO. J. BONNER,
S. WELCH.