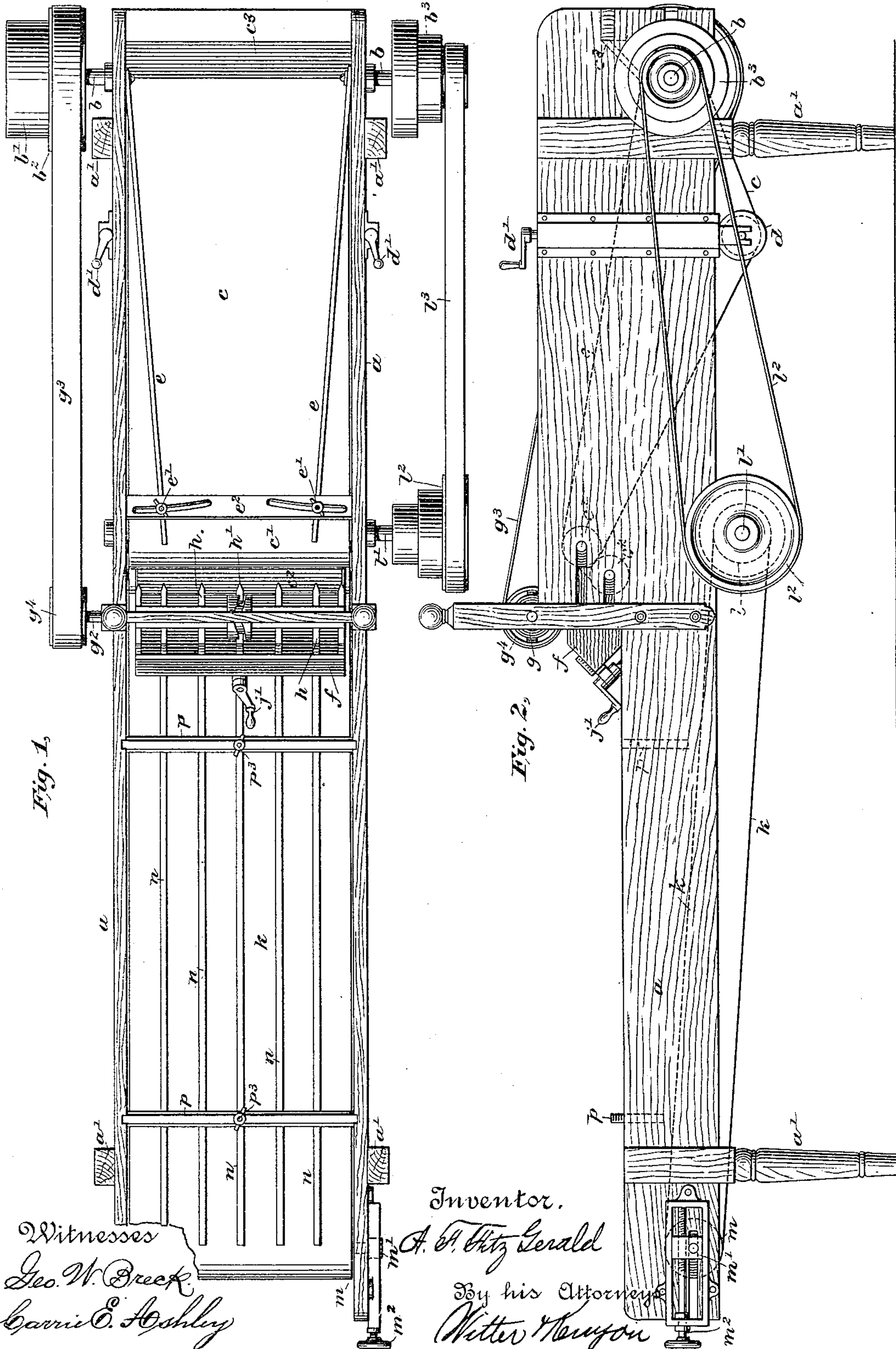


A. F. FITZ GERALD.
CRACKER STACKING MACHINE.

No. 403,526.

Patented May 21, 1889.



(No Model.)

3 Sheets—Sheet 2.

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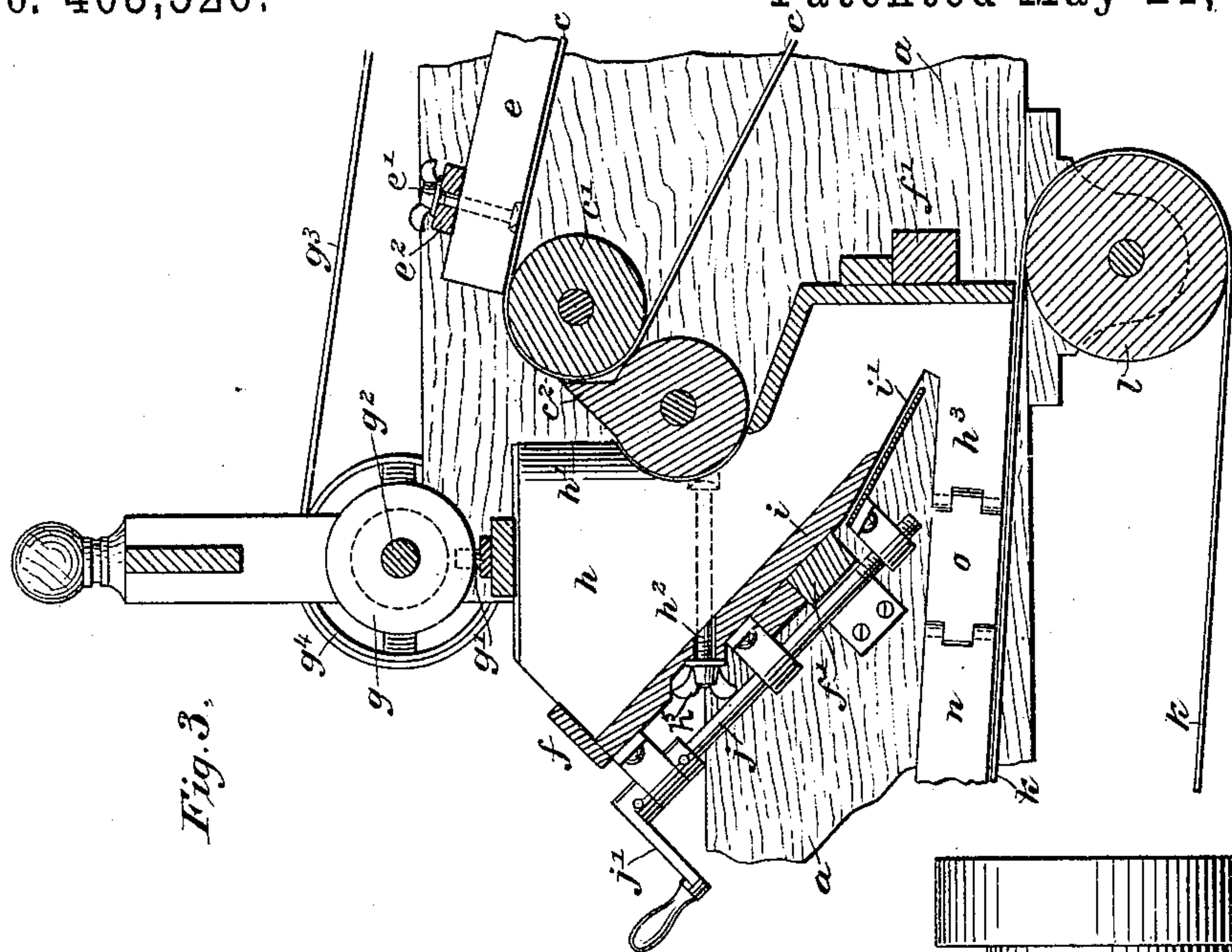


Fig. 3.

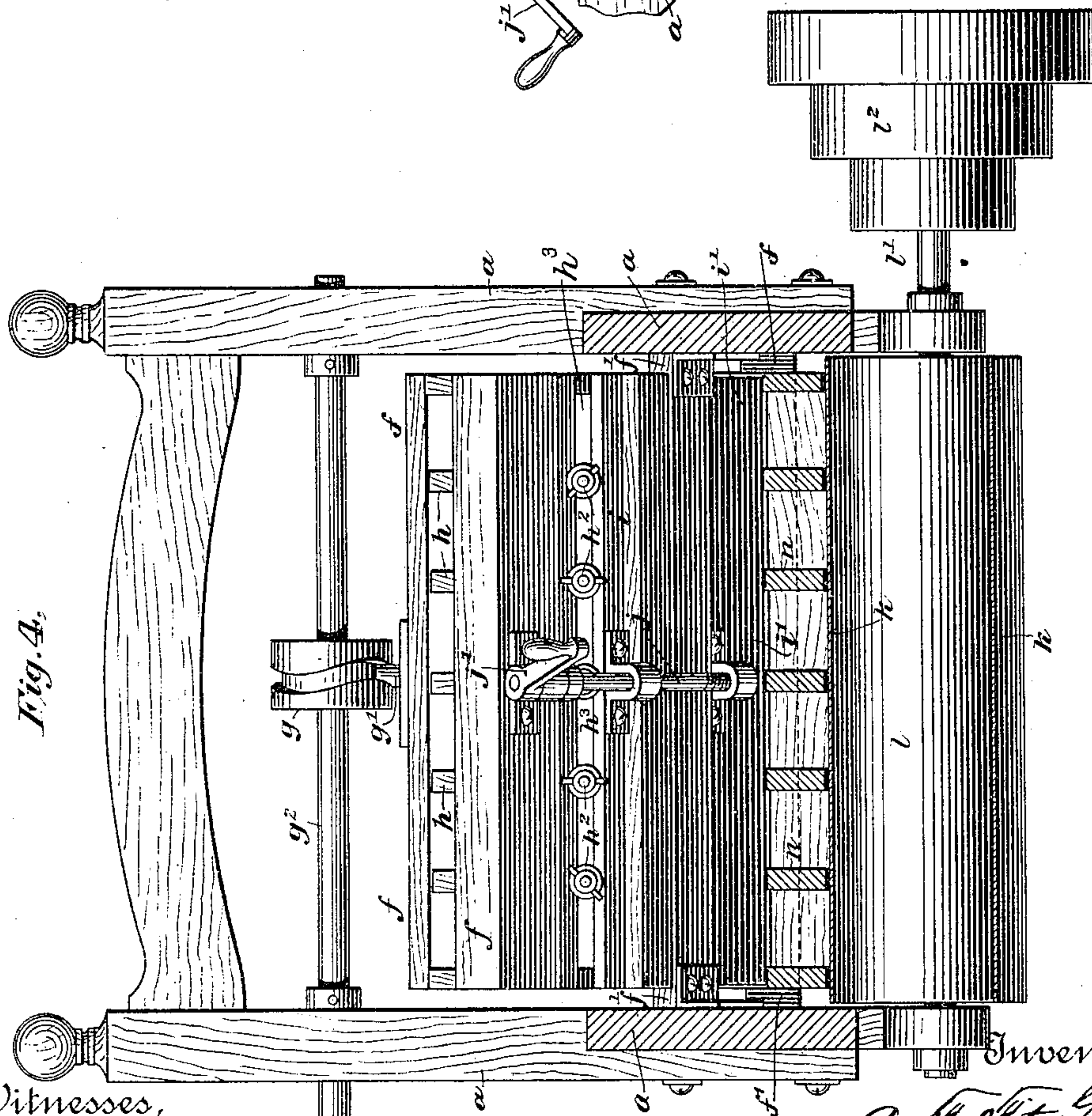


Fig. 4.

Witnesses,
Geo. W. Brock
Carrie C. Ashley

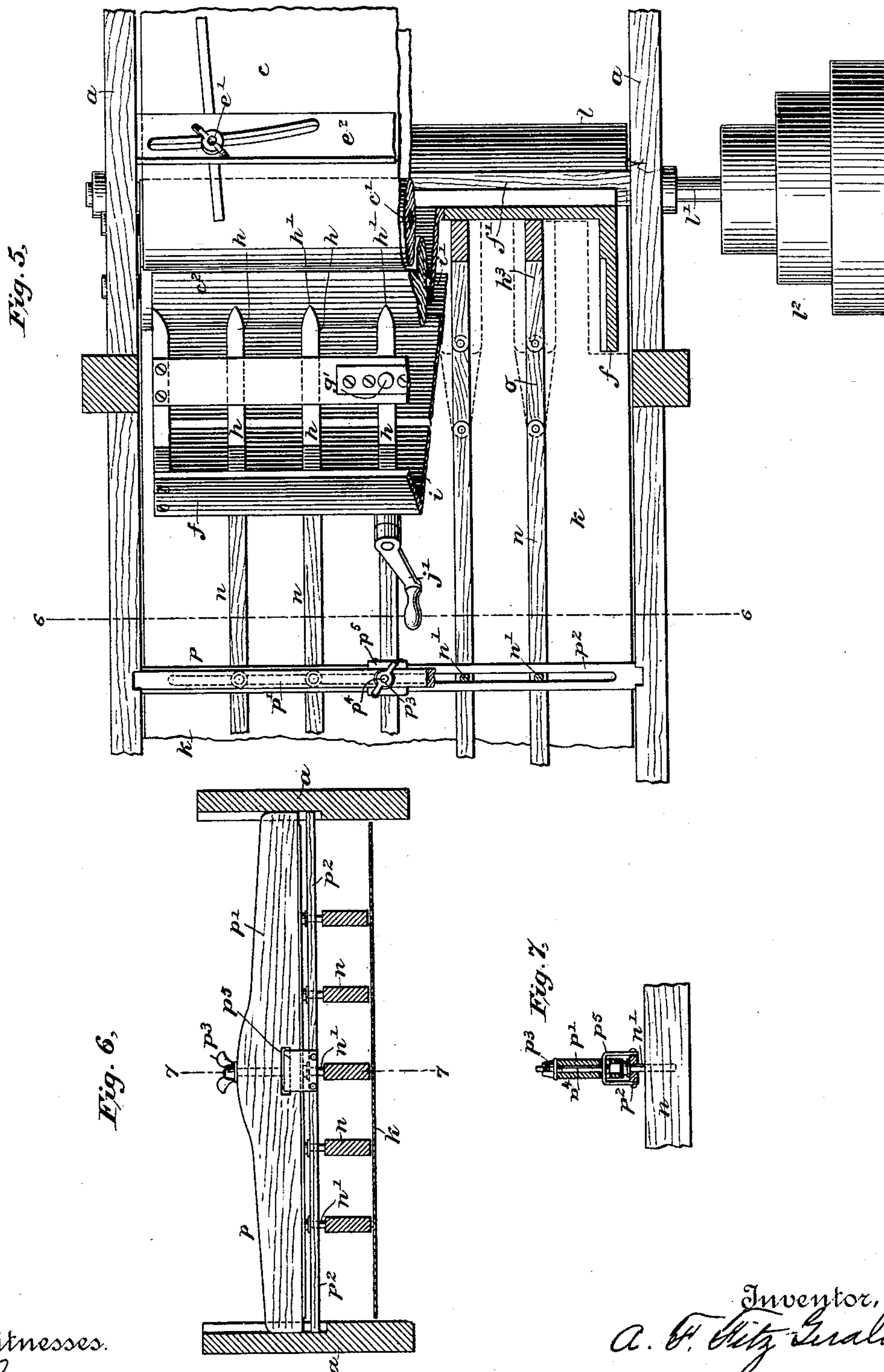
By his Attorneys

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UNITED STATES PATENT OFFICE.

AUGUSTINE F. FITZ GERALD, OF BROOKLYN, ASSIGNOR TO THE VAN DER-VEER & HOLMES BISCUIT COMPANY, OF NEW YORK, N. Y.

CRACKER-STACKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 403,526, dated May 21, 1889.

Application filed October 25, 1888. Serial No. 289,103. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTINE F. FITZ GERALD, a citizen of the United States, residing at Brooklyn, county of Kings, State of New York, have invented certain new and useful Improvements in Cracker-Stacking Machines, of which the following is a specification, reference being had to the accompanying drawings, forming part hereof.

The object of this invention is to facilitate the piling, stacking, or packaging of crackers, biscuit, and similar articles, and to reduce the amount of hand labor required in such operations; and the invention consists in arrangements of mechanism adapted to receive the crackers in a confused mass, except that their faces are all in the same direction, and to arrange them in rows ready for packing. When thus arranged, the crackers can be readily gathered up in bunches by the operatives and placed in suitable boxes or canisters, or stacked or piled in regular order, as may be desired.

This mechanism consists, essentially, of a feeder—preferably a traveling apron—a receiver, which is also preferably a traveling apron, and devices moving independently of the feeder and receiver, operating upon the crackers as they are carried along by the feeder or the receiver, or are passed from the feeder to the receiver, whereby the crackers are turned upon their faces and regularly arranged in rows or horizontal lines upon the receiver.

To describe my invention more particularly, I will now refer to the accompanying drawings, in which—

Figure 1 is a plan view, and Fig. 2 a side elevation, of the complete machine. Fig. 3 is an enlarged longitudinal section of a portion of the machine; Fig. 4, an end elevation of Fig. 3, or enlarged cross-section of the machine; and Fig. 5, an enlarged plan view, partly broken away. Fig. 6 is a transverse vertical section of Fig. 5 on the line 6 6, and Fig. 7 is a transverse vertical section of Fig. 6 on the line 7 7.

The frame of the machine consists of side pieces, *a a*, joined together by suitable braces and supported by legs *a' a'*. A wooden frame such as shown I have found well adapted for

the purpose. The driving-shaft *b* is situated at the right-hand or front end of the machine, and all moving parts are connected to this shaft.

b' is the pulley by which motion is imparted to the shaft *b*.

Two continuous traveling aprons, each the full width of the distance between the frames, feed the crackers forward through the machine. The feeder or upper apron, *c*, passes over and around a roller on the shaft *b*, over and around a roller, *c'*, journaled in the frames *a a*, some distance above the level of the shaft *b*, and back to the roller on the shaft *b*, passing under a stretching-roller, *d*, between and below the two other rollers. This stretching-roller *d* is held in screw-slides operated by handles *d' d'* in the usual manner. An inclined guard, *c³*, passes across the frame with its lower edge close to the apron *c*, and adjustable guides *e e*, the front ends of which are secured to the side frames, while their rear ends are adjustably held by thumb-screws *e' e'* in slots in the cross-piece *e²*, lie close to the apron *c* throughout the length of its upper portion between the roller on shaft *b* and the roller *c'*. A stripper and guide, *c²*, is pivoted in the side frames, and bears against the apron *c*, where the apron passes around the roller *c'*.

The apron *c*, the inclined guard *c³*, and the guides *e e* form a receptacle into which the crackers are thrown from the baking-pans. The crackers slide from the pans onto the apron with all their faces upward, but are otherwise irregularly arranged. The forward motion of the apron, imparted to it from the roller on the shaft *b*, carries the crackers up to where the apron passes around the roller *c'*. At this point the crackers fall from the apron over the stripper and guide *c²* and through the separating and inverting device to the receiver or lower traveling apron. This separating and inverting device consists of the frame *f*, provided with adjustable devices for controlling the crackers. This frame *f* is reciprocated by a rotating cam, *g*, acting on the pin *g'*, secured to the upper part of the frame *f*, and slides in the guides *f' f'*, secured to the frame of the machine. The actuating-cam *g* is secured on the shaft *g²*, having bear-

ings in the side pieces, $a a$, of the frame, and receiving motion from the shaft b by means of a belt, g^3 , passing over the pulley b^2 on the shaft b and the pulley g^4 on the shaft g^2 .

5 The frame f is divided by a series of adjustable vertical partitions, $h h$, all shaped alike, and each held in place by a bolt and clamping thumb-nut, h^5 . These bolts work in a slot, h^2 , in the frame f , thus permitting
10 the partitions h to be arranged in any desired manner.

The partitions are shaped to fit closely in the frame f . They embrace the stripper c^2 , their vertical edges $h' h'$ are tapered to a sharp
15 line, and their lower edges lie close to the receiver or lower apron. The upper ends of these partitions $h h$ act as fingers to separate the crackers. The construction of the lower ends of these partitions h will be hereinafter
20 described. The partitions are adjusted so that the spaces between them will be just wide enough for one cracker. As shown in Fig. 1, this adjustment of the partitions $h h$ has been made and four channels are pro-
25 vided of equal width. The guides $e e$ are adjusted, as shown, by means of the thumb-screws $e' e'$, so that all the crackers carried by the apron c will be guided to these four
30 channels. The crackers, as they slide down the stripper c^2 , meet the sharp vertical edges h^2 of the partitions h , and are thereby guided into one or other of the channels formed be-
35 tween the partitions h , the upper ends of the partitions thus acting as fingers to separate and control the crackers. The continual reciprocating motion imparted to the frame f insures this separation and guidance of the
40 crackers and removes all possibility of their lodging against the sharp edges h^2 or being broken or injured thereby.

The devices of the frame f have another function to perform besides that of directing the crackers down fixed channels—viz., in-
45 verting the crackers, turning them so that they will fall upon the receiver or lower apron with faces downward. This is accomplished by interposing in the path of the crackers, as they drop from the stripper c^2 , a deflector
50 formed by the inclined side i of the frame f , and by the adjustable plate i' , which forms a continuation of the inclined side i . The crackers fall upon this deflector from the stripper c^2 and slide down the deflector and
55 onto the second apron with their faces downward. I find it advisable to adjust the lower opening through which the crackers fall, and this I accomplish by adjusting the plate i' . This plate i' extends across the width of the
60 frame f . Thus by its adjustment all the channels are simultaneously affected. This adjustment is accomplished by the rod j , which is at its lower end threaded and works into a threaded lug secured to the plate i' , and the rod j is operated by the handle j' , se-
65 cured to its upper end.

The second or lower apron, k , which constitutes the receiver, passes around the roller l

on the shaft l' , having fixed bearings secured to the sides $a a$ of the frame, and around the
70 roller m , having bearings m' , sliding in the frame and adjusted by hand-screws m^2 , to tighten the apron, in the usual manner. The
75 shaft l' is provided with a stepped cone-pulley, l^2 , which receives motion by means of a belt, l^3 , from a cone-pulley, b^3 , provided with
80 reversely-arranged steps and secured on the shaft b . By shifting the belt to the different steps of these cone-pulleys the speed of the apron k in relation to the apron c may be ad-
85 justed as desired.

As before stated, the lower edges of the partitions h of the frame f lie close to the
90 lower apron, k . Each partition h is provided with an extension or arm, h^3 , which projects under the frame f and along over the apron
95 k . Each arm h^3 is connected to a long guide-bar or partition, n , which rests upon the apron k throughout the remaining length of its upper part, the connecting device of each
100 arm h^3 and corresponding guide-bar n consisting of a link, o , loosely pivoted in the end of the arm and of the guide-bar and held
105 closely to the apron k . These guide-bars n are adjusted when the partitions h are adjusted, as they should be so arranged as to be
110 in line with the partitions, respectively, when the frame f is in central position. The enlarged plan, Fig. 5, shows the frame f in central position, and the frame f is broken away
115 to show a few of the arms h^3 , links o , and guide-bars n , and dotted lines indicate the extreme positions of the arms h^3 and links o . The adjustment of the guide-bars $n n$ is ac-
120 complished by means of the two clamping-frames $p p$, which extend across from one
125 side frame a to the other, and are free to move vertically, but not otherwise, in grooves formed in the side frames, $a a$, thus allowing the guide-bars $n n$ to rest upon the apron k .

Each clamping-frame p consists of a main
130 bar, p' , and a clamping-bar, p^2 . Each clamping-bar p^2 is provided with a long slot extending throughout the greater part of its length, and bolts n' , secured to the guide-bars n , pass
135 freely through this slot, and are provided with heads and washers which rest upon the upper surface of the clamping-bar p^2 . The lower edge of the main bar p' being faced with a
140 strip of soft or elastic material—such as india-rubber—tension pulling the clamping-bar p^2 toward the main bar p' will cause the heads of the bolts n' to be firmly gripped be-
145 tween the bars p^2 and p' . This tension is applied by the thumb-nut p^3 , turning on the bolt p^4 , the lower end of which is held in the
150 bridge-piece p^5 , secured to the clamping-bar p^2 . This bridge-piece p^5 braces the parts of the bar p^2 at the center, and extends upward from the same and through a slot in the main
155 bar p' , so as to leave the slot in the clamping-bar p^2 free of obstruction. (See Figs. 5, 6, and 7.) When the thumb-nuts p^3 are slackened, the guide-bars n can be moved to any desired
160 position; and when the thumb-nuts are tight-

ened, the guide-bars are securely held to the clamping-frame.

The crackers fall upon the receiver or lower apron, *k*, from the channels of the frame *f*, as before described. As the frame *f* has a reciprocating motion, the crackers from the same channel do not always fall in the same line on the apron, but this is corrected by the oscillating movement of the links *o*, which, with the guide-bars *n*, form continuations of the partitions *h* in the frame *f*. Thus the crackers are arranged upon the receiver or apron *k* with their faces downward, or faced, and in straight lines.

With the machine adjusted as shown in the drawings the crackers would be in four lines in the four channels between the guide-bars *n n*. When thus arranged in line and lying on their faces, the crackers can be rapidly picked up by the operatives, who gather them in bunches or stacks by placing both hands some distance apart in the groove between two guide-bars, and moving their hands together in contact with the apron, thus bringing the crackers together turned on their edges, with their faces all in the same direction. The crackers, being fed upon the apron *k* in the manner described, are generally made to overlap each other, which facilitates their collection in bunches. If, owing to the relative rates of speed of the different parts of the machine or the rate of supply of the crackers, the crackers are not caused to overlap each other on the apron *k*, the work of gathering the crackers into bunches is still greatly aided and simplified by the machine. The operation of gathering them in stacks or bunches can be very rapidly performed, and the stacks or bunches thus gathered can be directly placed in the boxes or packages in which they are transported and sold.

In the practical working of the machine I have found that both round and square crackers can be handled with advantage. The most delicate crackers or wafers are not injured by passing through this machine.

It is obvious that by reason of the adjustability of the various parts the machine may be adjusted for stacking crackers of any size.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A cracker-stacking machine consisting of a feeder, a receiver placed below the feeder, a device independent of the feeder and receiver moving transversely of the machine and provided with fingers for separating the crackers, for arranging the crackers in a straight line or lines upon the receiver, and means for operating this separating device, substantially as shown and described.

2. A cracker-stacking machine consisting of a feeder, a receiver arranged below the feeder, a laterally-reciprocating frame independent of and placed between the feeder and receiver, provided with a channel or channels down which the crackers fall from the

feeder to the receiver, and means for operating the reciprocating frame, substantially as shown and described.

3. A cracker-stacking machine consisting of a feeder, a receiver arranged below the feeder, a laterally-reciprocating frame independent of and placed between the feeder and receiver, provided with a channel or channels down which the crackers fall from the feeder to the receiver, means for operating the reciprocating frame, and a deflector which inverts the crackers as they fall to the receiver, substantially as shown and described.

4. A cracker-stacking machine consisting of a traveling apron which feeds the crackers, a second traveling apron arranged below the first, means for operating the aprons, a laterally-reciprocating frame placed between the two aprons, means for operating the reciprocating frame, vertical partitions in the reciprocating frame, longitudinal guide-bars over the lower apron, and pivoted links joining the lower ends of the partitions and the ends of the guide-bars adjacent thereto, substantially as shown and described.

5. A cracker-stacking machine consisting of a traveling apron which feeds the crackers, a second traveling apron arranged below the first, means for operating the aprons, a laterally-reciprocating frame, means for operating the reciprocating frame, vertical partitions in the reciprocating frame, longitudinal guide-bars over the second apron, pivoted links joining the lower ends of the partitions and ends of the guide-bars adjacent thereto, and an adjustable deflecting-plate in the reciprocating frame and extending across the same under the partitions, substantially as shown and described.

6. A cracker-stacking machine consisting of a traveling apron which feeds the crackers, means for operating the apron, a laterally-reciprocating frame independent of and placed below the apron, provided with partitions forming a channel or channels down which the crackers fall, means for operating the reciprocating frame, and guides above the apron to direct all the crackers into the channels in the reciprocating frame, substantially as shown and described.

7. A cracker-stacking machine consisting of a traveling apron which feeds the crackers, guides placed above the apron, a stripper bearing against the apron, a laterally-reciprocating frame provided with partitions extending over the stripper and forming channels down which the crackers slide from the receiving-apron, a second traveling apron arranged below the first or feeding apron, guide-bars over the second apron, links connecting the lower ends of the partitions in the reciprocating frame with the ends of the guide-bars adjacent thereto, and means for operating the aprons and reciprocating frame, substantially as shown and described.

8. A cracker-stacking machine consisting of a traveling apron which feeds the crackers,

guides placed above the apron, a stripper bearing against the apron, a laterally-reciprocating frame provided with partitions extending over the stripper and forming channels down which the crackers slide from the feeding-apron, and a deflector which inverts the crackers as they fall, a second traveling apron arranged below the first or receiving apron, guide-bars over the second apron, links connecting the lower ends of the partitions in the reciprocating frame with the ends of the guide-bars adjacent thereto, and means for operating the aprons and reciprocating frame, substantially as shown and described.

9. In a cracker-stacking machine, in combination, the traveling apron *c*, means for operating the apron, the guards *c*³, extending transversely across the apron, and the adjustable guide-bars *e e*, extending longitudinally over the apron *c*, substantially as shown and described.

10. In a cracker-stacking machine, in combination, the traveling apron *c*, means for operating the apron, the adjustable guide-bars *e e*, extending longitudinally over the apron *c*, the laterally-reciprocating frame *f*, provided with partitions *h h*, adjustably clamped to the frame *f*, and means for operating the reciprocating frame, the guide-bars being arranged to guide crackers placed on the apron into channels formed by the partitions of the reciprocating frame *f*, substantially as shown and described.

11. In a cracker-stacking machine, in combination, the traveling apron *c*, means for operating the apron, the adjustable guide-bars *e e*, extending longitudinally over the apron *c*, the stripper *c*², bearing against the apron *c*, the laterally-reciprocating frame *f*, provided

with partitions *h h*, adjustably clamped to the frame *f*, and means for operating the reciprocating frame, the guide-bars being arranged to guide crackers placed on the apron into the channels formed by the partitions of the reciprocating frame, substantially as shown and described.

12. In a cracker-stacking machine, in combination, the traveling apron *c*, means for operating the apron, the stripper *c*², bearing against the apron *c*, and the frame *f*, provided with a deflector consisting of the inclined side *i* and plate *i'*, adjustably connected to and projecting from the side *i*, substantially as shown and described.

13. In a cracker-stacking machine, in combination, the laterally-reciprocating frame *f*, means for operating the frame *f*, the partitions *h h* in the same provided with extensions *h*³ *h*³, the traveling apron *k*, means for operating the apron *k*, the guide-bars *n n*, and the links *o o*, joining guide-bars *n* to extensions *h*³, substantially as shown and described.

14. In a cracker-stacking machine, an adjusting device for the guide-bars, consisting of the main piece *p'*, slotted clamping-piece *p*², bridge-piece *p*⁵, secured to the clamping-piece *p*², and clamping bolt and nut *p*⁴ *p*³, joining the main piece *p'* and bridge-piece *p*⁵, in combination with the guide-bars *n*, resting upon the traveling apron *k* and provided with headed bolts *n'*, the heads *n'* being clamped between the main piece *p'* and clamping-piece *p*², substantially as shown and described.

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