

No. 679,852.

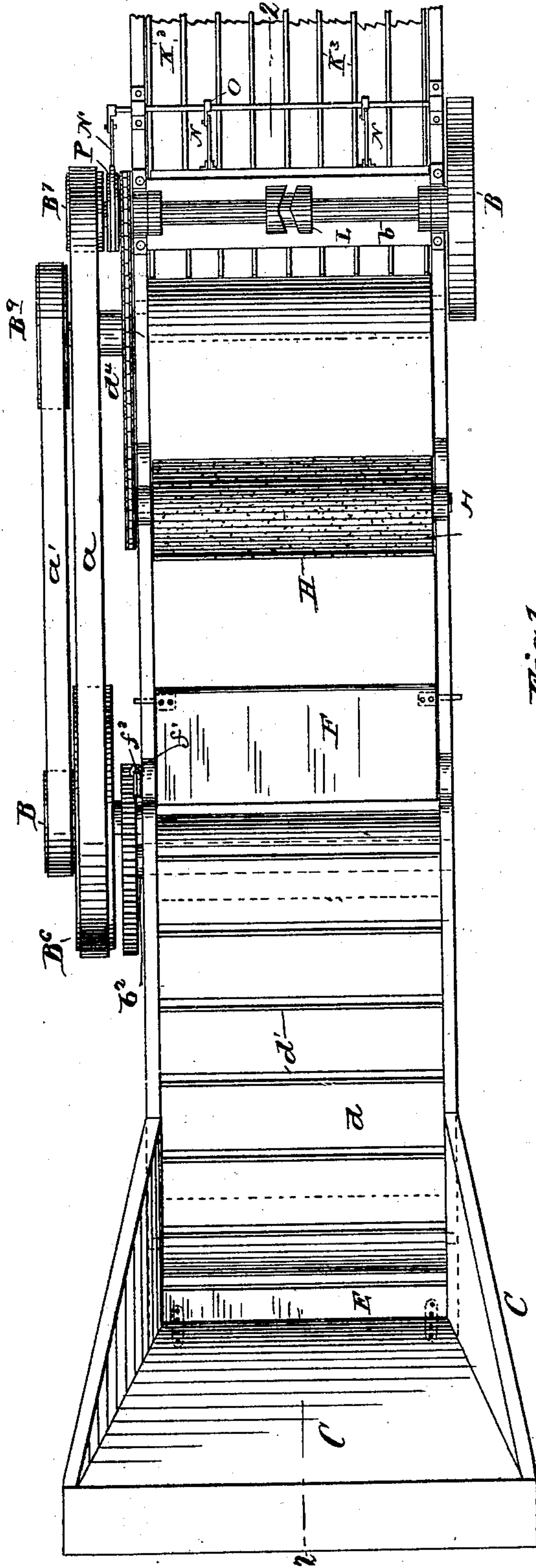
Patented Aug. 6, 1901.

E. MACKAY.  
CRACKER STACKING MACHINE.

(Application filed Aug. 28, 1897.)

(No Model.)

4 Sheets—Sheet 1.



Attest:  
C. H. Benjamins  
J. Kennedy.

Inventor:  
Edmund Mackay  
W. P. Reese Jr.  
his attorney



No. 679,852.

Patented Aug. 6, 1901.

E. MACKAY.  
CRACKER STACKING MACHINE.

(Application filed Aug. 28, 1897.)

(No Model.)

4 Sheets—Sheet 3.

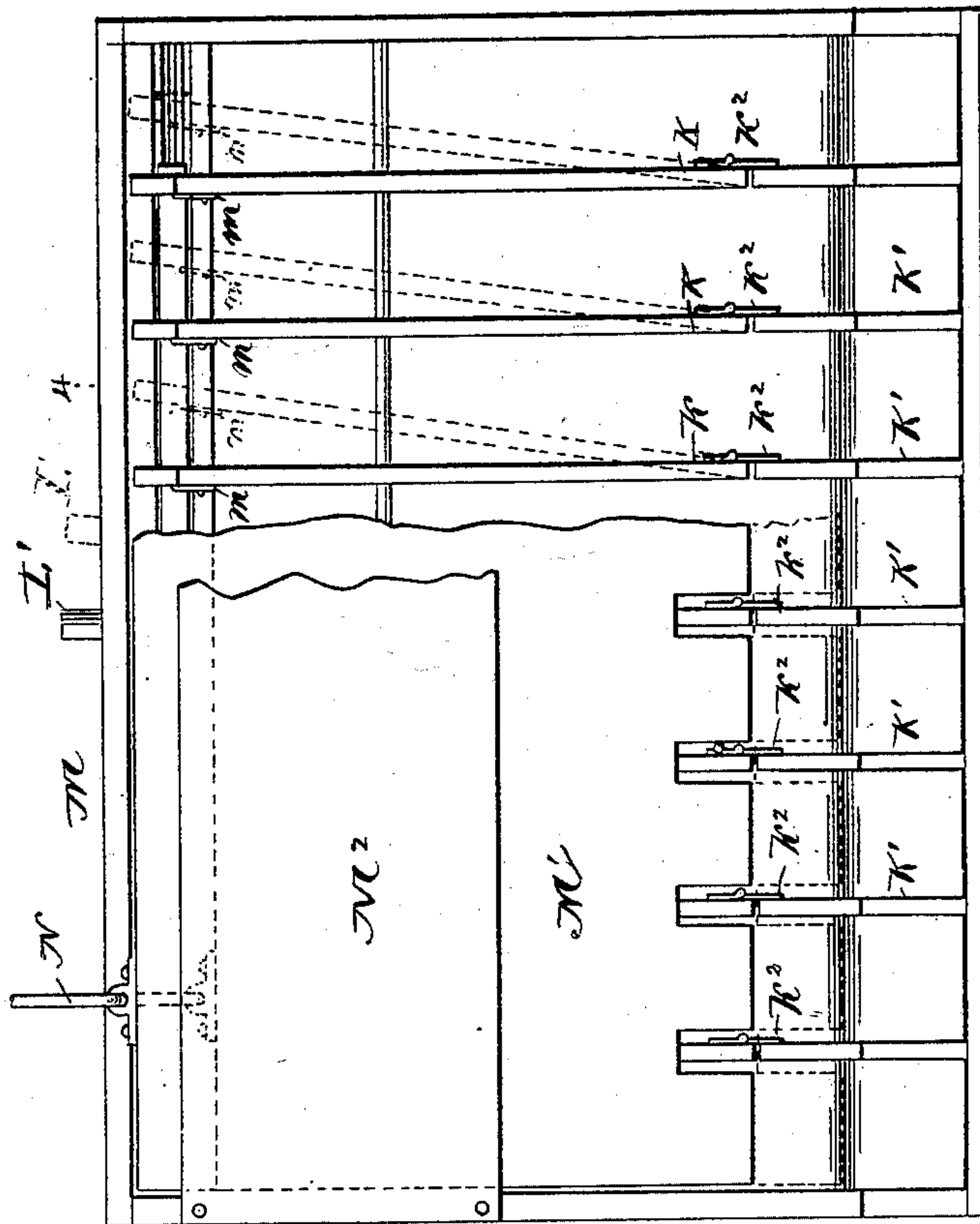


Fig. 3

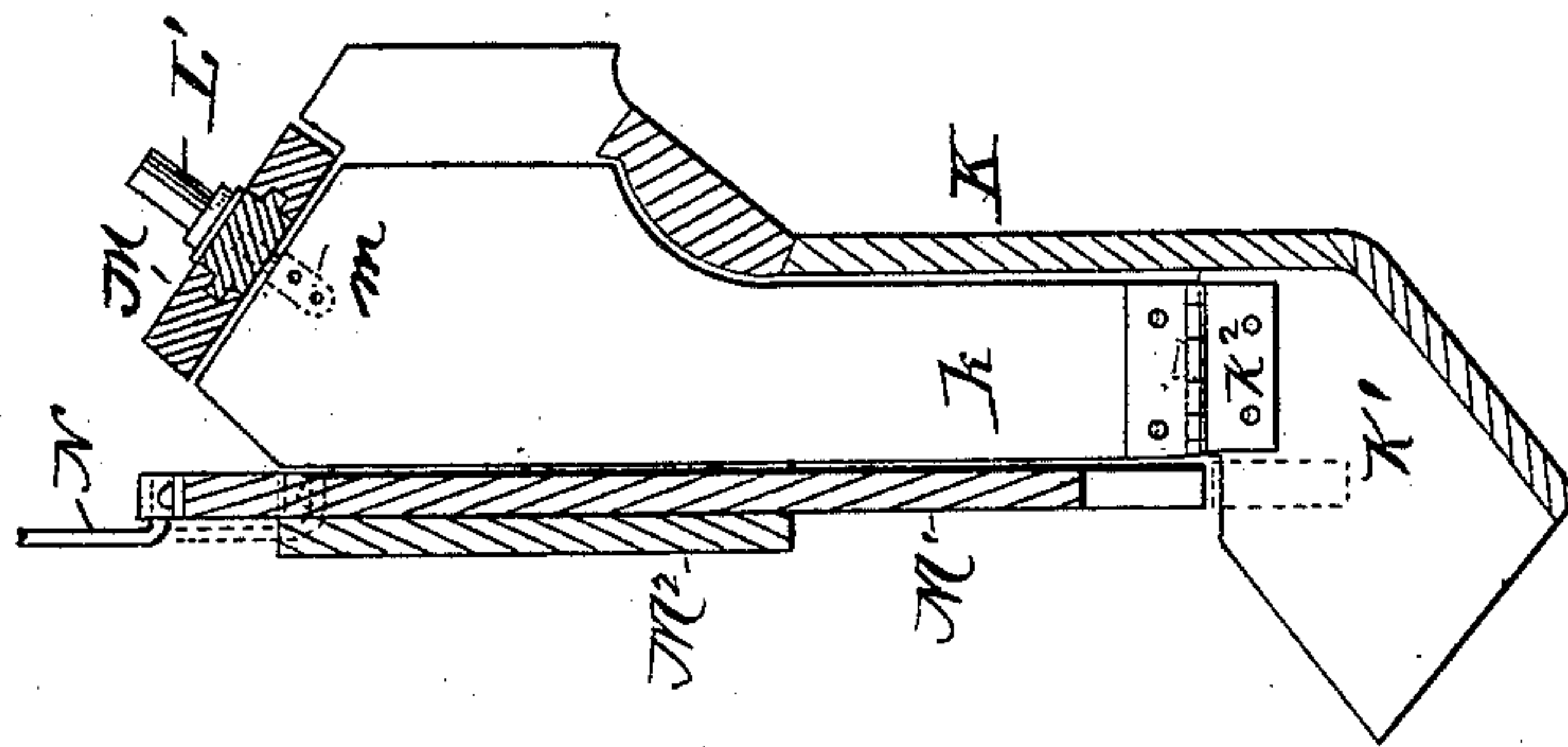


Fig. 4

Attest:  
C. W. Benjamin  
J. Kennedy.

Inventor:  
Edmund Mackay  
by W. P. Peble Jr  
his attorney

No. 679,852.

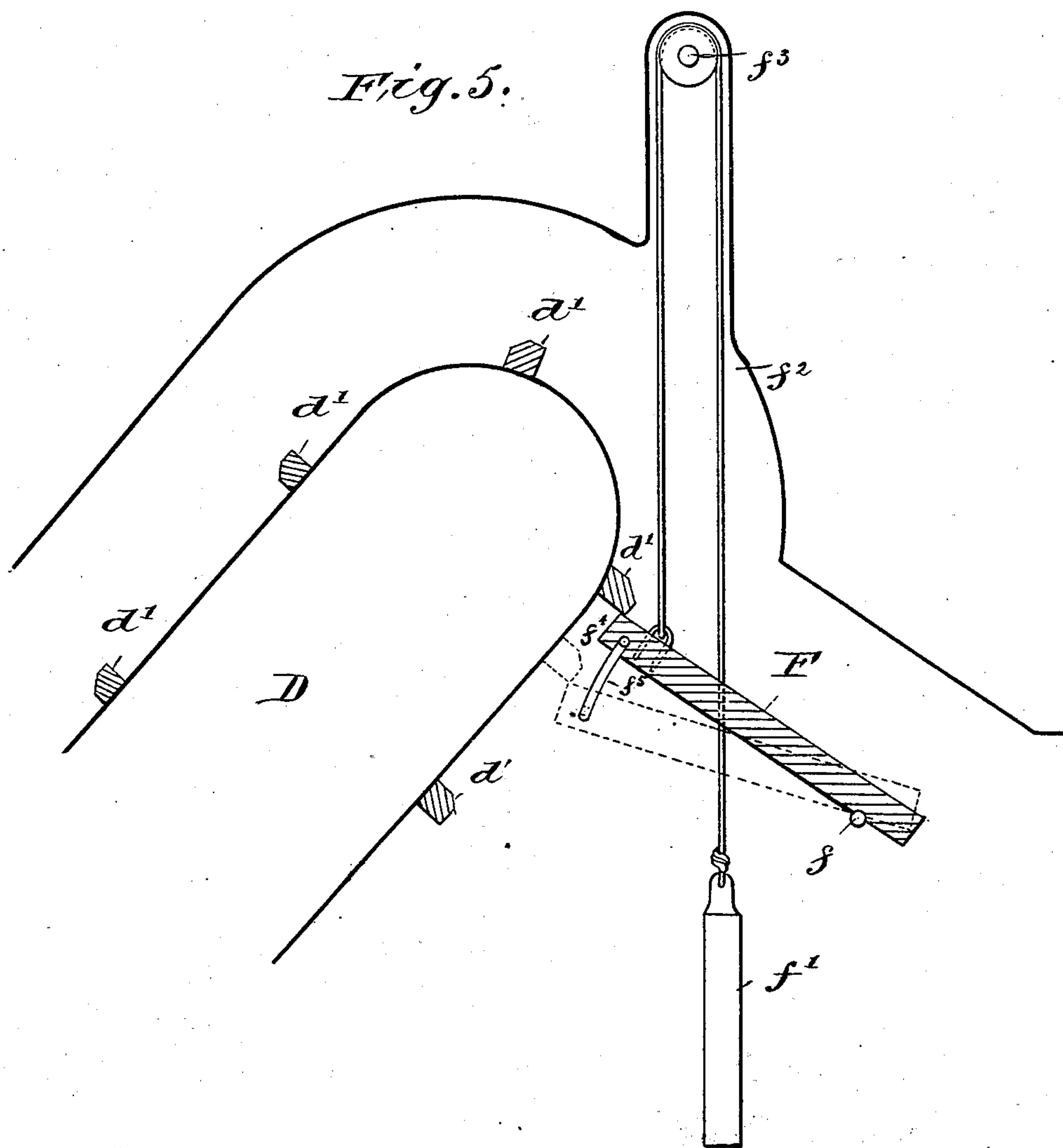
Patented Aug. 6, 1901.

E. MACKAY.  
CRACKER STACKING MACHINE.

(Application filed Aug. 28, 1897.)

(No Model.)

4 Sheets—Sheet 4.



Witnesses,  
C. H. Benjamin  
J. Kennedy.

Edmund Mackay *Inventor*  
by W. P. Preble Jr  
his atty



# UNITED STATES PATENT OFFICE.

EDMUND MACKAY, OF JERSEY CITY, NEW JERSEY.

## CRACKER-STACKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 679,852, dated August 6, 1901.

Application filed August 28, 1897. Serial No. 649,811. (No model.)

*To all whom it may concern:*

Be it known that I, EDMUND MACKAY, a citizen of the United States, and a resident of Jersey City, Hudson county, and State of New Jersey, have invented certain new and useful Improvements in Cracker-Stacking Machines, of which the following is a specification.

The object of my invention is to provide a cracker-stacking machine which by reason of its improved construction can operate more quickly and more accurately than cracker-stacking machines heretofore used. To this end my invention is adapted to handling a larger quantity of crackers, biscuit, or similar articles at a given time and is more effectively secured against clogging.

Cracker-stacking machines consist, essentially, of a feeding device or apron on which the crackers are deposited by an operator, a separating device to which the crackers are fed by the feeding-apron and by which they are separated into rows, and a receiving device or apron on which these separated rows of crackers are carried until picked up by an operative, who packs them in boxes, cans, barrels, or otherwise. In cracker-stacking machines heretofore used care had to be exercised by the operative who deposited the crackers from the baking tray or pan upon the feeding-apron so that all the crackers faced in the same direction. Only a small quantity of crackers could therefore be deposited at one time. This care is unnecessary in my apparatus, and a large quantity of crackers can be thrown into the machine at once.

One form of my invention is shown in the accompanying drawings, in which—

Figure 1 is a top plan. Fig. 2 is a longitudinal section on line 2 2 of Fig. 1. Fig. 3 is an enlarged detail of the separating device. Fig. 4 is a section thereof on line 4 4 of Fig. 3. Fig. 5 is an enlarged detail showing the stop which limits the motion of the shelf F.

Same letters indicate similar parts in the different drawings.

A is the stationary frame of the machine, on which the moving parts are mounted.

B is the driving-pulley, mounted on the shaft *b*, journaled in the framework and driven from a source of power. (Not shown.)

C is a hopper into which a tray or pan of crackers, biscuit, or similar articles is emptied as often as fresh trays are brought within reach of the operator who stands at that end of the machine.

D is the lifting device by means of which these crackers are taken from the hopper C and deposited on the feeding device of the machine. This lifting device consists, primarily, of an endless apron *d*, provided at convenient intervals with the strips or shelves *d'* and passing over the rollers *D'* and *D''*. Motion is communicated to the roller *D'*, which is mounted upon the shaft *b'*, journaled in the framework, by the sprocket-wheel *B'* on the outer end of said shaft and shown in dotted lines in Fig. 2. This sprocket-wheel is connected and moved in unison with the upper sprocket-wheel *B''* by the chain *d''*. The upper sprocket-wheel *B''* is mounted on the shaft *b''*, journaled in the framework and carrying on its outer end the gear-wheel *B'''*. This wheel meshes with the smaller gear *B''''* on the shaft *b'''*, journaled in the framework. The gear-wheel *B''''* meshes with the gear-wheel *B'''''* on the shaft *b''''*, carrying the pulley *B''''''*, which is connected by the belt *a* to the pulley *B'''''''* (see Fig. 1) on the outer end of the shaft *b*, which carries the main driving-pulley B, as before stated. The other elements of the lifting mechanism are the shelf E and the shelf F, Fig. 2. The strips *d''''* have a double function. They not only support the crackers during the lifting process, but they tip the shelves E and F. The shelf E is hinged at *e* on the framework so that it normally rests in the position shown in Fig. 2, being supported in a downwardly-inclined position by resting against the shoulder *e'* of the framework. This shelf constitutes a movable bottom to the hopper C and is raised by each successive strip *d''''* of the apron *d* as it comes under the same in the direction of the arrows. As soon as the strip passes, the shelf E falls back to its normal position. The crackers are therefore lifted by the apron from the under side of the pile in the hopper and as many of them carried to the top of the lifting device as can find support upon the apron in its inclined position. The tendency of this constant agitation of the crackers at the bottom of the hopper, in combination with



the steepness of the incline of the apron, is to allow only those crackers to reach the top of the lifting device which are so presented to the apron as to rest on the flat under side of the cracker. Crackers which are upside down are pretty sure to fall back into the hopper, because their rounded surface does not support them enough to reach the top of the incline. It therefore becomes unnecessary, as before stated, for the operator who supplies the hopper to see that the crackers are fed face up, as the machine does that, the crackers being continually turned over by the shelf E at the bottom of the hopper and only succeeding in reaching the top of the lifting device when they are presented to the apron face up. The shelf F is hinged at  $f$  to the framework and is normally held tipped up, as shown, by the balance-weight  $f'$ , attached to the free end of the shelf by the cord  $f^2$ , which passes over the pulley  $f^3$ . As one of the strips  $d'$  comes in contact with the free end of the shelf F it depresses said shelf, at the same time depositing the crackers which were between two of the strips thereon. The crackers fall face upward upon the upper side of said shelf F and thence slide down upon the feeding-apron in the direction of the arrows. As soon as the shelf F is released by the strip  $d'$  it is returned to its normal position, a stop  $f^4$ , carried thereby, reaching the upper point of the slot  $f^5$  in the framework of the machine and in which said stop plays both in its downward motion and when drawn up by the balance-weight  $f'$ , thereby throwing off any crackers which may have failed to slip off the shelf when originally deposited thereon. This operation is continuous as long as there are any crackers remaining in the hopper C.

The second part of the machine is the feeding device G. This is of usual construction, consisting of the apron  $d^3$ , which passes over the rollers  $D^3$ ,  $D^4$ , and  $D^5$ , mounted, respectively, on the shafts  $b^4$ ,  $b^5$ , and  $b^6$ , journaled in the framework. The position of the shaft  $b^6$  in its journal-box  $g$  is made adjustable, so that the apron  $d^3$  can be kept at the proper tension. Motion is communicated to this apron by the pulley  $B^6$ , which, as before explained, is mounted on the shaft  $b^4$ . This shaft also carries the pulley  $B^8$ , Fig. 2, which is connected by the belt  $a'$  with the pulley  $B^9$ , which is mounted on the shaft  $b^7$  and drives the receiving-apron, as hereinafter explained. The shaft  $b^7$  is journaled in the framework A. The brush H serves to keep the crackers back, so that they are carried in a single layer by the apron  $d^3$  to the separating device. This brush is mounted on a shaft  $b^8$ , journaled in the framework, and derives motion through the sprocket-wheel  $B^{10}$ , mounted on said shaft and engaged by the chain  $d^4$ , which also engages the sprocket-wheel  $B^{11}$  on the shaft  $b$ .

The third part of the machine is the separating device K, by means of which the

crackers which are fed irregularly by the apron  $d^3$  are divided into rows or stacks and fed onto the receiving-apron in proper rows. They are also inverted while passing through the separating device, so that they are presented upside down, and therefore in a position more easily to be seized by the operator. This separating and inverting device is shown in detail in Figs. 3 and 4, and consists, primarily, of a box or channel  $K'$ , provided with the movable partitions  $k k'$ . The lower part of these partitions  $k'$  is stationary, the upper part being hinged thereto by the hinges  $k^2$ . Permanent channels are thus created at the bottom of the box, communicating with corresponding channels in the receiving device. Motion is communicated to the movable part of the partitions  $k k'$  from the shaft  $b$ , as follows: Said shaft carries the cam L, in the cam-path of which plays the stud  $L'$ , Figs. 3 and 4. This stud is secured to a board M, which reaches across the top of the separating device, but leaving sufficient space for the necessary play of the partition. The extreme positions of the stud and the partition are shown in full and dotted lines in Fig. 3. From the under side of the board M project the pins  $m$ , which connect with the free end of the partitions  $k$ , one pin to each partition, in such manner as to allow just enough play to the connection to prevent binding when the partition is at the angle shown in dotted lines, Fig. 3. As the cam L revolves, the stud and board and with them the extreme end of the partitions  $k$  are reciprocated constantly in front of the crackers, which are fed to them by the apron  $d^3$ . It is obvious, therefore, that as the forward edge of a cracker strikes the end of a partition the cracker will be directed thereby into the proper channel—that is, into the channel which corresponds with the larger portion of the cracker as it strikes the partition. In this way the crackers, however irregularly fed, are separated into rows at the entrance of the separating-box, and so slide to the bottom thereof. The openings  $i$ , leading into the receiving-channel at the bottom of the box, are alternately enlarged or contracted, as follows: The inclined bottom  $M'$  of the box slides up and down under the partitions  $k$  by reason of the fact that a board  $M^2$ , which forms a stationary support for the sliding bottom  $M'$ , serves as a guide therefor when moved by the pitmen N. These pitmen, attached to the sliding bottom  $M'$ , are operated by the reciprocation of the crank-rod O, Fig. 1, which serves as a rock-shaft, journaled in the framework and driven by the rod  $N'$  and the eccentric P on the shaft  $b$ . For each revolution of the shaft  $b$ , therefore, the sliding bottom of the separating device is raised and lowered. In rising it enlarges the opening into the receiving-channels and in descending contracts said opening, thus preventing enough crackers from escaping into the receiving-channels to block the same.



The last part of the machine is the receiving device, which is of ordinary construction, and is therefore shown broken away in the drawings. This device consists of the apron 5  $d^5$  on the roller  $B^{12}$  and another roller, now shown and operated, as before described, by the pulley  $B^9$ . The space above this apron is divided by the partitions  $k^3$ , Fig. 1, into channels corresponding with the channels of 10 the separating-box. In descending through the separating-box the crackers originally presented face up get turned over and are therefore received in these receiving-channels face down.

15 The operation of my improved cracker-stacking machine will be readily understood, I think, without further description.

I claim—

20 1. A cracker-stacking machine consisting of a lifting device placed in advance of the feeder, a feeder, a separating and inverting device, and a receiving device adapted and arranged to receive a mixed supply of crackers, select and arrange them in suitable rows, 25 substantially as shown and described.

30 2. A cracker-stacking machine provided with a separating and inverting device which consists of a box provided with a series of hinged partitions, the movable portions of which are adapted to reciprocate in front of the crackers presented by the feeding device, mechanism whereby reciprocating motion is given to said partition, and suitable feeding devices and their operating mechanisms,

whereby the crackers are presented, substantially as shown and described. 35

3. In a cracker-stacking machine a lifting and arranging device which consists of an inclined lifting-apron and its operating devices, a hopper at one end of said lifting-apron, and 40 provided with a movable bottom intermittently lifted by said apron and at the other end with a receiving-shelf intermittently depressed by said apron, whereby the crackers thrown into said hopper are constantly turned 45 about and selected when they assume a face-upward position and so lifted and transferred to the feeding device of said cracker-stacking machine.

4. In a cracker-stacking machine a separating 50 device which consists of a box placed between the feeding and receiving devices and provided with an inclined reciprocating bottom and a series of partitions the upper portions of which reciprocate laterally, dividing 55 said box into channels corresponding to the channels of the receiving device, means for operating said sliding bottom and said partitions whereby the crackers presented to said separating device are divided, inverted and 60 delivered in rows or stacks to said receiving device and a receiving device provided with suitable channels for receiving the crackers.

EDMUND MACKAY.

Witnesses:

W. P. PREBLE, Jr.,  
J. KENNEDY.