J. H. KELLOGG.

BISCUIT MACHINE.

APPLICATION FILED APR. 17, 1909.

992,880.

Patented May 23, 1911.

3 SHEETS—SHEET 1.

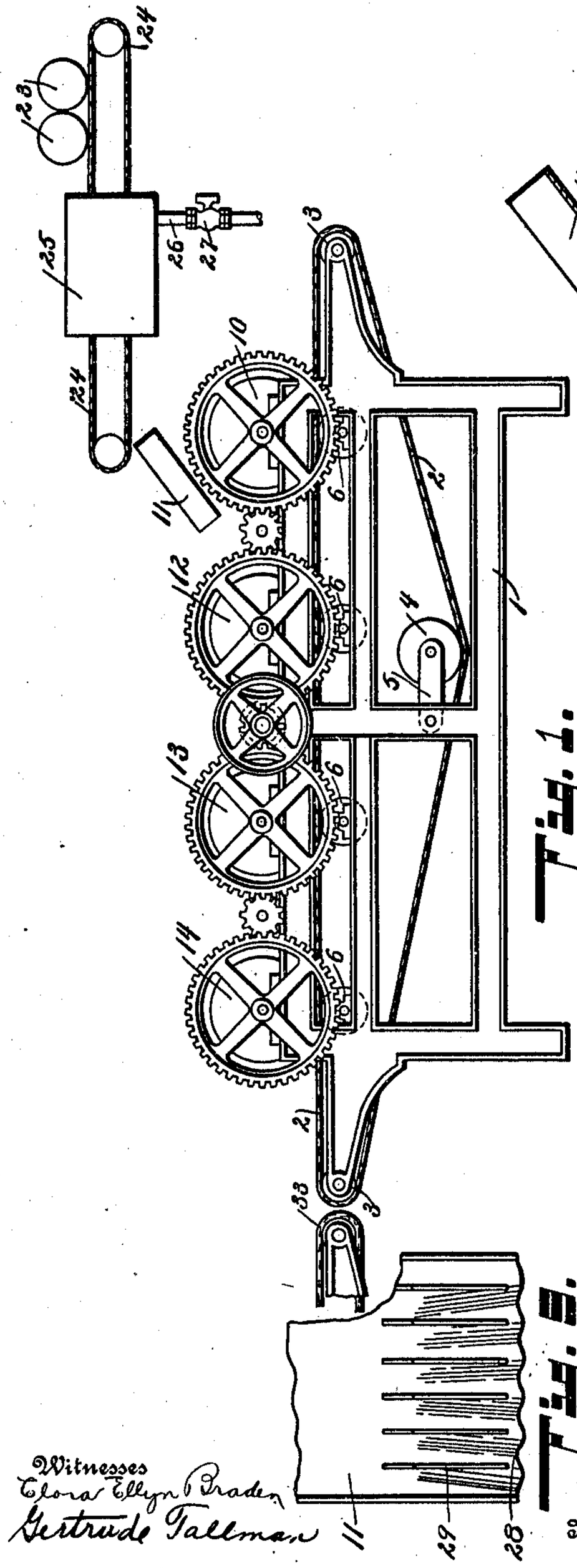

Fig. 1.

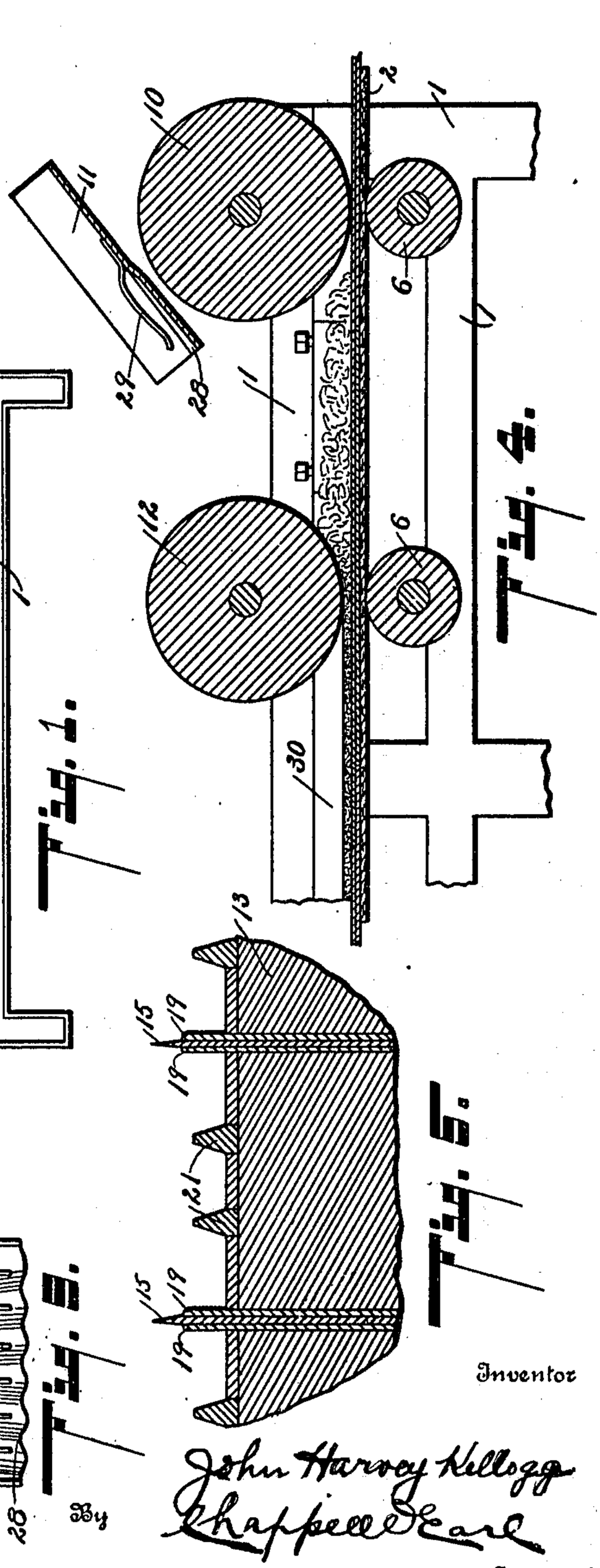

Fig. 4.

Fig. 5.

Fig. 6.

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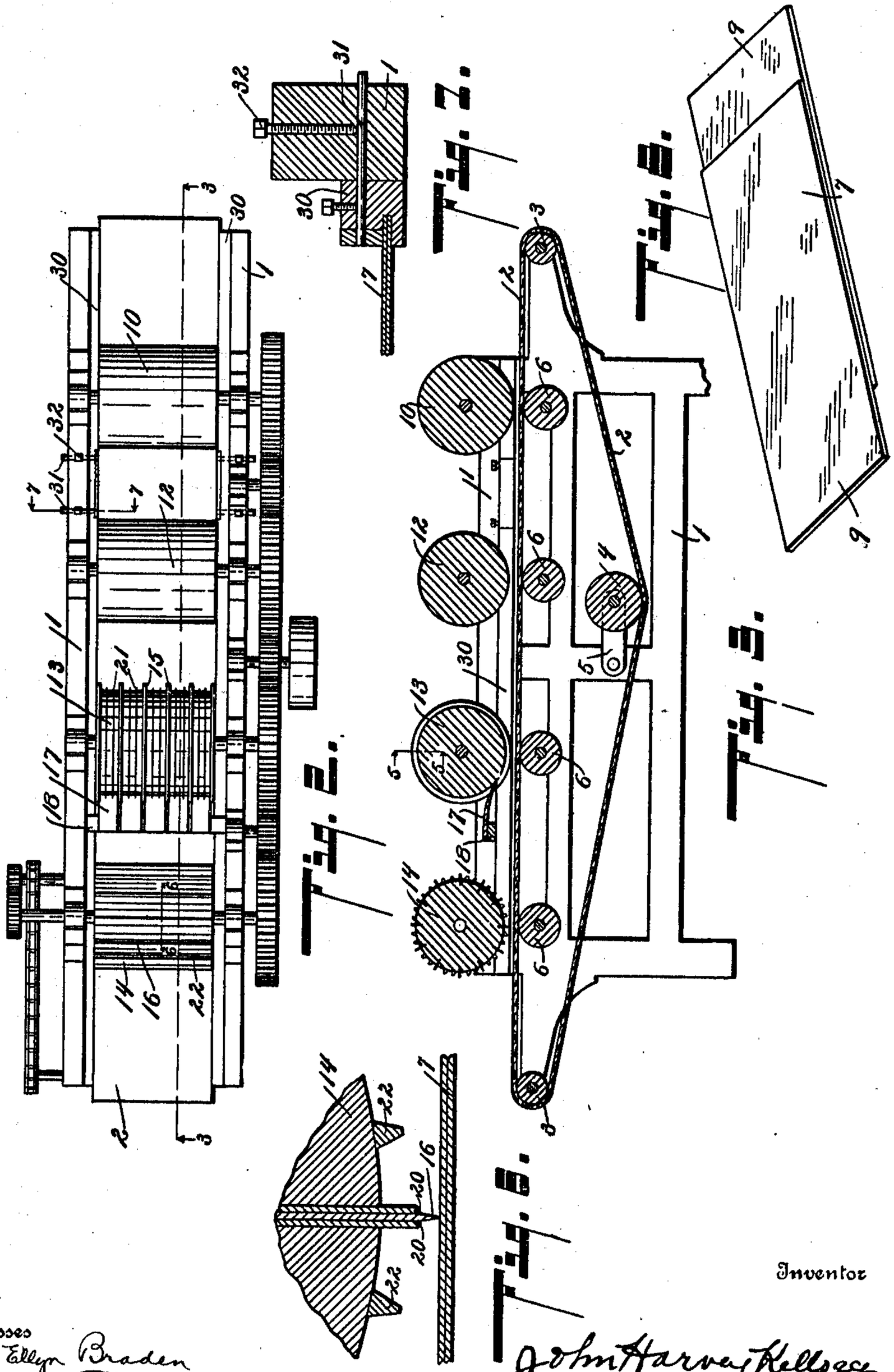

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3 SHEETS—SHEET 3.

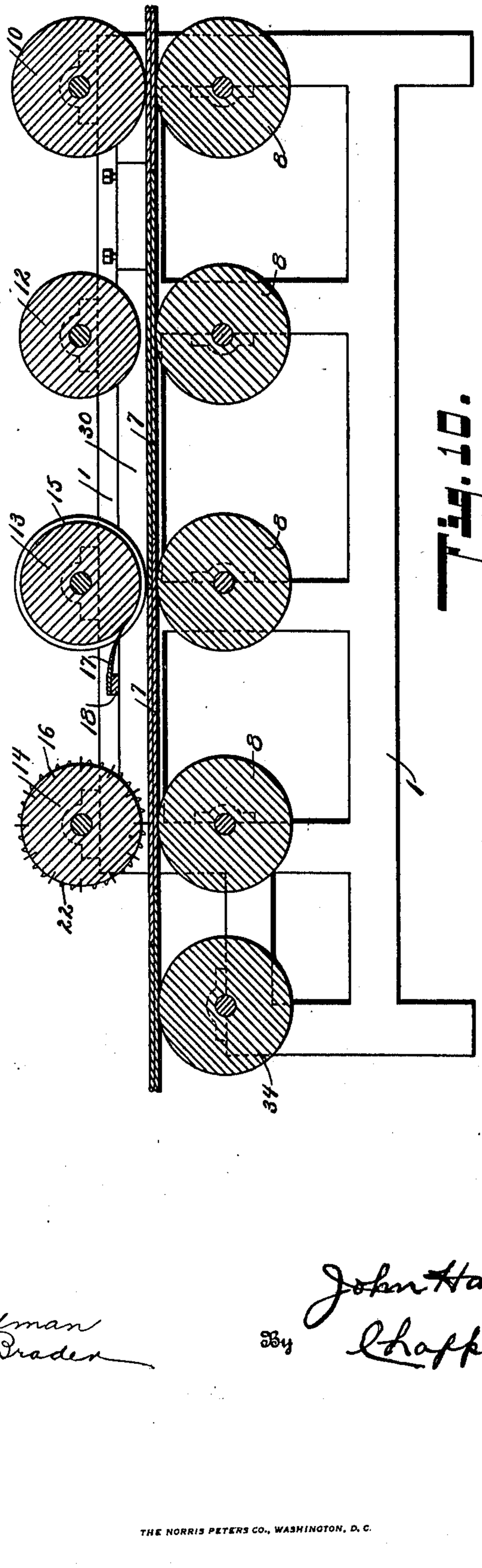

Fig. 10.

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UNITED STATES PATENT OFFICE.

JOHN HARVEY KELLOGG, OF BATTLE CREEK, MICHIGAN.

BISCUIT-MACHINE.

992,880. Specification of Letters Patent. Patented May 23, 1911.

Application filed April 17, 1909. Serial No. 490,486.

To all whom it may concern:

Be it known that I, JOHN HARVEY KELLOGG, a citizen of the United States, residing at the city of Battle Creek, Calhoun county, State of Michigan, have invented certain new and useful Improvements in Biscuit-Machines, of which the following is a specification.

This invention relates to improvements in biscuit machines.

The main objects of this invention are: First, to provide an improved biscuit machine by which cereal flakes may be effectively formed into biscuits preparatory to the baking of the same. Second, to provide in a structure of the class described improved cutters. Third, to provide in a structure of the class described, improved conveyer means.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure 1 is a detail side elevation of a structure embodying the features of my invention; parts being shown in conventional form only. Fig. 2 is a plan view thereof with the feed and delivery mechanism omitted. Fig. 3 is a vertical longitudinal section of the parts shown in Fig. 2. Fig. 4 is an enlarged detail vertical section showing details of the feed and compression means. Fig. 5 is an enlarged detail section taken on a line corresponding to line 5—5 of Fig. 3, showing details of one of the cutters. Fig. 6 is an enlarged detail taken on a line corresponding to line 6—6 of Fig. 2, showing details of the other cutter. Fig. 7 is an enlarged detail vertical section taken on a line corresponding to line 7—7 of Fig. 2. Fig. 8 is a perspective view of one of the conveyer pans or trays. Fig. 9 is a detail plan view of the delivery spout. Fig. 10 is a longitudinal section corresponding to that of Fig. 3 of a modified construction in which the conveyer belt is omitted, the conveyer trays being carried directly upon the conveyer rollers.

In the drawings, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, I provide a frame 1 preferably made up of suitable longitudinal and cross pieces. The conveyer belt 2 is carried by pulleys 3 located at each end of the machine. A belt tightener, preferably consisting of the roller 4 carried by the pivoted arms 5, is provided. This roller is preferably of sufficient weight to answer the purpose, although, of course, additional weights or springs might be provided. The belt is further supported by a plurality of conveyer rollers 6. Conveyer trays 7 are adapted to be carried through the machine on the conveyer belt, or in the modified construction shown in Fig. 10 they are carried through the machine directly upon the conveyer rollers 8 which correspond to the rollers 6 in the structure illustrated in Figs. 1 to 4. The trays 7 are preferably provided with offset portions 9 at each end, which are adapted to overlap the adjacent trays. These offsets are conveniently formed by forming the trays of two pieces of sheet metal, as I have illustrated.

Above the conveyer at its forward end is a feed roller 10 which engages the trays and assists in advancing them into the machine, the trays being, in the structure illustrated, fed into the machine by hand, one after another. The material is fed into the machine at the rear of the feed roller 10 by means of the spout 11, see Figs. 1 and 4. As the material is carried forward by the trays, it is compressed or compacted by means of the compression roller 12. As it is carried forward, it is acted upon by the cutters 13 and 14 and cut into suitable sized biscuits thereby. The cutter 13 is provided with a plurality of spaced circumferential knives 15, while the cutter 14 is provided with longitudinal radially arranged knives 16. The cutter having the rotary knives cuts the compressed material longitudinally as it is carried along by the conveyer, while the cutter 14 cuts it transversely.

The conveyer rollers 6 are arranged below the feed roller 10, compression roller 12 and cutters 13 and 14, so that the conveyer trays are effectively supported while the flakes carried thereby are being acted upon by the compression means and cutters.

To prevent the material adhering to the rotary cutter, I provide scrapers or clearers 17, the same being in the form of blades carried by a suitable cross-piece, as 18, see Figs. 2 and 3. I sometimes desire to form division lines in the biscuits, and to compress or crimp their edges, the advantages being that the biscuits may be readily broken into sections or pieces and that the flakes at the edges of the biscuits are effectively crimped or compressed together. This I accomplish by providing the knives of the rotary cutter with compression or crimping shoulders 19 at each side, see Fig. 5. These shoulders compress the flakes at the edges of the biscuits at the time of cutting the same, so that they adhere together, and the tendency for them to loosen or crumble apart during the baking process is largely overcome.

The knives of the cutter 14 are provided with crimping shoulders 20 at each side. These shoulders are preferably formed by arranging the plates at each side of the knives, as illustrated, although they may be otherwise formed by making them integral with the knives.

The biscuits are marked or divided into sections by the compression ribs 21 for the cutter 13 and the ribs 22 for the cutter 14, the ribs 21 being circumferential, while the ribs 22 are longitudinal. These compression ribs are of less depth than the cutters and are preferably of somewhat less depth than the crimping shoulders of the cutters. These ribs compress the flakes together at intervals, marking them off into sections so that they may be readily broken along the lines of compression. A further advantage is, as stated, that the biscuit can be more easily handled if desired to do so before baking without danger of breaking them.

In practice, I preferably deliver the flakes directly from the flaking rolls 23, which are shown in conventional form only in Fig. 1. Below these forms is a carrier 24 which is also shown in conventional form. This carrier preferably passes through the tempering or steaming chamber 25 which is provided with suitable means for supplying steam thereto, as the pipe 26 which is provided with a valve, at 27, for controlling the steam so that the flakes can be tempered properly for compressing and cutting the biscuit. The carrier 24 delivers to the upper end of the spout 11 which is arranged to deliver in front of the compression roller 12, as is illustrated. The lower end of this spout is preferably provided with corrugations 28 which are adapted to spread the flakes as they are delivered. To further assist in spreading the flakes and delivering them evenly on to the conveyer, I provide the spout with fingers 29 which are secured at their upper ends to the bottom of the spout and extend downwardly above the corrugations of the spout, see Figs. 4 and 9. The flakes are thus evenly delivered to the trays so that they are compressed in an even layer upon the trays.

I preferably provide guides 30 for the edges of the trays, see Fig. 7, the trays being delivered onto the conveyer between these guides. These guides are carried by rods 31, which are arranged through the side pieces of the frame and adjustably secured by the set screws 32; I preferably deliver the trays from the machine by means of the delivery belt 33, which is arranged to receive the conveyer trays from their carrier. This delivery device is preferably driven at a speed exceeding that of the conveyer so that the trays are separated as they are delivered, and may be lifted from the belt 33 and passed into the oven, or the biscuits may be removed therefrom to a suitable baking tray.

In the modified structure shown in Fig. 10, the conveyer belt is dispensed with and the delivery device consists of the roller 34 which serves to separate the trays so that they can be conveniently removed. The conveyer rollers are here preferably of the same diameter as the feed rollers and cutters.

My improved machine is of large capacity, and, at the same time, is comparatively simple and economical in structure. I have illustrated and described my invention in the form which I have found to be practical, although I am aware that the structure is capable of very considerable modification other than that shown in Fig. 10, but as these modifications will be readily understood by those skilled in this art, I have not attempted to illustrate or describe the same in detail herein.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a structure of the class described, the combination with a compression roller; of a rotary cutter having a plurality of spaced circumferential knives arranged at the rear of said compression roller; a transverse cutter arranged at the rear of said rotary cutter, said transverse cutter having a plurality of radially arranged knives; a conveyer comprising a plurality of trays having overlapping offsets at each end; and means for carrying said trays, comprising supporting rollers arranged beneath said compression roller and said cutters; guides adapted to receive the edges of said trays; and a delivery device for said trays, the speed of said delivery device being greater than that of said tray carrying means, whereby the trays are separated.

2. In a structure of the class described, the combination with a compression roller; of a rotary cutter having a plurality of spaced circumferential knives arranged at the rear of said compression roller; a trans-

verse cutter arranged at the rear of said rotary cutter, said transverse cutter having a plurality of radially arranged knives; a conveyer comprising a plurality of trays having overlapping offsets at each end; and means for carrying said trays, comprising supporting rollers arranged beneath said compression roller and said cutters; and a delivery device for said trays, the speed of said delivery device being greater than that of said tray carrying means, whereby the trays are separated.

3. In a structure of the class described, the combination with a compression roller; of a rotary cutter having a plurality of spaced circumferential knives arranged at the rear of said compression roller; a transverse cutter arranged at the rear of said rotary cutter, said transverse cutter having a plurality of radially arranged knives; a conveyer comprising a plurality of trays having overlapping offsets at each end; and means for carrying said trays, comprising supporting rollers arranged beneath said compression roller and said cutters, and guides adapted to receive the edges of said trays.

4. In a structure of the class described, the combination with a compression roller; of a rotary cutter having a plurality of spaced circumferential knives arranged at the rear of said compression roller; a transverse cutter arranged at the rear of said rotary cutter having a plurality of radially arranged knives; a conveyer comprising a plurality of trays having overlapping offsets at each end; and means for carrying said trays, comprising supporting rollers arranged beneath said compression roller and said cutter.

5. In a structure of the class described, the combination with a compression means; of a cutting means; a conveyer comprising a plurality of trays, and means for carrying said trays, comprising supporting rollers arranged beneath said compression roller and said cutter; and groove like guides adapted to receive the edges of said trays adapted to prevent the buckling of said trays by said compression and cutting means.

6. In a structure of the class described, the combination with a compression means; of a cutting means; a conveyer comprising a plurality of trays having overlapping offsets at each end, and means for carrying said trays, comprising supporting rollers arranged beneath said compression roller and said cutter; and guides adapted to receive the edges of said trays adapted to prevent the buckling of said trays by said compression and cutting means.

7. In a structure of the class described, the combination with a compression means; of a cutting means; and a conveyer comprising a plurality of trays having overlapping offsets at each end, and means for carrying said trays, comprising supporting rollers arranged beneath said compression roller and said cutter.

8. In a structure of the class described, the combination of a compression means; of cutters; a conveyer comprising a belt, and a plurality of trays having overlapping offsets at each end; and a delivery device for said trays comprising a belt, the speed of said belt being greater than that of said conveyer belt whereby the said trays are separated as they are delivered.

9. In a structure of the class described, the combination with a compression means; of cutters; a conveyer comprising a belt, and a plurality of trays having overlapping offsets at each end; and guides adapted to receive the edges of said trays adapted to prevent the buckling of said trays by said compression and cutting means.

10. In a structure of the class described, the combination with a compression roller; of cutter rollers; and a conveyer comprising a plurality of trays having offset ends adapted to overlap, and means for carrying said trays comprising rollers arranged beneath said compression and cutter rollers.

11. In a structure of the class described, the combination with a compression roller; of cutter rollers; and a conveyer comprising a plurality of trays, and means for carrying said trays comprising rollers arranged beneath said compression and cutter rollers, and a delivery device adapted to receive and separate the said trays.

12. In a structure of the class described, the combination with a compression means; of a cutter means; and a conveyer comprising a plurality of trays having offset ends adapted to overlap, and a delivery device adapted to receive and separate the said trays.

13. In a structure of the class described, the combination with a compression means; of a cutter means; and a conveyer comprising a plurality of trays having offset ends adapted to overlap.

14. In a structure of the class described, the combination of a compression means; of a cutter means; and a conveyer comprising a plurality of trays, and a delivery device adapted to receive and separate the said trays.

15. In a structure of the class described, the combination with the conveyer; of a compressing means arranged above said conveyer; a rotary cutter having a plurality of spaced circumferential knives arranged above said conveyer at the rear of said compression means, said knives being provided at each side with compressing or crimping shoulders; and a transverse cutter arranged at the rear of said rotary cutter, said trans-

verse cutter having a plurality of radially-arranged knives, said knives being provided on each side with a crimping or compressing shoulder.

16. In a structure of the class described, the combination with the conveyer; of a compressing means arranged above said conveyer; and a rotary cutter having a plurality of spaced circumferential knives arranged above said conveyer belt at the rear of said compression means, said knives being provided at each side with compressing or crimping shoulders.

17. In a structure of the class described, the combination with the conveyer, of a cutter having a plurality of knives, said knives being provided at each side with compressing or crimping shoulders; and compression ribs arranged between said knives.

18. In a structure of the class described, the combination with the conveyer, of a cutter having a plurality of spaced circumferential knives; a cutter having a plurality of spaced radially arranged knives; and compression ribs arranged between the knives of both of said cutters.

19. In a structure of the class described, the combination with the conveyer, of a rotary cutter having a plurality of knives thereon; a plurality of compression ribs arranged between said knives; a transverse cutter having a plurality of radially-arranged knives thereon; and a plurality of compression ribs arranged between said knives of said transverse cutter.

20. In a structure of the class described, the combination with the conveyer; of a rotary cutter having a plurality of spaced circumferential knives thereon; crimping shoulders arranged at each side of said knives; a plurality of compression ribs arranged between said knives; a transverse cutter having a plurality of radially-arranged knives thereon; crimping shoulders arranged between said knives of said transverse cutter.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

JOHN HARVEY KELLOGG. [L. S.]

Witnesses:
GAVIN RITCHIE, Jr.,
JAMES T. CASE.