F. R. HARRIS.

MACHINE FOR CUTTING FINGER NOTCHES IN BOXES.

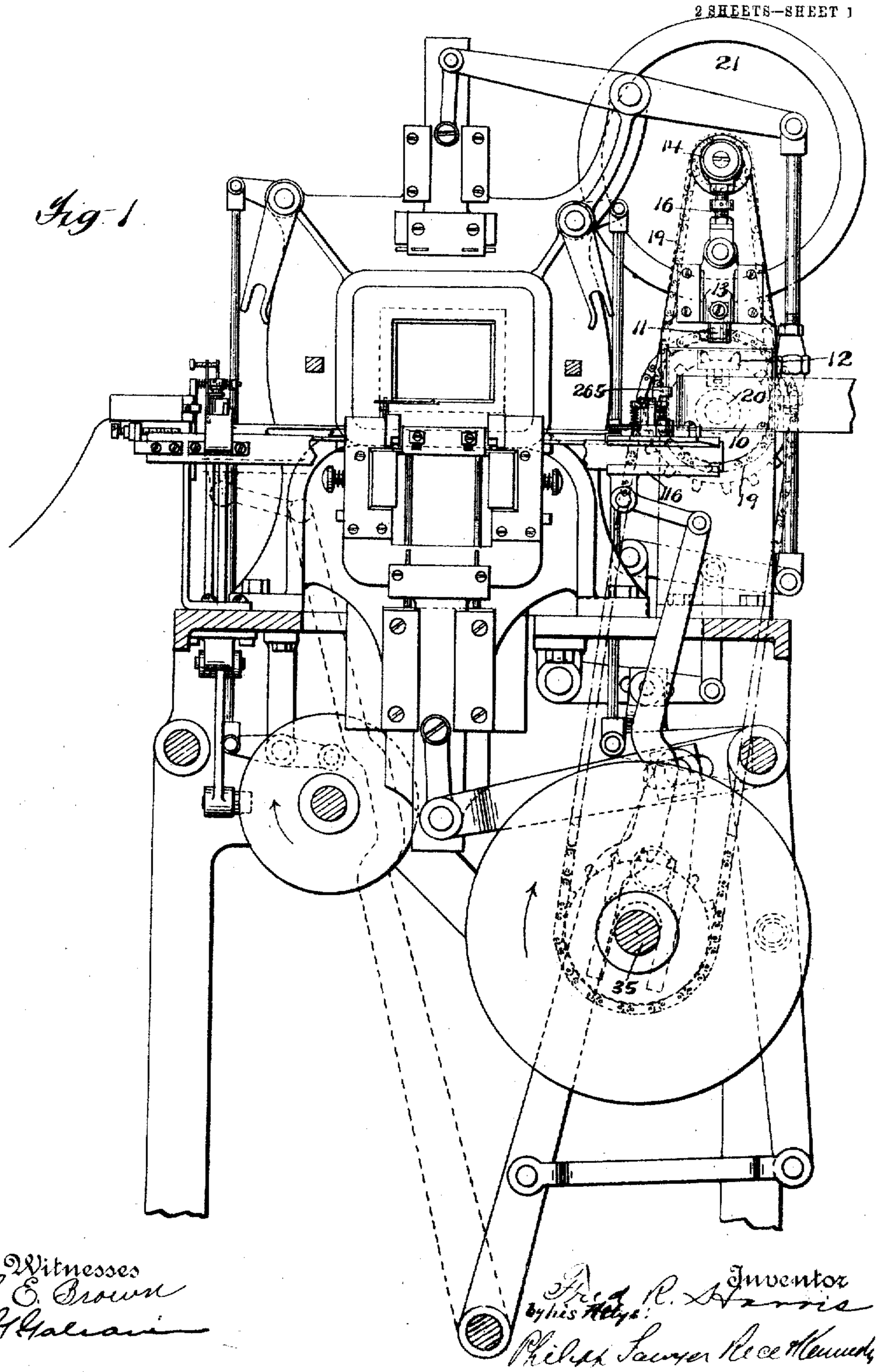
APPLICATION FILED JULY 16, 1904.

916,442.

Patented Mar. 30, 1909.

2 SHEETS—SHEET 1

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 3.

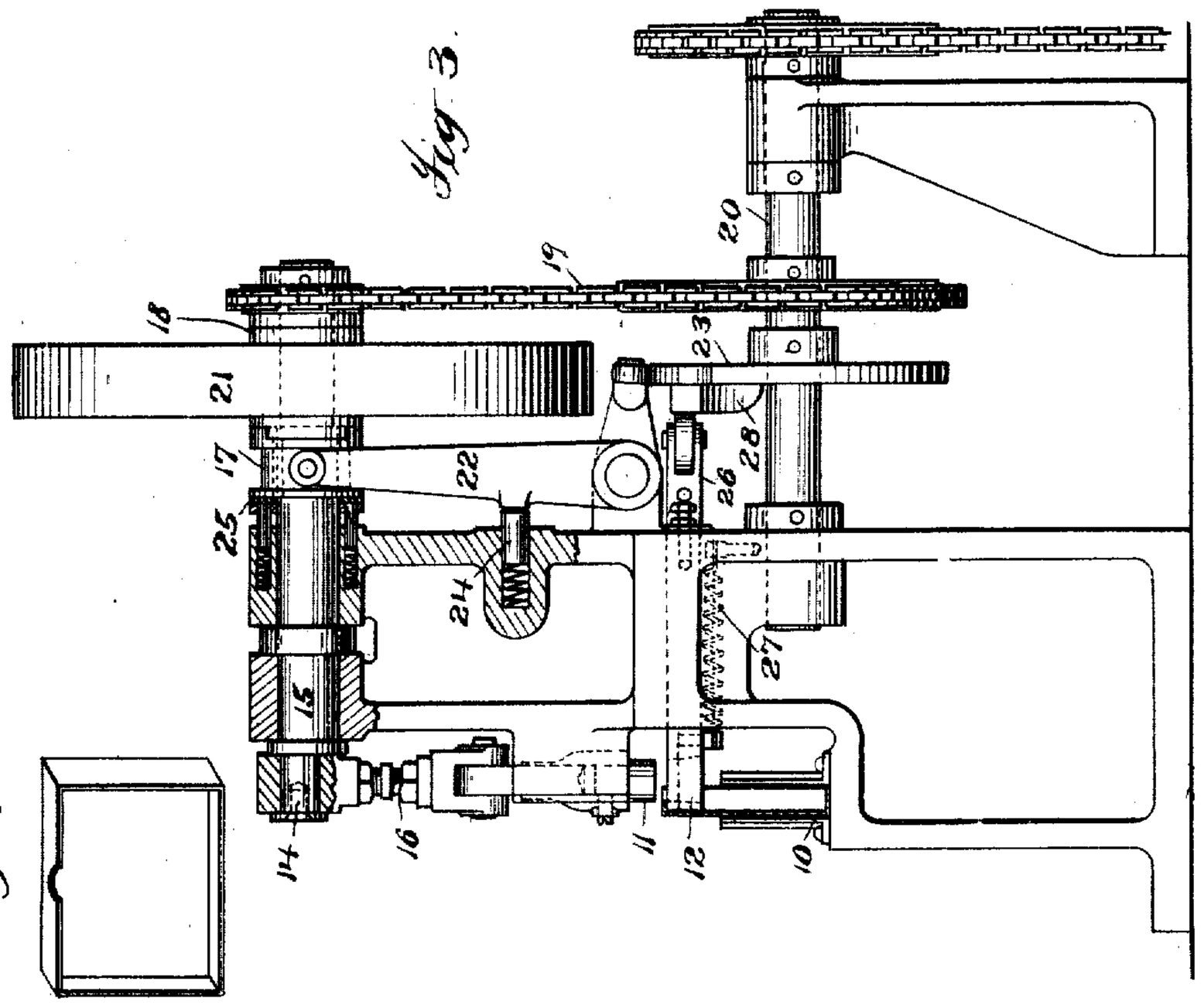
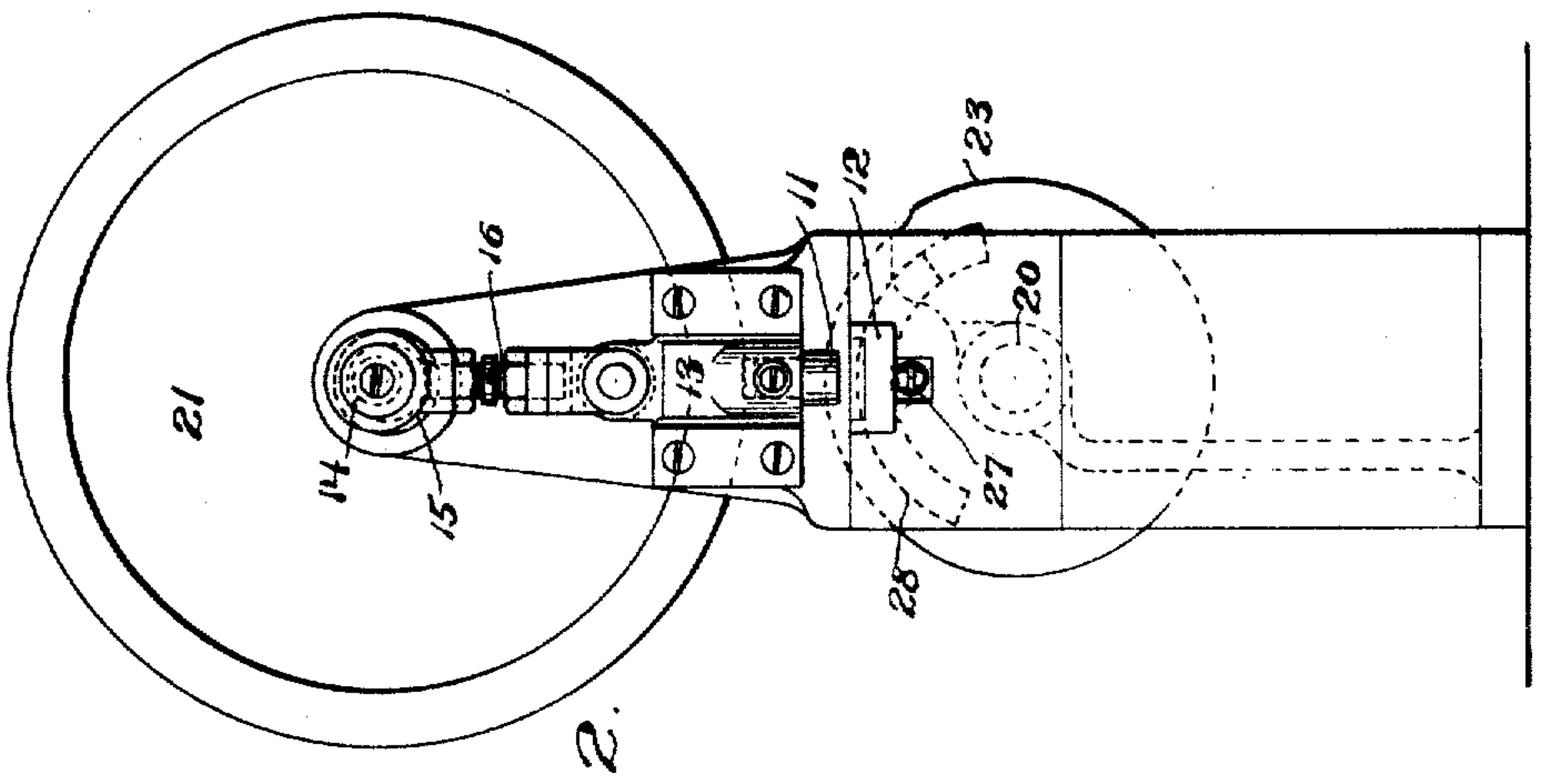


Fig. 4.

Fig. 2.



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UNITED STATES PATENT OFFICE.

FRED R. HARRIS, OF NEW YORK, N. Y., ASSIGNOR TO THE AMERICAN TOBACCO COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

MACHINE FOR CUTTING FINGER-NOTCHES IN BOXES.

No. 916,442 Specification of Letters Patent. Patented March 30, 1909.

Application filed July 16, 1904. Serial No. 216,820.

To all whom it may concern:

Be it known that I, FRED R. HARRIS, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Machines for Cutting Finger-Notches in Boxes, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is to provide a machine for cutting finger holes or notches in the sides of boxes, of such construction that the boxes may be readily placed in position and removed from the cutting or punching mechanism.

The invention has been made specially with the idea of providing the box making machine of my application for United States Letters Patent filed November 25th, 1903, No. 182,569, with means for cutting a finger notch in one of the sides of the boxes as they are fed from the machine. Such machine is adapted for making boxes or box covers having a bottom section or top section, as the case may be, of polygonal form and especially of rectangular form and having side sections extending from the bottom or top. When such boxes are intended to be used for the cover portion of the box, it is desirable to cut a finger notch in the edge of one of the box sides as the boxes are fed from the machine, and the present invention is intended to provide mechanism for accomplishing this result, although the invention is adapted to be embodied in a complete independent machine or combined with other machines from that shown in my said application. Although the part of the box that it is desirable to provide with such finger notches or holes, that is, the part having sides which extend outside of the other part of the box, is usually the box cover, such part will be termed a "box" herein, such term being used to include either the top or bottom or other portion of a box which it is desired to provide with such finger notches or holes.

A full understanding of the invention can best be given from a detailed description of a preferred construction embodying the various features thereof, and such description will now be given in connection with the accompanying drawings showing such a construction as applied to the machine of my said application No. 182,569.

In said drawings:—Figure 1 is a sectional elevation of the machine shown and described in my said application No. 182,569 provided with mechanism for punching finger notches in the sides of the boxes as they are fed from the machine. Fig. 2 is a front view of the notch punching mechanism. Fig. 3 is a side view of the same, partly in section, and Fig. 4 is a perspective view of the box after having the finger notches formed in one side thereof.

Referring first to Figs. 2 and 3, the mechanism shown in these figures comprises a feedway 10 through which the boxes are fed into and from position to be punched, a vertically reciprocating punch 11, and a die 12 for projecting into the box to co-act with the punch. The punch 11 is carried by a cross head 13 mounted to slide vertically in suitable ways and reciprocated by means of an eccentric pin 14 on the shaft 15 through a connecting rod 16 connected to the cross head. A clutch sleeve 17 splined to slide on the shaft 15 serves to connect the shaft with a sleeve 18 mounted to rotate freely on the shaft and driven by means of a sprocket chain 19 from a shaft 20, the sprocket wheel on the shaft 20 and the sleeve 18 being of such relative size that the sleeve is given a number of revolutions for each rotation of the shaft 20. The sleeve 18 also preferably carries a fly wheel 21 for giving momentum. The clutch 17 is operated to intermittently connect the shaft 15 with the sleeve 18 by means of a lever 22, the movements of which are controlled by a cam 23 on the shaft 20, said cam engaging a short arm carried by the shaft of the lever and acting to throw the lever against the pressure of a spring stud 24. A spring pressed annular friction plate 25 is preferably provided, as shown in Fig. 3, for bearing against the end of the clutch sleeve 17 for the purpose of stopping the rotation of the shaft on its being unclutched from the driving sleeve 18. The die 12 is arranged to be retracted to permit the boxes to be moved edgewise through the feedway into punching position. For this purpose the die is carried by or formed by the end of a bar 26 mounted

to reciprocate horizontally and endwise in suitable bearings in the supporting frame. The bar is normally held under tension of a spring 27 in its retracted position, that is, moved to the right from the position shown in Fig. 3, with the die retracted out of the path of the boxes and is intermittently projected for successive punching operations into the position shown in Fig. 3 by means of a crown cam 28 on the face of the cam disk 23.

In the operation of the machine, the boxes to be punched are fed edgewise through the feedway 10 into position while the die 12 is retracted. The die will then be projected into position to coöperate with the punch 11 and the shaft 15 having been clutched to the sleeve 18 the punch will operate to cut a finger notch in the side of the box. The shaft will then be disconnected from the sleeve 18 and the die will be retracted to permit the box to be moved onward through the feedway 10 and another box to be moved into position to be punched.

The boxes may be fed through the feedway 10 by hand or by any suitable mechanism for feeding the boxes into position in time for the operations of the punching mechanism. Such a construction is shown in Fig. 1 where the punching mechanism is shown as combined with the box making and covering machine of my application No. 182,569 above referred to. In said machine the formed boxes are fed edgewise from the box forming and covering devices by means of pushing fingers 265 carried by a horizontally reciprocating gripper slide 116. The notch punching mechanism is so positioned on said machine that as the completed boxes are moved edgewise from the box forming and covering devices by the pushing fingers 265 they will be fed into the feedway 10 and to position with the central portion of the upper side of the box beneath the punch 11. The die 12 will then be projected into operative position and the punch operated while the slide 11 is making its next reciprocation. The die will then be retracted while the punch remains in its elevated position as the slide 116 moves to the right again, as shown in Fig. 1 and the pusher 265 carries another completed box from the forming and covering devices to the punching mechanism, the box previously punched being ejected from the punching mechanism by the next box moved into position to be punched.

As shown in Fig. 1 the punching mechanism is driven from the shaft 35 of the box forming machine by means of a sprocket chain running on sprocket wheels on the shaft 35 and the shaft 20, said wheels being timed to cause an operation of the punching machine for each rotation of the shaft 35, that is, for each box formed and in time with the movements of the slide 116.

As the other parts of the box forming and covering machine shown in Fig. 1 are not concerned particularly with the present invention and are shown only for the purpose of illustrating the application of the punching mechanism to such machine, further description thereof is not necessary in this application.

It will be understood that the invention is not to be limited to the exact construction and arrangement of parts shown but that the invention includes various changes and modifications thereof within the terms of the claims.

What is claimed is:—

1. The combination with a punch and a die for cutting finger notches in the sides of boxes, of means for reciprocating the member which extends inside the box in a direction transverse to the direction of cutting movement of the punch or die and transverse to the direction of movement of the boxes into and out of position to be punched to permit the box to be moved into and out of position to be punched, substantially as described.

2. The combination with a punch for cutting finger notches in the sides of boxes, and means for reciprocating the punch, of a die which extends into the box when in operative position, a feedway through which the boxes move edgewise of the bottom of the box, and means for retracting the die in a direction transverse to the direction of movement of the punch and of the boxes to permit the boxes to move through the feedway, substantially as described.

3. The combination with a punch for cutting finger notches in the sides of boxes, and means for reciprocating the punch, of a die which extends into the box when in operative position, a feedway, means for advancing boxes successively through the feedway edgewise of the bottom of the box into position to be punched, and means for retracting the die in a direction transverse to the direction of movement of the punch and of the boxes to permit the boxes to be moved into position to be punched, substantially as described.

4. The combination with a punch for cutting finger notches in the sides of boxes, and means for reciprocating the punch, of a die which extends into the box when in operative position, a feedway through which the boxes move edgewise of the bottom of the box, means for retracting the die in a direction transverse to the direction of movement of the punch and of the boxes to permit the boxes to move through the feedway, punch operating means, and means for interrupting the operation of the punch operating means when the die is retracted, substantially as described.

5. The combination of the reciprocating punch 11, the die 12, which extends inside

the article to be punched when in operative position and means for intermittently reciprocating the die in a direction transverse to the direction of movement of the punch and transverse to the direction of movement of the articles into position to be punched, substantially as described.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

FRED R. HARRIS.

Witnesses:
A. L. KENT,
J. A. GRAVES.