

L. C. PALMER.
 CUTTING MECHANISM.
 APPLICATION FILED DEC. 17, 1910.

1,067,269.

Patented July 15, 1913

2 SHEETS—SHEET 1.

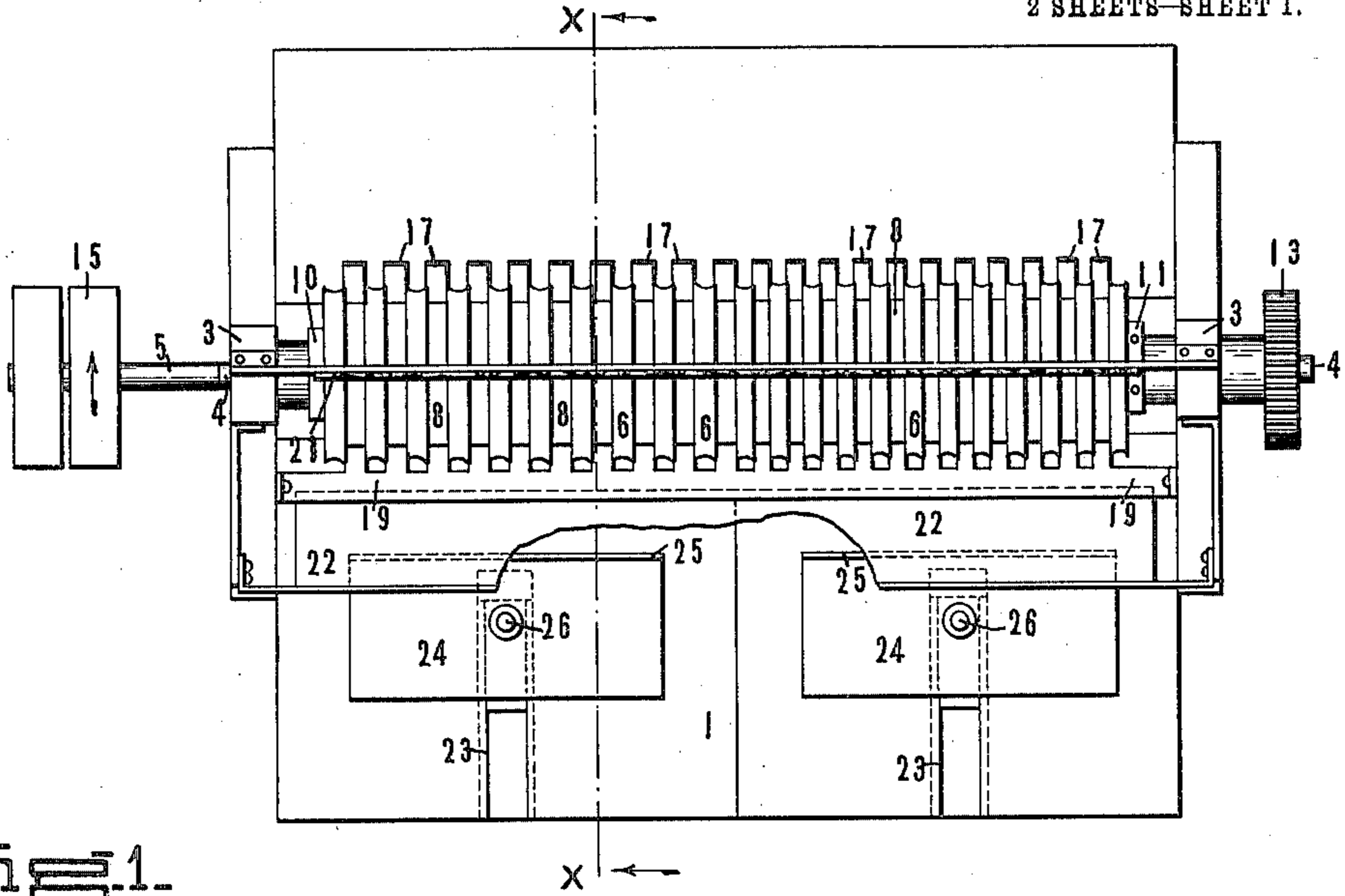


Fig. 1.

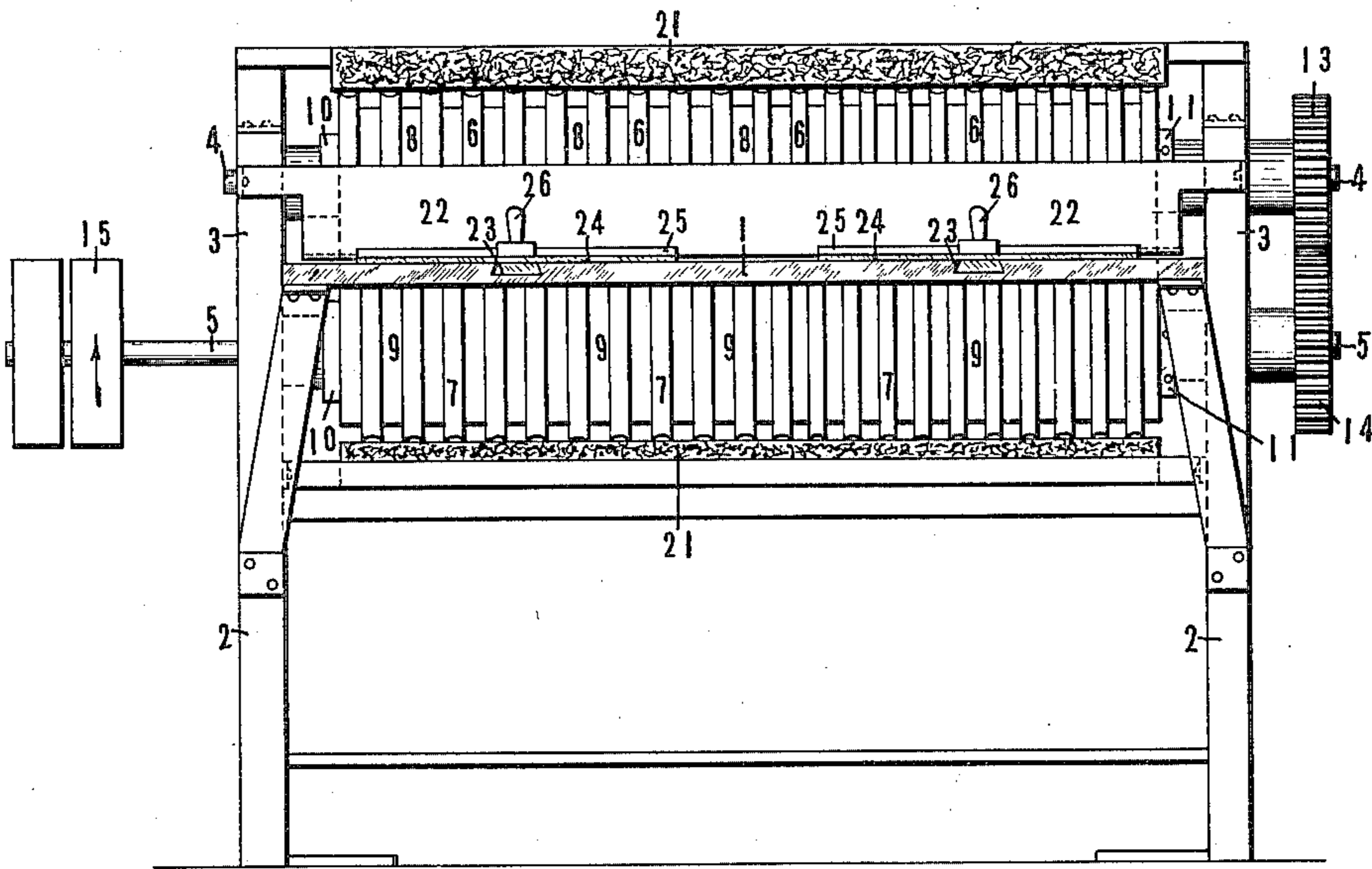


Fig. 2.

WITNESSES:

Horatio W. ...
Leonard ...

INVENTOR

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 ATTORNEYS

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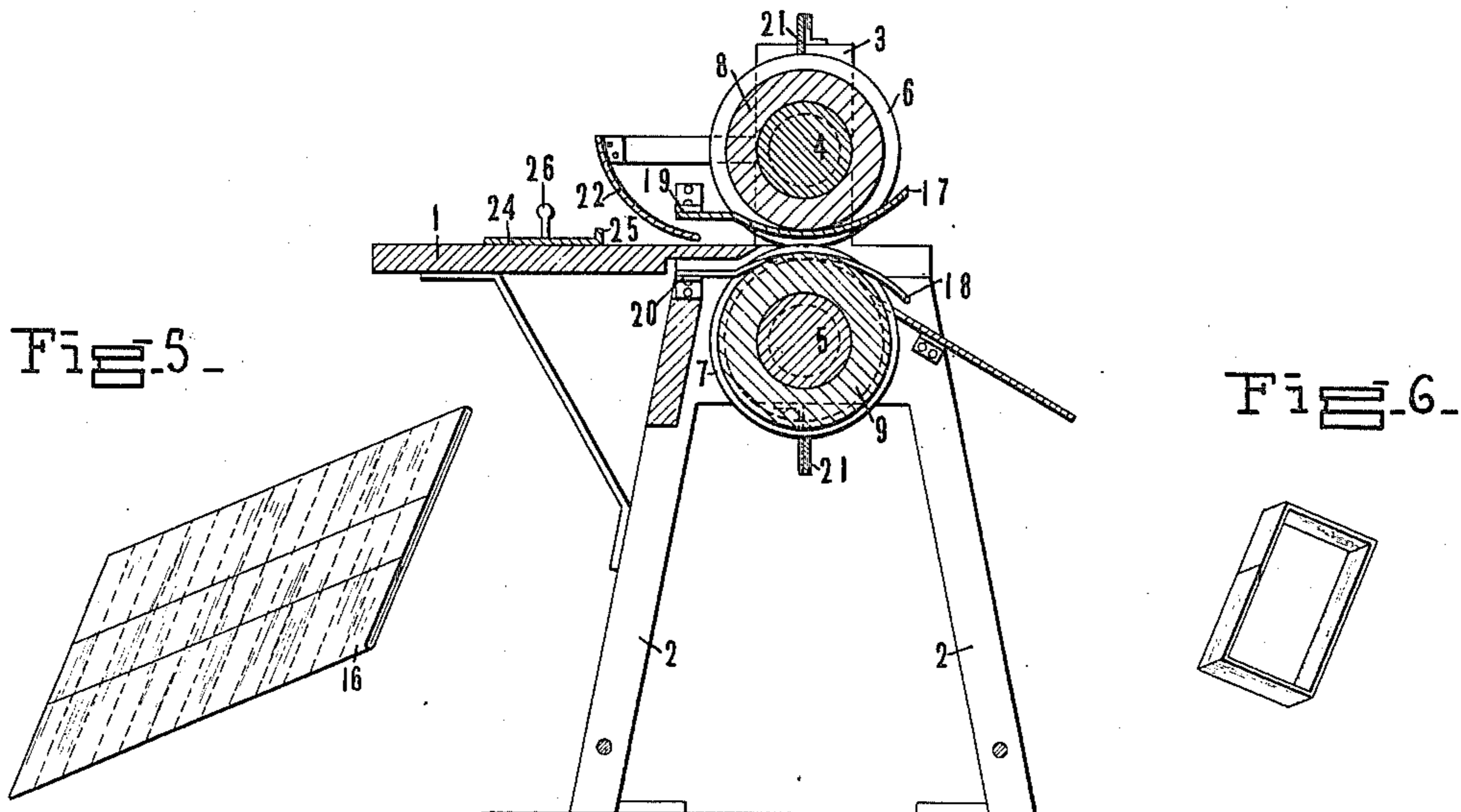


Fig. 3.

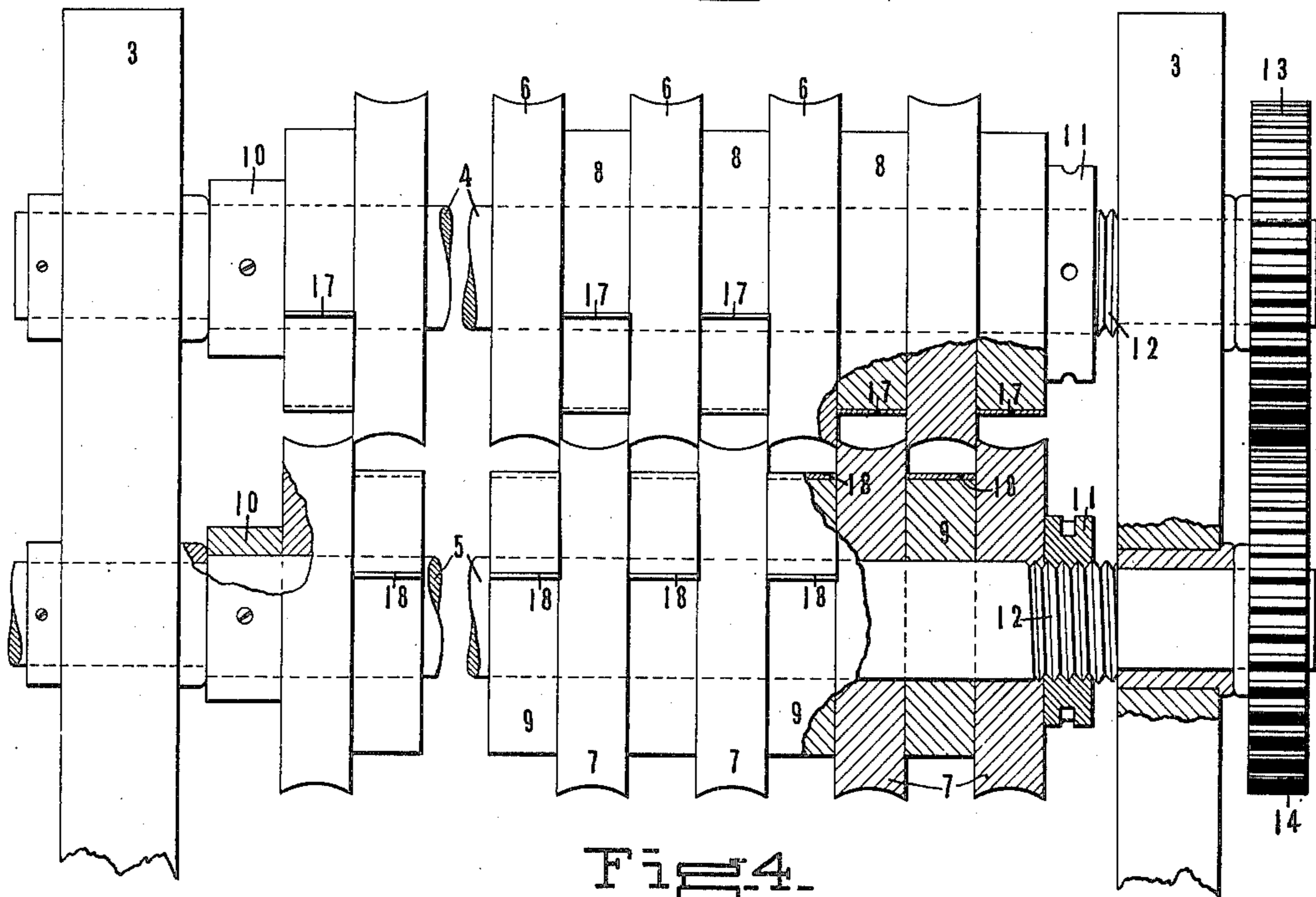


Fig. 4.

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UNITED STATES PATENT OFFICE.

LYNDON C. PALMER, OF BUFFALO, NEW YORK, ASSIGNOR TO THE F. N. BURT COMPANY, LIMITED, OF BUFFALO, NEW YORK, A CORPORATION OF CANADA.

CUTTING MECHANISM.

1,067,269.

Specification of Letters Patent.

Patented July 15, 1913.

Application filed December 17, 1910. Serial No. 597,915.

To all whom it may concern:

Be it known that I, LYNDON C. PALMER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Cutting Mechanism, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machinery for cutting, slitting or severing paper, cardboard, strawboard and similar materials, and especially to machinery for cutting cardboard or strawboard.

One object of the invention is the provision of mechanism for efficiently slitting or severing cardboard or strawboard, etc., accurately so as to provide a smooth and even edge.

Another object is the provision of a practical cutting mechanism wherewith narrow strips of material of the character referred to may be produced rapidly and continuously, and without distortion.

Another object of the invention is the provision of efficacious means to cut strips from double thicknesses of material, of the character above referred to, such as a folded tube, and produce a narrow continuous strip adapted to be used as a side or flange in the manufacture of a box.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, which form part of this specification, and in which similar characters refer to similar parts throughout the several views, Figure 1 is a plan view of the machine partly broken away for a more clear disclosure; Fig. 2 is a front elevation of the machine; Fig. 3 is a vertical section of the machine; Fig. 4 is an enlarged view in elevation, partly in section, showing the coöperative arrangement of the cutters or slitters; Fig. 5 represents a rectangular tube flattened or closed and in condition to be presented to the slitting mechanism, the dotted lines indicating the

strips to be cut therefrom; and Fig. 6 represents one of a series of strips into which the flattened tube is cut, the strip being open.

The numeral 1 represents a table or horizontal support for the operative parts of the apparatus, and comprises legs 2. At each end of the table are standards 3 in which are journaled horizontal parallel shafts 4 and 5 preferably located one above the other. Mounted on each shaft, and preferably concentric thereto, are a series of cutting elements, cutters, or circular knives 6 and 7, alternating on each shaft with annular spacing devices or collars 8 and 9. The cutters and collars on each shaft not only alternate with each other, but with the cutters and collars of the other shaft, so that a cutter on one shaft is opposite a collar of the opposite shaft, and vice versa. Each cutter preferably comprises a collar, disk, or body having oppositely beveled or inclined, and preferably concave, peripheral surfaces and flat outer walls or heads, and the walls and concave surfaces approximate, merge or meet in a cutting edge at each edge of each cutter, thus providing a double-edged cutter with the concave surface intervening the cutting edges. The spacing devices or collars are less in diameter than the cutters, and with the cutters form concentric spaces bounded on three sides by the two flat extended portions of the walls of the cutters and the periphery of the collar. The shafts 4 and 5 are so disposed that the cutters intermesh, the walls of the cutters on one shaft overlapping those of the cutters on the opposite shaft within the spaces above referred to, the edges of one cutter coöperating with an edge of two opposite and alternately arranged cutters in the shearing operation. The cutters and collars are preferably separate or independent elements of the same size on both shafts, and after being threaded on their respective shafts and arranged as above described, are secured in position thereon in any efficient manner, preferably by means of an abutment 10 and a clamping nut 11, which latter coöperates with the screw threads 12 and admits of adjustment both to clamp the cutters and collars in place or to permit their removal. Preferably one series of cutters is located above the table or platform, the other coöperative series being located below the

table, the cutters intermeshing and performing their cutting operation in substantially the plane of the table. In operation the cutters rotate on their axes, and to effect this the cutter shafts are provided at one end outside the standard with gear wheels 13 and 14, of suitable size, which mesh with each other, one of the shafts being driven by an attached belt pulley 15 at its end opposite the gear, a suitable belt shifter being mounted to slide in guides on the top of the standards and provided with an operating handle.

Cutters arranged as above described may not only be efficiently employed in producing wide strips but are especially efficacious in the production of narrow strips of cardboard or strawboard, say one-fourth inch or less in width, such as is employed in the manufacture of small boxes. Such narrow strips have a tendency to become distorted, warped or twisted in the cutting operation when produced by an ordinary cutting device, causing difficulty in assembling and the waste of a large amount of material. This is especially the case when the material cut is rather thick, such as the double thicknesses of newsboard in the flattened tube 16 shown in Fig. 5, which is designed to be cut into a plurality of continuous flattened collars or box sides, as indicated by the dotted lines in said figure. By the herein described construction the material is cut in planes substantially perpendicular to the plane of the material, passageway being provided opposite each severed portion through which the severed strip may be moved either longitudinally or laterally without coming into contact with any part having a tendency to obstruct or distort it. The passageways opposite each cutter comprise side walls substantially in line with the heads of the cutters so that the severed strip readily passes therethrough at any portion thereof, this movement being confined only by the opposing collar. In the present embodiment of the invention the passageways above referred to are substantially rectangular in cross section, the only deviation from this shape being due to the concave face of the cutter. It is evident, however, that other types of passageway might be provided capable of effecting the free disposition of the cut strips without departing from the spirit of this invention.

In order to positively prevent any tendency of the strips to follow the cutter after having been severed means are provided for deflecting or guiding them as they leave the cutters. In the present instance the guides or deflectors comprise stationary strippers or stripper fingers 17 and 18 located opposite each cutter. Said fingers preferably comprise a series of bars secured at one side of the cutters to supports 19 and 20 extend-

ing lengthwise of the series and fastened to some convenient portion of the frame of the table. The fingers project from said bars respectively and pass between the two cutter rollers, each finger preferably being slightly curved in order to conform somewhat to the collar upon which it may rest. The fingers pass respectively through the spaces or channels between the cutters and the collars provided by the arrangement described, there being a stripper finger opposite each cutter and situated between the edges of two adjacent cutters of the other series. Preferably the guide-bars or fingers 17 have their lateral edges closely adjacent the sides of the adjacent cutters, and said bars are disposed with their faces relatively close to the concave peripheries of the cutters of the series opposed thereto, thus providing means for efficiently severing narrow strips of material on right lines. The outer or free ends of the fingers incline from the surfaces of the respective cutters preferably in a curve, as clearly shown, and deflect the strips, preventing them from being carried around with the cutters. Suitably supported upon the frame so as to rest against the edges of the above series of cutters are strips 21 of felt, flannel or other material, adapted to serve as clearers for the cutters.

The platform or table 1 extends a sufficient distance in front of the cutting mechanism to provide space thereon for the reception of sheets or strips of the material to be cut. These sheets or strips are designed to be pushed along the surface of the table to the cutters, through which they will be automatically drawn in the cutting operation. The strips are guided toward the cutters and kept in position upon the table by an overhanging curved guiding plate 22 terminating near the surface of the table and properly secured to the frame. The upper surface of the table in front of the cutters is slotted as at 23 and a pusher comprising a plate 24, having a flange 25 and a handle 26 is mounted to reciprocate in said slot, offering efficient and efficacious means for accurately feeding or pushing the material into position to be cut.

In the construction illustrated it will be observed that two sizes of cutters are employed, those to the right being of smaller gage than those to the left of the center. It will also be noted that two pushers are employed, one before each of the rows of different size. By this arrangement one end of the slitting mechanism may be employed to cut a multiplicity of strips of one size, and the other end of the mechanism may be employed to cut a multiplicity of strips of a different size. By this relative arrangement one is enabled to sever large sheets into comparatively wide strips at one end of the machine and subsequently cut the severed strips

into narrower strips by employing the other end of the machine and feeding the long strips transversely thereto.

It will be observed that the disposition of the cutters and collars provides a severing mechanism which shears the material and presses it into the openings or channels provided opposite the cutters, and in this respect the mechanism provides a means to punch strips from a sheet of material, the product being pressed in opposite directions.

It will thus be seen that by the mechanism hereinbefore described I have provided a machine which accomplishes, among others, the several objects of the invention hereinbefore described.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

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

1. In an apparatus of the character described, in combination, a table, a plurality of parallel series of spaced double-edged rotary cutters, the cutters of one series intermeshing with those of another in substantially the plane of the table, stripper fingers having one end secured in planes above and below the table respectively and having free ends extending in opposite directions beyond the edges of the cutters, and a pusher adapted to move on the table to feed material to the cutters.

2. In an apparatus of the character described, in combination, a table, a plurality of parallel series of spaced double-edged rotary cutters, the cutters of one series intermeshing with those of another in substantially the plane of the table, stripper fingers having one end secured in planes above and below the table respectively and having free ends extending in opposite directions beyond the edges of the cutters, a pusher adapted to move on the table to feed material to the cutters, and means to guide the material to the cutters.

3. In an apparatus of the character described, in combination, a table, a plurality of parallel series of spaced double-edged rotary cutters, the cutters of one series intermeshing with those of another in substantially the plane of the table, stripper fingers

having one end secured in planes above and below the table respectively and having free ends extending in opposite directions beyond the edges of the cutters, a pusher adapted to move on the table to feed material to the cutters, and means adapted to deflect the material between the table and the upper strippers to the cutters.

4. In an apparatus of the character described, in combination, a shaft, alternate collars and rotary cutters secured thereto, and stripper fingers extending between the cutters and comprising portions conforming to and resting against the outer peripheral surface of the collars.

5. In an apparatus of the character described, in combination, a table, a pair of cutting rollers located above and below the table respectively and cooperating in substantially the plane of the table, a pusher adapted to feed material from the table to the cutter, and means to guide the material to the cutter.

6. In an apparatus of the character described, in combination, a table, a plurality of parallel series of spaced double edged rotary cutters, the cutters of one series intermeshing with those of another in substantially the plane of the table, stripper fingers projecting between the cutters, a pusher adapted to move on the table to feed material to the cutter, and means to guide the material to the cutters.

7. In an apparatus of the character described, in combination, a table having a slotted surface, and a pusher plate on the table having a depending portion guided in the slot and adapted to reciprocate with respect to the table.

8. In an apparatus of the character described, in combination, a table, a pair of parallel series of rotary double-edged cutters having concave peripheries located above and below the table respectively and cooperating in substantially the plane of the table, a pusher adapted to feed material from the table to the cutters, and means to guide the material from the cutters.

9. In an apparatus of the character described, in combination, a table, a pair of parallel series of spaced rotary double-edged cutters having concave peripheries located above and below the table respectively and cooperating in substantially the plane of the table, the cutters of one series intermeshing with those of the other, a pusher adapted to feed material from the table to the cutters, and stripper fingers extending between the series of cutters and between the cutters of each series.

10. In an apparatus of the character described, in combination, a pair of parallel series of spaced rotary double-edged cutters, having concave peripheries, the cutters of one series intermeshing with those of an-

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other, and stripper fingers extending between the cutters of each series and between each series of cutters, whereby short lengths of cut material will be stripped from the cutters.

11. In an apparatus of the character described, in combination, a pair of parallel series of spaced rotary double-edged cutters, the cutters of one series intermeshing with those of the other, and means extending between the cutters of each series and between the series of cutters from one side to the other to guide the material to and from the cutters.

12. In an apparatus of the character described, in combination, a table, a pair of parallel series of spaced double-edged rotary cutters, the cutters of one series intermeshing with those of another, a pusher adapted to feed material from the table to the cutters, and means extending between the cutters of each series, and between the series of cutters from one side to the other adapted to guide the material to and strip it from the cutters.

13. In an apparatus of the character described, in combination, a frame comprising a table, parallel shafts rotatably journaled above and below the table, alternate collars and rotary cutters secured to each shaft, the cutters being adapted to cooperate in substantially the plane of the table, cooperating gears on each shaft, means to drive said gears, each cutter comprising a concave periphery providing a double-edged cutter, and bars extending between each shaft and the cutters on the opposite shaft and spaced from the cutting plane providing a guiding and deflecting element for each cutter.

14. In an apparatus of the character described, in combination, a pair of parallel series of spaced rotary double-edged cutters having concave peripheries, the cutters of one series intermeshing with those of the

other, and guide bars opposite the periphery of the cutters of each series and closely adjacent said periphery adapted to maintain the path of movement of the material so that it is cut in right lines.

15. In an apparatus of the character described, in combination, a pair of parallel series of spaced rotary double-edged cutters having concave peripheries, the cutters of one series intermeshing with those of the other, and guide bars opposite the periphery of the cutters of each series and closely adjacent said periphery and the sides of adjacent cutters of the respective series adapted to maintain the path of movement of the material so that it is cut in right lines.

16. In an apparatus of the character described, in combination, a pair of parallel series of spaced rotary double-edged cutters having concave peripheries, the cutters of one series intermeshing with those of the other, and curved guide bars opposite the periphery of the cutters of each series and closely adjacent said periphery adapted to maintain the path of movement of the material so that it is cut in right lines.

17. In an apparatus of the character described, in combination, a pair of parallel series of spaced rotary double-edged cutters having concave peripheries, the cutters of one series intermeshing with those of the other, and guide bars extending between the cutters of each series and between each series of cutters, the lateral edges of the guide bars being closely adjacent the sides of adjacent cutters of the respective series, and the faces of said bars being closely adjacent the periphery of the opposed cutters.

In testimony whereof I affix my signature, in the presence of two witnesses.

LYNDON C. PALMER.

Witnesses:

FRANK E. DRULLARD,
MARY R. CASS.