

E. C. NORTHRUP.

TABLE MECHANISM FOR BOX MAKING MACHINES.

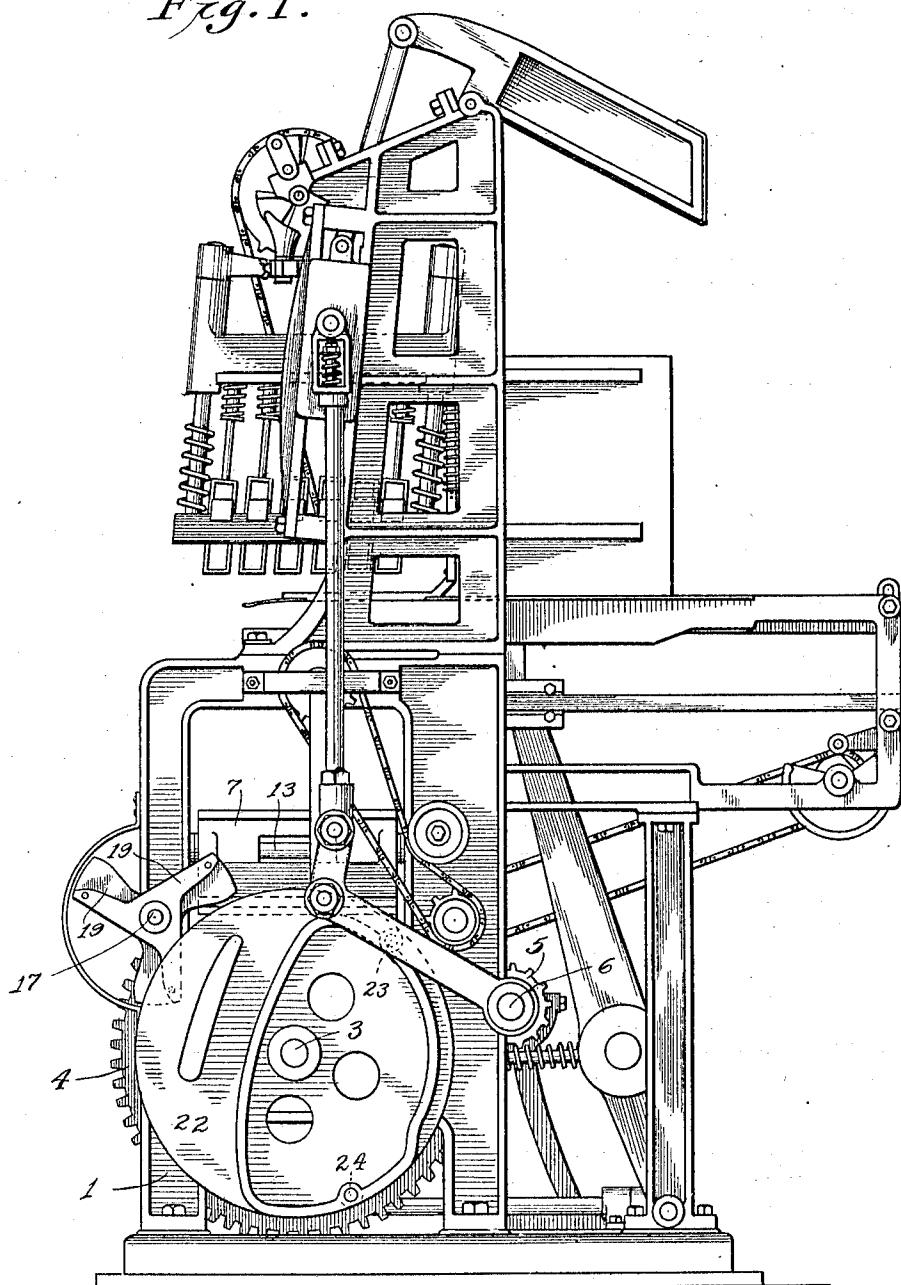
APPLICATION FILED FEB. 20, 1911.

1,048,201.

Patented Dec. 24, 1912.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2

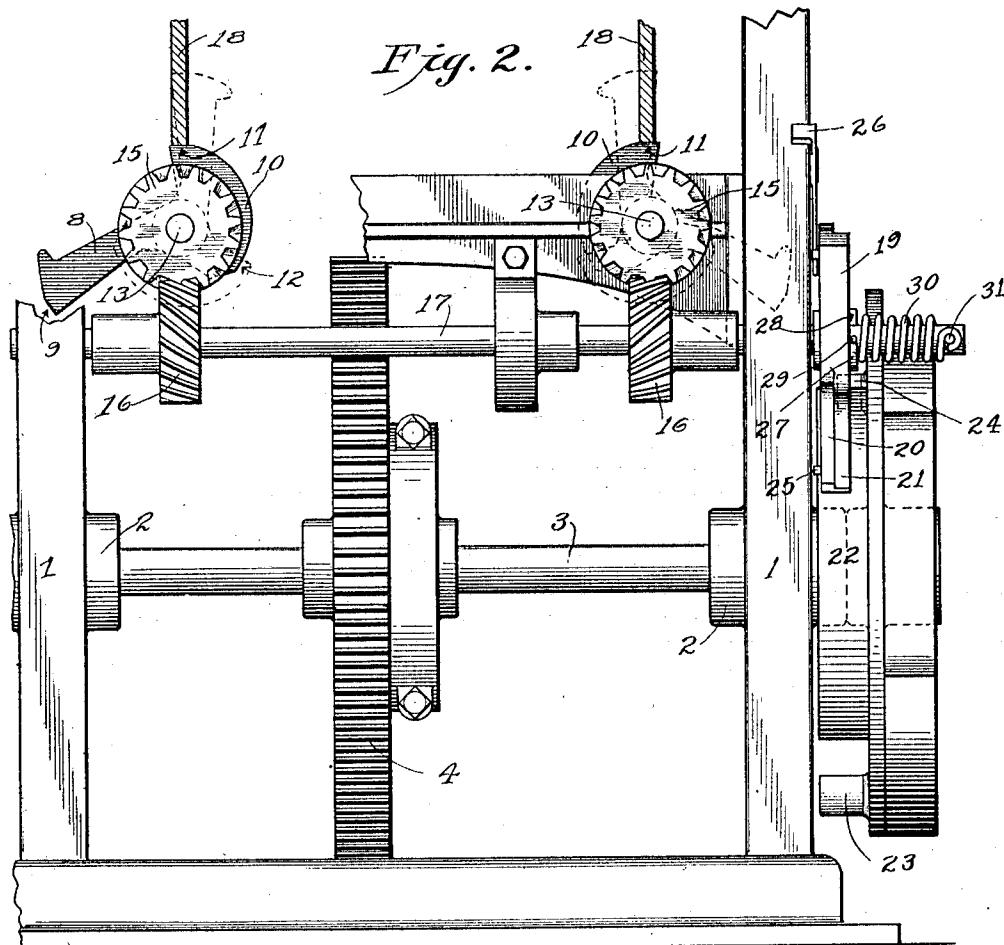
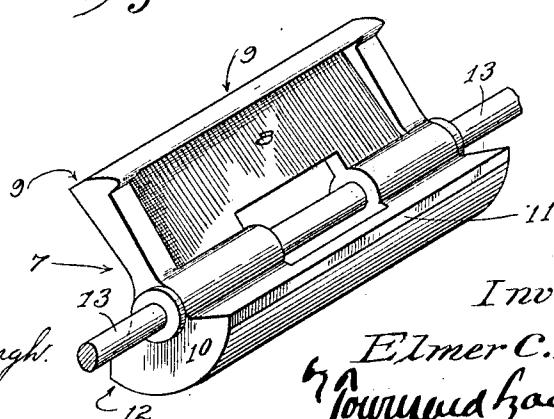


Fig. 3.



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3 SHEETS-SHEET 3.

Fig. 4.

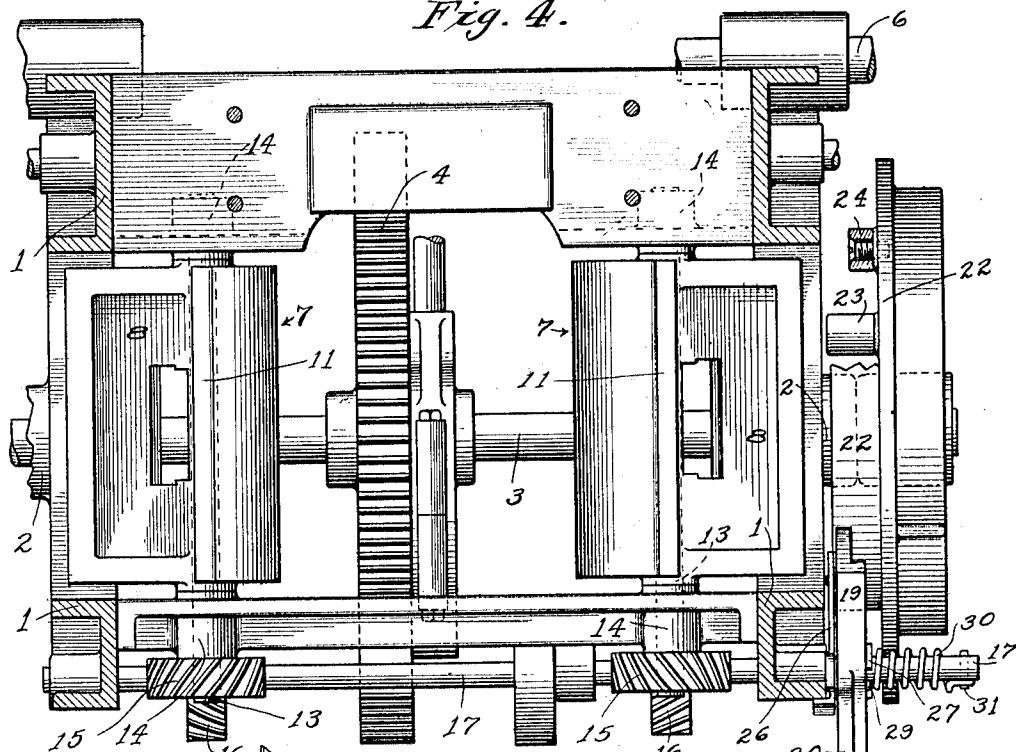
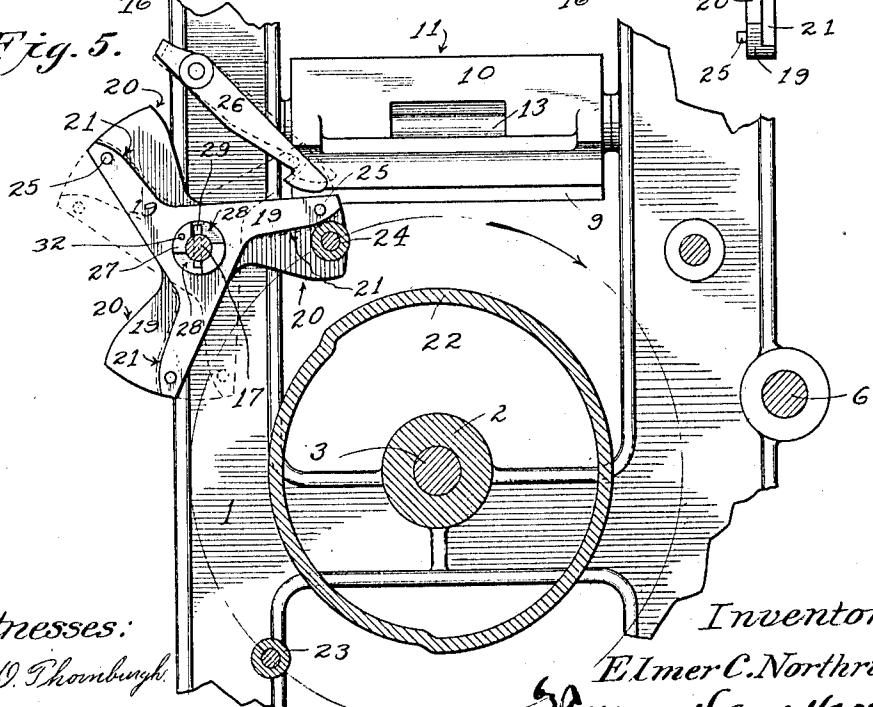


Fig. 5.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## TABLE MECHANISM FOR BOX-MAKING MACHINES.

1,048,201.

Specification of Letters Patent.

Patented Dec. 24, 1912.

Application filed February 20, 1911. Serial No. 609,820.

*To all whom it may concern:*

Be it known that I, ELMER C. NORTHRUP, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented 5 a new and useful Table Mechanism for Box-Making Machines, of which the following is a specification.

This invention relates to a modified form 10 of table mechanism adapted for use in box making machines of a type shown in an application of mine filed February 15, 1911, Serial No. 608,817.

One object of the present invention is 15 to drive the table in one direction and employ spiral gears for turning the tables.

Another object is to provide a novel form 20 of actuating mechanism whereby with a star-wheel having but three arms I am able to produce six turning operations on the star-wheel. This enables a star-wheel of smaller diameter being employed, as where the star-wheel is made with six arms, its diameter is much greater. The star-wheel 25 which I employ, although having but three arms, is operated and produces the same result as though it were made with six arms.

Another object is to produce a safety device whereby if the table should be prevented 30 from turning, the mechanism which drives it is permitted to yield an amount sufficient to allow the roller which drives the star-wheel to pass freely out of engagement with the arm of the star-wheel 35 with which it is engaged.

Referring to the drawings: Figure 1 is 40 a side elevation of the machine in which the mechanism forming the invention is used. Fig. 2 is a front elevation of the lower portion of the machine, showing the invention on a larger scale. Fig. 3 is a perspective view in detail of one of the tables. Fig. 4 is a plan view of what is shown in Fig. 2. Fig. 5 is a side elevation of what is shown 45 in Fig. 4.

1 designates the frame with bearings 2 in which is mounted a shaft 3 driven by a gear 4, the latter being driven by a pinion 5 on the driving shaft 6 of the machine, 50 see Fig. 1.

7, 7 designate tables, shown in detail in Fig. 3, each table comprising a leaf 8 with a face 9 adapted to support a head or box end and formed with a segmental thicker leaf 10 having faces 11 and 12 adapted to support side pieces. The table 7 is fixed 55 on a shaft 13, the shaft 13 being mounted to rotate in bearings 14 and on the outer end of each shaft 13 is a spiral gear 15 which meshes with a spiral gear 16 mounted 60 on a shaft 17 which is journaled in frame 1.

The shaft 17 is rotated intermittently to bring the respective faces of the tables into position underneath the heads 18 of the box, as illustrated in Fig. 2, in which view 65 the faces 11 are shown supporting the heads 18. While in this position the first side is nailed to the heads 18, after which the box is turned one quarter around, and the tables are revolved to bring the faces 9 in position 70 to support the box, while the bottom is being nailed and after the bottom has been nailed, the tables are turned to bring the faces 9 away from under the box, the box is then turned and then the tables are 75 turned to bring the faces 12 under the box for the nailing of the last side, thus completing the operation. This intermittent rotation of the tables is accomplished by a novel mechanism comprising a star-wheel 80 having three arms 19, each arm 19 having a face 20 and a face 21 which is raised or lies in another plane of rotation from that of the face 20.

22 designates a rotating cam which carries rollers 23 and 24, the roller 24 being shorter than the roller 23, whereby the roller 24 has a path of movement against the faces 21 of the star-wheel, while the roller 23 has a path of movement against 90 the faces 20. Thus as the cam 22 rotates, the roller 24 upon coming in contact with a face 21 turns the star-wheel somewhat less than one-sixth into the position shown in full lines in Fig. 5. The star-wheel 95 remains stationary in this position during about one-third of a revolution of the cam 22 when the roller 23 comes in contact with the face 20 of the small arm just previously actuated and turns the star-wheel somewhat 100

more than one-sixth farther, or enough to make a full third turn of the star-wheel for the total movement performed by the two rollers 23 and 24, into the position shown in dotted lines in Fig. 5, whereupon the pin 25 engages the pawl 26 and the latter holds the star-wheel from rearward movement. The star-wheel is not actuated again until the cam 22 has made two-thirds of a revolution to bring short roller 24 into engagement with the face 21 of the next arm.

The star-wheel has a hub 27 which is formed with two segmental recesses 28 and a pin 29 on the shaft 17 lies in these recesses. As shown in Fig. 2, the shaft 17 extends for some distance beyond the hub 27 and a torsion spring 30 encircles the protruding portion of shaft 17, one end of the spring being secured to a pin 31 in the shaft 17 and its other end engaging in a perforation 32, see Fig. 5, in the hub 27, and the torsion spring 30 normally keeps the pin 29 against the shoulders at the sides of the recesses 28, as shown in Fig. 5, so that as the star-wheel is operated, it drives the shaft 17 through the medium of the torsion spring 30. The torsion spring 30 is sufficiently strong to drive the shaft 17 and parts operated thereby during the normal operation of the machine, but should the tables strike the box before the latter had been turned, or should any part stick, the spring 30 will yield enough to let the star-wheel turn far enough to allow the roller 23 or 24, as the case may be, to pass out of engagement with the arm of the star-wheel and thus prevent damage to the machine.

What I claim is:

1. In a table mechanism for box making machines, a shaft, a pair of tables mounted transversely above said shaft and rotatable transversely of the shaft, each of said tables having a plurality of faces adapted to support the box at the desired elevation or to recede from the box to permit the box to be turned, and gearing between said shaft and tables for operating said tables.

2. In a table mechanism for box making machines, a pair of tables adapted to support the respective ends of the box, each of said tables having a plurality of faces for supporting the box at the desired elevations or to clear the box to permit the box to be turned, and means for revolving each of said tables in a direction transversely to the direction in which the box is turned.

3. In a table mechanism for box making machines, a shaft, a pair of tables mounted transversely above said shaft and rotatable transversely of the shaft, each of said tables having a plurality of faces adapted to support the box at various elevations or to clear the box to allow the box to be turned, a shaft supporting each table, a spiral gear

on each of the latter shafts, and spiral gears on the first shaft meshing with the first mentioned spiral gears.

4. In a table mechanism for box making machines, a pair of revolving tables, each table provided with a plurality of faces adapted to support the box at various elevations or to clear the box to permit the box to be turned, gearing for revolving said tables, a shaft for driving said gearing, a star-wheel on said shaft, a disk with a roller for operating said star-wheel, and a yielding connection between said star-wheel and shaft whereby an excess of resistance to the shaft will permit said roller to move the star-wheel ahead of the shaft to allow the roller to release from the star-wheel without turning the shaft.

5. In a table mechanism for box making machines, a pair of revolving tables, gearing for operating the tables, a shaft for driving said gearing, a star-wheel on said shaft, each arm of said star-wheel having two bearing faces in different planes of rotation, and a disk with two rollers of different lengths for operating against the respective bearing faces of the star-wheel, whereby each arm of the star-wheel will be operated through two distinct steps by the two rollers.

6. In a table mechanism for box making machines, a pair of revolving tables, gearing for operating the tables, a shaft for driving said gearing, a star-wheel on said shaft, each arm of said star-wheel having two bearing faces in different planes of rotation, a disk with two rollers of different lengths for operating against the respective bearing faces of the star-wheel, whereby each arm of the star-wheel will be operated through two distinct steps by the two rollers, a retaining pawl, and a pin on each arm adapted to engage said retaining pawl when an arm of the star-wheel has been moved through its second step.

7. In a table mechanism for box making machines, a pair of revolving tables, gearing for operating the tables, a shaft for driving said gearing, a star-wheel on said shaft, each arm of said star-wheel having two bearing faces in different planes of rotation, a disk with two rollers of different lengths for operating against the respective bearing faces of the star-wheel, whereby each arm of the star-wheel will be operated through two distinct steps by the two rollers, said star-wheel having a hub with two recesses, a pin through said shaft projecting into said recesses, said shaft projecting beyond the hub, a torsion spring on the projecting portion of the shaft, one end of the torsion spring being connected to the star-wheel and the other end of the spring being connected to the shaft.

8. In a table mechanism for box making

machines, a table mounted to rotate in one direction and consisting of a leaf with a face 9, and having a thicker leaf with faces 11 and 12, the first mentioned face 9 being adapted to support a box head while the bottom is nailed, each of the other faces 11 and 12 supporting a head while a side is nailed.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 10 31 day of January 1911.

ELMER C. NORTHRUP.

In presence of—

G. T. HACKLEY,  
FRANK L. A. GRAHAM.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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