

No. 734,224.

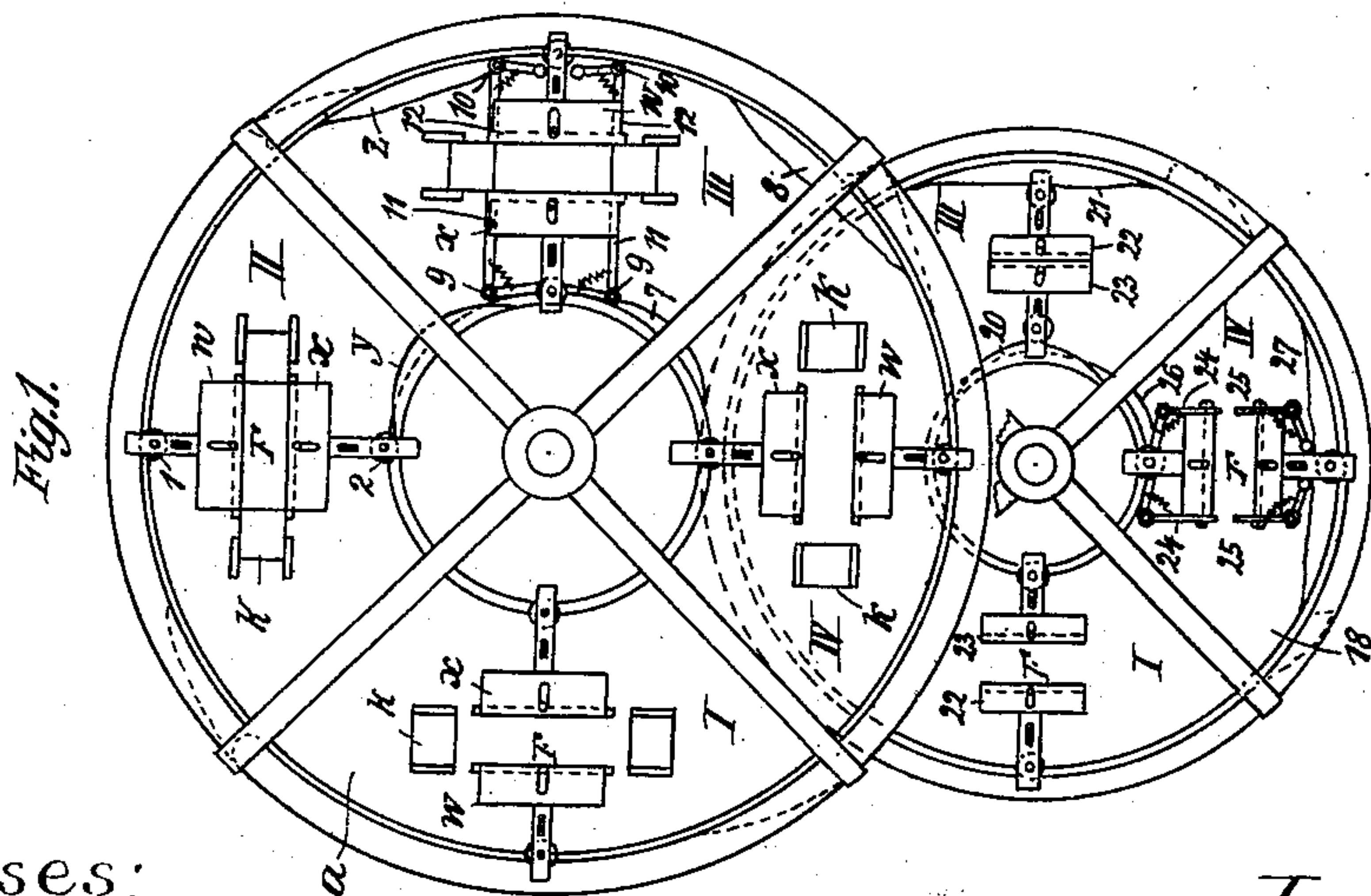
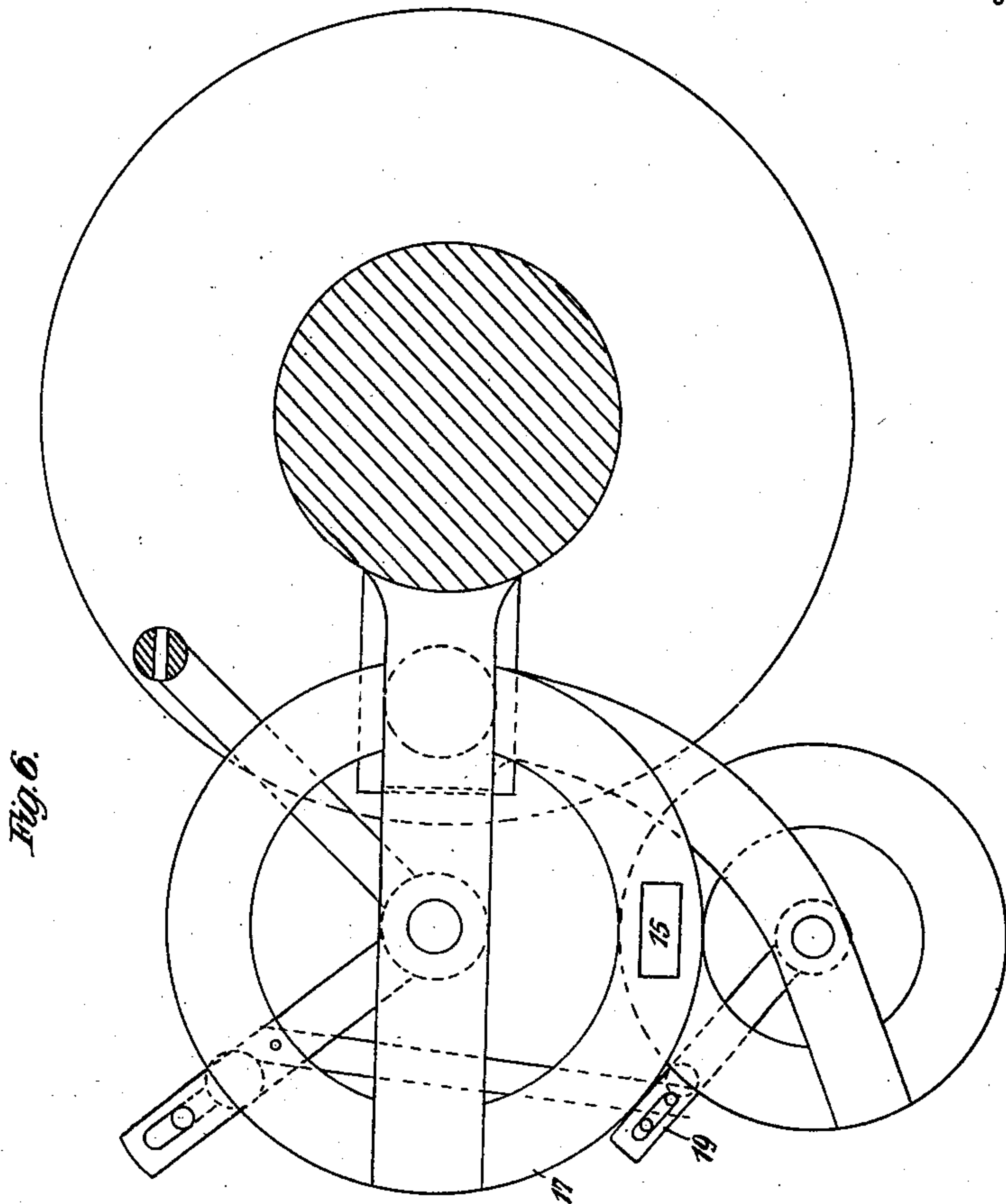
PATENTED JULY 21, 1903.

E. DÜHRING.  
PACKING MACHINE.

APPLICATION FILED OCT. 11, 1901.

NO MODEL.

5 SHEETS—SHEET 1.



Witnesses:  
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L. R. Church

Inventor:  
Emil Düring  
by Max Georger  
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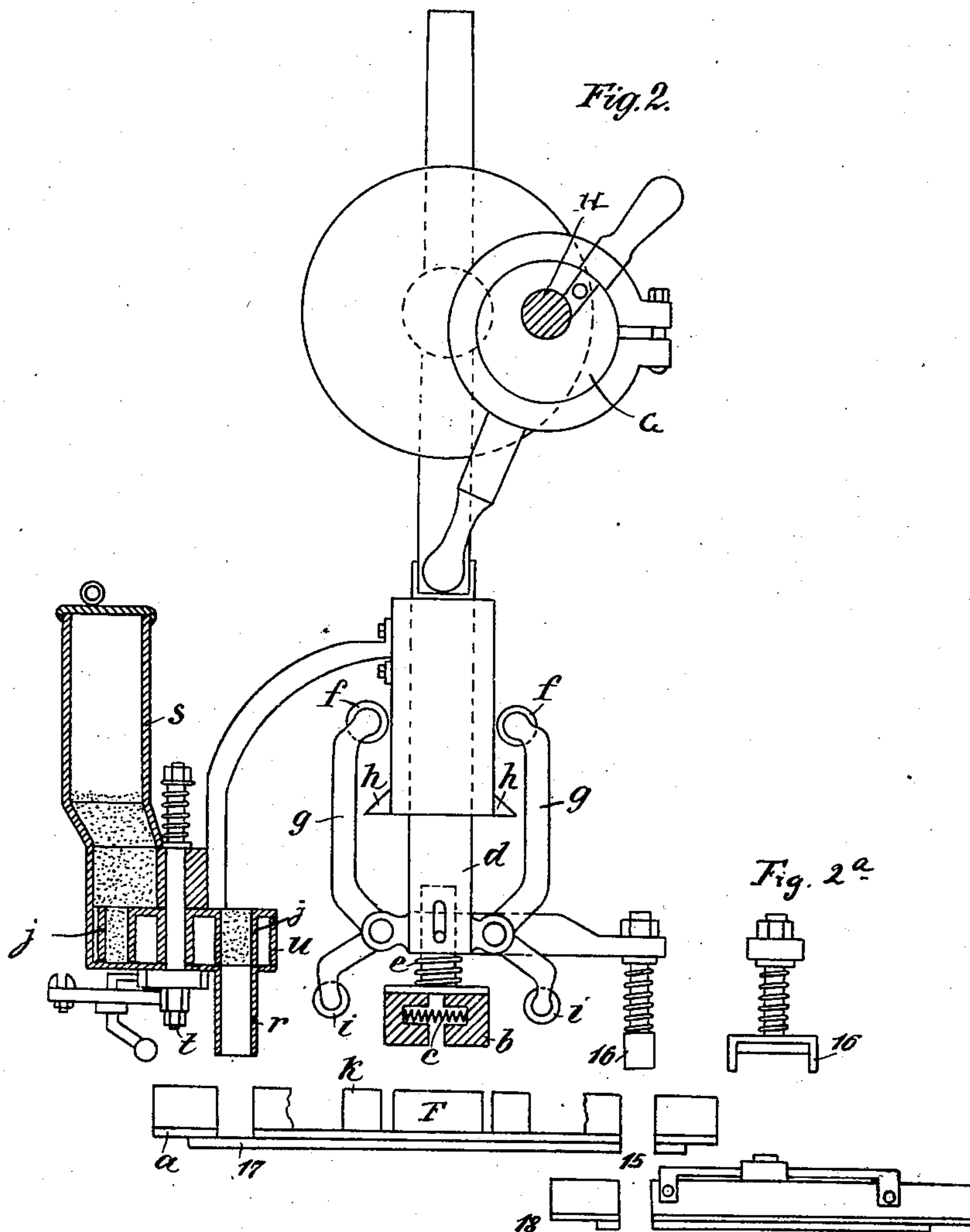
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5 SHEETS—SHEET 2.



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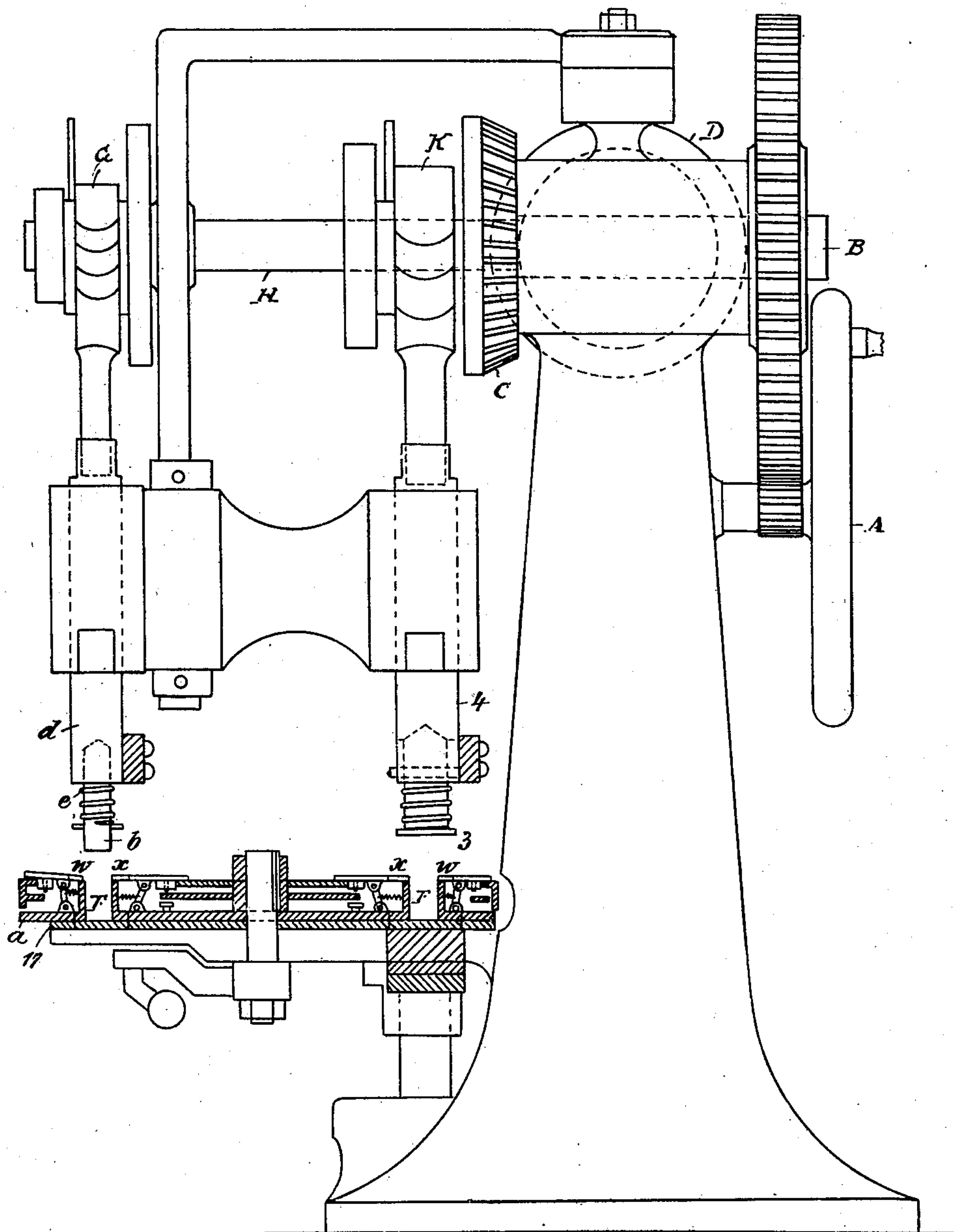
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NO MODEL.

6 SHEETS—SHEET 3.

*Fig. 3.*



Witnesses.

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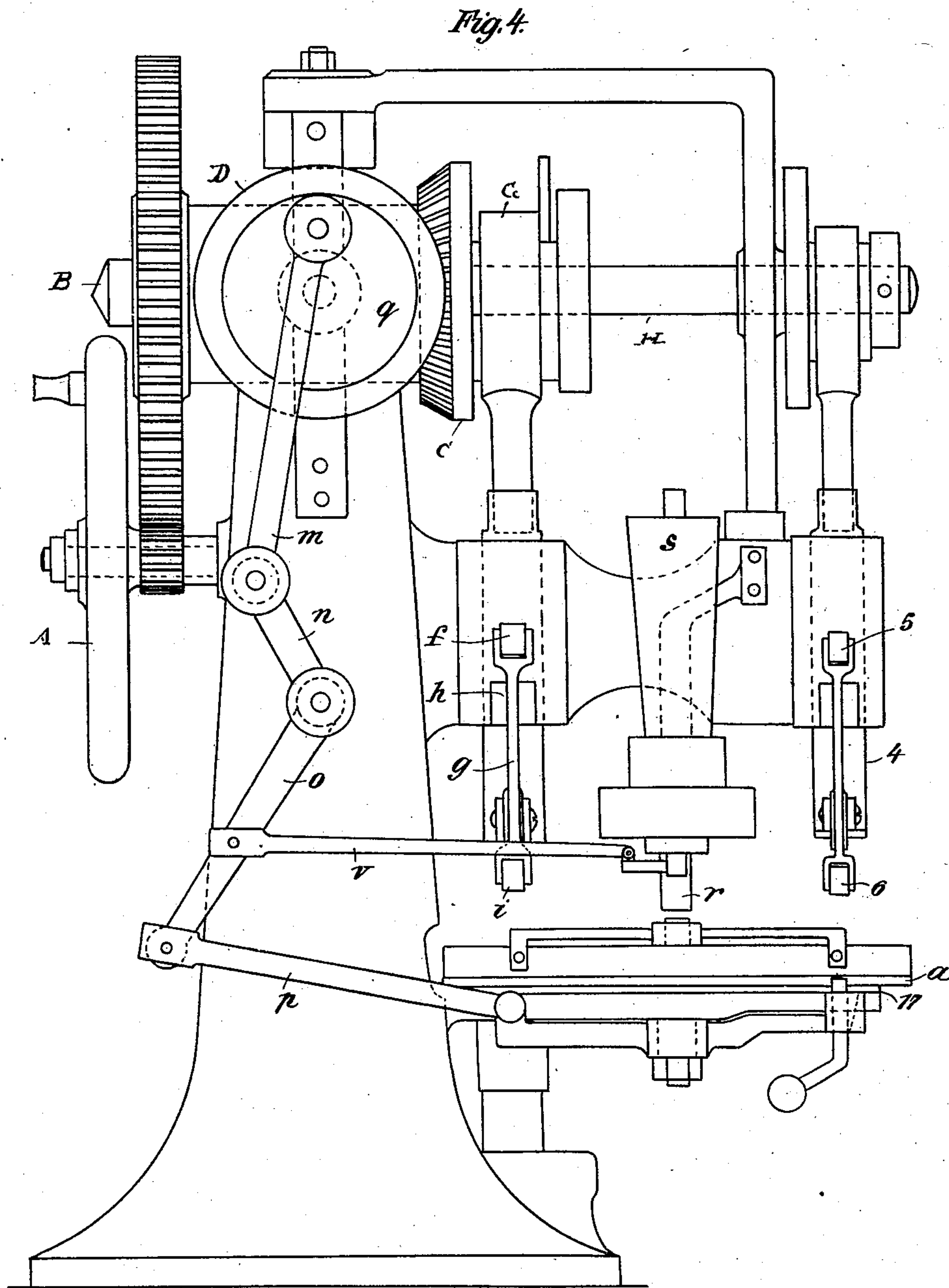
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NO MODEL.

5 SHEETS—SHEET 4.



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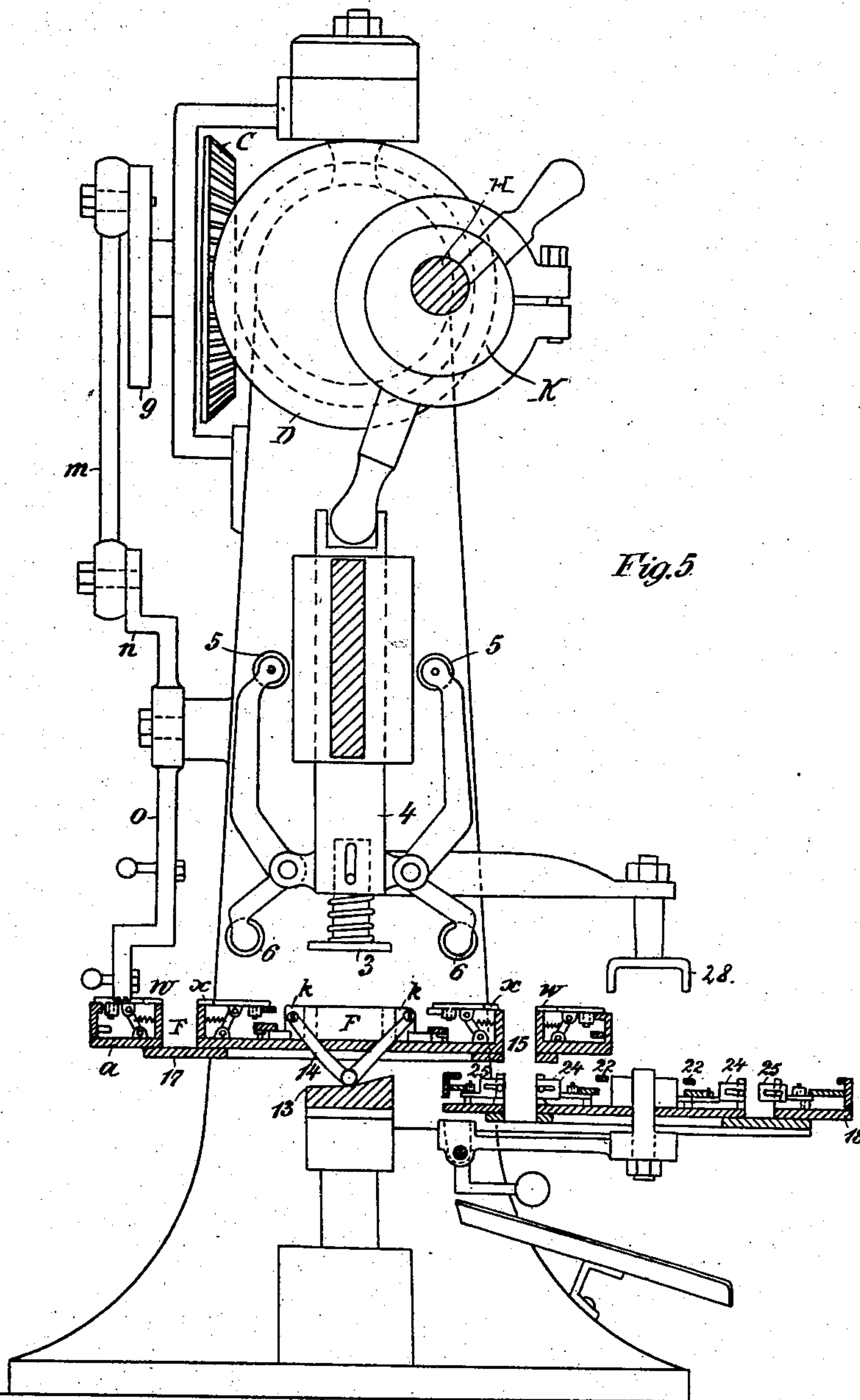
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PACKING MACHINE.

APPLICATION FILED OCT. 11, 1901.

NO MODEL.

5 SHEETS—SHEET 5.



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## UNITED STATES PATENT OFFICE.

EMIL DÜHRING, OF BERLIN, GERMANY.

## PACKING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 734,224, dated July 21, 1903.

Application filed October 11, 1901. Serial No. 78,320. (No model.)

*To all whom it may concern:*

Be it known that I, EMIL DÜHRING, a subject of the King of Prussia, Emperor of Germany, residing at No. 106 Alt-Moabit, Berlin, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Packing-Machines, (for which I have made application in Germany, Serial No. D. 11,361, dated March 11, 1901, and in France, Letters Patent No. 311,421, dated June 3, 1901,) of which the following is a specification.

My invention relates to improved apparatus for forming parcels by wrapping a measured quantity of pulverized or granular matter or any dry substance with one or more sheets of paper, tin-foil, or other wrapping material, folding the wrapper around the said matter, and delivering the completed parcel.

The wrapping is performed by successive operations of the machine working automatically, the only manual work required being to place the sheets of paper or other wrapping material in proper position to be filled.

In the accompanying drawings I have illustrated an embodiment of my invention, in which similar reference characters indicate corresponding parts throughout.

In the drawings, Figure 1 is a plan view of the work-tables and molds for forming the parcel. Fig. 2 is a side elevation of the upper part of the machine, showing the feed-hopper, the measuring-drum, and one plunger in section. Fig. 2<sup>a</sup> is a side view of the discharging-plunger. Fig. 3 is a side elevation of the machine, showing the main work-table in section. Fig. 4 is a front elevation. Fig. 5 is a side elevation showing the two work-tables in section, and Fig. 6 is a plan view of the supports of the two work-tables.

Motion is imparted to the driving-gear of the machine either by the hand-wheel A or by suitable power pulley or gearing, and from the main shaft B rotary motion is transmitted by bevel gear-wheels C and D to the gearing-wheel *q*, Figs. 4 and 5, which through the medium of links *m n o* and connecting-rod *p* imparts intermittent rotary motion at regular intervals to the main work-table *a*, supported upon the frame 17. The said work-table carries four sets of molds and folding means, each set being a counterpart of the

others. In Fig. 1 the four sets are shown relatively positioned, but only one (numbered III) is shown complete. Each of the four sets consists of a mold formed by two stationary parallel sides *F*, as shown in Figs. 2, 3, and 5. Opposite the open ends of said mold are disposed the longitudinally-sliding blocks *k*, and the lateral sliding plates 11 and 12 are arranged to move across the open ends of the mold, while other horizontally-disposed sliding plates *W* and *X* are provided to move across the open top side of the mold.

It is supposed in the present instance that the parcel or package to be formed is desired to have an oblong rectangular shape; but it may, if desired, be formed square, the molds of the work-table corresponding of necessity to the shape of the package to be formed.

Before starting the machine a blank of the wrapping material is placed upon the top of the mold *F* of section I of the work-table *a*, the said blank being previously cut to the proper size to cover the six sides of the parcel. Upon starting the machine an eccentric *G* on the shaft *H*, deriving motion from the main shaft *B*, will push down a plunger *b*, Fig. 2, said plunger consisting of two blocks with an interposed spiral spring *c*. The said plunger *b* has a limited sliding movement longitudinally of its supporting-rod *d*, a spring *e* tending to hold the plunger downward. The said plunger *b* is adapted to fit loosely between the two fixed parallel sides of the mold *F* and in its descent pushes the wrapper-blank down between the said sides, shaping the blank into the form of the letter *U*, with its edges extending above the sides of the mold and its ends projecting beyond the ends of the mold. The lower end of the plunger-rod *d* carries two pivoted levers *g*, each bearing rollers *f* and *i* at their upper and lower ends. When the plunger *b* has reached the bottom of the mold *F* and the rod *d* proceeds farther down, by compressing the spring *e* the rollers *f* will bear against the inclined guide-surface *h* of the frame, whereby the lower arms of the levers *g* and the rollers *i* are forced inwardly and engage the sliding blocks *k*, pushing the same toward the mold *F*, thereby closing the ends of the mold within the wrapper, and when this has been ac-



accomplished the rod *d* commences to retrace  
 its course. When the lower side of the plun-  
 ger *b* reached the bottom of the mold *F*, the  
 spring *e* was compressed, and now as the rod  
 5 *d* begins to move upward the plunger *b* re-  
 mains in its lowest position and forms an  
 abutment for the sliding blocks *k* until the  
 rollers *i* are carried out of engagement with  
 the blocks. When the plunger *b* has been  
 10 withdrawn from the mold, the work-table *a*  
 is turned one-quarter of a revolution, and  
 thereby the mold, lined upon its sides with  
 the wrapper, is brought into position below  
 the filling-tube *r*, from which at the proper  
 15 time the exact quantity of matter required for  
 one parcel is discharged into the mold.

The measuring and discharging of the  
 proper quantity to be packed is performed in  
 the following manner: The matter to be  
 20 packed is contained in the hopper *s*, Fig. 2,  
 from which it falls into one of the compart-  
 ments *j* of a rotating drum *u*, to which one-  
 half revolution is imparted by a connecting-  
 rod *v*, hinged to the lever *o*, Fig. 4. The said  
 25 filled compartment *j* after the half-revolution  
 of the drum *u* is placed exactly over the feed-  
 tube *r*, from which the matter falls into the  
 mold *F*, lined upon its two sides with the  
 wrapper. After the contents of the compart-  
 30 ment *j* have been discharged into the mold  
 the work-table *a* is turned into position III,  
 and during the passage from position II into  
 position III the cams *y* and *z*, projecting from  
 the circular upright flanges of the support 17,  
 35 successively act against the rollers 1 and 2,  
 forcing the sliding plates *w* and *x* in turn across  
 the upper surface of the mold and folding the  
 parallel projecting edges of the wrapping-  
 paper over the contents. While the mold is  
 40 in position III, after the sliding plates are  
 withdrawn, the stamp 3, Fig. 5, is actuated  
 by the eccentric *K* upon shaft *H* and moves  
 down and compresses the folded edges of the  
 wrapping-paper and the matter contained in  
 45 the mold. The stamp or plunger 3 is con-  
 nected to its rod 4 in the same manner as  
 heretofore described with reference to the  
 plunger *b* and its shaft *d*. The rod 4 carries  
 levers of the same kind as the levers *g* and  
 50 provided with rollers 5 and 6, which when  
 the plunger 3 is in its lowermost position  
 move inwardly and engage the sliding blocks  
*k*, pressing the same firmly against the con-  
 tents of the mold. By this means the matter  
 55 discharged into the mold will be well dis-  
 tributed and compressed by the vertical pres-  
 sure of the plunger 3 and the longitudinal  
 pressure of the blocks *k* under the influence  
 of the rollers 6. When the plunger 3 and  
 60 the rollers 6 have receded, the work-table *a*  
 is moved into position IV, and while moving  
 the cam-surfaces 7 and 8, Fig. 1, act against  
 the rollers 9 and 10, forcing the vertically-  
 disposed sliding plates 11 and 12 toward each  
 65 other across the end of the mold, thus fold-  
 ing the paper from the two sides of each end  
 of the mold. As the sliding plates 11 and 12

advance the blocks *k* recede from the end of  
 the mold, such receding motion of the blocks  
*k* being obtained by means of the hinged arms 70  
 14, Fig. 5, connected to each other by a com-  
 mon pivot which slides up an inclined sur-  
 face 13, mounted upon the frame below the  
 table. The package upon arriving in posi-  
 tion IV has its upper side infolded within 75  
 the paper, and at each end the paper has  
 been folded from both sides inwardly, the up-  
 per and lower side of each end remaining  
 still unfolded. The fixed support 17 of the  
 work-table *a* is provided with a correspond- 80  
 ing aperture 15, which registers with the bot-  
 tom of the mold in position IV, whereby the  
 package when placed in position IV corre-  
 sponds with said aperture 15. A forked  
 plunger 16, carried by a projection from the 85  
 plunger-rod *d*, Fig. 2<sup>a</sup>, and moving down  
 with said plunger-rod, engages the parcel be-  
 tween the members of said fork and forces  
 the parcel down into the aperture in the  
 support 17, at the same time folding the pa- 90  
 per at the ends from the upper side and  
 also causing the edges of the aperture 15 to  
 fold the paper from the lower side across the  
 end as the parcel enters the said aperture.  
 Thereupon the parcel is pushed out of said 95  
 aperture at the lower side of the support 17  
 completely wrapped.

If it be desired to apply a second wrapper  
 around the same parcel, this may be done in  
 the following manner: A second work-table 100  
 18 is arranged below the main work-table *a*,  
 but eccentrically to the same, and is rotated  
 at regular intervals corresponding with the  
 rotation of the table *a*. The said table 18 is  
 provided with four molds I II III IV, similar 105  
 to those of table *a*, (but without the sliding  
 blocks *k*,) and the folding mechanism of said  
 molds is the same as described with reference  
 to the mold *F* of table *a*, Fig. 1. A blank of  
 paper or other wrapping material is laid on 110  
 the mold in position I, and by the first par-  
 tial rotation of the table 18 it is placed below  
 the aperture 15, and the parcel discharged  
 through said aperture, as before described,  
 forces the paper blank into the mold and si- 115  
 multaneously as it enters the same mold fold-  
 ing the blank into the shape of the letter *U*,  
 and in its progress from position II into posi-  
 tion III the cam-surfaces 20 and 21, project-  
 ing from the upright flanges of the support 120  
 for table 18, act against the guide-rollers of  
 the folding-plates 22 and 23 to fold the edges  
 of the wrapper over the other side of the  
 parcel. Then on the way from position III  
 into position IV the cam-surfaces 26 and 27 125  
 act against the rollers controlling the folding-  
 slides 24 and 25, thus folding the paper from  
 both sides of the two ends of the parcel.  
 Finally the fork 28, similar to fork 16, before  
 described, and projecting from the plunger- 130  
 rod 4, Fig. 5, engages the parcel, folds the  
 wrapper from the upper side down, and forces  
 the parcel through an aperture (similar to ap-  
 erture 15) in the supporting-frame of the ta-



ble 18, thus folding the paper from below across the two ends of the parcel and delivering the parcel from said aperture into a suitable collector.

5 It will be easily seen that as the dimensions of the molds and folding device of table *a* and of the molds and folding device of table 18 are alike the operator merely has to place a fresh sheet of wrapping material upon the mold  
10 when in position I. All further work is automatically performed by the machine, and the parcel is delivered with one wrapper from the work-table *a* or with two wrappers from the work-table 18, as may be desired, in the man-  
15 ner described.

Therefore, having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

20 1. In an apparatus of the character described, a table carrying a mold adapted to receive a wrapper, mechanism for folding the wrapper over at the sides and ends to form a parcel, and means providing for the discharge of the parcel through the bottom of the mold.

25 2. In an apparatus of the character described, a table, a mold consisting of parallel sides carried by the table, movable blocks adapted to close the ends of said mold, means for positioning the wrapper within the mold  
30 in such manner as to receive the matter to be wrapped, means for folding the wrapper over at the open top of the mold, means for folding the wrapper across at the ends, and means for folding the wrapper downwardly over the  
35 ends and discharging the parcel.

3. In an apparatus of the character described, a table, a mold consisting of parallel sides carried by the table, sliding blocks adapted to close the ends of the mold, a plun-  
40 ger for positioning the wrapper within the mold in such manner as to receive the matter to be wrapped, reciprocating plates for folding the wrapper across the open top of the mold, reciprocating plates for folding the  
45 wrapper across at the ends, and a plunger for folding the wrapper downwardly over the ends and discharging the parcel.

4. In an apparatus of the character described, a table, a mold consisting of paral-  
50 lel sides carried by the table, sliding blocks adapted to close the ends of said mold, a plunger for positioning the wrapper within the mold in such manner as to receive the matter to be wrapped, reciprocating plates for fold-  
55 ing the wrapper across the open top of the mold, reciprocating plates for folding the wrapper laterally across the ends, and means for folding the wrapper downwardly over the ends and at the same time discharging the  
60 parcel.

5. In a parcel-forming apparatus, a rotary table, a mold consisting of parallel sides car-  
ried by the table, movable blocks adapted to close the ends of the mold, a vertically-recip-  
65 rocating plunger for positioning the wrapper within the mold in such manner as to receive the matter to be wrapped, horizontally-recip-

rocating plates for folding the wrapper across the open top of the mold, horizontally-recip-  
rocating plates for folding the wrapper later- 7c  
ally across the ends, and a vertically-recip-  
rocating plunger operating to fold the wrap-  
per downwardly over the ends and at the  
same time to discharge the parcel.

6. In a parcel-forming apparatus, a rotary 75  
table, a plurality of molds each consisting of parallel sides carried by the table, movable blocks adapted to close the ends of the mold, a vertically-reciprocating plunger for posi-  
80 tioning the wrapper within the mold in such manner as to receive the matter to be wrapped, horizontally-reciprocating plates for folding the wrapper across the open top of the mold, horizontally-reciprocating plates for folding  
85 the wrapper laterally across the ends, and a vertically-reciprocating plunger operating to fold the wrapper downwardly over the ends and at the same time to discharge the parcel.

7. In a parcel-forming apparatus, a work-  
90 table, means for rotating the table, a mold consisting of parallel sides carried by the table, movable blocks adapted to close the ends of the mold, a vertically-reciprocating plunger for positioning the wrapper within  
95 the mold in such manner as to receive the matter to be wrapped, horizontally-reciprocating plates for folding the wrapper across the open top of the mold, horizontally-reciprocating plates for folding the wrapper later-  
100 ally across the ends, and a vertically-reciprocating plunger operating to fold the wrapper downwardly over the ends and at the same time to discharge the parcel.

8. In a parcel-forming apparatus, a table, means for rotating the table, a plurality of 105  
molds carried by the table and each consisting of parallel sides, movable blocks adapted to close the ends of the mold, a vertically-reciprocating plunger for positioning the wrapper within the mold in such manner as 110  
to receive the matter to be wrapped, horizontally-reciprocating plates for folding the wrapper across the open top of the mold, horizontally-reciprocating plates for folding the  
115 wrapper laterally across the ends, and a vertically-reciprocating plunger operating to fold the wrapper downwardly over the ends at the same time to discharge the parcel.

9. In a parcel-forming apparatus, a rotary 120  
table, a mold consisting of parallel sides carried by the table, movable blocks adapted to close the ends of said mold, a plunger for positioning the wrapper within the mold, a hop-  
per for containing and discharging into the mold the matter to be wrapped, reciprocating 125  
plates for folding the wrapper across the open top of the mold, reciprocating plates for folding the wrapper laterally across the ends, means for folding the wrapper downwardly over the ends and discharging the parcel, and 130  
means for imparting motion to the mechanism.

10. In a parcel-forming apparatus, a rotary table, a mold consisting of parallel sides car-  
ried by the table, movable blocks adapted to



close the ends of said mold, means for positioning the wrapper within the mold, a hopper for containing the matter to be wrapped, a rotary drum operating to receive a determinate quantity of the matter from the hopper and to discharge the same into the mold, reciprocating plates for folding the wrapper across the open top of the mold, reciprocating plates for folding the wrapper laterally across the ends, means for folding the wrapper downwardly over the ends and discharging the parcel, and means for imparting motion to the mechanism.

11. In a parcel-forming apparatus, a rotary table and provided with apertures, a plurality of molds each consisting of parallel sides arranged on either side of an aperture and disposed at equally-spaced intervals upon the surface of table, sliding blocks adapted to close the ends of said molds, a vertically-reciprocating plunger for positioning the wrapper within the molds, means for discharging the matter to be wrapped into the molds, horizontally-reciprocating plates for folding the wrapper across the open top of the molds, reciprocating plates for folding the wrapper laterally across the ends, a plunger for folding the wrapper downwardly over the ends and discharging the parcel through the aperture, means for imparting to the work-table an intermittent rotary motion to bring each mold successively in registry with the other parts of the mechanism, and means for imparting motion to the wrapping mechanism.

12. In a parcel-forming apparatus, a table, means for imparting to the same an intermittent rotary motion, a mold consisting of fixed sides carried by the table, movable blocks mounted opposite the open ends of the mold, a plunger operating to fit the wrapper within the mold, arms carried by the plunger and operating to engage the movable blocks and bring the same into position to close the open ends of the mold, means for discharging into the mold the matter to be wrapped, horizontally-reciprocating plates operating to fold the wrapper across the open top of the mold, a plunger operating to vertically compress the matter within the mold, arms carried by the plunger and serving to laterally compress the matter within the mold, means operating to retract the sliding blocks to close the ends of the molds, horizontally-reciprocating plates operating to fold the paper laterally across the open ends of the mold, cams serving to actuate the reciprocating plates, a forked plunger operating to fold the wrapper downwardly over the open ends of the mold and at the same time to discharge the parcel, and means for imparting motion to the mechanism.

13. In a parcel-forming apparatus, a table, means for imparting to the same intermittent rotary motion, a plurality of molds each consisting of parallel sides carried by the table, movable blocks disposed opposite the open

ends of the molds, a plunger for positioning the wrapper within the molds, arms carried by the plunger and adapted to engage the movable blocks and to bring the same into position to close the open ends of the molds, a rotary drum operating to discharge a measured quantity of matter into each mold, horizontally-reciprocating plates for folding the wrapper across the open top of the molds, means consisting of pivoted links and a cam-surface operating to retract the movable blocks from the ends of the molds, horizontally-reciprocating plates for folding the wrapper laterally across the open ends of the molds, means consisting of a roller cooperating with cam-surfaces to actuate the sliding plates across the open top of the molds, means consisting of pivoted links cooperating with cam-surfaces to actuate the reciprocating plates across the open ends of the molds, a plunger serving to vertically compress the matter within the molds, arms carried by the plunger and engaging the movable blocks in such manner as to laterally compress the matter within the molds, and a forked plunger operating to fold the wrapper downwardly at the ends of the molds and to discharge the parcel.

14. In a parcel-forming apparatus, a support containing an aperture, a table rotatively mounted thereon, a mold consisting of parallel sides carried by the table and disposed opposite an aperture in the table coextensive with the mold, a plunger for positioning the wrapper within the mold, means for discharging the matter to be wrapped within the mold, reciprocating plates for folding the wrapper across the open top of the mold, reciprocating plates for folding the wrapper laterally across the ends of the mold, means for folding the wrapper downwardly over the ends and at the same time pushing the parcel through the aperture in the bottom of the mold and in the support for the table thereby serving to fold the wrapper from the bottom upwardly over the ends of the parcel, a second table rotatively mounted beneath and eccentric to the first table and containing a mold, means for rotating the two tables in such manner that the opening in the mold upon the first table will register with the aperture in the support for the table when directly above the mold upon the lower table thus allowing the parcel discharged from the first table to be deposited within the mold upon the lower table carrying with it and positioning a second wrapper therein, means for folding the wrapper across the sides and the ends of said parcel, and means for discharging the parcel therefrom.

In witness whereof I have hereunto set my hand in presence of two witnesses.

EMIL DÜHRING.

Witnesses:

HENRY HASPER,  
WOLDEMAR HAUPT.