No. 862,161. PATENTED AUG. 6, 1907.

I. W. HOLLETT.

PAPER BOX MACHINE.

APPLICATION FILED JAN. 3, 1902

8 SHEETS—SHEET 1.

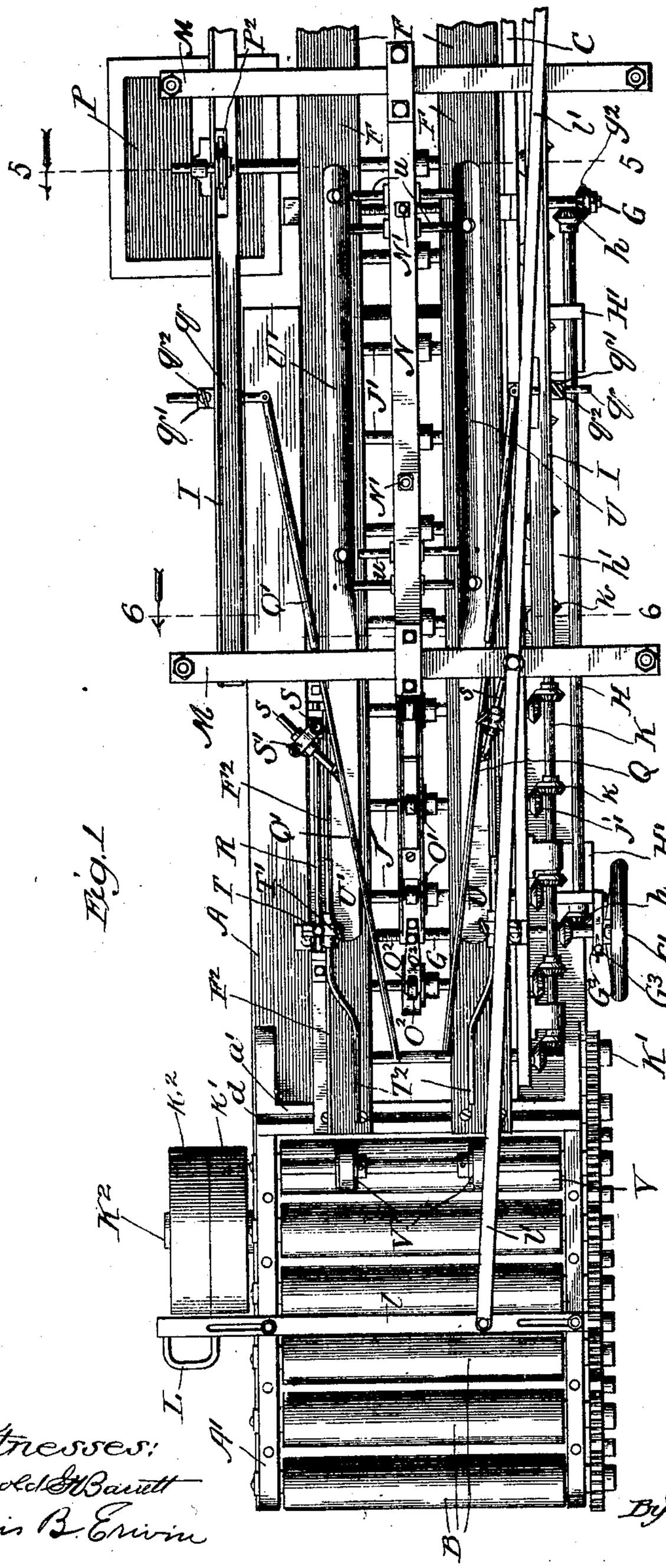

Fig. 1.

Witnesses:
Harold S. Barrett
Louis B. Ervin

Inventor
Ira W. Hollett
By Rector & Nissen
Hrs Attys

No. 862,161. PATENTED AUG. 6, 1907.

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8 SHEETS—SHEET 2.

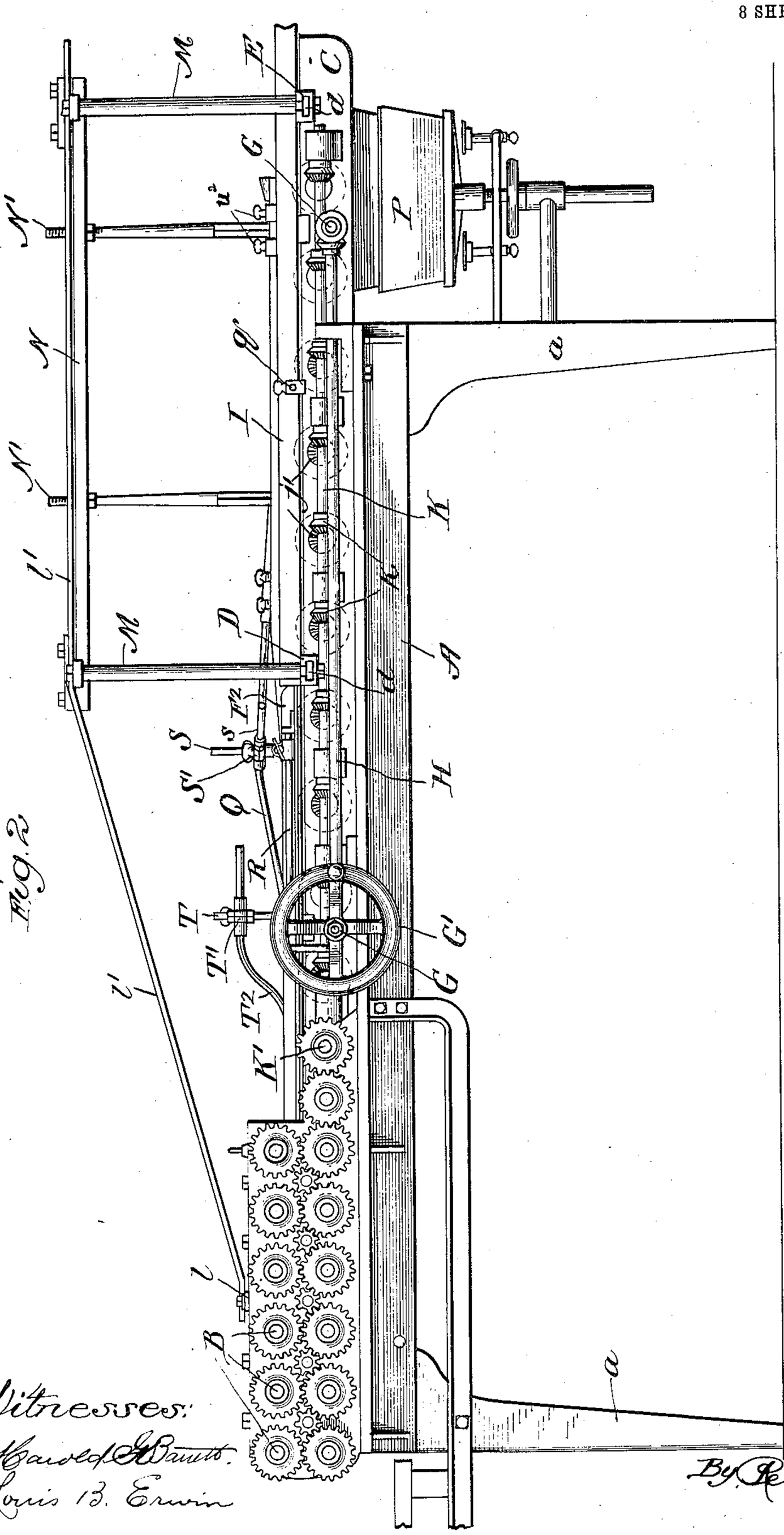

Fig. 2.

Witnesses:
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No. 862,161. PATENTED AUG. 6, 1907.

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8 SHEETS—SHEET 3.

Fig. 3a

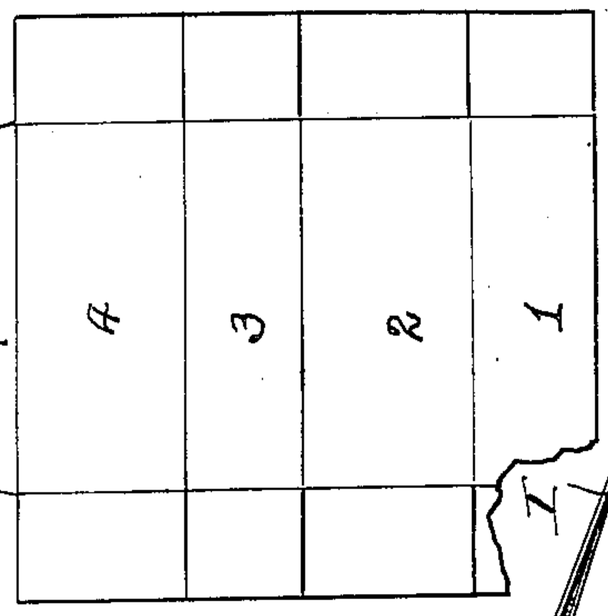

Fig. 3

Witnesses
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No. 862,161. PATENTED AUG. 6, 1907.

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8 SHEETS—SHEET 4.

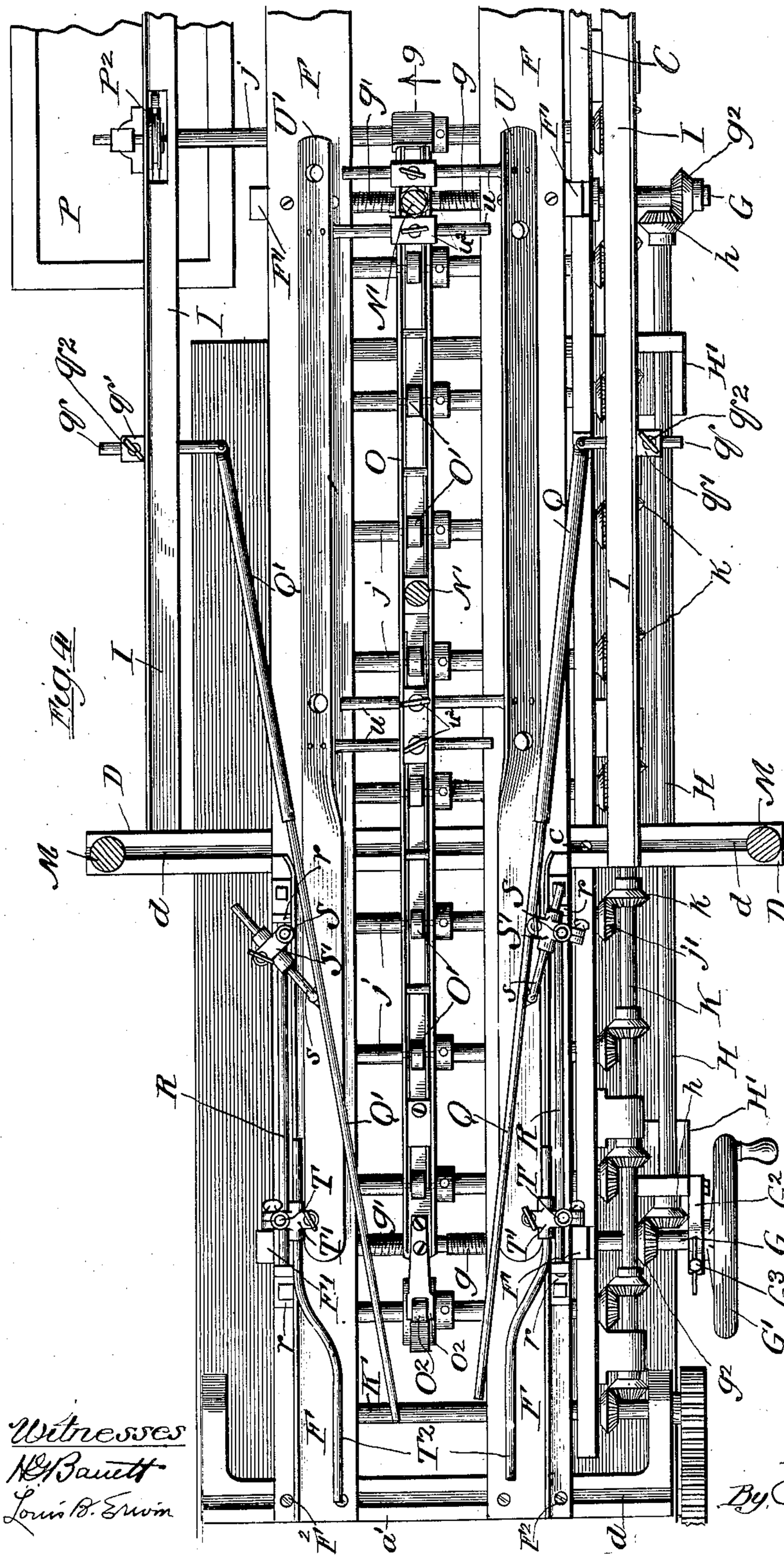

Fig. 4.

Witnesses
M. G. Bartlett
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No. 862,161. PATENTED AUG. 6, 1907.

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8 SHEETS—SHEET 5.

Fig. 5

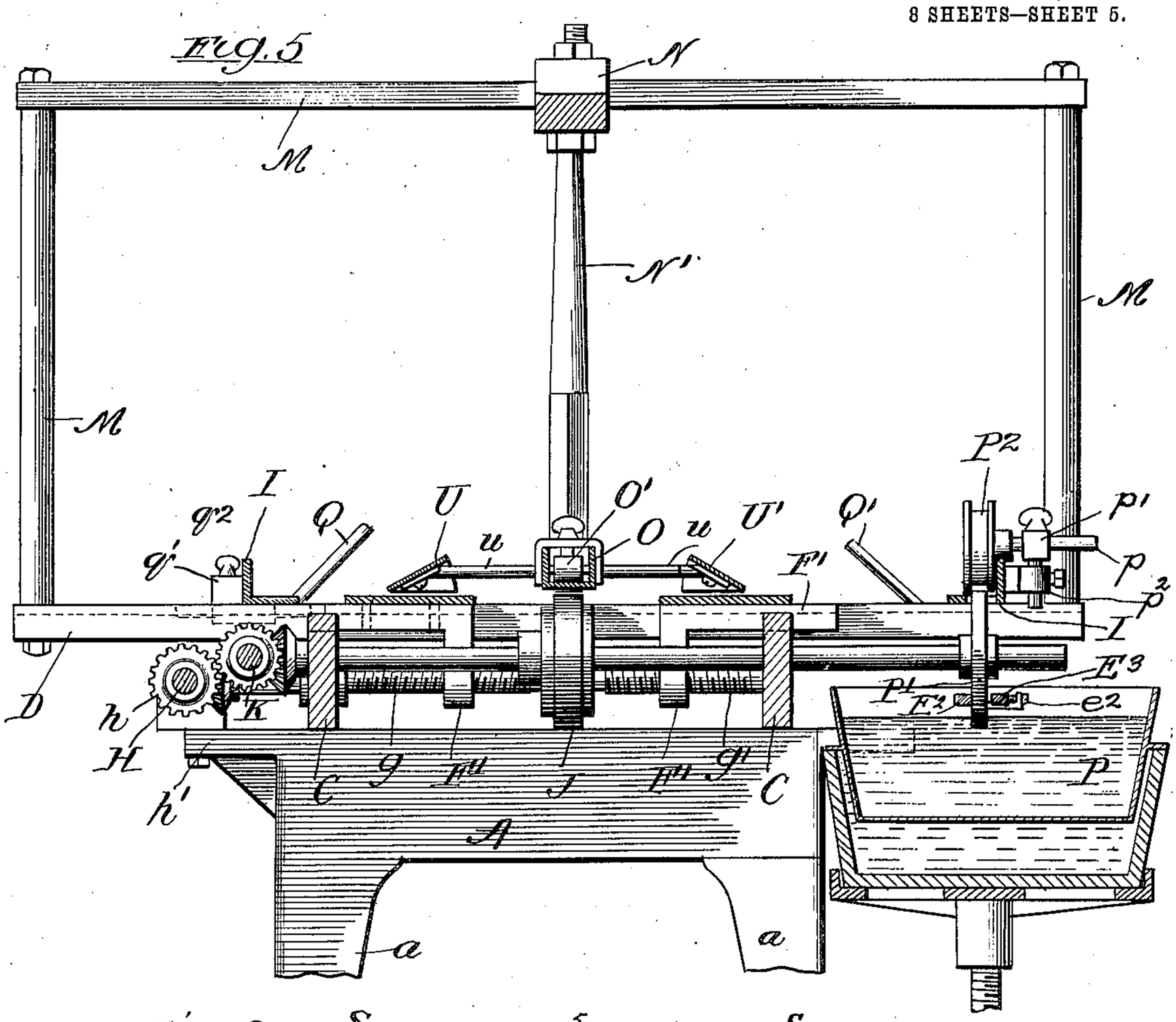
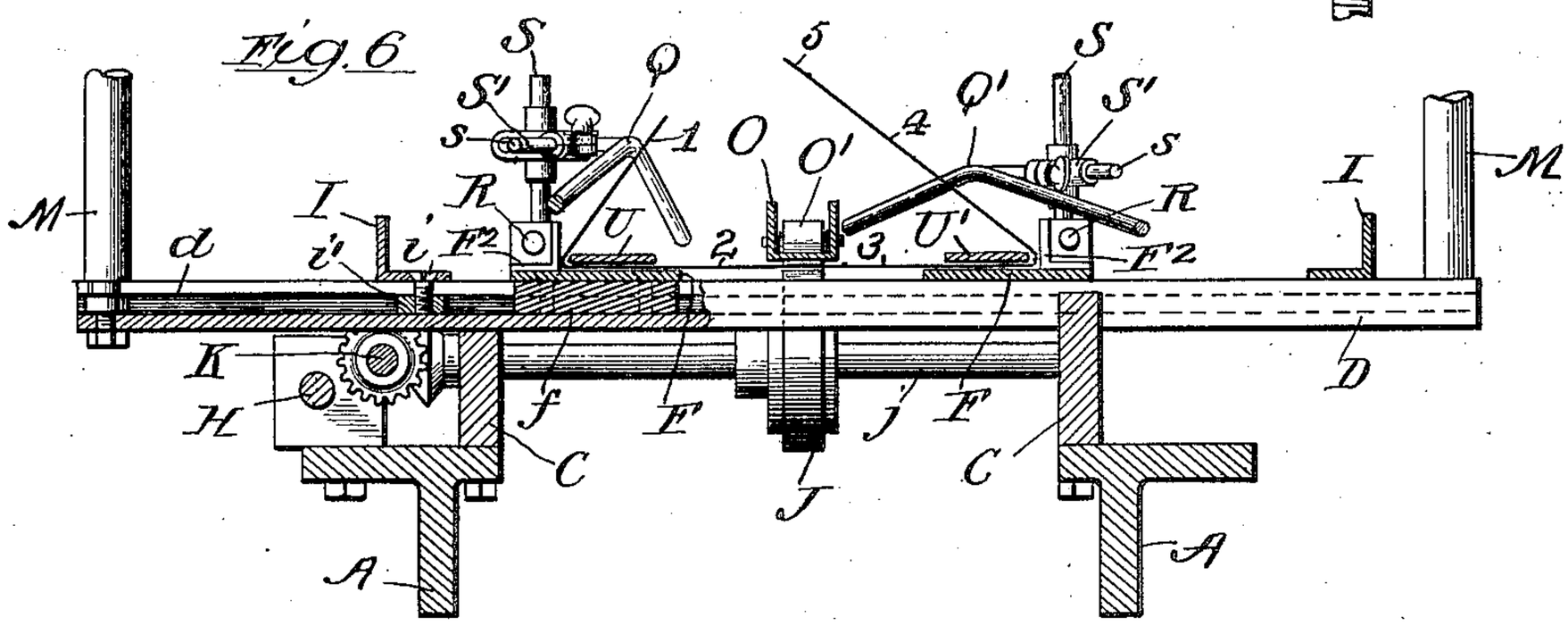


Fig. 6



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No. 862,161. PATENTED AUG. 6, 1907.

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3 SHEETS—SHEET 6.

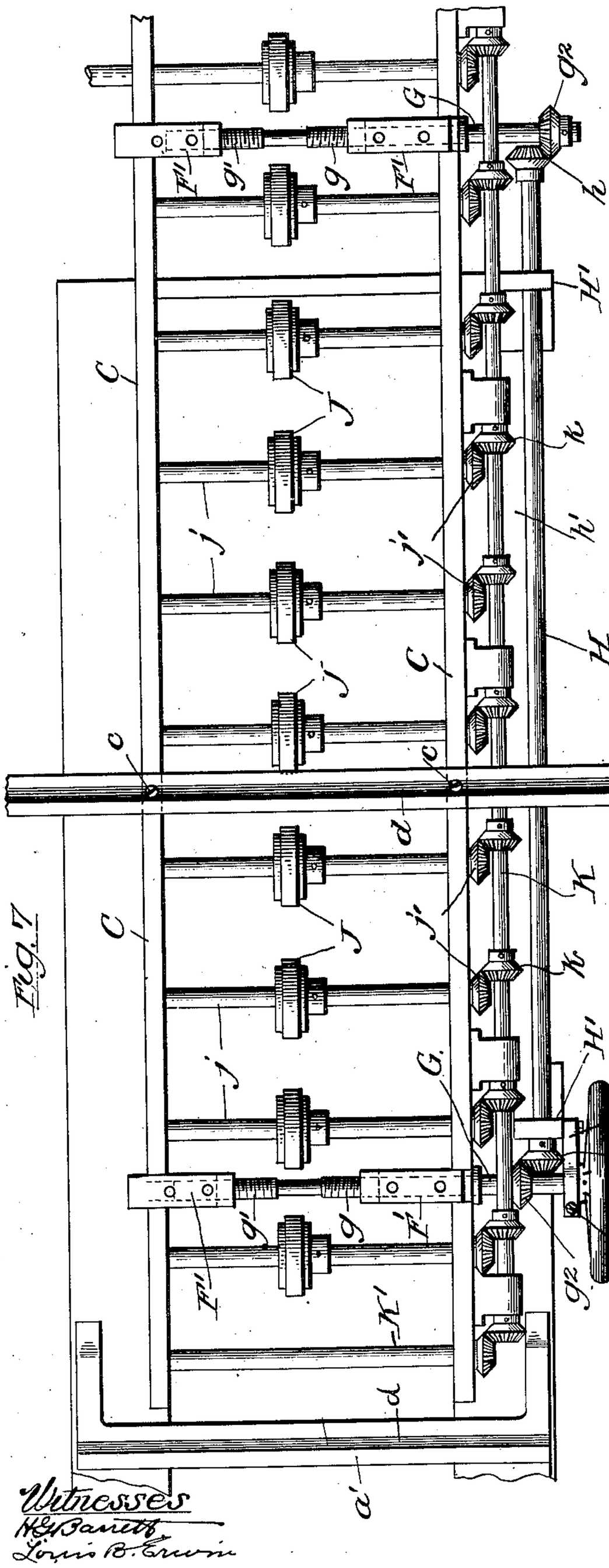

Fig. 7

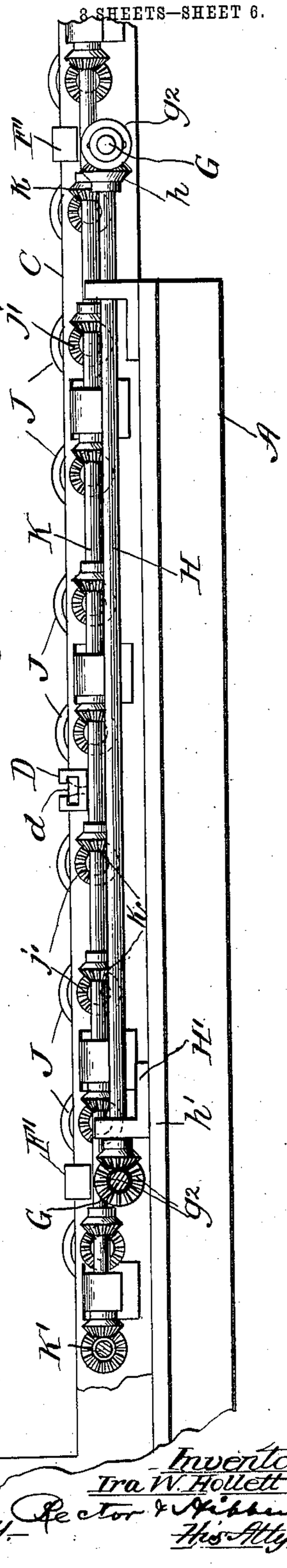

Fig. 8

Witnesses
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No. 862,161. PATENTED AUG. 6, 1907.

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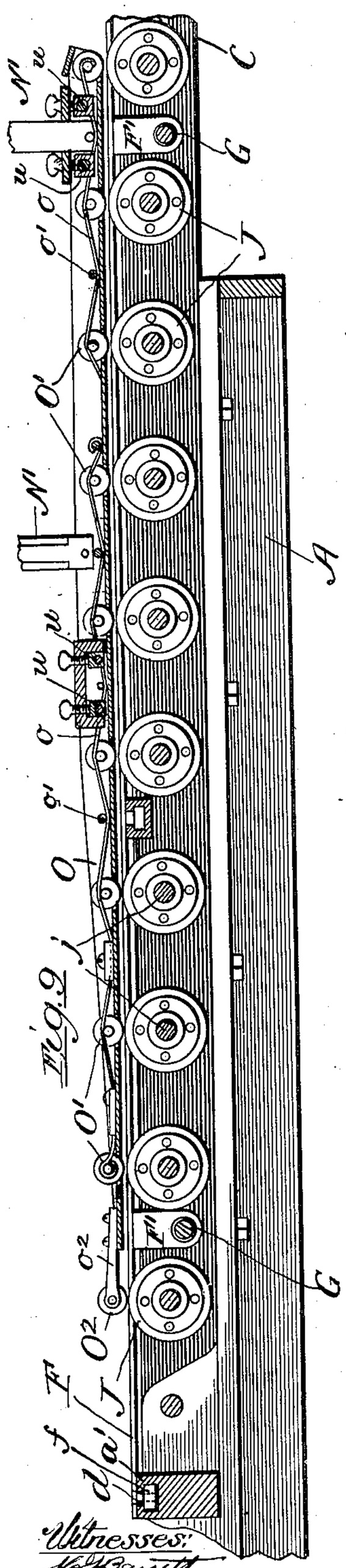
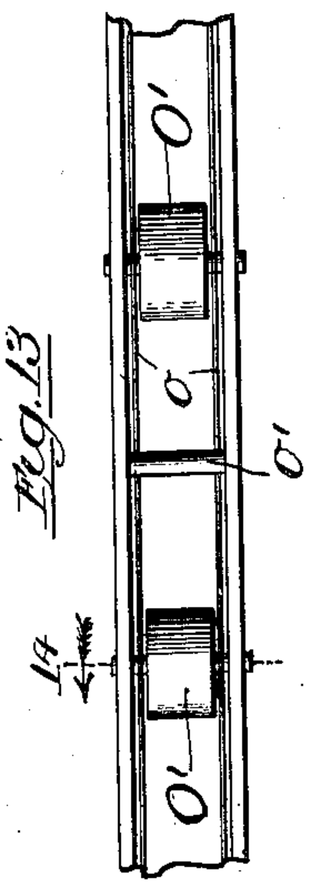
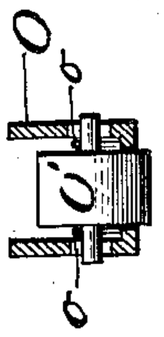
PAPER BOX MACHINE.

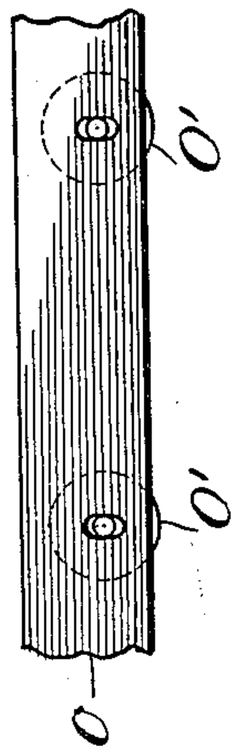
APPLICATION FILED JAN. 3, 1902.

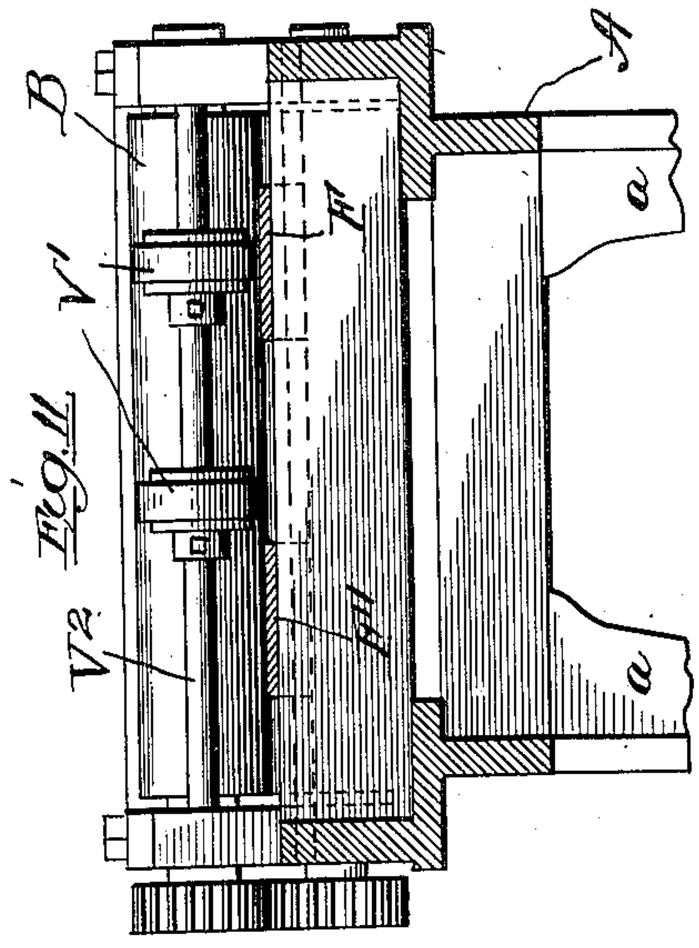
8 SHEETS—SHEET 7.

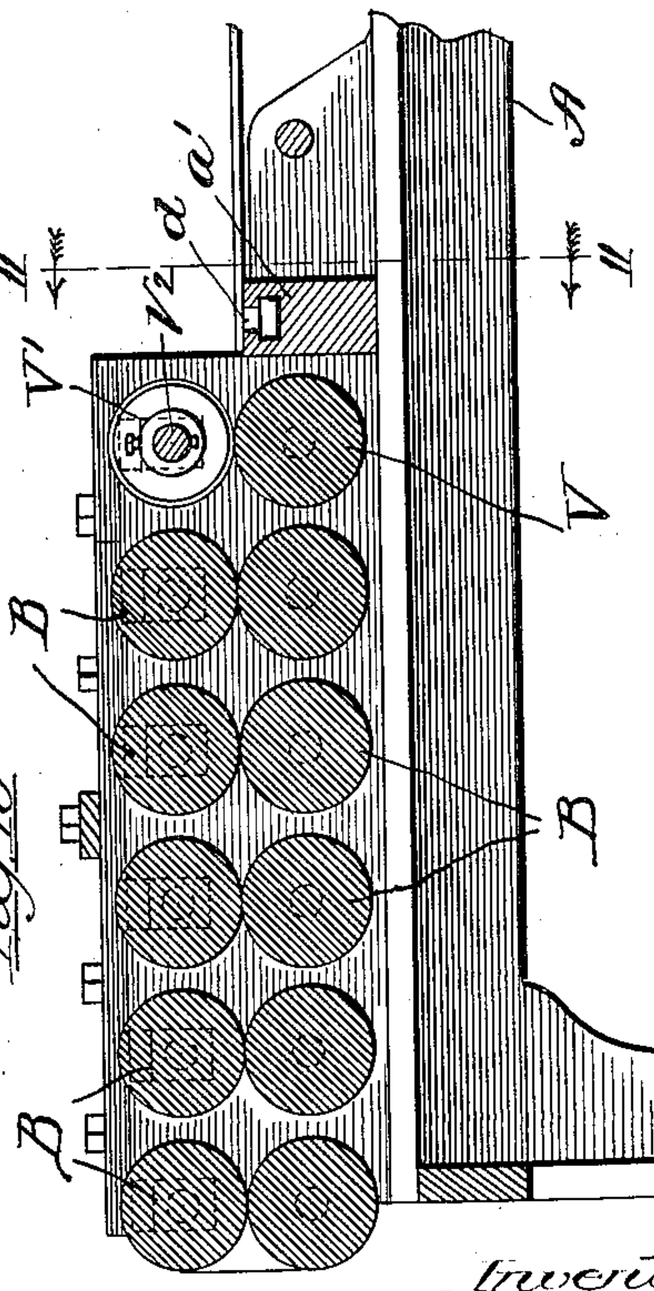












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PAPER BOX MACHINE.

APPLICATION FILED JAN. 3, 1902.

8 SHEETS—SHEET 8.

Fig. 15

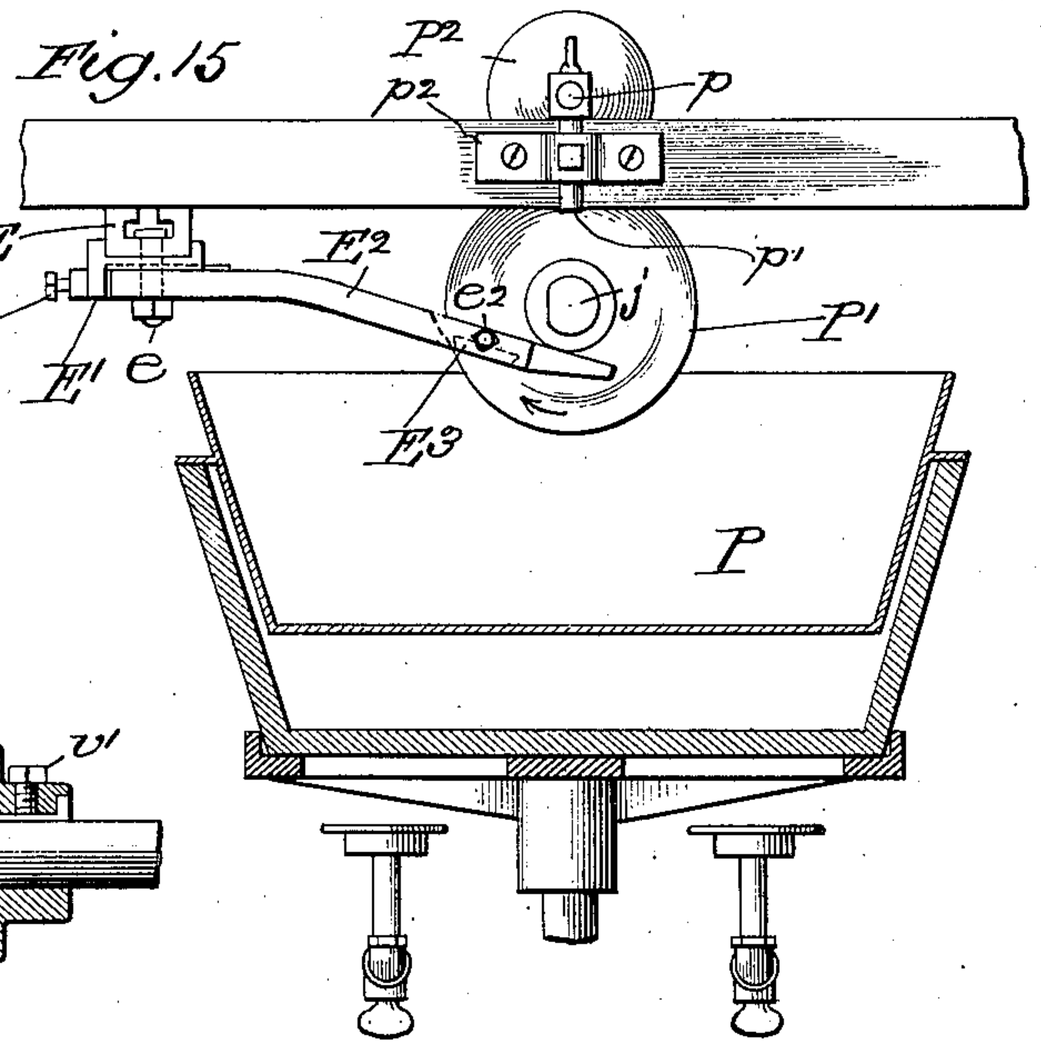


Fig. 17

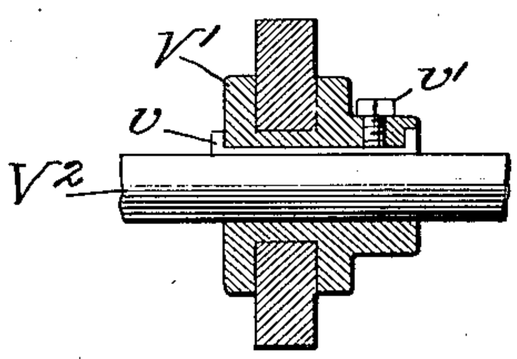


Fig. 16

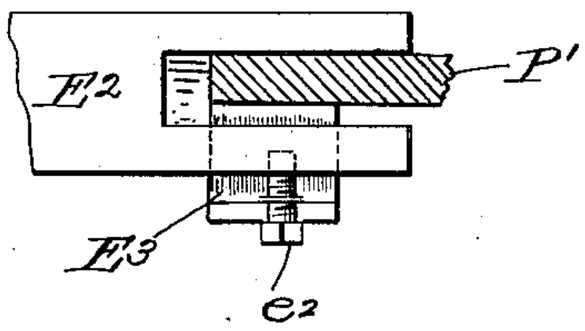


Fig. 19

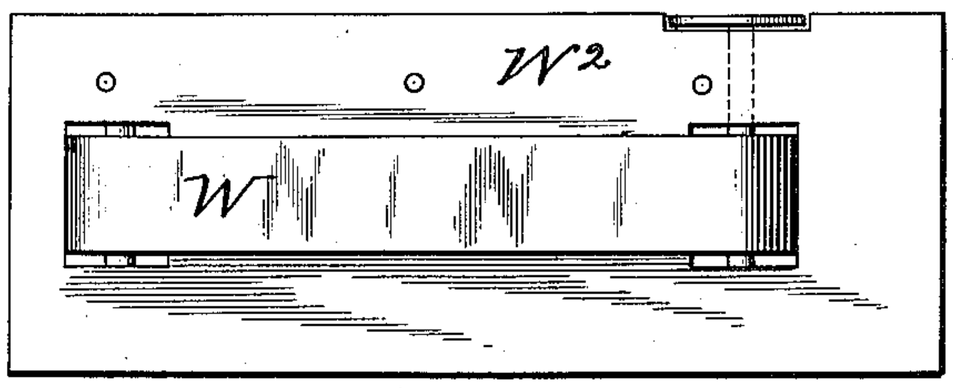


Fig. 18

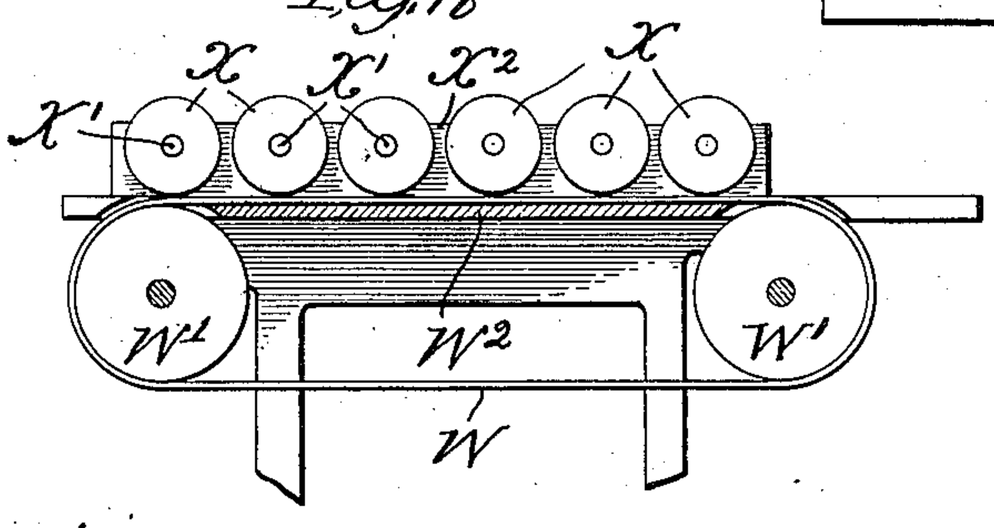
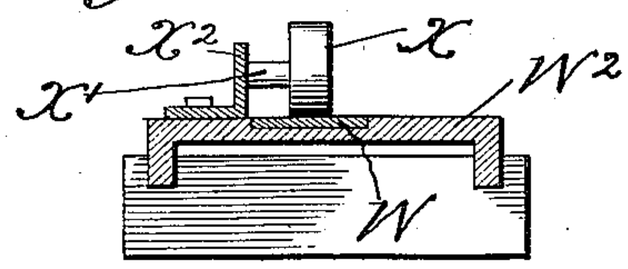


Fig. 20



Witnesses:
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Louis B. Erwin

Inventor:
Ira W. Hollett
By Rector & Hibben
Hrs Attys

UNITED STATES PATENT OFFICE.

IRA W. HOLLETT, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE J. W. SEFTON MANUFACTURING COMPANY, OF ANDERSON, INDIANA, AND CHICAGO, ILLINOIS, A CORPORATION OF INDIANA.

PAPER-BOX MACHINE.

No. 862,161. Specification of Letters Patent. Patented Aug. 6, 1907.

Application filed January 3, 1902. Serial No. 88,327.

To all whom it may concern:

Be it known that I, IRA W. HOLLETT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Paper-Box Machines, of which the following is a description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates more particularly to paper box machines in which the properly creased blank for the box to be formed is automatically folded into collapsed or flat box form and the opposite edges of the blank pasted together to form an open ended tube which is delivered from the machine in collapsed or flat form, and is rectangular in cross section when opened out into box form.

My invention has for its object, the simplification and increased efficiency of the automatic folding and pasting mechanism making up the machine, and its novelty consists in certain new constructions, arrangements, combinations and modes of operation of the parts employed, which will be hereinafter more fully explained and particularly set forth in the claims.

In the accompanying drawings, Figure 1, represents a top plan view of the machine, with the supporting frame that projects vertically above the bed of the machine cut away to better expose the parts beneath; Fig. 2, a side elevation of the machine, with said frame shown in position; Fig. 3 a perspective view of the folding and pasting mechanism of the machine showing the folding operations of several paper blanks going therethrough; Fig. 3ª a detail of one of the box blanks for whose folding the machine is here shown adjusted; Fig. 4 a top plan view of the parts shown in Fig. 3; upon a larger scale; Figs. 5 and 6 vertical cross sections upon lines 5—5 and 6—6 respectively of Fig. 1; Fig. 7 a horizontal plan view of the parts beneath the bed or table of the machine, showing the lower set of feed rollers and the driving gearing therefor and also showing the means for adjusting the strips H; Fig. 8 a side elevation of the driving gearing shown in Fig. 7; Fig. 9 a longitudinal vertical section through the bed of the machine adjacent the train of feed rollers taken on line 9 of Fig. 4 and showing such feed rollers; Figs. 10, 11, 12 and 13 details of the upper train of feed rollers, Fig. 11 being a section on line 11 of Fig. 10 and Fig. 14 a section on line 14 of Fig. 13; Figs. 15 and 16 detail views of the gluing mechanism; Fig. 17 a section of one of the feed rollers V′ and Figs. 18, 19 and 20 detail views showing a modified construction of feed devices.

The working parts of the machine are mounted on a main frame A supported on the legs *a* and having at its left hand end, Fig. 1, upwardly extending plates or flanges A′ in which are journaled the train or series of transversely arranged pressure rollers B. Extending to the right from said train of rollers is the bed or table of the machine, comprising, in the present instance, the pair of longitudinal rails or bars C, the two cross bars D and E, the thin longitudinal metal strips F adjustably secured to said cross bars and movable in unison towards or away from each other in a manner and for a purpose hereinafter more particularly described. The rails or bars C are supported by and secured to the machine frame, as clearly illustrated in Figs. 3, 5 and 6, while the cross bars D and E which are each provided with the slots *d* are let into the longitudinal rails C and fastened thereto by screws *c*, Fig. 7, or otherwise. At the rear of the machine and adjacent the pressure rollers a third cross bar *a′* is provided which cross bar is here shown as a separate part of the frame A and in the top of which a slot *d* is formed similar to the slots in the cross bars D and E.

The strips F which may be said to form the table on which the box blanks slide in their progress through the machine are arranged to slide transversely of the machine along the cross bars and in such a manner that they will approach or recede from each other in unison without disturbing their parallelism. To this end each strip F is fastened by screws or otherwise to T shaped blocks *f* movable in the slots *d* which are correspondingly T shaped to receive them. Each strip is also fastened to the horizontal portion or limb of L shaped blocks F′ as shown more particularly in Figs. 5 and 7, and for the purpose of having the blocks and consequently their strips move towards and away from each other suitable mechanism is employed such as the two transverse screws G which are journaled near their ends in the rails or bars C and are provided with the right and left screw threads *g* and *g′* which respectively engage the vertical portions or limbs of the L shaped blocks F′. Each screw has on one end a bevel gear g^2 adapted to mesh with a bevel gear *h* secured to the ends of a shaft H extending longitudinally of the machine as best seen in Figs. 1, 2, 3 and 7, such shaft being suitably mounted, in the present instance in the bearing brackets or supports H′ secured to the ledge or flange *h′* of the main frame Fig. 3. One of the screws G is provided with the hand wheel G′ by turning which both screws are rotated in the same direction through the gears and shaft just described, with the result that the strips F will be adjusted transversely of the machine towards or away from each other according to the direction of rotation, whereby such strips are capable of accommodating different widths of box blanks having different scoring. It will be understood that the strips F are also secured to blocks *f* adapted to slide in the slot formed by the cross bar *a′* adjacent the pressure rollers. Beginning in the present instance at a point near the cross bar D

and extending towards and substantially to the pressure rollers, an abutment is formed on each strip F such abutment here comprising an angle plate or guide F^2 secured to the strip and extending longitudinally thereof, Figs. 3, 4 and 6, as will be understood from an examination of Fig. 3. The distance between these abutments or angle plates F^2 represents the width of the folded box in its flat form as completed by the machine.

Secured at their opposite ends to the cross bars D, E, at the extreme opposite sides of the machine are two angle plates or horizontal strips or guides I, having upturned flanges at their outer edges, and constituting guide ways for the outer edges of the blanks when first put on the machine, that is the unfolded blanks, Fig. 3. These angle plates are adjustable transversely of the machine, along the cross bars, the same as the strips F but not by the same means, screws *i* here clamping the guides to the block *i'* in the slots of the cross bars, Fig. 6.

Arranged longitudinally beneath the horizontal bed or table of the machine, near its middle line, is a train of feed rollers J, Figs. 7 and 8 fast upon transverse shafts journaled at their opposite ends in bearings in the longitudinal rails or bars C of the frame work of the machine and projecting beyond the left hand one of said bars and having fast upon their projecting ends bevel gears or pinions *j'* meshing with corresponding gears *k* upon a shaft K driven at its forward end by a shaft K'. This shaft K' is geared to the main driving shaft K^2 of the machine by gearing shown in Figs. 1 and 2 and the shaft K^2 has mounted upon its opposite end a tight pulley *k'* and loose pulley k^2 over which the driving belt passes, and is shifted from one to the other by a shifter L operated by a transversely sliding bar *l* guided by slots and bolts upon the top of the frame work in which the feed rollers B are journaled. A lever *l'* is connected at its front end to a shifter bar *l* and extends rearward to the rear of the machine, within convenient reach of the operator engaged in feeding the blanks to the machine, so that he may readily stop and start the machine at will.

Supported at their lower ends upon the cross bars D and E of the machine are two vertical rectangular yoke frames M, Figs. 1, 2, 3 and 5, which serve to support, at some distance above the bed or table of the machine, a bar N extending longitudinally of the machine, Figs. 1, 3 and 4. Depending from and vertically adjustable in said bar N are two rods N' which carry at their lower ends a sort of trough O, Figs. 1, 3, 4, 5, 6 and 12, 13 and 14. The function of this trough is to support the inner pair of folders above the bed or table of the machine, as hereinafter described, and also to form a support and bearing for a train of feed rollers O' immediately above and in line with the feed rollers J. It is rectangular in cross section, with an open top, and its bottom is provided with openings immediately beneath the rollers O' to permit the latter to extend through the bottom of the trough into position to cooperate with the rollers J. The trunnions or journals of the rollers O' are mounted in vertical slots in the side walls of the trough O, Figs. 3, 12 and 14, to permit vertical adjustment or play of said rollers, and the rollers are yieldingly pressed downward into contact with the feed rollers J beneath them by wire springs, *o*, Figs. 3, 9, and 14 extending longitudinally of the trough immediately within its side walls. These wires are secured to the trough at their opposite ends and intermediate the rollers O' they pass beneath cross rods *o'* secured in the trough, which hold the wires down against the spindles of the rollers O'. The trough O while supported entirely by the rods N depending from the yoke frames M extends forward of said rods nearly to the train of pressure rollers B and carries the series of feed rollers O' to coöperate with each one of the rollers J. The last roller O^2 in the train is carried by a yoke o^2 secured to the front end of the trough, Fig. 1, instead of being journaled in the side walls of the trough as are the other rollers.

A paste or glue box P is suitably supported beneath the right side of the machine, near its rear end, Figs. 1, 2 and 5, and the glue roll P' turning at its lower edge in the same, and coöperating therewith, projects at its upper edge through a slot in the right hand guide or angle plate I of the table, into position to coöperate with a feed and pressure roller P^2 suitably mounted upon the table.

For the purpose of properly folding the box blank in its travel through the machine, it is caused to encounter certain rods Q, Q', hereinafter referred to as the folder rods. There are two of these rods, which, in the present instance, are each formed of two telescoping sections, one of which sections is a pipe or tube to receive and support the outer or curved rod portion which extends towards and in proximity to the pressure rollers. The tube sections of the folder rods are pivoted on the inner ends of short transverse rods *q* which are adjustably supported in the angle plates I. As shown in Figs. 1 and 3 these short rods *q* pass through the plates I and also through blocks *q'* fastened to plates I. These rods can thus be adjusted transversely of the machine and held in position by the set screw q^2, and, as will be understood, the folder rods are correspondingly adjusted at their supported ends.

The outer ends of the folder rods are capable, in the present instance, of a universal adjustment by means of the following construction and arrangement; a horizontal rod R is secured to each strip F, Fig. 3 by means of the angle plates *r*, which, in fact, rest upon the abutment plates or guides F^2. Posts S are clamped at their lower ends to the rods R in such manner that the posts may be adjusted longitudinally as well as rotarily thereon. The posts also carry a support S' adapted to swivel thereon and to be clamped thereto and also to be moved or adjusted up or down, that is longitudinally of the posts. Mounted to move longitudinally of and to swivel on the supports S' are rods *s* which are pivotally connected at one end to the folder rods Q, Q', Fig. 1. By this means, all the necessary adjustments of the folder rods are obtainable, it being understood that the folder rods are adapted to be adjusted independently and in different manner with respect to each other in order that one part of the box blank may be folded in advance of another part as will hereinafter be made apparent. The rods R also carry posts T similar to the other posts and also provide with the supports T' in which are adjustably mounted the bent or curved pressure rods T^2 which are capable of universal adjustment and whose function is to press upon the folded sides of the box blank just before it is

delivered to the pressure rollers. Coöperating with the curved folder rods Q, Q′, in this folding of the blank are two folder plates U U′, Figs. 1, 3, 4, 5 and 6. These folder plates extend substantially full length of the trough O upon opposite sides of the same, and are supported therefrom, near their middle and at their rear ends, by horizontal rods *u* there being two of said rods projecting inward from each folder plate and passing through horizontal apertures in the side walls of the trough. The rods *u* in the present instance pass through the trough and below a block *u′* on the trough and are secured in their different adjusted positions therein by means of set screws u^2, Figs. 1, 3, 4 and 9. This connection of the folder plates with the trough O serves to support them immediately above the horizontal bed of the machine formed of the strips F so as to permit free passage of the paper blanks beneath them, and at the same time permits them to be adjusted laterally to coöperate with blanks of different widths and differently scored for boxes of varying proportions.

The rear half or portion of each of the folder plates is inclined upward and inward at an angle approximating forty five degrees, Fig. 5, but about midway of its length each plate is bent over and inward and downward into a horizontal plane, Fig. 1, 4 and 6 and lies immediately beneath the superposed folder rods.

In Fig. 3ª there is shown one of the paper blanks which the machine is designed and here shown adjusted to fold and secure in box form, said blank being composed of longitudinal side walls 1, 2, 3, 4, and a pasting flap 5, separated by scoring along the lines indicated and also composed of the usual end flaps projecting from the opposite ends of said side walls which flaps, however, are not folded by the machine. The box resulting from the blank herein shown is a rectangular box. To accommodate and properly fold into box form, the box blank herein shown, the abutments or guide plates I have been adjusted to such a distance from each other transversely of the machine that the opposite edges of the blank pass freely but somewhat closely between them which causes the glue flap 5 upon the right hand edge of the blank to pass between the glue roll and the superposed feed and pressure roller P^2 and thereby cause glue to be applied to the under side of said flap. Likewise by turning the hand wheel G′ in the proper direction the two strips F are moved in unison towards or away from each other so that the distance between the angle plates F^2 which they carry will represent the width of the box when in folded or collapsed form. Also the folder rods Q, Q′ are properly adjusted in such manner that the side 4 of the box which carries the glued flap 5 will be folded down in advance so that the side 1 to be superposed will be folded down on top of the pasted side of the glued flap. The folder plates are adjusted by hand so that their outer edges will approximately register with or overlie the score lines between the sides 1—2 and 3—4 of the box blank. Furthermore the presser rods T^2 are adjusted so as to press with the proper pressure and at the proper place upon the folded blank. The blanks are then inserted one by one and pushed rearward by hand until the flap 5 of the box blank is engaged by the glue roll and its coöperating pressure roller and the body of the blank passes beneath the rear end of the trough and is engaged by the rearmost pair of feed rollers J and O′, whereupon the blank will be carried on further through the machine by the successive pairs of feed rollers. The perspective of the machine, Fig. 3, shows a series of four box blanks passing through the machine, following each other closely as in actual practice, and in different stages of formation or folding. The first blank shown at the right hand end of Fig. 3 has already received glue from the glue roller and has been advanced by the series of feed rollers sufficiently far to have its sides 1 and 4 encounter the folder rods Q, Q′ which bend its said sides 1—4 upwardly as shown by the first blank in said perspective. As the blank progresses further in its passage through the machine, the folder rods continue to fold the sides 1—4 as shown by the second blank in said perspective and such folding is continued as the blank passes on through the machine until the sides 1—4 are bent to a substantially horizontal position, the side 4 however, being folded or bent downwards in advance of the side 1 so that the glued side of the flap is presented upwardly and the side 1 superposed. The folder plates U, U′ which have been adjusted so as to approximately register with or overlie the scored lines separating the sides 1—2 and 3—4 of the blank insure the proper bending of the blank along said score lines, the blank being folded over until the folder plates are embraced between the sides 1—2 and 3—4 respectively. The blank now passes on rearward beneath the presser rods and is carried to a position to be gripped between a cylindrical roller V and a superposed pair of feed rollers V′ mounted on a shaft V^2 driven by the driving shaft, Fig. 1, and preferably provided with a rubber face so as to properly grip and draw the blank rearwardly. By preference the shaft V^2 is arranged to yield vertically in suitable journal boxes and is normally pressed downwardly by suitable tension, Fig. 10, and its rollers are adjustable longitudinally thereon, Fig. 17, through the provision of the key *v* and tightening set screw *v′*. These rollers V′ deliver the blank to the train of pressure rollers B by which it is pressed into flat form and the edge of the side 1 firmly secured to the flap 5 and from which the blank is delivered in completed form upon any suitable support or table which may be provided at the rear of the machine to receive the completed or folded blanks.

As hereinbefore described, the glue wheel is adjustable with the right hand guide or plate I which it passes. As illustrated in Figs. 5, 15 and 16, the glue feed roller P′ which dips into the glue is rotated by the last shaft *j* at the front of the machine which shaft is extended for this purpose further than the others. This extended shaft is slightly flattened on one side and the feed roller P′ is shaped to fit thereon in such manner as to slide freely longitudinally on such shaft when the guide I is adjusted, and to be rotated by such shaft. Mounted on the cross piece E by means of the bolt *e* is a bracket E′ into which is dovetailed a scraper arm E^2 forked at its forward end to embrace the glue roller P′, Figs. 5, 15 and 16. When the bolt *e* is loosened the scraper arm may be adjusted by the set screw *e′* either forwardly or backwardly longitudinally of the machine. As shown in Figs. 15 and 16 a scraper blade E^3 is dovetailed into one of the forks of the arm E^2 and adjusted towards and away from the roller P′ by a set screw e^2. The glue roller P^2 is mounted to rotate on a horizontal shaft *p*

passing through and adjustable laterally on a vertical post p' which is adjustable vertically in a lug p^2 on the guide I. By these means the glue wheel P^2 may be adjusted laterally together with the guide I and also adjusted vertically.

It will be understood that the supporting posts of the trough O and the folder plates U, U′ carried by such trough do not interfere with or obstruct the passage of the blanks through the machine, since the sides 1—4 of the blanks are not bent over or inward to horizontal position until after they have passed rearward of the rear one N of said posts. Furthermore their supporting or depending posts are adjustable independently in such manner that the trough or feed roller frame which they carry may be adjusted towards or away from the stationary lower train of feed rollers. By such independent adjustment different points of the roller frame may be moved closer to or further away from the machine table, and likewise the spring of the unsupported rear end of such roller frame may be compensated for by operating the rearmost post so as to adjust such rear end downward.

The variety and character of the described adjustments in my machine are desirable owing to the different sizes and scoring of the blanks as well as the different kind and weights of paper of the blanks. The adjustment of the guides I I is determined by the width of the unfolded blank and that of the guides F^2 by the width of the folded blank. The rapidity of the folding of the opposite sides of the blank is determined by the particular adjustment of the folder rods Q Q′ and the same is true of their relative folding, one in the advance of the other. So also the presser rods T^2 are adjusted longitudinally for the different lengths of box, being moved rearwardly for long boxes and are adjusted axially for different widths of box or blank. The action of stock of different size, weight and character differ so much that no particular adjustment can be specified but the parts are adjusted by trial until the blanks pass through their operations with the perfection and smoothness.

My improved machine in the form above described is designed to accommodate the ordinary sized blanks, but when it is desired to employ the machine for folding very small blanks such as cigarette box blanks, I substitute for the lower train of feed rollers J an endless feed belt W passing over driving rollers W′ suitably located in the machine, and traveling at its upper side upon a table W^2 between said rollers, Figs. 18, 19 and 20; and for the upper train of rollers carried by the trough O I substitute the train of rollers X bearing upon the belt W as it passes over the table W^2, the latter being provided with a groove to receive said belt, so that the upper surface of the latter will be flush with the upper surface of the table, as shown in Fig. 20. The rollers X are mounted upon spindles X′ secured at their outer ends to and vertically adjustable in brackets X^2 secured to the upper surface of the table. This feeding mechanism composed of the feed belt W and rollers X will feed very small blanks more efficiently than can be accomplished with a feed mechanism composed simply of two trains of rollers as in the principal construction which I have described.

Suitable locking means may be provided for the hand wheel G′ in order that the proper adjustment may be maintained against accidental displacement or tampering and in the present instance I have shown a clamp comprising a clamping plate G^2 secured to the bracket H′ and embracing the screw G and adapted to be clamped thereto by the screw G^3.

Having thus fully described my invention, I claim:

1. In a machine for folding paper box blanks, the combination, with means for feeding the blanks through the machine, of a pair of inner folder plates which are supported above the horizontal bed or table of the machine and permit free passage of the blanks beneath them, said plates having straight longitudinal edges lying in the same plane and being inclined at their forward ends, curved intermediate of their length and horizontal or flat at their rear ends, and coöperating folding means serving to fold the opposite sides of the blank upward and over said folder plates as the blank is carried through the machine; substantially as described.

2. In a machine for folding paper box blanks, the combination, with means for feeding the blanks through the machine, of a pair of inner folder plates supported above the horizontal bed or table of the machine and permitting free passage of the blanks beneath them, said folder plates being of substantially uniform width from end to end and each having a continuous edge lying in the same plane, the forward portions of said folder plates being inclined upward and inward at an angle to the horizontal bed of the machine and their rearward portions being flat in a horizontal plane, and coöperating folding means serving to fold the opposite sides of the blank upward and inward around the folder plates as the blank is carried through the machine; substantially as described.

3. In a machine for folding paper box blanks, the combination, with means for feeding the blanks through the machine, of a pair of inner folder plates which are supported above the horizontal bed or table of the machine and arranged parallel to each other, said plates being independently adjustable towards and away from each other and each comprising a flat strip at its forward portion inclined at an angle to the horizontal bed of the machine and at its rearward portion arranged in a horizontal plane, and coöperating folding means serving to fold the opposite sides of the blank upward and over said folder plates as the blank is carried through the machine; substantially as described.

4. In a machine for folding paper box blanks, the combination with means for feeding the blanks through the machine, of a pair of folder plates which are arranged in parallel relation above the horizontal bed of the machine and are independently adjustable towards and away from each other, each of said folder plates comprising a flat strip which at its forward portion is inclined at an angle to the horizontal plane of the bed of the machine and which at its rearward portion is arranged in such horizontal plane, and a pair of folder rods adapted to coöperate with said folder plates and extending rearwardly convergingly and across the vertical plane of the folder plates at a point between the inclined and horizontal portions thereof; substantially as described.

5. In a machine for folding paper box blanks, the combination, with mechanism for feeding the blanks through the machine, of a pair of inner folder plates which are supported above the horizontal bed or table of the machine and arranged parallel to each other upon opposite sides of the feeding mechanism, said folder plates being inclined upward and inward at their forward portions and being flat in a horizontal plane at their rearward portions, and a pair of coöperating folder rods also arranged above the horizontal bed or table of the machine and extending above and across the folder plates whereby the opposite sides of the blanks are folded upward and inward around said folder plates; substantially as described.

6. In a machine for folding paper box blanks, the combination, with the horizontal bed or table of the machine, and means for feeding the blanks through the machine upon said bed or table, of a pair of inner folder plates supported above said bed or table and independently thereof so as to permit free passage of the blanks along said table and beneath said folder plates, and a pair of outer co-

operating folder rods also arranged above said table and serving to fold the opposite sides of the blank upward and inward over said inner folder plates said rods being adjustable in length; substantially as described.

7. In a machine for folding paper box blanks, the combination, with mechanism for feeding the blanks through the machine, of a pair of inner folder plates which are supported above the horizontal bed or table of the machine and arranged parallel to each other upon opposite sides of the feeding mechanism, said folder plates being inclined upward and inward at their forward portions and being flat in a horizontal plane at their rearward portions, and a pair of coöperating folder rods supported beyond the outer edges of the folder plates adjacent their forward inclined portions and extending convergingly and across such plates at their rearward flat portions; substantially as described.

8. In a machine for folding paper box blanks, the combination, with lower feeding mechanism extending longitudinally of the machine, of a frame having an upper feeding mechanism supported above said lower mechanism and coöperating therewith to carry the blanks through the machine, a pair of folder plates suppored from and at opposite sides of said frame and arranged to be adjusted toward and away from each other said plates being inclined as to their forward portions and flat as to their rearward portions, and coöperating folding means serving to fold the outer sides of the blanks over said folder plates as the blanks are carried through the machine by the feeding mechanism; substantially as described.

9. In a machine for folding paper box blanks, the combination, with a lower train of feed rollers extending longitudinally of the machine, of a longitudinal trough or roller-supporting frame supported immediately above said lower train of rollers, an upper train of feed rollers journaled in said trough and coöperating with the lower train of rollers to carry the blanks through the machine, a pair of inner folder plates supported from and at opposite sides of said trough, so as to permit free passage of the blanks beneath them and between the two trains of feed rollers, and coöperating folding means serving to fold the outer sides of the blank over said inner folder plates as the blank is carried through the machine by the trains of feed rollers; substantially as described.

10. In a machine for folding paper box blanks, the combination, with the horizontal bed or table of the machine and means for feeding the blanks through the machine upon said bed or table, of a pair of vertically disposed yoke frames, each supported at the opposite sides of said bed or table and extending transversely above the same, a pair of inner folder plates carried by supports depending from said yoke frames, and permitting free passage of the blanks beneath them upon the horizontal bed of the machine, and coöperating folding means serving to fold the opposite sides of the blank upward and over said inner folder plates as the blank is carried through the machine by the feeding mechanism; substantially as described.

11. In a machine for folding paper box blanks, the combination, with the horizontal bed or table of the machine, of a pair of vertically disposed yoke frames, each supported at opposite sides of said bed or table and extending transversely above the same, a longitudinal trough supported immediately above the bed of the machine by supports depending from said yoke frames, a train of feed rollers journaled in said trough, and coöperating feeding devices located immediately beneath said train of rollers; substantially as described.

12. In a machine for folding paper box blanks, the combination, with the horizontal bed or table of the machine, of a pair of vertically disposed yoke frames, each supported at opposite sides of said bed or table and extending transversely of the same, a longitudinal trough supported immediately above the bed of the machine by supports depending from said yoke frames, a train of feed rollers journaled in said trough, and a second train of feed rollers located immediately beneath the first named train of rollers and coöperating with the latter to feed the blanks through the machine; substantially as described.

13. In a machine for folding paper box blanks, the combination, with the horizontal bed or table of the machine, of a pair of vertically disposed yoke frames, each supported at opposite sides of said bed or table and extending transversely above the same, a longitudinal trough supported immediately above the bed of the machine by supports depending from such yoke frames, a train of feed rollers journaled in said trough, coöperating feeding devices located beneath said train of rollers, a pair of inner folder plates supported by and at opposite sides of said trough, and coöperating folding means serving to fold the opposite sides of the blank upward and over said inner folder plates as the blank is carried through the machine; substantially as described.

14. In a machine for folding paper box blanks, the combination, with the horizontal bed or table of the machine, of a pair of vertically disposed yoke frames, each supported at opposite sides of said bed or table and extending transversely above the same, a longitudinal trough supported immediately above the bed of the machine by supports depending from said yoke frames, a train of feed rollers journaled in said trough, a second longitudinal train of feed rollers located immediately beneath and coöperating with said first mentioned train of rollers, a pair of folder plates supported by and at opposite sides of said trough, and coöperating folding means serving to fold the opposite sides of the blank upward and over said inner folder plates as the blank is carried through the machine; substantially as described.

15. In a machine for folding paper box blanks, the combination, with the horizontal bed or table of the machine, of a supporting frame above said table, vertically adjustable supports depending from said frame, a longitudinal train of feed rollers carried by said supports, immediately above the bed of the machine, and coöperating feeding devices beneath the bed of the machine; substantially as described.

16. In a machine for folding paper box blanks, the combination, with the horizontal bed or table of the machine, of a supporting frame located above said table, vertically adjustable supports depending from said frame, a longitudinal train of feed rollers carried by said supports immediately above said table, and a second longitudinal train of feed rollers located immediately beneath and coöperating with the first mentioned train of rollers; substantially as described.

17. In a machine for folding paper box blanks, the combination, with the horizontal bed or table of the machine, of a longitudinal trough supported immediately above the said bed or table, a train of feed rollers mounted in said trough and vertically movable in their bearings therein, springs acting upon said rollers to press them downward in their bearings, and coöperating feeding devices beneath the bed of the machine; substantially as described.

18. In a machine for holding paper box blanks, the combination, with the horizontal bed or table of the machine, of a longitudinal trough supported immediately above said bed or table, a train of feed rollers having their trunnions or spindles journaled in vertical slots in the opposite walls of said trough, springs extending longitudinally of said trough upon opposite sides thereof and bearing upon the spindles of said rollers to depress the same, and coöperating feeding devices located beneath said train of rollers; substantially as described.

19. In a machine for folding paper box blanks, the combination, with pasting and folding mechanism, of transverse frame bars provided with longitudinal slots, longitudinal strips secured to said frame bars and adjustable along said slots transversely of the machine, guide plates arranged on the rearward ends of said strips and movable therewith, and outer guide plates arranged at opposite sides of the machine adjacent the forward ends of said strips, said latter named guide plates being also secured to said transverse frame bars by means of said slots and adjustable thereby transversely of the machine; substantially as described.

20. In a machine for folding paper box blanks, the combination, with the folding and pasting mechanism of transverse frame bars provided with longitudinal slots, longitudinal strips or slats secured to said transverse bars and adjustable transversely of the machine along said slots, and outer angle plates at the opposite sides of the machine

also secured to said transverse frame bars by means of said slots and adjustable thereby transversely of the machine; substantially as described.

21. In a machine for folding paper box blanks, the combination with an adjustable machine table and a pair of inner folder plates adjustable transversely of the machine, and arranged above the table of coöperating outer folder means also adjustable transversely of the machine and serving to bend the opposite sides of the blank upward and over said inner folder plates, whereby the machine may be adjusted to fold blanks scored to form boxes of different proportions; substantially as described.

22. In a machine for folding paper box blanks, the combination of a pair of folder plates adjustable transversely of the machine, a pair of guides arranged at opposite sides of the machine for opposite edges of the flat unfolded blank and independently adjustable transversely of the machine, and folder means mounted on said guides and adjustable transversely therewith and coöperating with said folder plates; substantially as described.

23. In a machine for folding paper box blanks, the combination, with the horizontal bed or table of the machine provided at its opposite sides with transversely adjustable guides for the outer edges of the unfolded blank, of a pair of inner folder plates, also adjustable transversely of the machine, coöperating outer folder means likewise adjustable transversely of the machine and serving to fold the opposite sides of the blank upward and over the inner folder plates, and a pair of transversely adjustable guides for the opposite edges of the folded blank; substantially as described.

24. In a machine for folding paper box blanks, the combination, with the horizontal bed or table of the machine, of the outer angle plates I adjustable transversely of the machine and serving as guides for the opposite edges of the unfolded blanks, a pair of inner folder plates U, U′ supported immediately above the table and adjustable transversely of the machine, the outer folder rods Q, Q′ supported at their rear ends by the outer guide plates I I and adjustable therewith, and having their forward ends also adjustably supported, and the pair of transversely adjustable guides F^2 for the inner edges of the folded blank; substantially as described.

25. In a machine for folding paper box blanks, the combination, with the horizontal bed or plate of the machine, of the longitudinal trough or frame O supported immediately above said table by depending supports, the folder plates U, U′ at opposite sides of said trough O and supported therefrom by the rods *u* passing through said trough, and the set screws engaging said rods to hold said plates in adjusted position; substantially as described.

26. In a machine for folding paper box blanks, the combination, with means for feeding the blanks through the machine and applying paste thereto, of means comprising a pair of extensible rods for folding the blanks into box form as they pass through the machine, both said means being arranged in substantially the same horizontal plane, a train of pressure rolls arranged in the same horizontal plane for pressing the folded blanks into flat form and delivering them in that condition at the rear end of the machine, and adjustable presser rods bearing upon the folded blank before entrance to said pressure rolls and arranged substantially intermediate the folding means and pressure rolls; substantially as described.

27. In a machine for folding paper box blanks, the combination, with means for feeding the blanks through the machine by frictional contact, means for applying paste to the under surface of one edge of the blank as the latter enters the machine in flat condition, of means for folding the pasted blank into box form with its pasted surface overlapped by the opposite edge of the blank, comprising a pair of parallel adjustable folder plates, a train of pressure rolls for pressing the blanks into flat form, and a pair of presser rods having a substantially universal adjustment and arranged at opposite sides of the machine in advance of the rolls to press upon the blanks after folding and before delivery to the rolls; substantially as described.

28. In a machine for folding and pasting paper box blanks, the combination, with means for feeding the blanks through the machine by frictional contact, means for applying paste to one edge thereof, of a pair of inner folder plates supported above the horizontal bed or table of the machine and permitting free passage of the blanks beneath them, coöperating folding means serving to fold the opposite sides of the blank over said inner folder plates as the blank is carried through the machine, with the pasted surface of the blank overlapped by the opposite edge of the blank, and a train of pressure rollers through which the folded blank passes for the purpose of pressing it into flat form and securing its pasted surfaces together and presser rods intermediate said pressure rollers and folding means, for holding the folded box flat; substantially as described.

29. In a machine for folding and pasting paper box blanks, the combination, with means for feeding the blanks through the machine and applying paste to one edge thereof, of a pair of inner folder plates supported above the horizontal bed or table of the machine and permitting free passage of the blanks beneath them, a pair of outer coöperating folder rods serving to fold the opposite sides of the blank upward and inward over said inner folder plates, with the pasted surface of the blank overlapped by the opposite edge thereof, and a train of pressure rollers through which the folded blanks pass for the purpose of pressing them into flat form and securing their pasted surfaces together and a pair of presser rods adapted to press on the folded box and arranged in advance of the folder rods; substantially as described.

30. In a machine for folding paper box blanks, the combination, with the horizontal bed or table, of the trains of feed rollers O′, and J, for feeding the blanks along said table, folding means operating to fold the blanks into flat box form as they are advanced by said feed rollers, the trains of feed and pressure rollers to which the folded blanks are delivered by the rollers O′ and J and the pressure rods T^2 intermediate the rollers O′ and J and the feed and pressure rollers mentioned, for holding the folded blanks in flat form during their passage from the trains of rollers A′ and J to the other trains of rollers; substantially as described.

31. In a machine for folding paper box blanks, the combination with the horizontal bed or table provided at its opposite sides with the guides I I, the paste box P and the paste wheel P′ dipping therein and projecting vertically through the bed or table of the machine at one side thereof, longitudinal folder plates U, U′ supported by depending supports immediately above the table H, the folder rods Q, Q′ coöperating with said inner plates, trains of feed rollers O′ and J for feeding the blanks through the machine over the table, the guides F^2, F^2 for the opposite edges of the folded blank, the train of pressure rollers B and the presser rods T^2 intermediate the rollers B and the feed rollers O′; substantially as described.

32. In a machine for folding paper box blanks, the combination with the horizontal bed or table provided at its sides with the guides I I, the paste box P and the paste wheel P′ dipping therein and projecting vertically through the bed or table of the machine at one side thereof, longitudinal folder plates U, U′, supported by depending supports immediately above the table, the folder rods coöperating with said inner folder plates, the trains of feed rollers O′ and J for feeding the blanks through the machine over the table, the guides F^2, F^2 for the opposite edges of the folded blanks the train of pressure rollers B, the feed rollers V′, V′ intermediate the pressure rollers B and the feed-rollers O′, J, and the presser rods T^2 intermediate the rollers V′ V′ and the feed rollers O′, J; substantially as described.

33. In a machine for folding box blanks, the combination of means for feeding the blanks through the machine, mechanism for folding certain of the sides of the box, pressure rollers through which the folded blank passes, and a pair of presser rods arranged between the said rollers and folding mechanism for pressing upon the folded box after its folding; substantially as described.

34. In a machine for folding box blanks, the combination of feeding mechanism, folding mechanism for folding and bringing together the outer side portions of the blanks, and flat folder plates of substantially uniform

width, said plates being inclined inwardly and upwardly at their forward portions, bent downwardly substantially at their middle portion and continuing straight in a horizontal plane for the remainder of their length; substantially as described.

35. In a machine for folding paper box blanks, the combination of a feeding mechanism, folding mechanism for folding the outer side portions of the blanks, a pair of parallel folder plates adjustable transversely of the machine, and transversely adjustable guide plates for the unfolded blanks, to which guide plates the said folding mechanism is connected and with which it is adjustable; substantially as described.

36. In a machine for folding box blanks, the combination of feeding mechanism, folding mechanism for folding the outer side portions of the blanks, a pair of transversely adjustable guide plates arranged on opposite sides of such mechanism to accommodate different widths of unfolded blanks and a second pair of independently adjustable guide plates to accommodate different widths of folded blanks; substantially as described.

37. In a machine for folding box blanks, the combination of means for feeding the blanks through the machine, a pair of transversely adjustable guide plates, folding mechanism comprising a pair of inner adjustable folder plates and a coöperating pair of outer adjustable folding rods carried on the guide plates and serving to fold the opposite sides of the blank over said folder plates, substantially as described.

38. In a machine for folding paper box blanks, the combination, with pressure rolls for pressing the folded blanks, of feeding mechanism extending from the front of the machine to a point adjacent said rolls for the purpose of feeding the blanks through the machine, a pair of folder plates arranged parallel to each other and carried upon and at opposite sides of the feeding mechanism, said plates extending parallel to such feeding mechanism throughout substantially its entire length and being inclined as to their forward portions and flat as to their rearward portions, means for adjusting said plates independently towards and away from each other, and means for folding opposite sides of the blank upward and inward around the folder plates; substantially as described.

39. In a machine for folding paper box blanks, the combination of mechanism for feeding the blanks through the machine, a pair of folder plates arranged parallel to each other and having pins entering said mechanism, set screws coöperating with said pins for holding the plates in adjusted position, and a coöperating pair of folder rods serving to fold the opposite sides of the blank upward and inward around said folder plates; substantially as described.

40. In a machine for folding paper box blanks, the combination of mechanism for feeding the blanks through the machine, a pair of folder plates arranged parallel to each other upon opposite sides of the feeding mechanism and suspended therefrom, said plates being independently adjustable towards or away from each other, and a coöperating pair of folder rods supported at one end and having an universal adjustment near the other end and serving to fold the opposite sides of the blank over the folder plates; substantially as described.

41. In a machine for folding paper box blanks, the combination with the machine frame, of the lower train of feed rollers extending longitudinally of the machine, a frame suspended above the machine frame proper and having a series of opposite vertical slots, an upper train of downwardly spring-pressed feed rollers coöperating with the lower train to feed the blanks through the machine and having trunnions bearing in said slots, folder plates mounted upon said suspended frame, and a pair of folder rods coöperating with said plates to fold the blank; substantially as described.

42. In a machine for folding paper box blanks, the combination with the machine frame, of the lower train of feed rollers extending longitudinally of the machine, a supporting frame on the machine frame, a roller frame suspended from the supporting frame, an upper train of idler feed rollers journaled in the roller frame and cooperating with said lower train and folding means acting on the blanks as they are carried through the machine; substantially as described.

43. In a machine for folding paper box blanks, the combination with the machine frame, of a lower train of feed rollers extending longitudinally of the machine, a supporting frame on the machine frame, a roller frame suspended from the supporting frame and extending part way of the machine, an upper train of feed rollers journaled in the roller frame and coöperating with said lower train, means for vertically adjusting the roller frame and its train of feed rollers, and folding means acting on the blanks as they are carried through the machine; substantially as described.

44. In a machine for folding paper box blanks the combination with the machine frame, of the lower train of positively driven feed rollers extending longitudinally of the machine, a supporting frame on the machine frame, a roller frame, carried by the supporting frame and extending part way of the machine frame, an upper train of downwardly spring pressed idler feed rollers journaled in the roller frame and coöperating with said lower train; and a pair of adjustable supports depending from said supporting frame and engaging said roller frame, and folding means acting on the blanks as they are carried through the machine; substantially as described.

45. In a machine for folding paper box blanks, the combination of the machine frame, mechanism for folding the blanks, comprising a pair of extensible and adjustable folder rods and a pair of folder plates, pressure rolls for pressing the blanks after folding, and adjustable presser rods arranged substantially intermediate the folder rods and plates and the pressure rolls for holding the blanks in flat, folded form while being delivered to the pressure rolls; substantially as described.

46. In a machine for folding paper box blanks the combination of the machine frame, mechanism for folding the blanks, pressure rolls for pressing the blanks after folding, and adjustable pressure rods adapted to bear upon the folded blanks and hold them in flat form while being delivered to the pressure rolls; substantially as described.

47. In a machine for folding paper box blanks, the combination of the machine frame, mechanism for folding the blanks, pressure rolls for pressing the blanks after folding, and a pair of presser rods arranged on the machine frame for universal adjustment and adapted to bear upon the folded blanks and thereby hold them in flat form while being delivered to the pressure rolls; substantially as described.

48. In a machine for folding paper box blanks the combination of the machine frame, mechanism for folding the blanks, pressure rolls for pressing the blanks after folding, a pair of horizontal rods arranged at opposite sides of the machine, a post arranged on each rod and adapted to slide and swivel thereon, a support or bracket, and a pressure rod adjustable in said support and adapted to bear upon the folded blanks; substantially as described.

49. In a machine for folding paper box blanks, the combination of the machine frame, mechanism for folding the blanks, pressure rolls for pressing the blanks after folding and adjustable crank shaped pressure rods adapted to bear upon the folded blanks with one of the straight portions and thereby hold the blanks in flat form; substantially as described.

50. In a machine for folding paper box blanks the combination of means for feeding the blanks through the machine, folding mechanism therefor, a pair of longitudinally extending and transversely adjustable guide strips and presser rods arranged beyond the folding mechanism and adapted to hold the blanks in folded form; substantially as described.

51. In a machine for folding paper box blanks, the combination of means for feeding the blanks through the machine, folding mechanism therefor, a pair of longitudinally extending and transversely adjustable guide strips, and presser rods mounted on said strips and adjustable therewith; substantially as described.

52. In a machine for folding paper box blanks, the combination of means for feeding the blanks through the machine, folding mechanism therefor, a pair of longitudinally extending and transversely adjustable guide strips, and

presser rods mounted on said strips and adjustable therewith and also independently thereof, said rods being adapted to press upon and hold the blanks in folded form; substantially as described.

53. In a machine for folding paper box blanks, the combination of the machine frame, means thereon for folding the blanks, comprising a pair of parallel adjustable folder plates, a train of rollers for feeding the blanks through the machine, a series of pressure rolls for pressing the folded blanks, a gripping roller for gripping the blanks delivered from the feeding rollers and for feeding such blanks to the pressure rolls, and a pair of adjustable presser rods arranged in advance of the gripping roller for keeping the folded blanks pressed flat while being delivered to the gripping roller; substantially as described.

54. In a machine for folding paper box blanks, the combination of the machine frame, means thereon for folding the blanks, mechanism for feeding the blanks through the machine pressure rolls for pressing the blanks after folding and a transversely adjustable roller arranged intermediate said rolls and folding means for delivering the folded blanks to the rolls; substantially as described.

55. In a machine for folding paper box blanks, the combination of the machine frame, means thereon for folding the blanks, mechanism for feeding the blanks while being folded, a train of pressure rolls for pressing the blanks after folding, a transverse rotatable shaft in said frame adjacent the rolls, a pair of pressure rollers secured on said shaft and adjustable longitudinally thereof and a cylindrical pressure roll with which said rollers coöperate; substantially as described.

56. In a machine for folding paper box blanks, the combination with means for feeding the blanks through the machine, of a pair of folding rods longitudinally and rotarily adjustable and encountered by the blank in its progress through the machine and adapted to fold such blank and supports having a universal movement and connected to the rods respectively intermediate of their length; substantially as described.

57. In a machine for folding paper box blanks, the combination of a machine frame, a pair of adjustable strips extending longitudinally of the machine and forming an adjustable table, feeding mechanism arranged between said strips for feeding the blanks along the top of such table, folder plates arranged at opposite sides of the feeding mechanism and inclined as to their forward portions and flat or horizontal as to their rearward portions, and means coöperating with the folder plates for folding the blanks; substantially as described.

58. In a machine for folding paper box blanks, the combination with the machine frame, of a pair of transversely adjustable flat strips extending longitudinally of the machine and forming a table, a suspended frame having a series of rollers arranged centrally and longitudinally of the machine and between the strips for feeding the blanks, a pair of folder plates supported by such suspended frame, and folder rods arranged above the table and arranged convergingly across the rearward end of said plates, said folder rods being independently adjustable; substantially as described.

59. In a machine for folding paper box blanks, the combination with mechanism for feeding the blanks through the machine, of a pair of folder plates supported slightly above the bed or table of the machine to permit of the passage of the blanks therebelow, said folder plates being independently adjustable toward and away from each other to accommodate differently scored blanks, and a pair of folder rods arranged adjacent said folder plates and coöperating therewith to fold the blanks, said folder rods extending rearwardly convergingly above and across the folder plates and with their forward portions arranged to fold opposite sides of the blanks upwardly and laterally and with their rearward portions arranged to fold such opposite sides downwardly; substantially as described.

60. In a machine for folding paper box blanks, the combination with means for feeding the blanks through the machine, of a pair of folder rods having a universal adjustment on the machine and adapted to fold the blank and a pair of universally adjustable supports to which the rods are connected intermediate of their lengths; substantially as described.

61. In a machine for folding paper box blanks, the combination with means for feeding the blanks through the machine, a pair of folder rods adjustably arranged on the machine, and also adjustable in length; substantially as described.

62. In a machine for folding paper box blanks, the combination with means for feeding the blanks through the machine, of a pair of folder rods for folding the blanks, and means for adjusting the position of each rod comprising a post mounted on the machine, a support or bracket adjustable on the post, and a rod adjustably secured to said support and connected to its folder rod; substantially as described.

63. In a machine for folding paper box blanks, the combination with means for feeding the blanks through the machine, of a pair of folder rods for folding the blank and means for adjusting the position of each rod comprising a horizontal rod or bar on the machine, a post adjustably secured to the rod or bar, a support or bracket adjustable on the post and a rod adjustably secured to said support and connected to its folder rod; substantially as described.

64. In a machine of the class described, the combination, with means for feeding the blanks through the machine, of the horizontal rods R on the machine, posts S having clamps on their lower ends to engage the rods R, supports or brackets S′ adjustable longitudinally and rotarily of their posts, rods *s* adjustable in the supports S′ and folder rods Q, Q′ to which the rods *s* are connected; substantially as described.

65. In a machine for folding paper box blanks, the combination with means for feeding the blanks through the machine, of a pair of folder rods for folding the blanks and means for adjusting the position of each rod comprising a post mounted on the machine, a support or bracket on the post, and a rod adjustably secured to said support and pivoted at one end to its folder rod; substantially as described.

66. In a machine for folding paper box blanks, the combination, with means for feeding the blanks through the machine, of a pair of folder rods for folding the blanks and means for adjusting the position of each rod comprising a post mounted on the machine and adjustable longitudinally and axially, a support or bracket on the post and a rod adjustably secured to said support and pivoted at one end to its folder rod; substantially as described.

67. In a machine for folding paper box blanks, the combination with means for feeding the blanks through the machine, of folding mechanism, a pair of adjustable guides for the flat blanks and a second pair of adjustable guides for the folded blanks; substantially as described.

68. In a machine for folding paper box blanks, the combination, with means for feeding the blanks through the machine, of folding mechanism, a pair of adjustable guides for the folded blanks and means for simultaneously adjusting such guides towards or away from each other; substantially as described.

69. In a machine for folding paper box blanks, the combination with means for feeding the blanks through the machine, of folding mechanism, a pair of longitudinally arranged strips forming a table on which the blanks pass, guide plates shorter than said strips and arranged upon the rearward end of the latter for the purpose of guiding the folded blanks, means for simultaneously adjusting such strips and their guide plates towards or away from each other transversely of the machine, and a second pair of guide plates arranged in the rear of the first named guide plates and adapted to guide the unfolded blanks; substantially as described.

70. In a machine for folding paper box blanks, the combination with means for feeding the blanks through the machine, a pair of adjustable guides for the unfolded blanks, folding devices carried by said guides and a second pair of adjustable guides for the folded blanks; substantially as described.

71. In a machine for folding paper box blanks, the combination with means for feeding the blanks through the machine a pair of adjustable guides for the unfolded

blanks, folding devices comprising folder rods mounted on said guides and a second pair of adjustable guides for the folded blanks; susbtantially as described.

72. In a machine for folding paper box blanks, the combination with means for feeding the blanks through the machine, a pair of guides adjustable transversely of the machine to accommodate different widths of unfolded blanks, folding devices comprising folder rods mounted on said guides, a second pair of adjustable guides for the folded blanks, and means for simultaneously adjusting such second pair of guides transversely of the machine and towards or away from each other; substantially as described.

73. In a machine for folding paper box blanks, the combination of means for feeding the blanks through the machine, folding mechanism, a pair of guides for the folded blanks and adjustable transversely of the machine, and means for obtaining simultaneous adjustment of said guides comprising a rotatable screw having right and left hand screw threads to coöperate with the guides respectively; substantially as described.

74. In a machine for folding paper box blanks, the combination, of means for feeding the blanks through the machine, folding mechanism, a pair of guides for the folded blanks and adjustable transversely of the machine, a pair of longitudinal strips to which said guides are secured, and a rotatable screw having right and left hand screw threads coöperating with the strips to adjust them and their guides towards or away from each other; substantially as described.

75. In a machine for folding paper box blanks, the combination of means for feeding the blanks through the machine, folding mechanism, a pair of guides for the folded blanks and adjustable transversely of the machine, a pair of longitudinal strips to which said guides are secured, blocks secured to the strips and arranged to slide transversely of the machine and a rotatable screw having right and left hand screw threads engaging with the blocks respectively; substantially as described.

76. In a machine for folding paper box blanks, the combination of means for feeding the blanks through the machine, folding mechanism, a pair of adjustable guide strips extending longitudinally of the machine, a pair of blocks secured to each strip, two rotatable screws having right and left hand screw threads to engage a pair of blocks each, and means for rotating said screws in unison; substantially as described.

77. In a machine for folding paper box blanks, the combination of means for feeding the blanks through the machine, folding mechanism, a pair of adjustable guide strips extending longitudinally of the machine, a pair of blocks secured to each strip, two rotatable screws having right and left hand screw threads to engage a pair of blocks each, and means for rotating said screws in unison, comprising a longitudinal shaft, gears thereon at its ends, gears meshing therewith and secured to said screws and a hand operated device connected to one of the screws; substantially as described.

78. In a machine for folding paper box blanks, the combination of means for feeding the blanks, folding mechanism, a pair of transversely adjustable strips extending longitudinally of the machine and forming a table on which the blanks pass, blocks secured to the strips respectively, a rotatable screw having right and left screw threads engaging the blocks respectively, guides secured to the rear portions only of such strips for guiding the folded blanks, and independently adjustable guides arranged at the forward end of the machine for the unfolded blanks; substantially as described.

79. In a machine for folding paper box blanks, the combination of means for feeding the blanks, folding mechanism, a pair of adjustable guide strips extending longitudinally of the machine, blocks secured to the strips respectively, a rotatable screw having right and left hand screw threads engaging the blocks respectively and means for holding the screw in adjusted position comprising a clamp secured to the machine and engaging the screw and a device for operating the clamp; substantially as described.

80. The combination of a machine frame having longitudinal rails C C, having at certain points cut away portions, transverse folding mechanism in the machine, a pair of adjustable guide strips also forming the machine table, a pair of blocks secured to each strip and arranged to slide in said cut away portions, and rotatable screws having right and left hand screw threads adapted to engage said blocks; substantially as described.

81. In a machine for folding box blanks the combination of blank feeding mechanism, guides arranged at opposite sides of the machine and between which the blank passes, and blank folding mechanism comprising a pair of folder rods adjustably secured at one end to said guides; substantially as described.

82. In a machine for folding box blanks, the combination of blank feeding mechanism, guides arranged at opposite sides of the machine, and adjustable transversely thereof, and blank folding mechanism comprising a pair of folder rods adjustably secured at one end to said guides and adjustable therewith; substantially as described.

83. In a machine for folding paper box blanks, the combination of blank feeding mechanism, a pair of adjustable guide plates, blank folding mechanism comprising a pair of folder rods secured at one end to said guide plates and adjustable therewith and also capable of independent transverse adjustment; substantially as described.

84. In a machine for folding paper box blanks, the combination of blank feeding mechanism and blank folding mechanism comprising a pair of folder rods adjustably secured at one end and having a universal movement at the other end and also having an adjustment in length; substantially as described.

85. In a machine for folding box blanks, the combination of blank feeding mechanism, a pair of guides arranged at opposite sides of the machine and between which the unfolded blank passes, a second pair of guides arranged in advance of the other guides and through which the folded blank passes, and folding mechanism comprising a pair of folder rods connected at one end to the first mentioned pair of guides respectively, and near the other end to the other pair of guides respectively; substantially as described.

86. In a machine for folding box blanks, the combination, of blank feeding mechanism, guides I, I, adjustably arranged on the machine and folder rods Q, Q' and transverse rods *q* adjustably secured to said guides and to which said folder rods are pivoted at one end; substantially as described.

87. In a machine for folding paper box blanks, the combination of means for feeding the blanks through the machines, and a pair of folder rods for folding the blanks, each rod being formed of telescoping sections; substantially as described.

88. In a machine for folding paper box blanks, the combination of means for feeding the blanks through the machine, and a pair of folder rods for folding the blanks, each rod being composed of a tube section connected to the machine and a rod section telescoping into the tube section; substantially as described.

89. In a machine for folding paper box blanks, the combination of means for feeding the blanks and a pair of folder rods for folding the blanks, each rod being composed of a tube section pivotally supported on the machine, and a rod section telescoping into the tube section, and also supported on the machine; substantially as described.

90. In a machine for folding paper box blanks, the combination of means for feeding the blanks and a pair of folder rods for folding the blanks, each rod being composed of a tube section, and a rod section telescoping therein and adjustable rods *q* mounted on the machine and to which the tube sections are pivotally connected; substantially as described.

91. In a machine for folding paper box blanks, the combination of means for feeding the blanks transversely, adjustable guide plates I arranged longitudinally of the machine, and a pair of telescoping folder rods pivotally connected with the guide plates respectively and adjustable therewith; substantially as described.

92. In a machine for folding paper box blanks, the combination of means for feeding the blanks transversely, adjustable guide plates I arranged longitudinally of the machine, and a pair of folder rods pivotally connected at their

inner ends with the guide plates respectively and supported at their outer ends upon the machine with a universal adjustment; substantially as described.

93. In a machine for folding paper box blanks, the combination with means for feeding the blanks, blank folding mechanism, transversely adjustable guide plates, a glue mechanism comprising a glue pot, a glue roller therein, a superposed glue wheel, and means whereby the roller and glue wheel may be adjusted simultaneously with the guide plates; substantially as described.

94. In a machine for folding paper box blanks, the combination of means for feeding the blanks, blank folding mechanism, transversely adjustable guide plates one of which has a slot, and glue mechanism comprising a glue pot, a glue roller extending into the glue pot and passing through said slot, a rotating shaft on which the glue roller is mounted to slide longitudinally and to be rotated, and a superposed glue wheel; substantially as described.

95. In a machine for folding paper box blanks, the combination of means for folding the blanks, blank feeding mechanism, transversely adjustable guide plates, and glue mechanism comprising a glue pot, a glue roller therein, a rotating shaft on which the glue roller is mounted to slide longitudinally and to be rotated, a superposed glue wheel, and a scraper adjustable with the adjustments of the glue roller, said glue roller being adjustable with the guide plates substantially as described.

96. In a machine for folding paper box blanks, the combination of means for feeding the blanks, blank folding mechanism, transversely adjustable guide plates, one of which is provided with a slot and glue mechanism comprising a glue pot, a glue roller projecting through said slot and adjustable therewith and a superposed glue wheel mounted on said plate which is provided with the slot; substantially as described.

97. In a machine for folding paper box blanks, means for feeding the blanks in combination with folding mechanism comprising a pair of folder rods pivoted at one end to the machine, posts S arranged on the machine, short rods pivotally connected to the folder rods respectively intermediate of their length and adjustably supported by said posts; substantially as described.

98. In a machine for folding paper box blanks, means for feeding the blanks in combination with folding mechanism comprising a pair of adjustable folder rods, rods R mounted on the machine, posts S adjustably mounted on the rods R respectively and means for adjustably connecting the folder rods intermediate of the length to the posts respectively; substantially as described.

99. In a machine for folding paper box blanks, means for feeding the blanks in combination with adjustable folding mechanism comprising a pair of folder rods, rods R mounted on the machine, posts S adjustably mounted for longitudinal and rotarial movement on said rods R and adjustable connections between the folder rods and their respective posts; substantially as described.

100. In a machine for folding paper box blanks, means for feeding the blanks in combination with adjustable folding mechanism comprising a pair of folder rods, two rods R mounted longitudinally of the machine, posts S adjustably mounted for longitudinal and rotarial movement on said rods R, clamps S′ arranged on said posts and rods *s* connecting the folder rods with their respective clamp; substantially as described.

101. In a machine for folding paper box blanks, means for feeding the blanks in combination with adjustable folding mechanism comprising a pair of folder rods, two rods R mounted longitudinally of the machine, posts S adjustably mounted on the rods R respectively, adjustable connections between the folder rods and said posts respectively, posts T also adjustably mounted on the rods R, and presser rods T^2 adjustably carried by said posts T; substantially as described.

102. In a mechanism for folding paper box blanks, means for feeding the blanks in combination with a pair of adjustable strips forming a table, folder rods pivoted at one end to the machine, guides F^2 arranged at the rear ends of said strips to guide the folded blanks, adjustable supports mounted on said strips and connected to the folder rods respectively intermediate of their length, a second set of adjustable supports also mounted on the strips and presser devices carried by the latter set of supports for pressing on the blanks after their folding; substantially as described.

103. In a machine for folding paper box blanks, the combination of a pair of folder plates and a coöperating pair of folder rods arranged to fold the opposite sides of a blank over said folder plates each rod being in sections slidable longitudinally on each other and thereby adjustable in length; substantially as described.

104. In a machine for folding paper box blanks, the combination of a lower train of feed rollers extending longitudinally of the machine, a longitudinal trough or roller-supporting frame supported above said lower train of rollers, an upper train of feed rollers journaled in said trough and coöperating with the lower train of rollers to carry the blanks through the machine, a yoke carried on the extreme rear end of such trough and in which the last one of the upper train of rollers is journaled, and mechanism for folding the blanks as they are carried through the machine; substantially as described.

105. In a machine for folding paper box blanks, the combination of means for feeding the blanks through the machine, a pair of longitudinal strips which are transversely adjustable and form a table or bed on which the blanks pass, means for simultaneously adjusting such strips toward and away from each other, a pair of folder plates arranged substantially above such strips, and mechanism for folding the blanks over said plates; substantially as described.

106. In a machine for folding paper box blanks, the combination, with the machine frame, of means for feeding the blanks through the machine, a pair of longitudinal strips forming a table or bed on which the blanks pass and having transverse bearings in such frame and arranged to be adjusted transversely thereof, means for adjusting such strips and causing them to approach or recede from each other in unison, a pair of folder plates arranged substantially above such strips, and mechanism for folding the blanks over said plates; substantially as described.

107. In a machine for folding paper box blanks, the combination of means for feeding the blanks through the machine, a pair of longitudinal strips which are transversely adjustable and form a table or bed on which the blanks pass, means for simultaneously adjusting such strips transversely and causing them to approach or recede from each other in unison, a pair of folder plates arranged substantially above such strips and adjustable transversely of the machine, and mechanism for folding the blanks over said plate; substantially as described.

108. In a machine for folding paper box blanks, the combination of means for feeding the blanks through the machine, a pair of longitudinal strips which are transversely adjustable and form a table or bed on which the blanks pass, means for simultaneously adjusting such strips transversely and causing them to approach or recede from each other in unison, a pair of folder plates arranged substantially above such strips and having independent adjustment transversely of the machine, and mechanism for folding the blanks over said plates; substantially as described.

109. In a machine for folding paper box blanks, the combination, with the machine frame having transverse slots, of means for feeding the blanks through the machine, means for folding the blanks, a pair of longitudinal strips having blocks slidable in said slots for transverse adjustment on the machine frame, and means for adjusting such strips and causing them to approach or recede from each other in unison; substantially as described.

110. In a machine for folding paper box blanks, the combination, with the machine frame having transverse slots, of means for feeding the blanks through the machine, means for folding the blanks, a pair of longitudinal strips having blocks slidable in said slots for transverse adjustment on the machine frame, means for adjusting such strips and causing them to approach or recede from each other in unison, and means for locking the strips in adjusted position; substantially as described.

111. In a machine for folding paper box blanks, the combination, with the machine frame having transverse slots, of means for feeding the blanks through the machine, means for folding the blanks, a pair of longitudinal strips having blocks slidable in said slots for transverse adjustment on the machine frame, and means for adjusting such strips towards and away from each other comprising a rotatable screw having right and left hand threads cooperating with the strips to move them in unison either toward or away from each other; substantially as described.

112. In a machine for folding paper box blanks, the combination, with the machine frame having transverse slots, of means for feeding the blanks through the machine, means for folding the blanks, a pair of longitudinal strips having blocks slidable in said slots for transverse adjustment on the machine frame, and means for adjusting such strips towards and away from each other comprising separate blocks secured to the strips respectively, and a rotatable screw having right and left hand threads engaging the blocks respectively; substantially as described.

113. In a machine for folding paper box blanks, the combination, with the machine frame having transverse slots, of means for feeding the blanks through the machine, means for folding the blanks, a pair of longitudinal strips having blocks slidable in said slots for transverse adjustment on the machine frame, means for adjusting such strips and causing them to approach or recede from each other in unison, a pair of folder plates supported from above on such frame and arranged substantially above such strips, and means for independently adjusting such plates transversely of the machine; substantially as described.

114. In a machine for folding paper box blanks, the combination, with the machine frame having transverse slots, of means for feeding the blanks through the machine, means for folding the blanks, a pair of longitudinal strips having blocks slidable in said slots for transverse adjustment on the machine frame, said strips being flat and horizontally disposed, means for adjusting such strips and causing them to approach or recede from each other in unison, and a pair of folder plates supported from above on such frame and arranged substantially above the strips, such plates being inclined towards the strips at their forward ends and substantially parallel therewith at their other ends; substantially as described.

115. In a machine for folding paper box blanks, the combination of a lower train of feed rollers extending longitudinally of the machine, a longitudinal trough or roller supporting frame supported above said lower train of rollers, a pair of folder plates carried by and independently adjustable on said trough, a pair of longitudinal strips forming the table or bed on which the blanks pass and transversely adjustable in unison towards and away from each other, such strips being arranged below the folder plates, and means for so adjusting the strips in unison; substantially as described.

116. In a machine for folding paper box blanks, the combination, with the machine frame, of means for folding the blanks, mechanism for feeding them through the machine, a series of pressure rolls for pressing the folded blanks, and a transversely adjustable gripping roller positively operated and arranged in advance of the pressure rolls for gripping the blanks delivered from the feeding mechanism and feeding such blanks to the pressure rolls; substantially as described.

117. In a machine for folding paper box blanks, the combination, with the machine frame, of means for folding the blanks, mechanism for feeding them through the machine, a series of pressure rolls for pressing the folded blanks, a cylindrical roller V journaled in the machine frame, a positively driven rotatable shaft V^2 also journaled in such frame and above the roller V, and two gripping rollers V' transversely adjustable on said shaft; substantially as described.

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