

No. 639,809.

Patented Dec. 26, 1899.

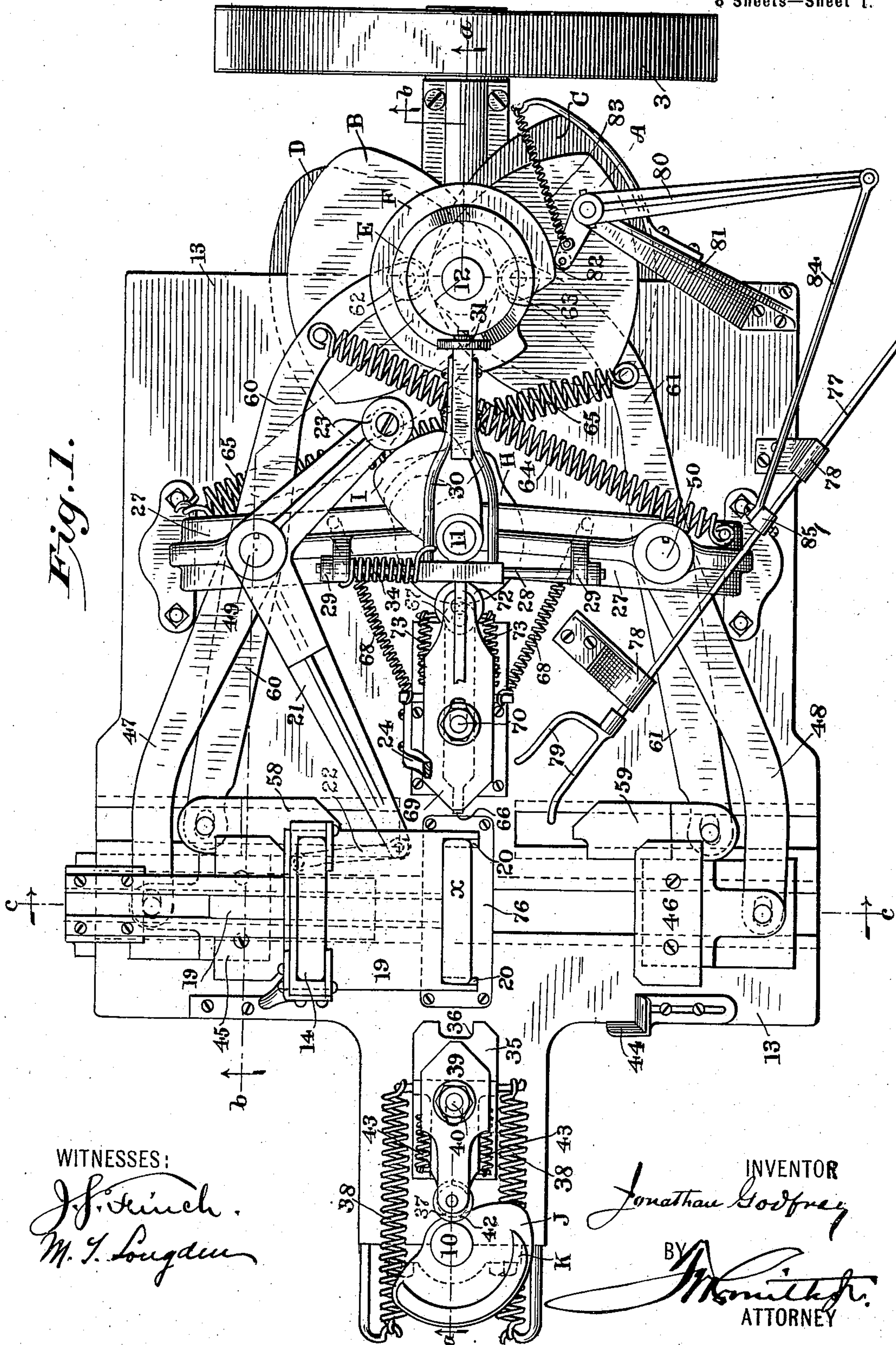
J. GODFREY.  
PAPER BOX MACHINE.

(Application filed Apr. 19, 1899.)

(No Model.)

8 Sheets—Sheet 1.

Fig. 1.



WITNESSES:

J. F. Finch.  
M. T. Longden

INVENTOR

Jonathan Godfrey

BY

J. Smith & Co.  
ATTORNEY



No. 639,809.

Patented Dec. 26, 1899.

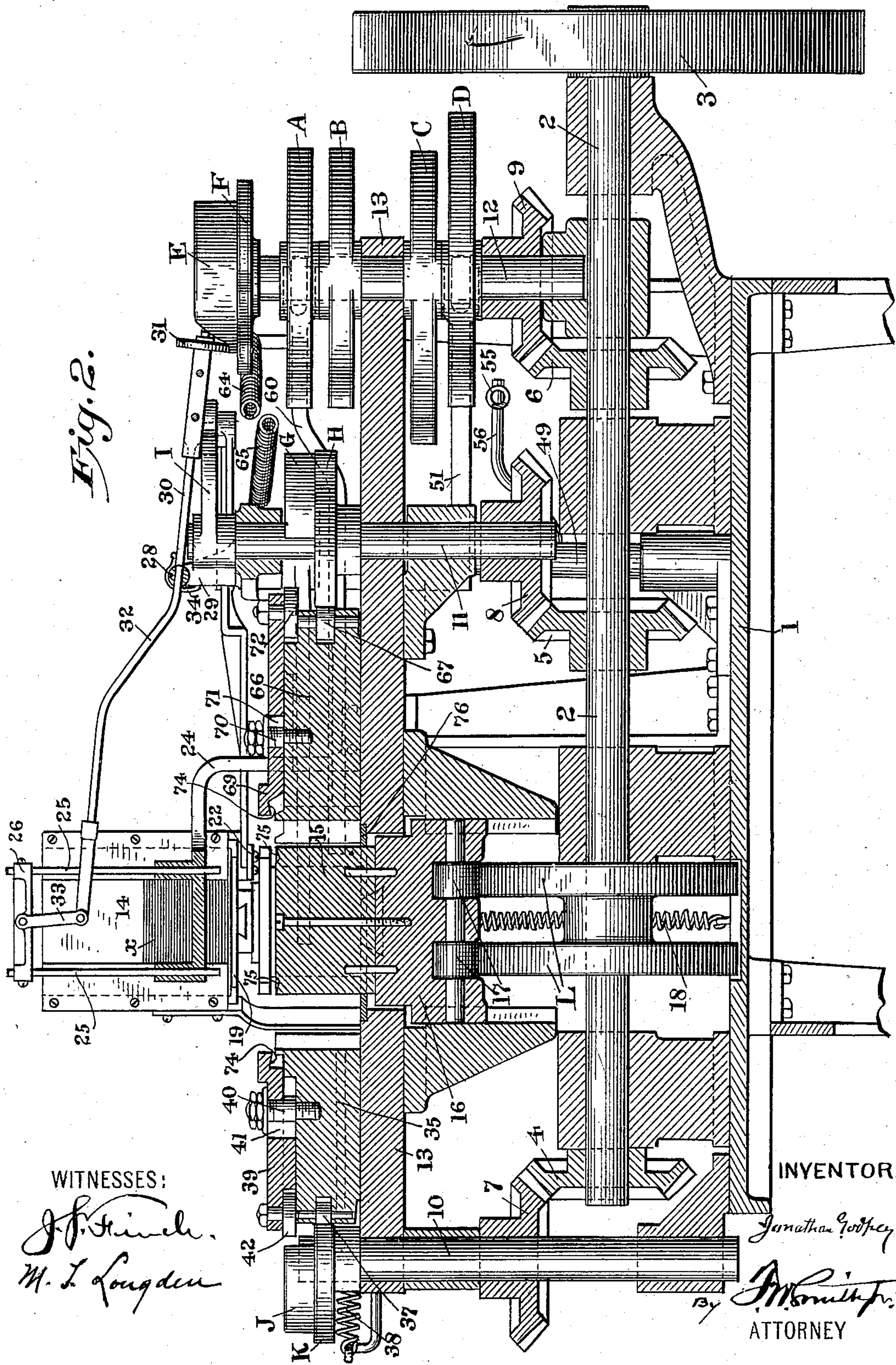
J. GODFREY.

PAPER BOX MACHINE.

(Application filed Apr. 19, 1899.)

(No Model.)

8 Sheets—Sheet 2.



WITNESSES:

*J. P. Kinch.*  
*M. L. Longden*





No. 639,309.

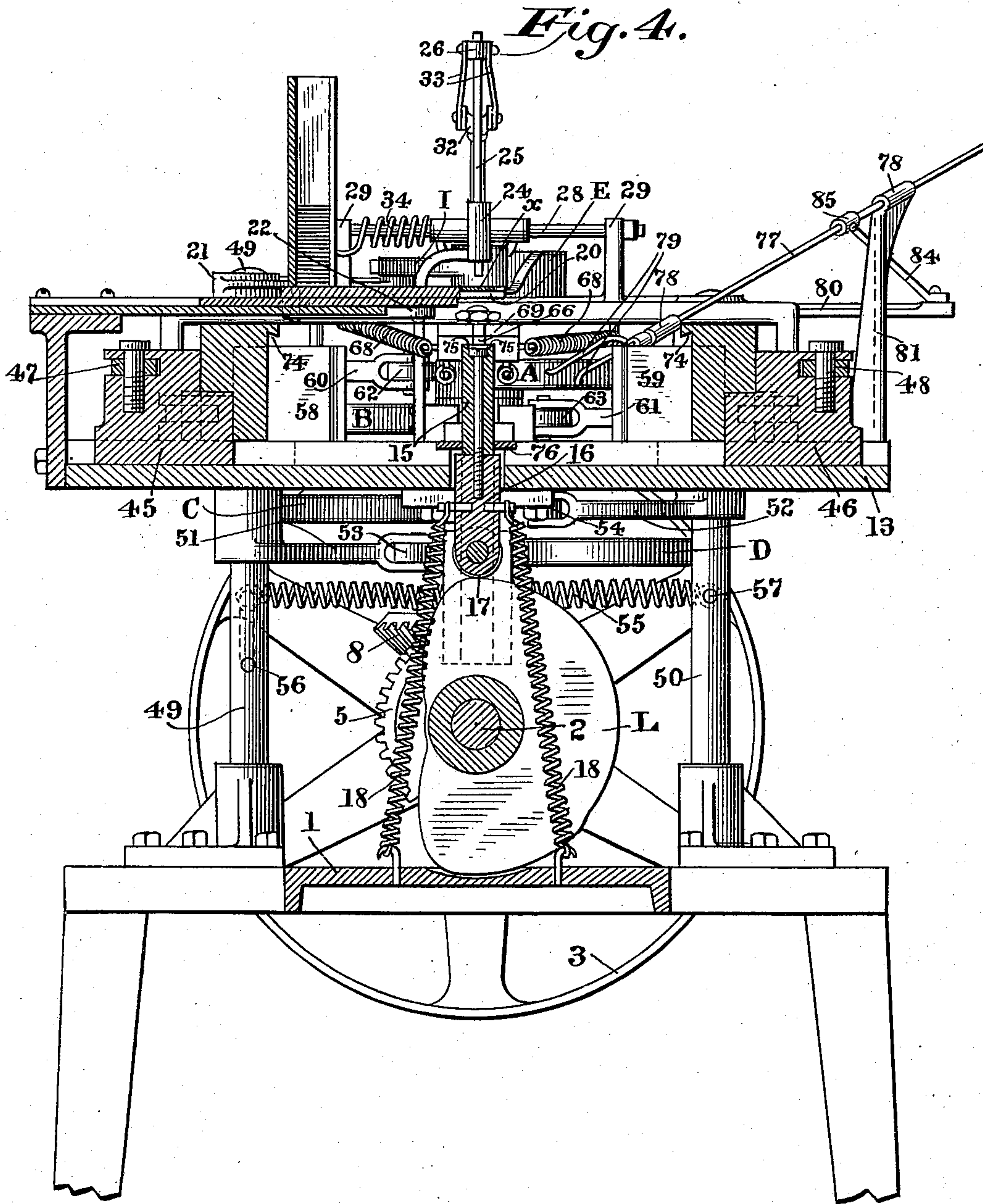
Patented Dec. 26, 1899.

J. GODFREY.  
PAPER BOX MACHINE.

(Application filed Apr. 19, 1899.)

(No Model.)

8 Sheets—Sheet 4.



WITNESSES:

*J. Finch.*  
*M. J. Longden*

INVENTOR

*Jonathan Godfrey*

BY

*A. Smith*

ATTORNEY



No. 639,809.

Patented Dec. 26, 1899.

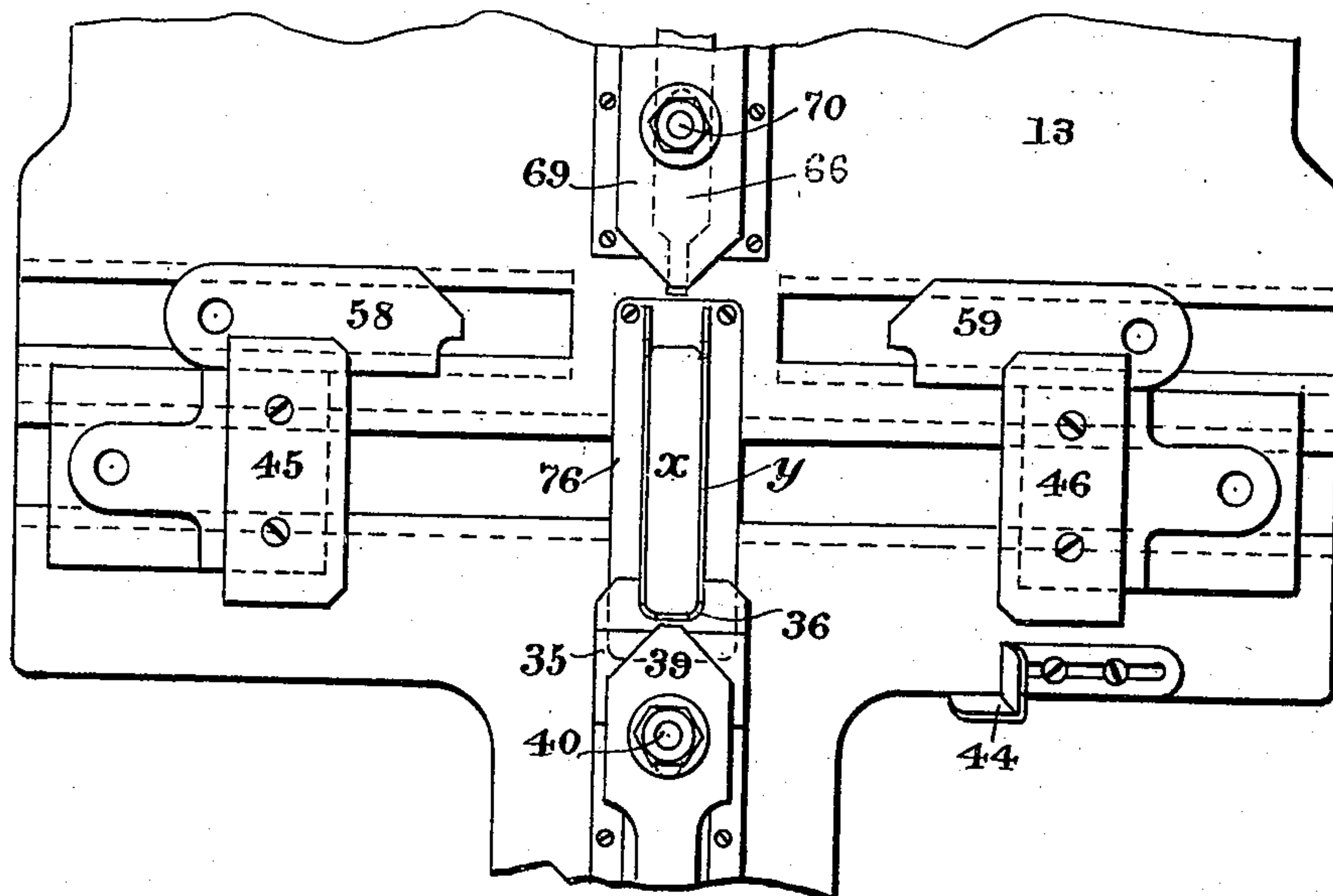
J. GODFREY.  
PAPER BOX MACHINE.

(Application filed Apr. 19, 1899.)

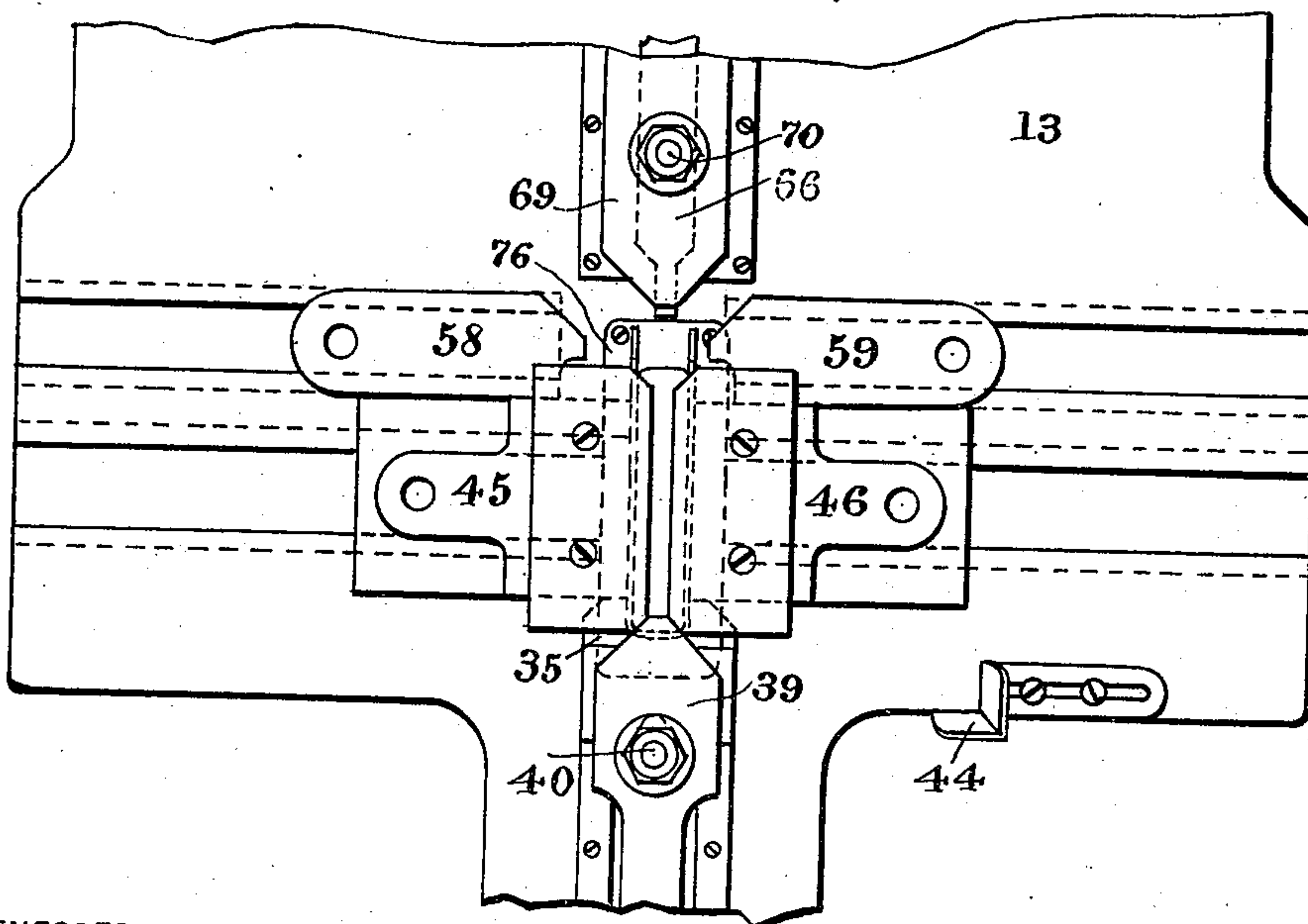
(No Model.)

8 Sheets—Sheet 5.

*Fig. 5.*



*Fig. 6.*



WITNESSES:

*J. F. Finch.*  
*M. J. Loughead.*

INVENTOR

*Jonathan Godfrey*

BY

*Monell*

ATTORNEY

No. 639,809.

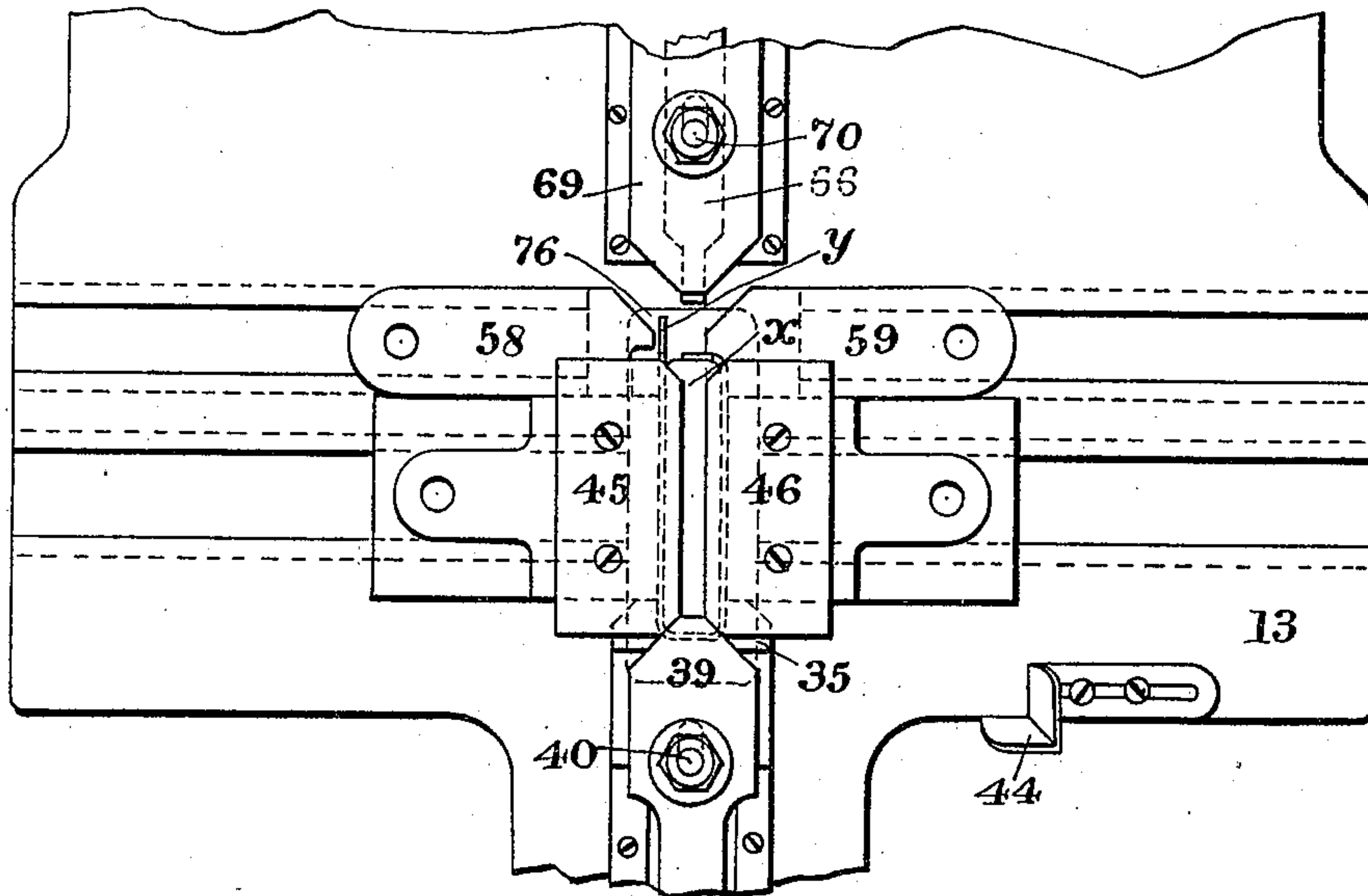
Patented Dec. 26, 1899.

J. GODFREY.  
PAPER BOX MACHINE.  
(Application filed Apr. 19, 1899.)

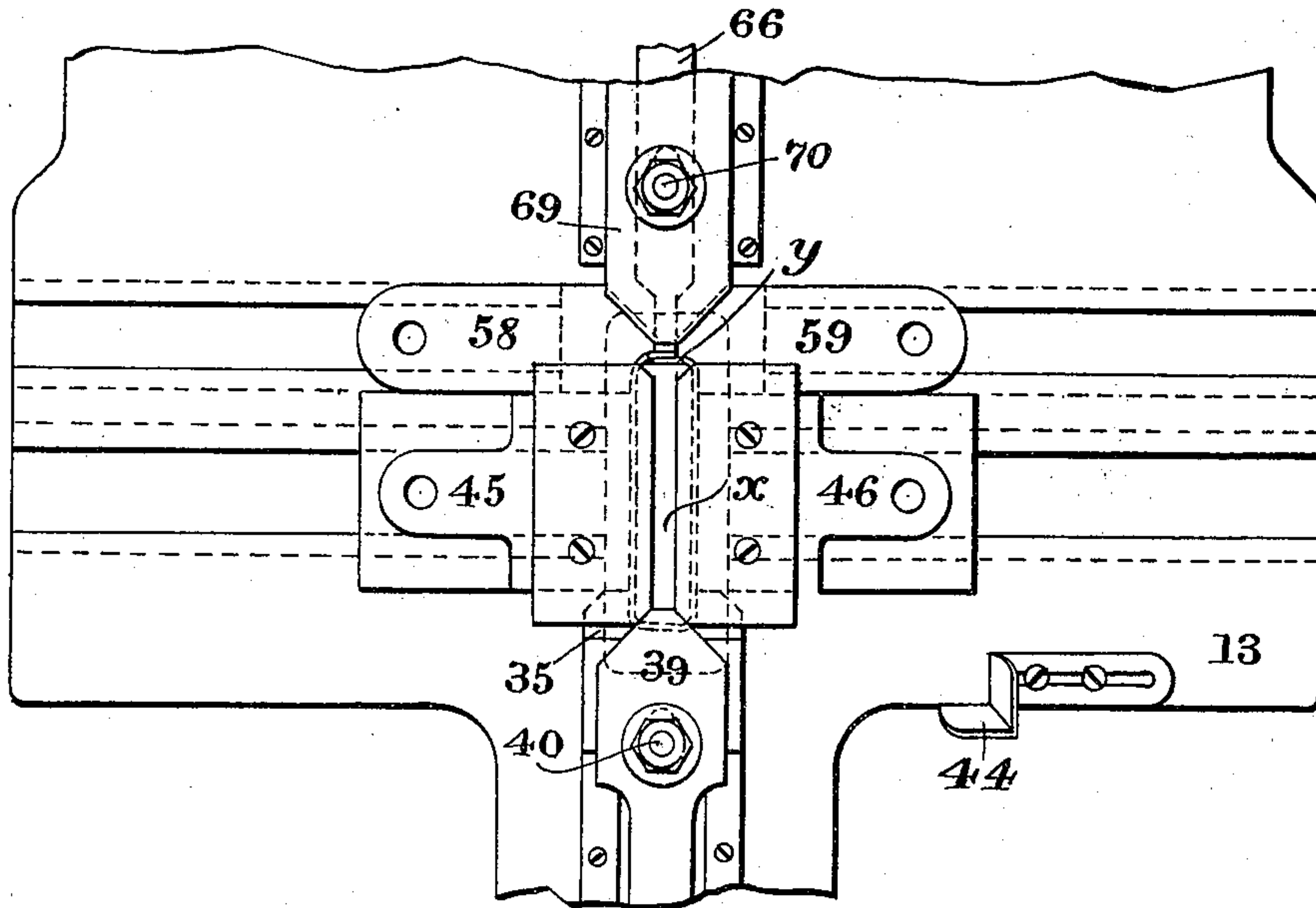
(No Model.)

8 Sheets—Sheet 6

*Fig. 7.*



*Fig. 8.*



WITNESSES:

*J. F. Finch.*  
*M. J. Longden.*

INVENTOR

*Jonathan Godfrey*  
BY *A. Smith Jr.*  
ATTORNEY

No. 639,809.

Patented Dec. 26, 1899.

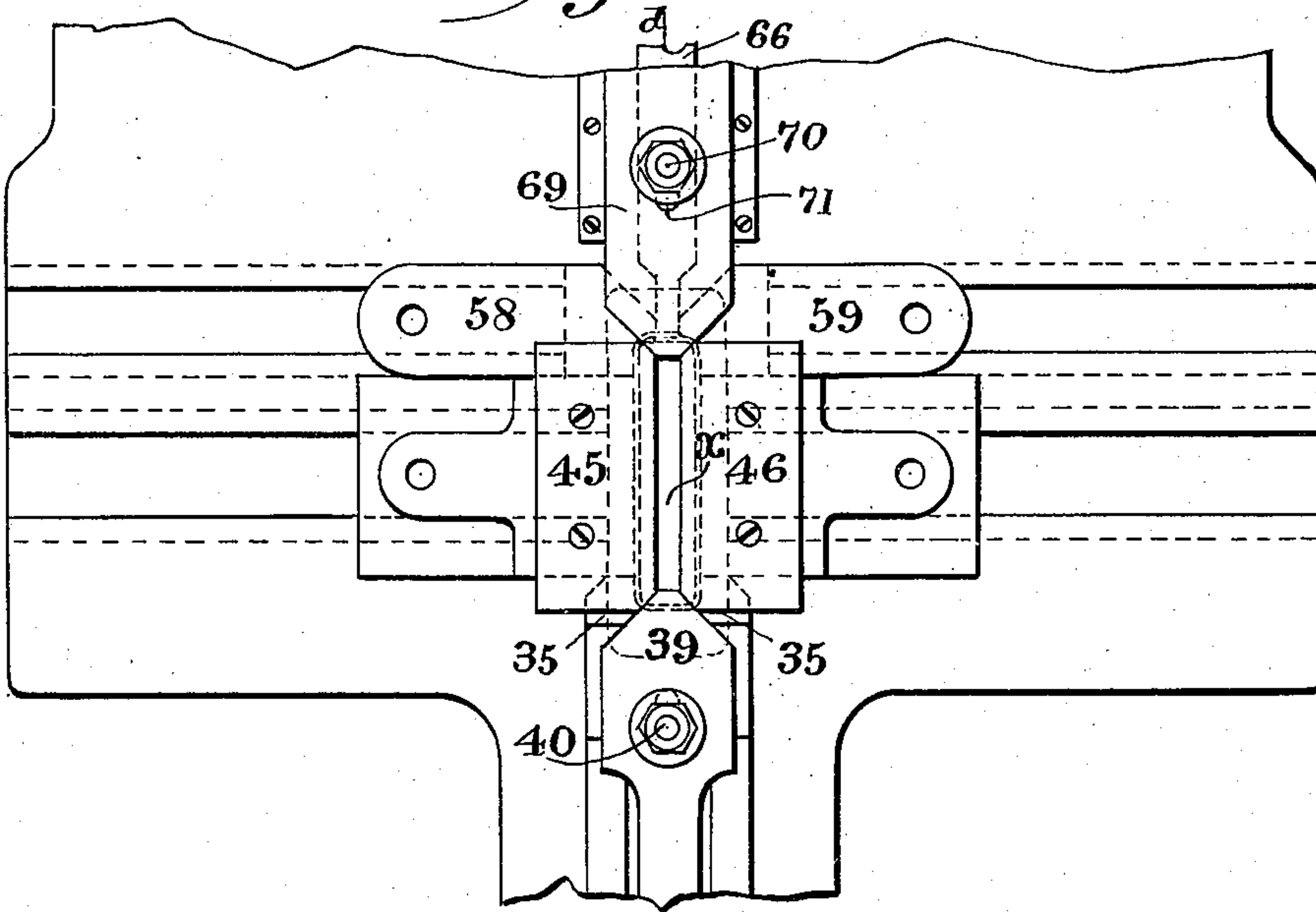
J. GODFREY.  
PAPER BOX MACHINE.

(Application filed Apr. 19, 1899.)

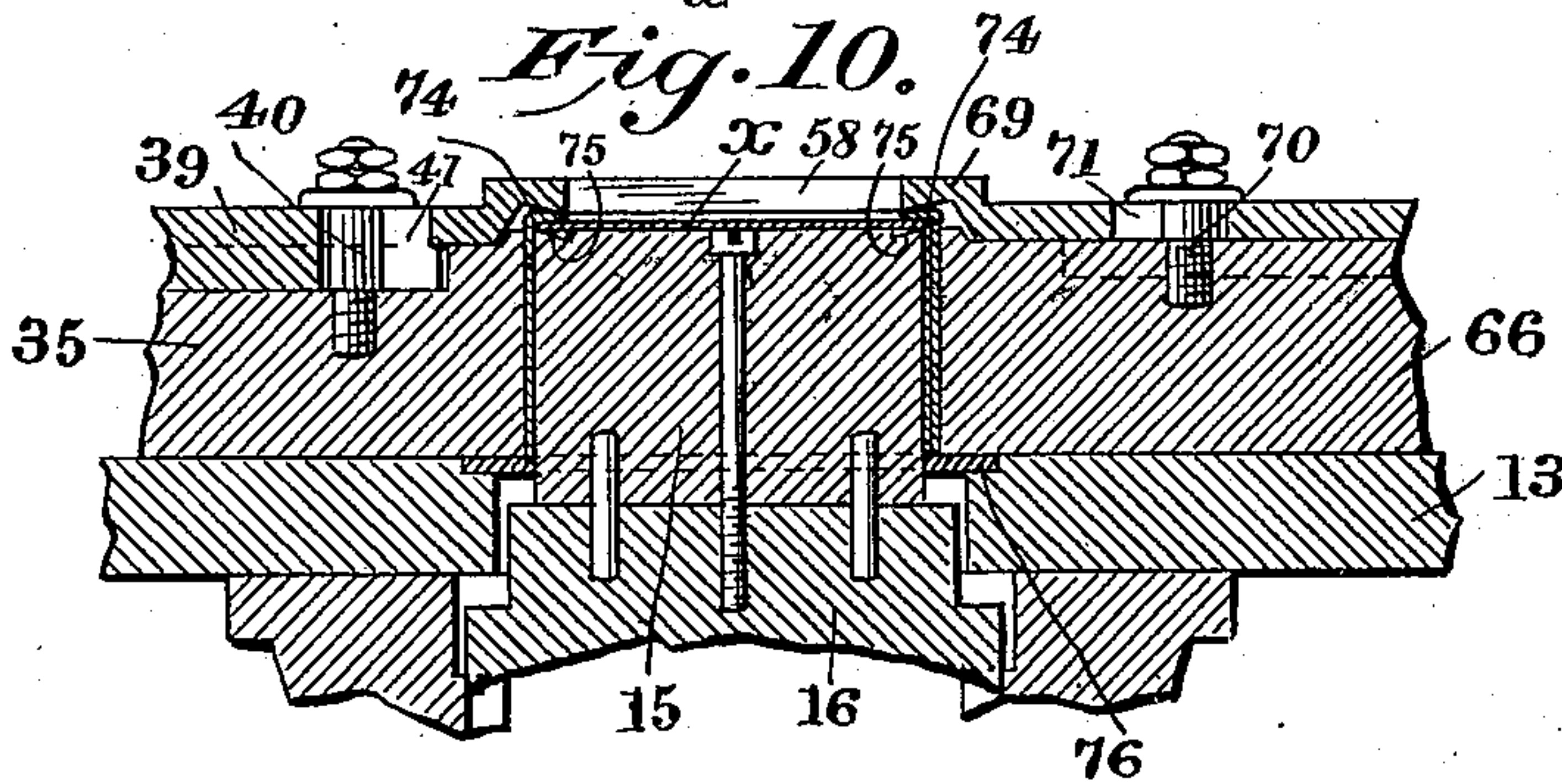
(No Model.)

8 Sheets—Sheet 7.

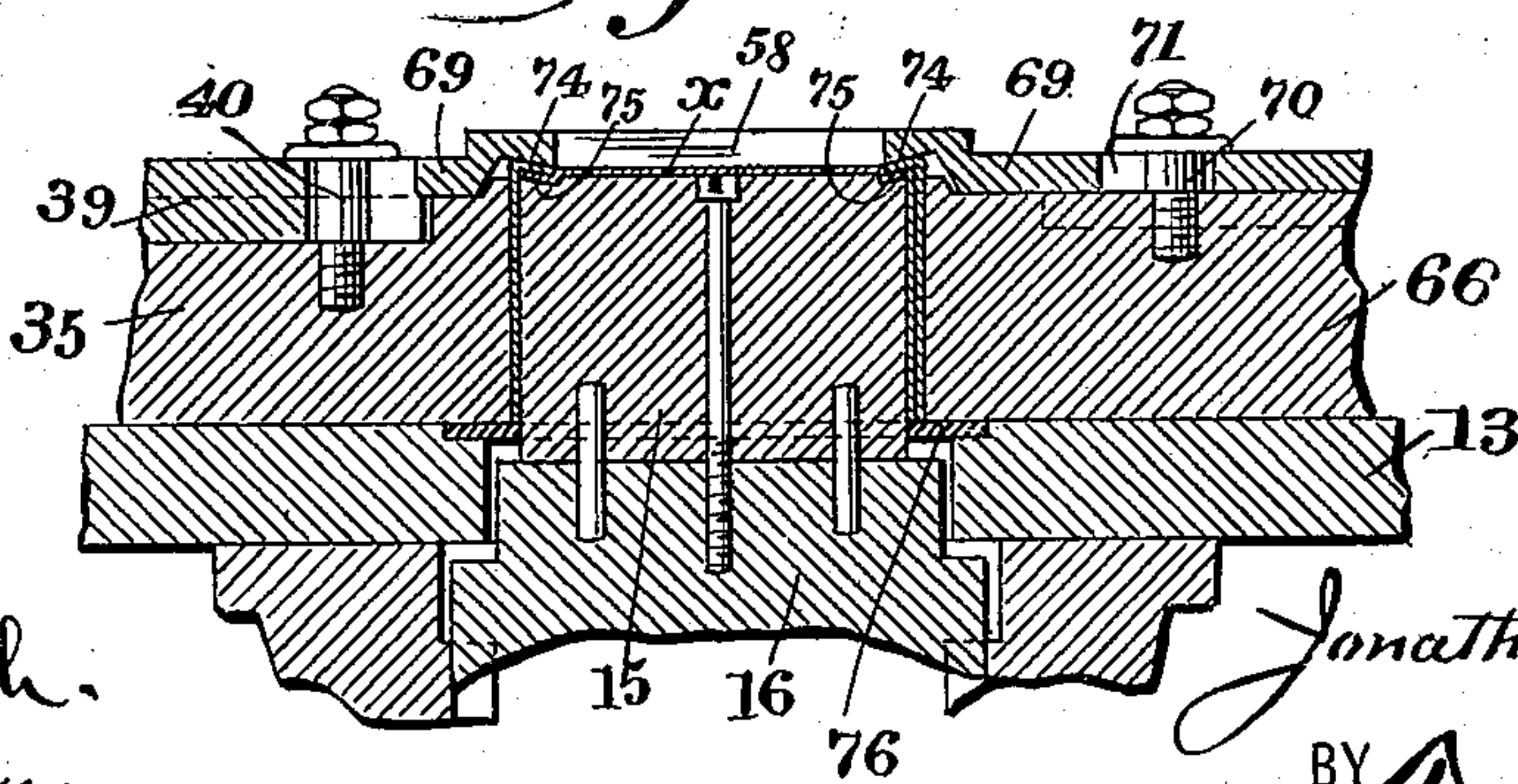
*Fig. 9.*



*Fig. 10.*



*Fig. 11.*



WITNESSES:

*J. F. Kinch.*  
*M. J. Longden.*

INVENTOR

*Jonathon Godfrey*

BY

*A. Honnith*  
ATTORNEY



No. 639,809.

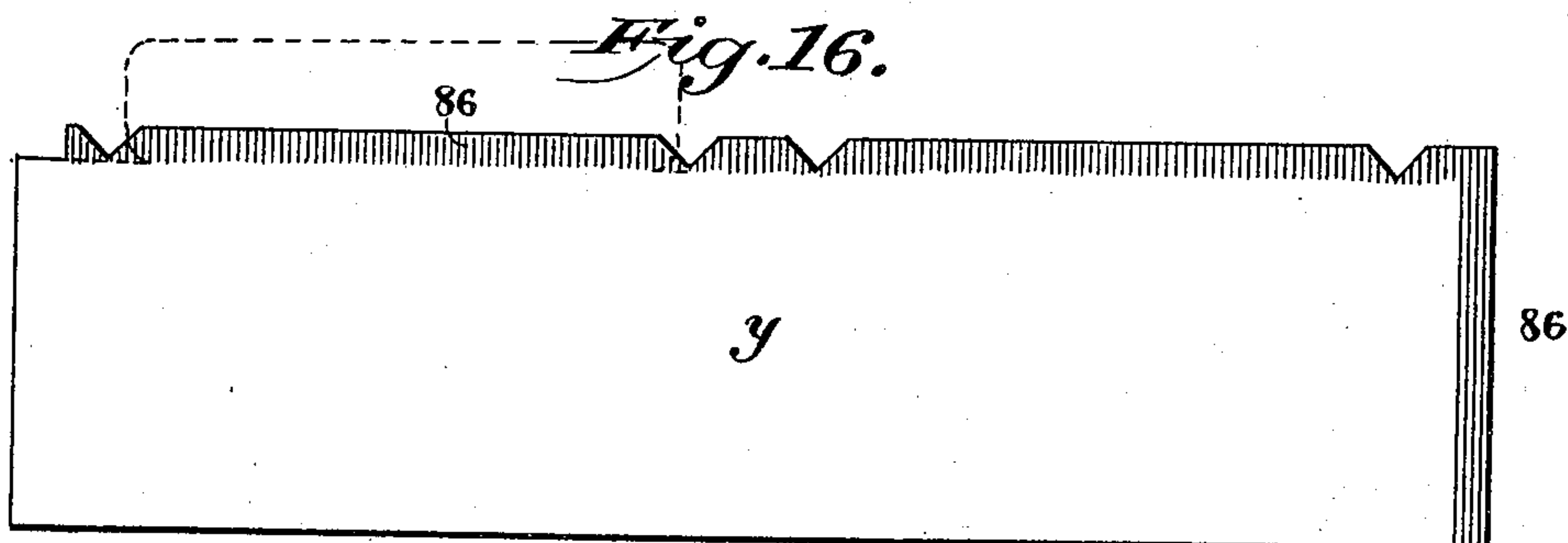
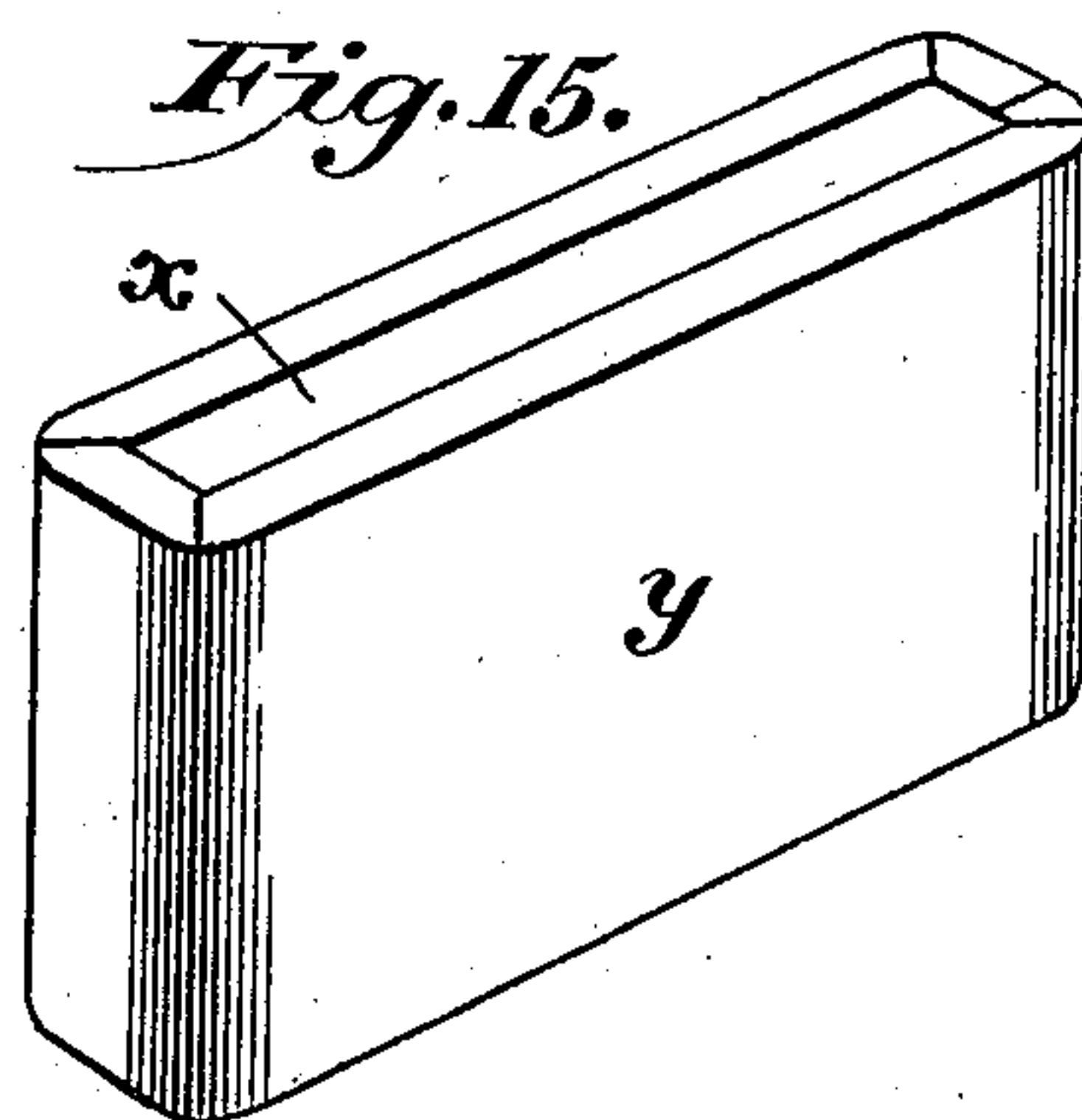
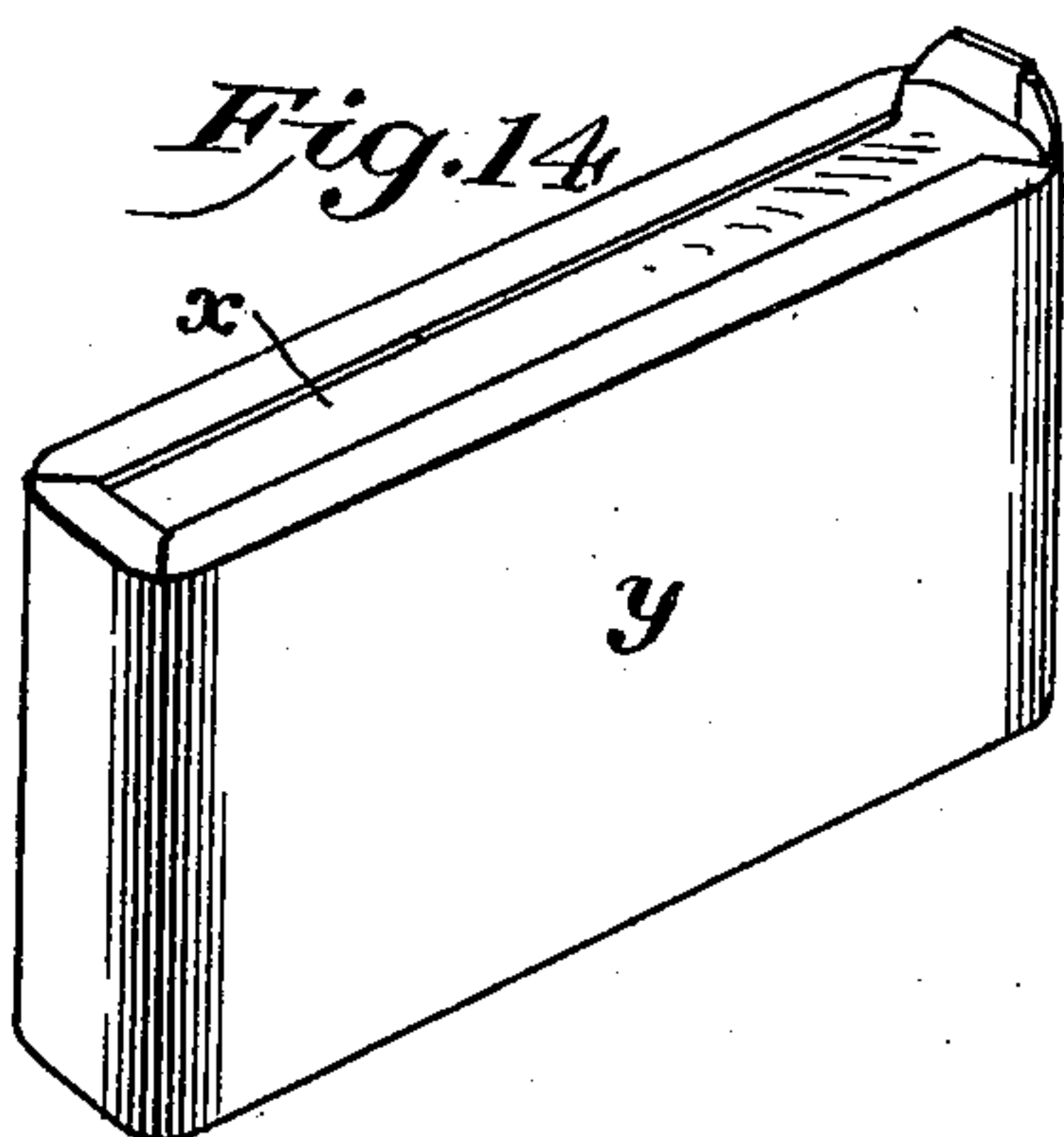
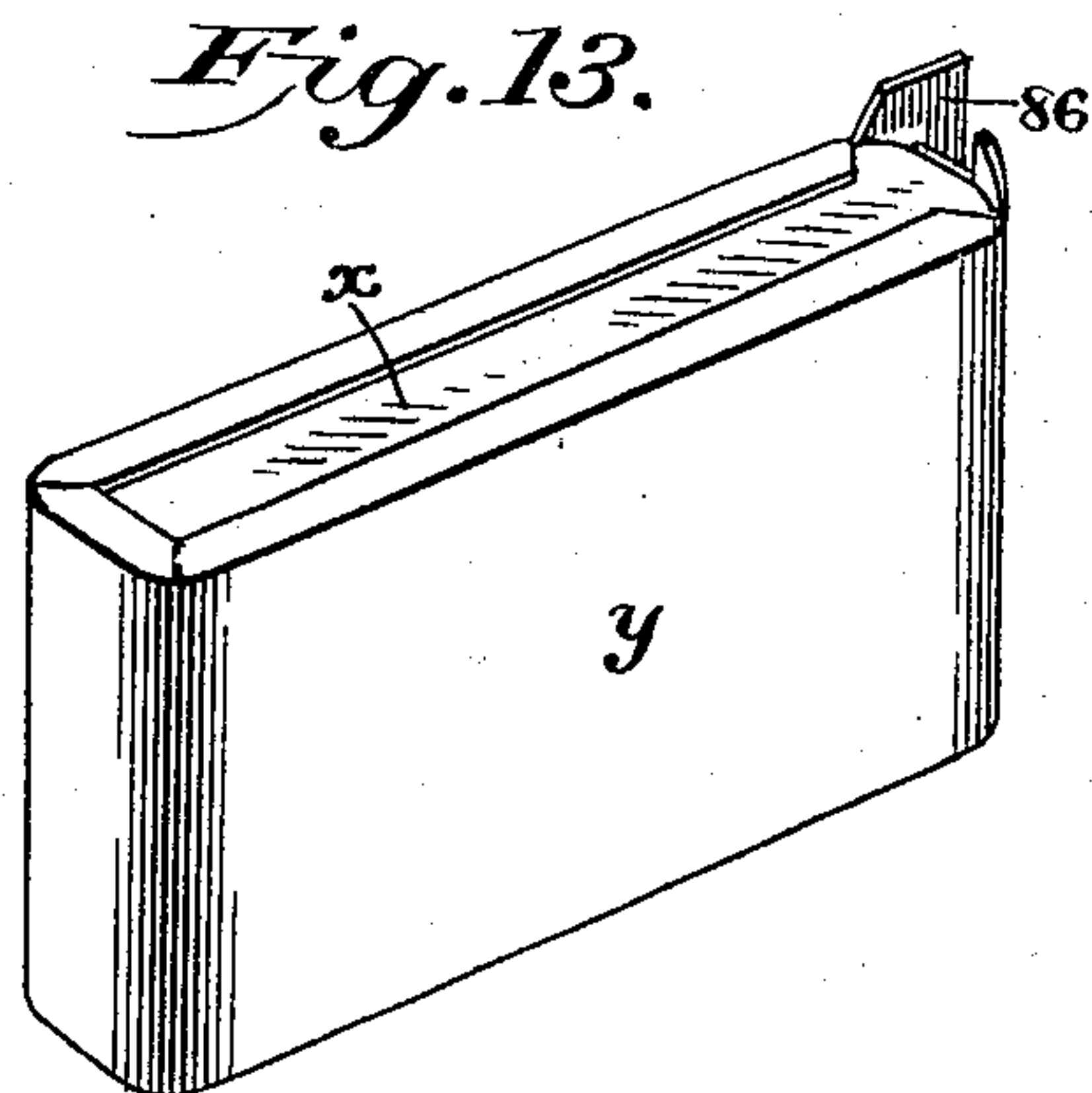
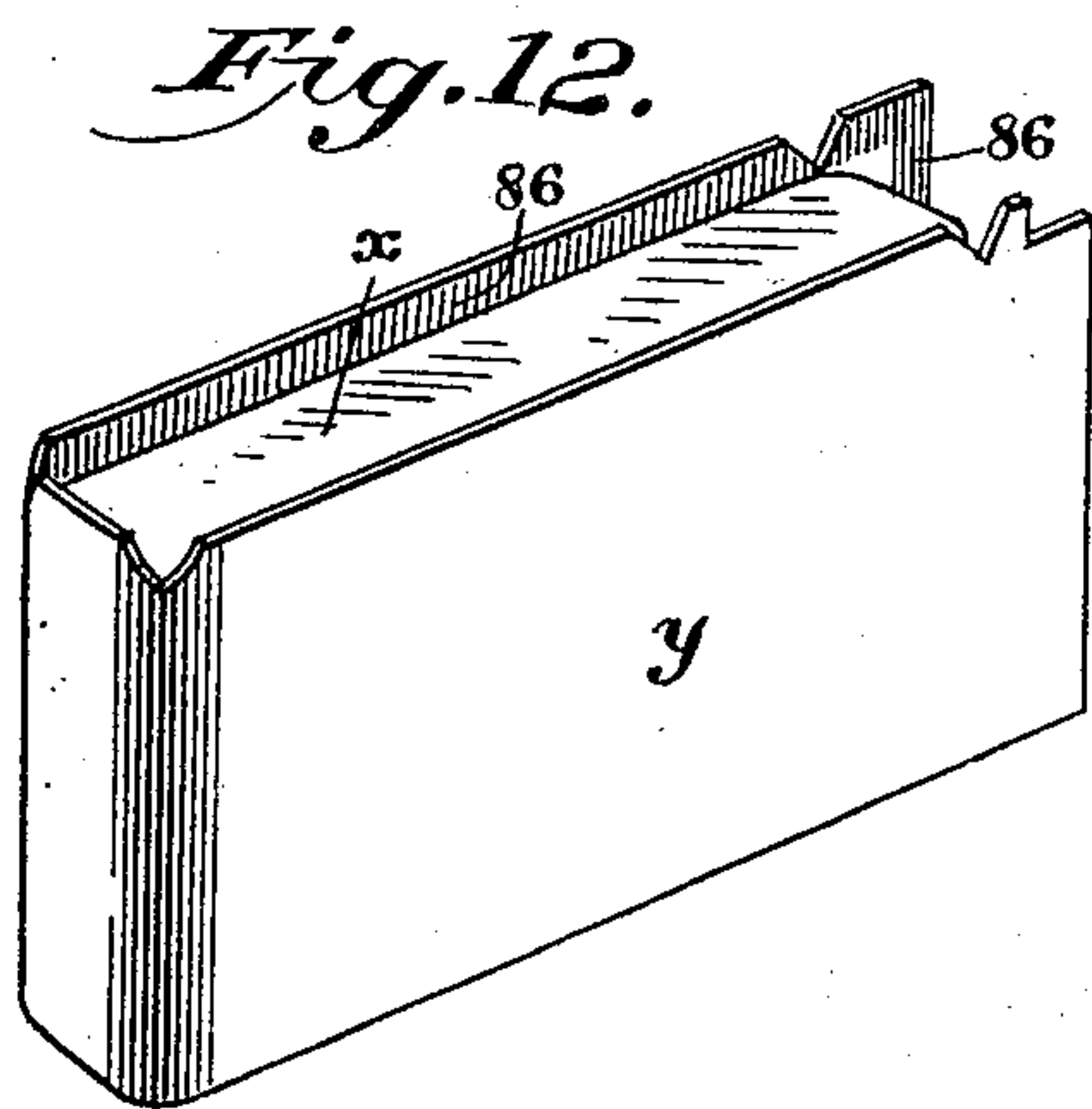
Patented Dec. 26, 1899.

J. GODFREY.  
PAPER BOX MACHINE.

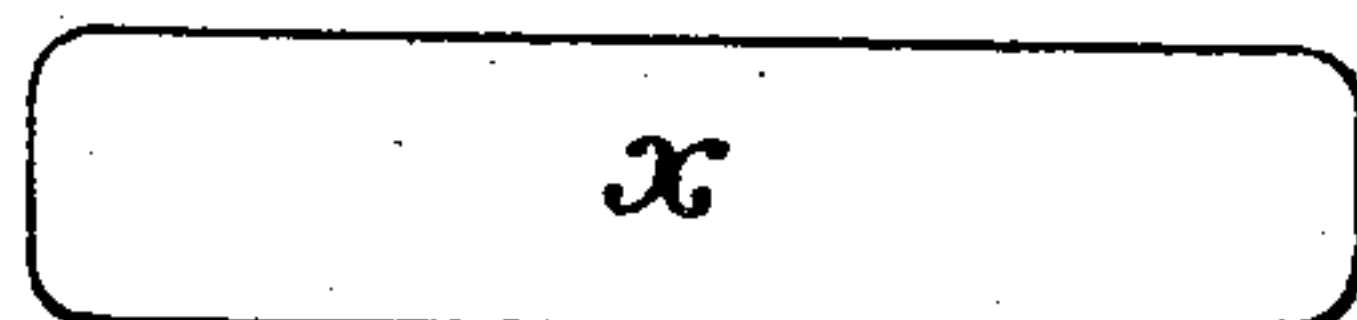
(Application filed Apr. 19, 1899.)

(No Model.)

8 Sheets—Sheet 8.



*Fig. 17.*



WITNESSES:

*J. Finch.*  
*M. J. Longden.*

INVENTOR

*Jonathan Godfrey*

BY

*M. Smith.*  
ATTORNEY



# UNITED STATES PATENT OFFICE.

JONATHAN GODFREY, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR OF ONE-HALF TO THE COMPRESSED PAPER BOX COMPANY, OF SAME PLACE.

## PAPER-BOX MACHINE.

SPECIFICATION forming part of Letters Patent No. 639,809, dated December 26, 1899.

Application filed April 19, 1899. Serial No. 713,650. (No model.)

*To all whom it may concern:*

Be it known that I, JONATHAN GODFREY, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Machines for Making Paper Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain improvements in machines for automatically making paper boxes, and has for its objects to manufacture such boxes economically, rapidly, and uniformly, while at the same time these articles shall be of considerable strength, so that they may be used for the purpose of containing and shipping heavy cartridges of the well-known "Mauser" type.

With these ends in view my invention consists in the details of construction and combination of elements, such as will hereinafter be fully described and then specifically be designated by the claims.

In the accompanying drawings, which form a part of this application, Figure 1 is a plan of my improved machine; Fig. 2, a section at the line *a a* of Fig. 1; Fig. 3, a section at the line *b b* of Fig. 1; Fig. 4, a section at the line *c c* of Fig. 1. Figs. 5, 6, 7, 8, and 9 are detail broken plan views illustrating, respectively, the position of the various tools which operate immediately upon the box-blank in the performance of the successive operations necessary for the completion of the box and prior to the operation of setting. Figs. 10 and 11 are detail broken sectional elevations on the line *d d* of Fig. 9, illustrating the position of the setting-tools, respectively, before and after the operation of setting. Figs. 12, 13, 14, and 15 are detail perspective views illustrating the several steps or folding operations which are performed in the manufacture of the box; Fig. 16, a detail plan of the blank from which the box-body is made, and Fig. 17 a detail plan of the blank from which the bottom of the box is made.

Similar numbers and letters of reference denote like parts in the several figures of the drawings.

The box which my machine makes must be formed of stout material, must be strongly put together, and must be rapidly made; and it is with these ends in view that I have contrived the various mechanisms and tools, all operating automatically, as will be hereinafter set forth.

The body of the box and the cover are made in precisely the same manner, the only difference being that the cover is a trifle larger, and the description to be given will apply equally as well to one as to the other.

For convenience in explanation I will refer to the article made as the "box," and would say that this box is formed from two blanks, one a body-blank, which is wrapped around a mandrel, and the other a bottom-blank, which is placed on top of the mandrel, so that the edges of the body-blank project beyond the same, these edges being properly notched, so that when they are closed over and down upon the bottom-blank the ends and sides will meet in a proper miter-joint.

There are several operations necessary in the manufacture of this box, namely: feeding the bottom-blanks and delivering them on top of the mandrel or forming-block, bending the body-blank around the mandrel with the free ends of this blank overlapping each other at one end of the mandrel, closing over the ends and sides down against the bottom-blank, the parts thus coming in contact being previously covered with glue, stamping or corrugating the bottom of the box thus formed so as to firmly set these glued portions together, and finally withdrawing the mandrel and tools and stripping the box and delivering the same into any suitable receptacle. It is immaterial in what way the operations of closing over the glued edges of the sides and ends against the bottom-blank are performed, but for the purposes of saving time and space and in order that the various cams and mechanisms may be more conveniently timed I have constructed my machine to perform these various operations in the manner presently to be set forth, and I therefore do not wish to be limited in this respect.

For the purposes of a better understanding of my improvement I will describe the same as near as practicable with reference to the



order in which the several operations are performed.

1 is the bed of the machine, 2 the main shaft, journaled in boxes supported on the bed, and 3 the power-pulley, secured on this shaft. 4 5 6 are bevel-gears secured on this shaft and meshing with bevel-gears 7 8 9, secured on shafts 10 11 12, journaled within suitable boxes supported by the bed and by the upper table 13 of the machine. These shafts 10 11 12 are vertically disposed and are at right angles to the shaft 2. The shaft 12 carries cams A B C D E F, the shaft 11 carries the cams G H I, and the shaft 10 carries the cams J K.

14 is a well capable of snugly containing the bottom-blanks  $x$  and supported in vertical disposition by any stationary portion of the machine in a plane immediately above the plane of the mandrel 15 when the latter is in its uppermost position, as will be presently explained. This mandrel is mounted upon any suitable block 16 capable of reciprocation within ways, and within the lower portion of this block are journaled friction-rolls 17.

L are cams carried by the shaft 2 and kept in contact with the rolls 17 by means of springs 18, whose ends are connected with said block and the bed of the machine, so that it will be readily understood that the revolution of these cams will effect the elevating and lowering of the mandrel. A portion of the periphery of these cams L is concentric with the shaft 2, so that the mandrel will remain in elevated position during the operation of forming the box, and the bottom-blanks are delivered from the well 14 and deposited upon the mandrel when the latter is in said position.

19 is a push-finger or slide capable of reciprocation within suitable ways at or about the plane of the bottom-blank in the well. The forward extremity of this finger is cut away to accommodate the blanks and is provided with ledges 20, and this push-finger really constitutes the bottom of the well. In normal position this finger is withdrawn, so that the lowermost blank rests within the cut-away portion upon the ledges 20, and when said finger is pushed forward it will then extend throughout its area across the bottom of the well, thus closing the same until the finger is retracted to normal position, whereupon the lowermost blank will then drop into the cut-away portion and rest upon the ledges, as before set forth.

21 is a bell-crank lever, the outer or long leg of which is pivoted to a link 22, which latter is in turn pivoted to the finger 19, and this lever is pivoted at its knee around the rock-shaft 49, presently to be described, while the rear or shorter leg of this lever is provided with a roll 23, which bears against the cam I. As the long radius of this cam I acts against this lever the push-finger will be projected to deliver a blank above the mandrel, and the nature of the cam is such that the parts actuated thereby will remain in the position which

caused the projection of the finger until the blank has been deposited upon the mandrel, as will now be explained.

24 is a bracket supported by any suitable stationary element, and 25 are pins which project loosely through said bracket and are joined at their upper ends by a cross-piece 26. This bracket overhangs the mandrel, so that when the pins are depressed they will be driven against the blank that is held by the push-finger, thereby forcing said blank down upon the mandrel, the blank yielding, owing to its flexible nature, to permit of this.

27 is a frame which is supported on the table 13, and 28 is a rod journaled within ears 29, extending from said frame. 30 is a crank extending rearwardly from said rod and provided at its extremity with a roller 31, which rests upon the cam E, and 32 is a crank which extends from this rod 28 and is pivoted at its extremity to the link 33, the other end of the latter being pivoted to the cross-piece 26.

34 is a coil-spring around the rod 28 and having its extremities connected, respectively, with a stationary element and with the crank 30, whereby the latter is normally depressed to keep the roller 31 always in contact with the cam E.

Presupposing the push-finger to have been projected, whereby a blank is held in its outer end immediately above the mandrel, the cam E now operates to elevate the crank 30, thereby forcing the pins 25 down against the blank, whereby the latter is carried and deposited upon the mandrel. The next operation has reference to the delivery of the body-blank and to the wrapping of the same around the mandrel. The inner wall of the body-blank is covered with glue near the bottom edge or, more properly speaking, the edge which, though uppermost around the mandrel, is to be at the bottom of the completed box.

35 is a block capable of sliding freely within ways in the table 13 and cut away, as seen at 36, at its inner end, while the other end carries a roll 37, which is kept in contact with the cam K by means of springs 38, secured, respectively, to said block and to the table. Mounted in ways upon this block is a closing-over die 39, which is confined by means of a screw-bolt 40, which passes through an elongated slot 41 in the die into said block, so that it will be clear that said die is capable of a limited sliding movement independent of said block. 42 is a roll which is carried at the outer end of this die 39 in the same horizontal plane with the cam J, and 43 are springs whose ends are secured, respectively, to the die and block, whereby said die is kept in a normally-retracted position. The body-blank  $y$  after the proper application of glue is placed edgewise upon the table 13 immediately in front of the block 35 and with one corner abutted against the gage 44, secured to the table, and as the block advances, owing to the action of the cam K, the blank  $y$  will be forced against the mandrel and will be bent



around the letter in U shape by reason of the coöperation between said mandrel and the cut-away portion 36 in the block.

The blank *y* is shaped and notched as shown at Fig. 16, and after undergoing the operation just described the position of this blank with respect to the bottom-blank on the mandrel will be as shown at Fig. 12, by reference to which it will be seen that the edges of the blank *y* project above the plane of the bottom-blank *x*, while it will also be clear that the object of the notching of the blank is to cause the sides and ends of these projecting edges of the blank *y* to meet in a miter-joint when these edges are closed over upon the blank *x*, as will be presently explained. Immediately after the cam K has operated to effect the result above described the cam J will strike against the roll 42 and will force the die 39 forward to close over the edge of the blank *y* at the end thereof. I have shown at Fig. 5 the position of the various tools immediately after the operation of the block 35 to bend the blank around the mandrel, and by reference to this figure as well as to Fig. 6 it will be observed that I have illustrated this end die 39 and the side-closing dies (presently to be explained) as having, to all appearances operated simultaneously; but in reality the die 39 operates to perform its function before the edges of the sides of the blank *y* are closed over, although, as will appear later on, the order in which these various operations on the blank *y* are performed is really immaterial.

For the purpose of closing over the glued edges of the blank *y* along the sides thereof, I provide two blocks 45 46, capable of sliding freely within ways on the table 13, and loosely pivoted to the outer ends of these blocks are levers 47 48, the inner ends of which levers are keyed to rock-shafts 49 50, which latter are vertically disposed and are journaled within suitable bearings in the bed 1 and frame 27. Also keyed to these rock-shafts 49 50 are cranks 51 52, which are provided at their free ends with friction-rolls 53 54, that are normally kept in contact with the cams D C by means of spring 55, whose ends are secured, respectively, to crank-pins 56 57, projecting from these rock-shafts. It will thus be readily understood that the levers 47 51 and 48 52 are in effect single levers, owing to the fact that each pair is connected, respectively, with the rock-shafts 49 50, and therefore it will be clear that the cams C D will effect the swinging movements of these levers, whereby the blocks 45 46 will be thrown toward the mandrel or withdrawn therefrom. As these blocks are forced against the mandrel they will close over the side edges of the blank *y* down against the bottom-blank *x*, so that the position of the various tools will be as is shown at Fig. 6.

58 59 are properly-shaped blocks capable of sliding freely within ways in the table 13 and located immediately inside the blocks 45

46. 60 61 are levers whose outer ends are pivoted loosely to these blocks 58 59, while the levers themselves are pivoted at or about their middle portions around the rock-shafts 49 50. The rear ends of these levers are provided with friction-rolls 62 63, which are kept normally in contact with the cams A B by means of coil-springs 64 65, whose ends are secured, respectively, to said levers and to the frame 27. The cams A B are so timed with respect to these levers that the block 59 will be operated slightly in advance of the block 58, so that as the block 59 is thrown against the mandrel it will cause one of the free ends of the blank to be bent around the mandrel, while immediately after this the block 58 will bend the other free end of the blank around the mandrel and overlapping the first-mentioned end, so that the various tools will now be in the position as shown at Fig. 8, while the box itself as thus far completed is illustrated at Fig. 14.

66 is a block capable of sliding freely within ways in the table 13, and carrying at its rear end the roller 67, which is normally kept in contact with the cam H by means of the springs 68, whose ends are connected, respectively, with said block and with a stationary part of the machine. Mounted within ways on top of this block 66 is a closing-in die 69, confined in position by means of a threaded pin 70, which passes through an elongated slot 71 in said die into said block. The rear end of this die carries a roll 72, which is in the same horizontal plane as the cam G. The die 69 is kept in a normally-retracted position by means of springs 73, whose extremities are secured, respectively, to said die and block. The rotation of the cam H will force the block 66 firmly against the overlapping edges of the blank *y*, and immediately after this cam G will operate to throw the die 69 toward the mandrel, thus closing down the projecting edges at the end of the partially-completed box formed by the overlapping ends, the said parts being now in the position shown at Fig. 9.

It will be observed that the dies which operate to close over the edges of the blank *y* both at the sides and at the ends are beveled upwardly from their outer ends, this beveled portion being denoted in all instances by the reference-numeral 74, while the mandrel is correspondingly beveled on its upper surface along its edges, as seen at 75.

After the operations heretofore described have been performed the position of the mandrel with respect to the closing-in dies is as is shown at Fig. 10, where I have illustrated the position of the end dies with respect to such mandrel, and the cam L will as it continues to revolve now throw the mandrel upward, so as to force the edges that have been glued over against the bottom-blank upward and firmly compress them between the mandrel and the closing-in dies, the bottom of this blank being by this movement forced upward, so that the parts will be in the position as



shown at Fig. 11. This upward movement of the mandrel will cause the glued edges of the blank  $y$  and the blank  $x$  to be firmly compressed together between the beveled portions of the dies and mandrel, thereby effectually "setting" these glued portions, while the throwing up of the body of the blank  $x$  will cause these compressed glued portions to assume a position substantially parallel with the bottom-blank, so that in the completed box the entire bottom will be in substantially one plane. After these various operations have been performed the cams heretofore mentioned will by their continued revolution effect the withdrawal of the various blocks, dies, and mandrel, and as the latter is withdrawn the box will be stripped therefrom by means of the stripper-plate 76, which is secured upon the table 13 around the mandrel and upon which the blank  $y$  rests during the formation of the box. After the mandrel has been withdrawn the box remains resting upon the stripper-plate and is projected therefrom into any suitable receptacle by the mechanism which I will now describe.

77 is a kicker-rod supported within suitable bearings 78 and capable of a free movement therein, the inner extremity of said rod carrying prongs 79, while the rod itself is inclined in the direction of the stripper 76.

80 is a bell-crank lever pivoted at its knee to any suitable bracket 81, supported by the table 13, the inner or short leg of this lever carrying a roll 82, which is kept normally in contact with the cam F by means of the coil-spring 83, whose ends are secured, respectively, to said leg and any stationary part of the machine. The long leg of said lever is pivoted to a rod 84, the other extremity of the latter being connected to a block 85, secured to said kicker-rod 77. After the completed box has been left supported upon the stripper, as hereinbefore set forth, the cam F will operate to cause the kicker-rod to be suddenly projected toward the box, thereby kicking the latter off the stripper-plate into any suitable receptacle.

From the brief description which I have heretofore given a general understanding will be had of the construction and operation of my improvement; but I will now more particularly describe the manner in which a box is made upon my improved machine.

Glue is applied to the blank from which the body of the box is to be made along certain edges, as shown at 86 in Fig. 16, and the notched edge of this blank is uppermost when said blank has been bent around the mandrel.

The various cams heretofore mentioned are so constructed and timed that the operations of disposing the blank  $y$  around the mandrel and the closing of the projecting glued edges down upon the blank  $x$  are performed in a certain order; but it will be clear that it is immaterial whether the side edges are turned over simultaneously or in succession, or whether the end edges are turned over simul-

taneously or in succession, or whether the sides and ends are turned over all at the same time. It will accordingly be understood that the tools and dies which are the immediate factors in forming the box are the chief and most important elements of my machine, while the cams and the connections between the latter and these tools or dies are secondary features, which may be varied greatly without departing from the spirit of my invention.

The operator keeps the well 14 supplied with the blanks  $x$ , and as soon as the cam L has operated to throw the mandrel up into position the push-finger 19 is operated to carry the lowermost of these blanks into position immediately above said mandrel, whereupon the plunger-pins 25 descend and force said blank down upon the mandrel. After a glued blank  $y$  has been placed in front of the block 35 the cam K operates to project this block, thereby wrapping this blank around the mandrel, with the free ends of said blank projecting in parallelism at the opposite end of such mandrel, while the glued edges will extend above the plane of the blank  $x$ , the position of the various tools and dies being as is shown at Fig. 5. Immediately after this operation of the block 35 the cam J will operate to throw the die 39 against the projecting glued edges of the blank  $y$  at the closed end of this blank down against the blank  $x$ , while at substantially the same time the blocks 45 46 will be forced against the sides of the blank  $y$  by the action of the cams D C and will close over the projecting glued edges of these sides down against the blank  $x$ , the parts being now in the position as shown at Fig. 6. The sliding blocks 58 59 are now operated by means of the cams A B, the block 59 being operated slightly in advance of the block 58, so that one of the projecting free ends of the blank  $y$  will first be wrapped closely around the end of the mandrel, whereupon the block 58 will cause the other end of said blank to likewise be wrapped around the mandrel, but overlapping the first-mentioned end, this operation being clearly shown at Fig. 7, while the position of the various tools and dies after these projecting ends have been properly disposed around the mandrel is as is shown at Fig. 8. The cam H now operates to throw the block 66 against these overlapping edges, thereby firmly setting the glued portions, while immediately after this the cam G will force the die 69 against the upwardly-projecting edges of these overlapping portions, thereby forcing these edges down against the bottom blank  $x$ , the position of the several tools and dies being now as is shown at Fig. 9.

It will thus be readily understood that a box has been completely formed by the operations heretofore described; but since the box is made of heavy substantial material it becomes advisable to apply considerable pressure to the glued portions in order that they may be more firmly united, and I therefore



have recessed the mandrel near its edges, as shown at 75, while those portions of the dies that have operated to close over the projecting edges of the blank *y* are undercut, so as to afford recesses 74, similar to the recesses 75. The parts being now in the position as shown at Fig. 10, the cams L now operate to throw the mandrel slightly upward, thereby crushing the glued portions firmly within these recesses, as shown at Fig. 11. This crushing of the glued edges has the effect to slightly raise the bottom of the box, so that the edges are practically "countersunk," so to speak, and the effect of this is to make the bottom of the box perfectly level and with no projecting portions near the edges, thus greatly strengthening the box and adding materially to its neat appearance. The several tools and dies all remain in position around the mandrel until the box is completely formed, whereupon the various cams will operate to withdraw the blocks and dies which have operated upon the sides and ends of the box, thus leaving the completed box upon the mandrel, with the edge near the bottom of the mandrel resting upon the stripper-plate 76. The cams L now operate to withdraw the mandrel, after which the cam F will operate to cause the kicker-rod 77 to dart toward the box, thereby projecting the latter into any suitable receptacle, whereupon the mandrel will again be elevated into position by means of the cams L, and the operations heretofore described will be again repeated, and so on.

While I have illustrated and described my improvement as used for the purpose of making paper boxes from two blank portions, it will be perfectly clear that the box could be made from a single blank. I have therefore illustrated at Fig. 16 by dotted lines the position which the bottom-blank would occupy with respect to the body-blank in case the two were to be in a single piece; but I greatly prefer to make the box from two blanks, owing to the great waste which would occur in the stock were the blanks to be cut in a single piece.

Boxes of various sizes may be made on a single machine by substituting different sizes of mandrels and by using different-sized tools and dies and making the proper adjustments of parts intermediate of the cams and several tools and dies.

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

1. In a machine for making paper boxes, the combination of a non-rotary mandrel capable of vertical reciprocation, the stripper at the base of said mandrel, means for depositing the bottom-blanks upon said mandrel, automatic instrumentalities for wrapping a plain straight blank around the sides of the mandrel with the edges of said blank projecting upwardly above said mandrel whereby the

sides of the box are formed, and means for closing the projecting edges thus formed down against the bottom-blank, substantially as set forth.

2. In a machine for making paper boxes, the combination of a non-rotary mandrel capable of a vertical reciprocation, the stripper at the base of said mandrel, means for depositing the bottom-blanks upon said mandrel, automatically-operated instrumentalities for bending the body-blanks into U shape around said mandrel, automatically-operated instrumentalities for overlapping the free ends of said body-blanks around said mandrel, automatically-operated instrumentalities for folding the projecting edges of the body-blank over the bottom-blanks, means automatically operated for compressing said folded edges and bottom-blanks together, and automatically-operated instrumentalities for compressing the overlapping ends of the body-blank, substantially as set forth.

3. In a machine for making boxes from paper blanks notched at predetermined places and previously coated with glue at proper locations, the combination of a suitably-shaped mandrel around which the blanks are bent and formed into a completed box, a stripper-plate at the base of the mandrel, means for wrapping the body-blanks around the mandrel with the notched and glued edges projecting above the bottom-blank previously deposited on said mandrel, instrumentalities for closing said edges over and down against said bottom-blank, and means for compressing all the glued and overlapping parts of the box, substantially as set forth.

4. In a machine for making paper boxes, the combination of a suitably-shaped mandrel, automatic instrumentalities for properly assembling the bottom and body blank sections respectively upon and around the mandrel with the edges of the body-blank projecting beyond the bottom-blank, said projecting edges having been previously coated with a suitable adhesive, automatically-operated devices for folding said projecting edges down upon the bottom-blank, and means for compressing said folded edges and bottom-blank together, for the purpose specified.

5. In a machine for making paper boxes, the combination of a suitably-shaped mandrel, automatic instrumentalities for properly assembling the bottom and body blank sections respectively upon and around the mandrel with the edges of the body-blank projecting beyond the bottom-blank and the ends of said body-blank overlapping said projecting edges and one of said ends having been previously coated with a suitable adhesive, automatically-operated devices for folding said projecting edges down upon the bottom-blank, means for compressing said folded edges and bottom-blank together, and instrumentalities for compressing the overlapping ends of the body-blank, substantially as set forth.



6. In a machine for making paper boxes, the combination of a mandrel, means for depositing the bottom-blank upon said mandrel, automatically-operated instrumentalities for bending the body-blank into U shape around said mandrel, automatically-operated instrumentalities for bending the free ends of said body-blank one in advance of the other around said mandrel, automatically-operated instrumentalities for folding the projecting edges of the body-blank over upon the bottom-blank, and means for automatically compressing said folded edges and bottom-blank together, substantially as set forth.

7. In a machine for making paper boxes, the combination of the mandrel capable of vertical reciprocation, the recessed block whereby the body-blanks are bent around the mandrel, the die mounted on said block and capable of a movement independent thereof, means for operating said block and die, the blocks capable of sliding in ways on the bed of the machine whereby the edges along the sides of the body-blank are closed over against the bottom-blank, the sliding blocks capable of operation one in advance of the other against the projecting free ends of the body-blanks, the sliding block whereby the overlapping ends of the body-blanks are firmly compressed, and the die carried by the last-named block and capable of movement independent thereof, substantially as set forth.

8. In a machine for making paper boxes, the combination of a non-rotary mandrel, a series of independent sliding blocks around said mandrel, means for driving said blanks against the straight body-blanks, whereby the latter are bent and formed around said mandrel and firmly held in such position with their upper edges projecting above said mandrel, and a series of dies whereby said

projecting edges are closed over, substantially as set forth.

9. In a machine for making paper boxes, the combination of a mandrel capable of vertical reciprocation, a stripper-plate around the base of said mandrel, means for depositing the bottom-blanks upon the face of said mandrel, a series of blocks whereby the body-blanks are wrapped around the mandrel with their edges projecting above the latter, and a series of dies whereby these projecting edges are closed down upon the bottom-blank, substantially as set forth.

10. In a machine for making paper boxes, the combination of the mandrel having a beveled recess upon its upper face adjacent to the sides and ends, means for depositing the bottom-blanks upon said mandrel, the sliding blocks whereby the bottom-blank properly coated with glue is wrapped around said mandrel with its ends overlapping and compressed and with its edges extending above said bottom-blank, the dies having beveled recesses in their under surfaces, means for operating said dies whereby said projecting edges are closed down against the bottom-blank thereby bringing the recesses in the dies in a vertical alinement with the recessed portion of the mandrel, and means for compressing said mandrel and dies together whereby the overlapping portions at the bottom of the box are compressed and brought substantially on a level with the bottom of the box, substantially as set forth.

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

JONATHAN GODFREY.

Witnesses:

J. S. FINCH,

M. I. LONGDEN.