No. 891,359. PATENTED JUNE 23, 1908.

W. F. MORSE.

MACHINE FOR CUTTING BOX FORMS.

APPLICATION FILED JUNE 20, 1904. 4 SHEETS—SHEET 1.

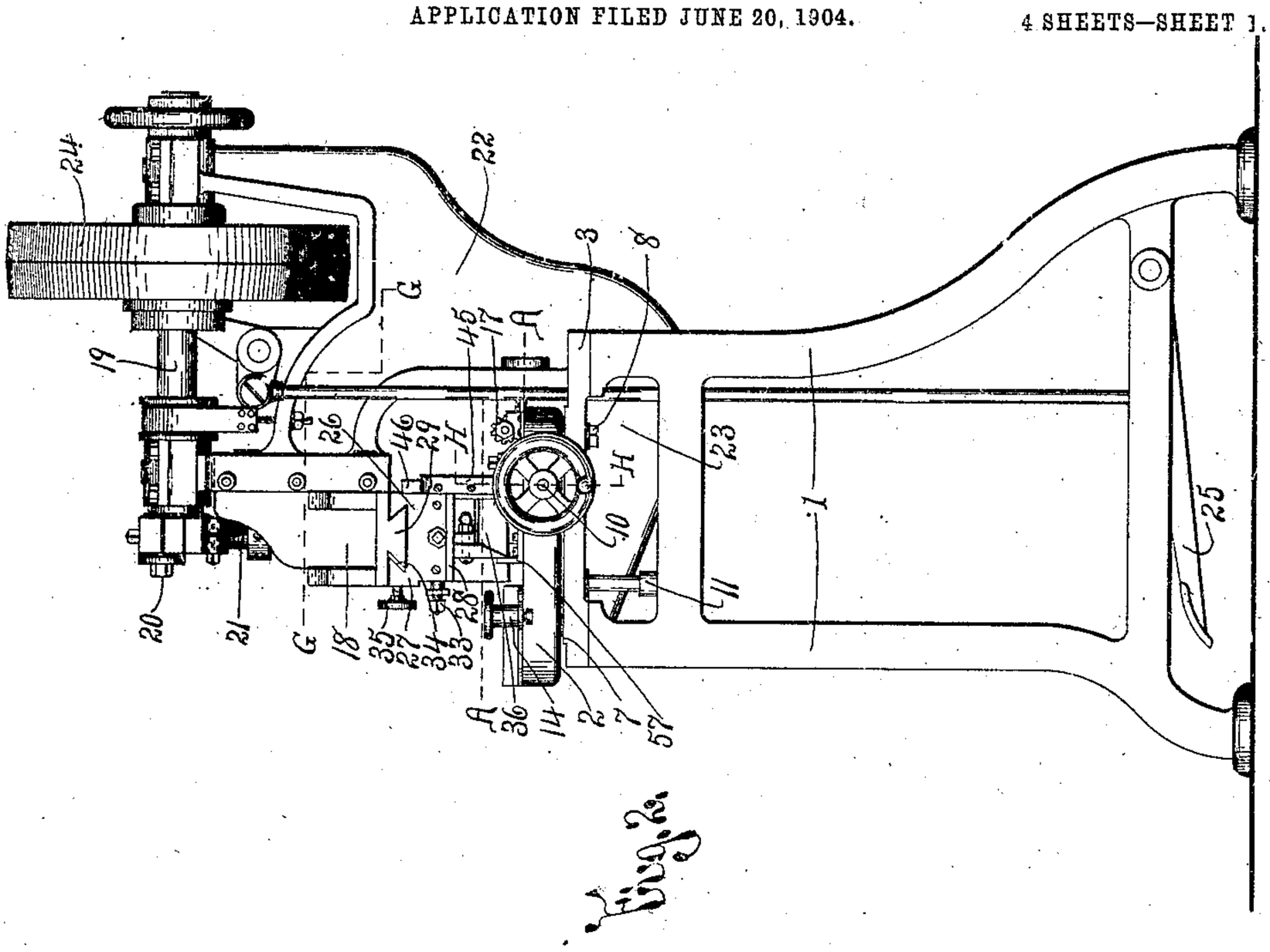
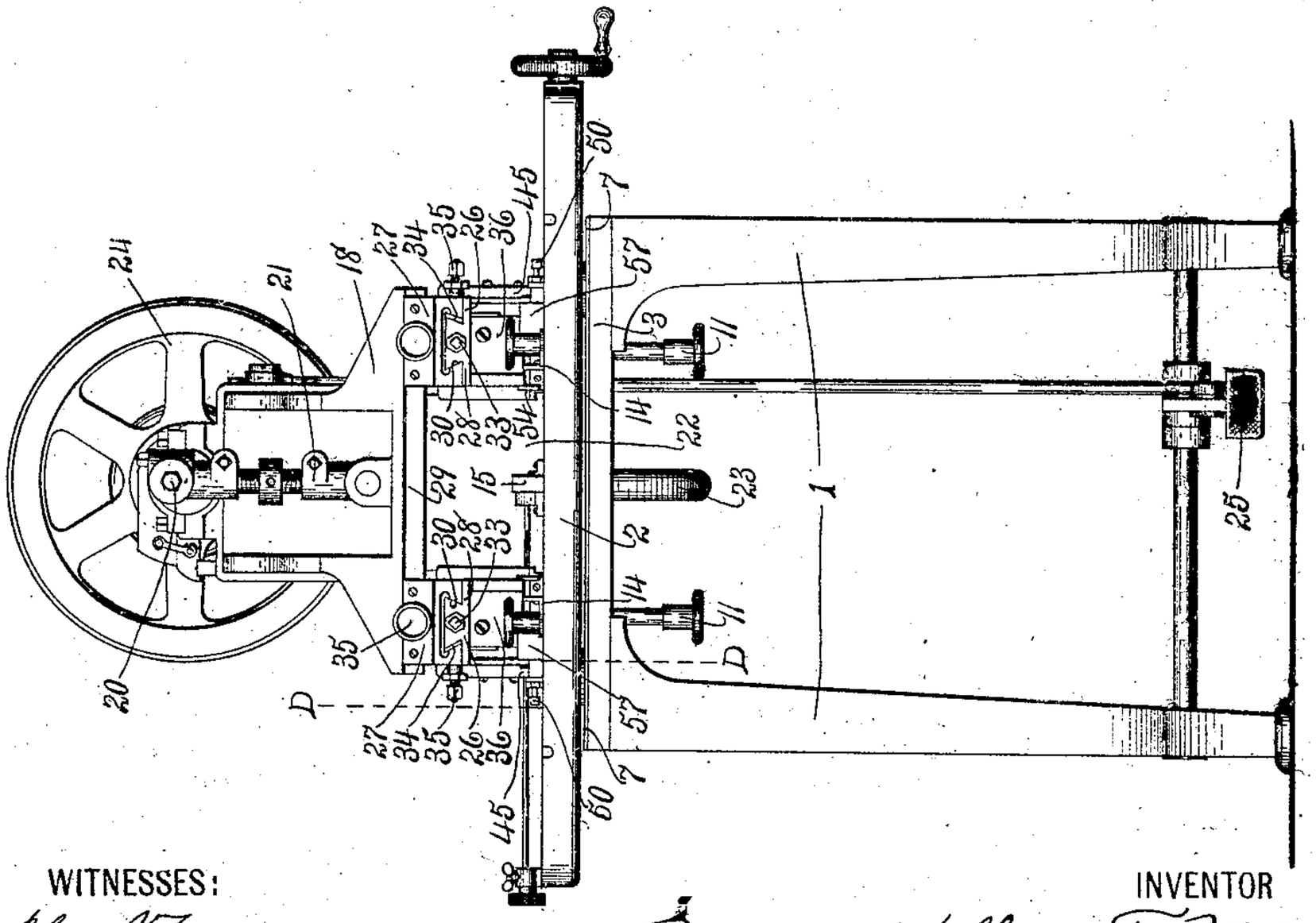



Fig. 2.

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S. Davis

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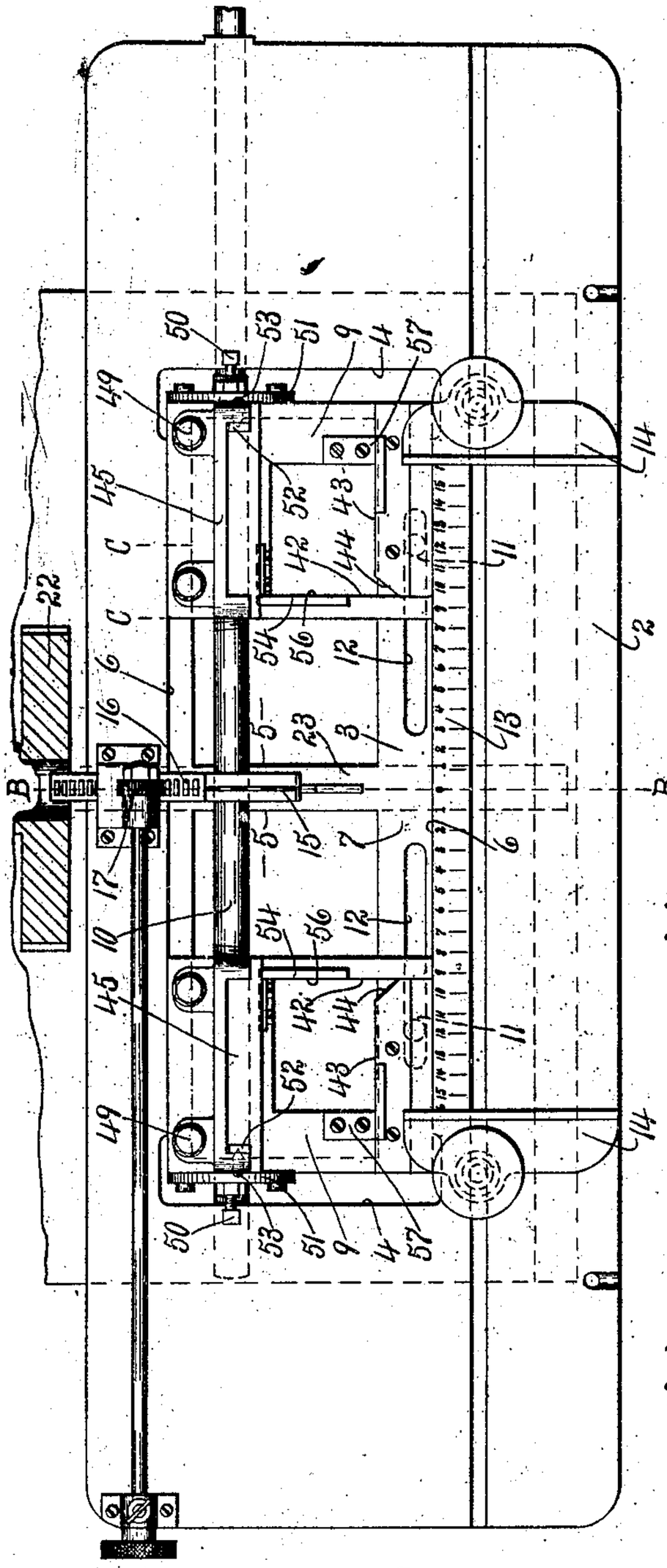



Fig. 4.

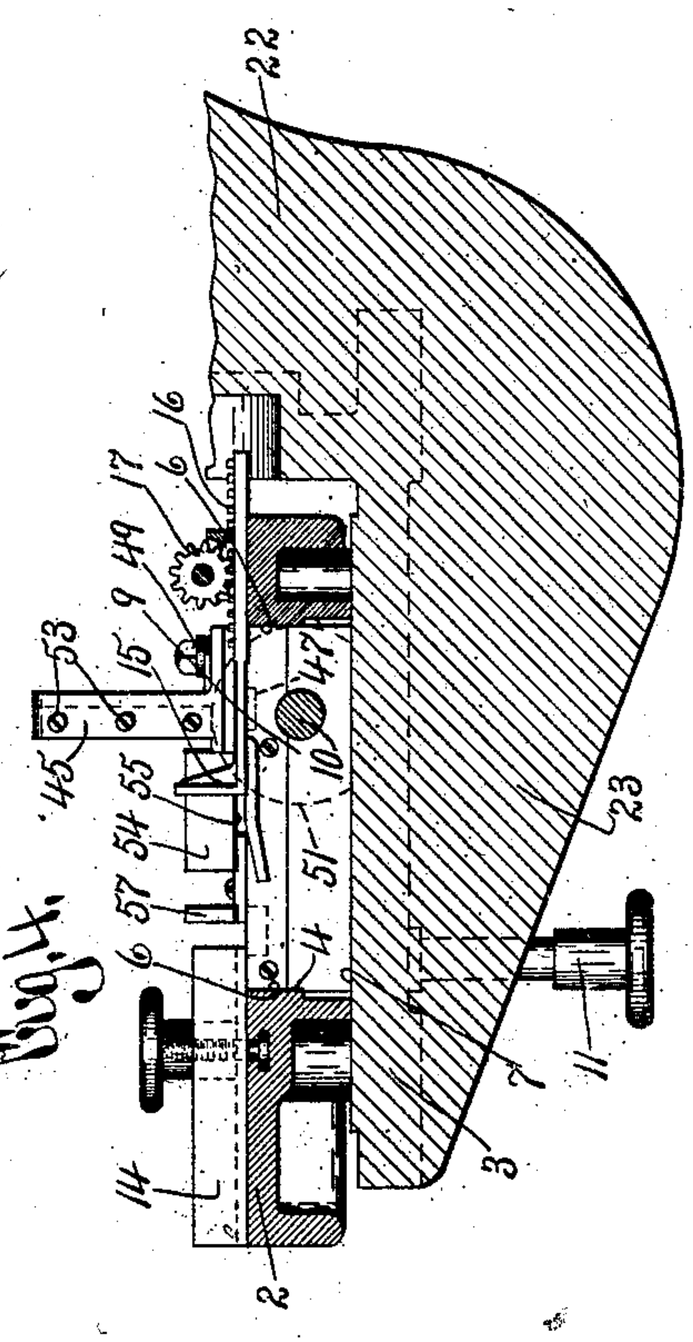
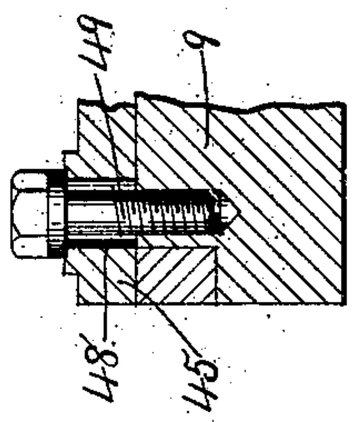



Fig. 5.

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4 SHEETS—SHEET 3.

Fig. 6.

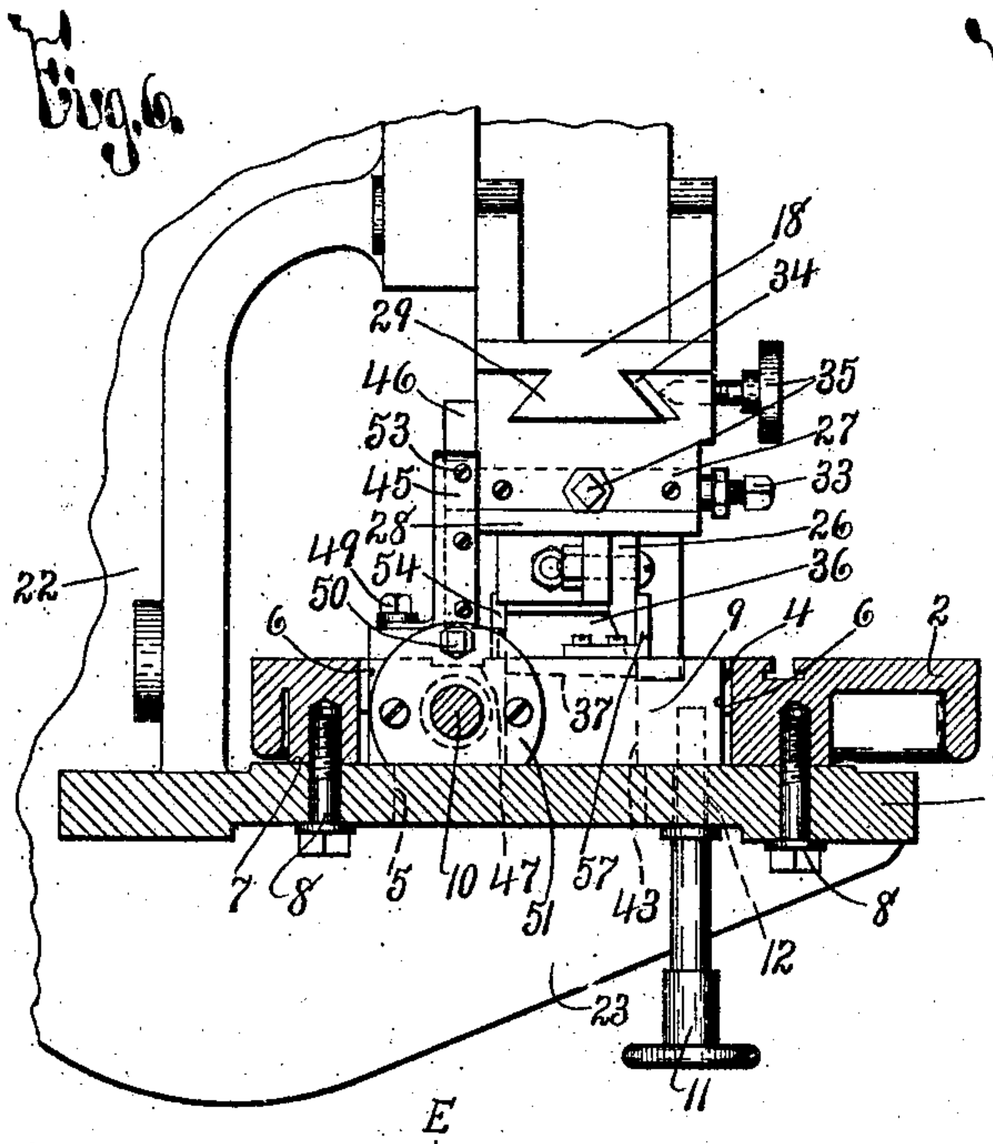



Fig. 7.

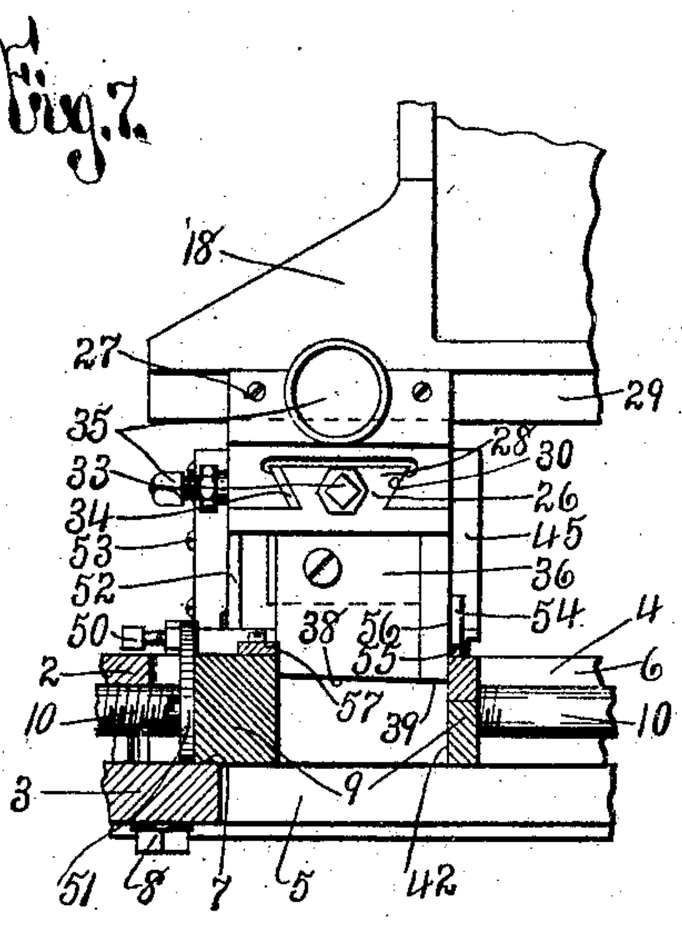



Fig. 8.

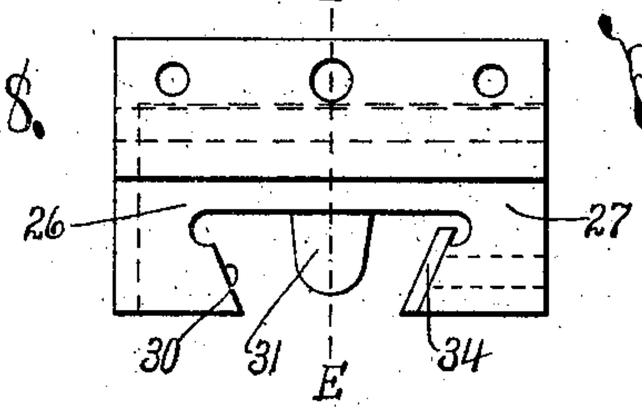



Fig. 10.

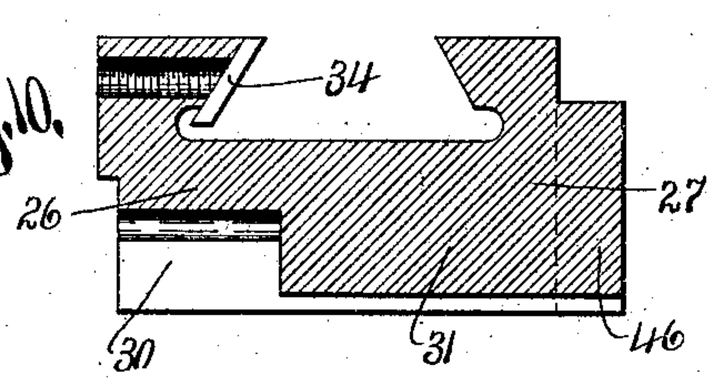



Fig. 9.

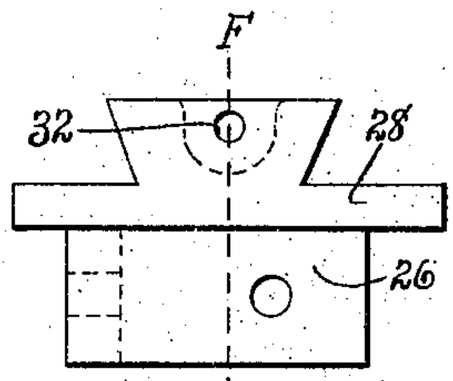
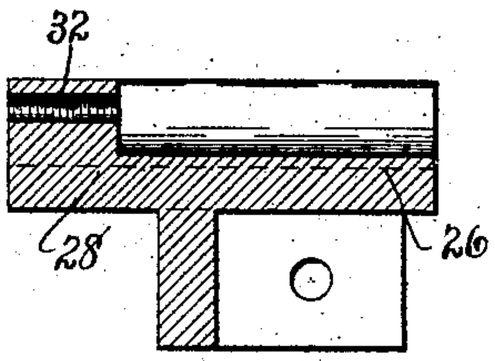



Fig. 11.

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MACHINE FOR CUTTING BOX FORMS.

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4 SHEETS—SHEET 4.

Fig. 15.

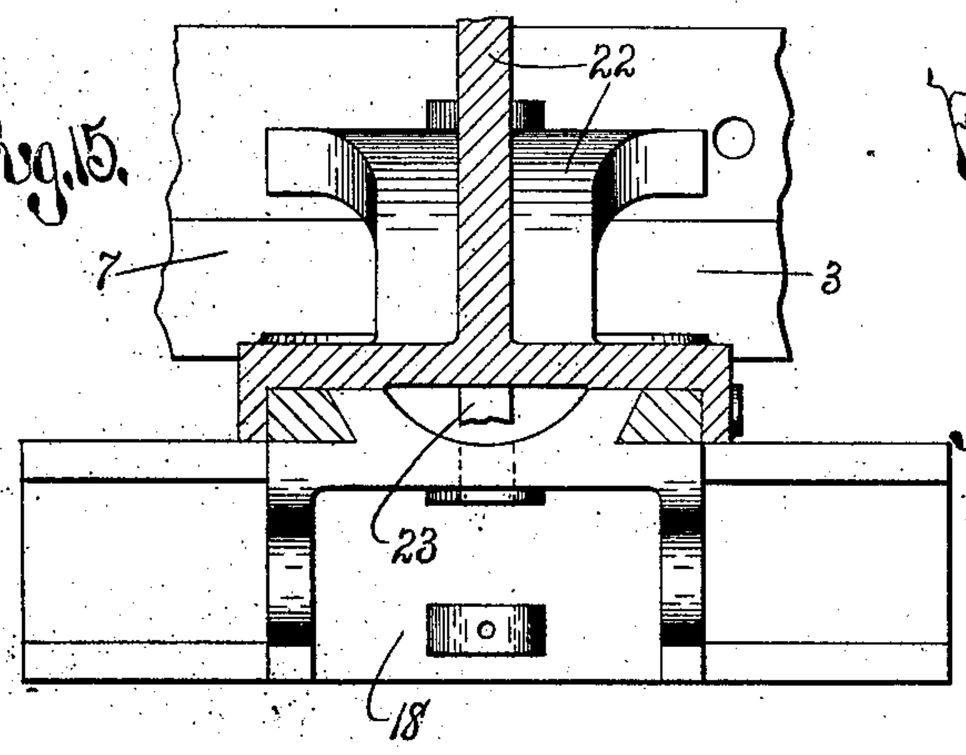



Fig. 12.

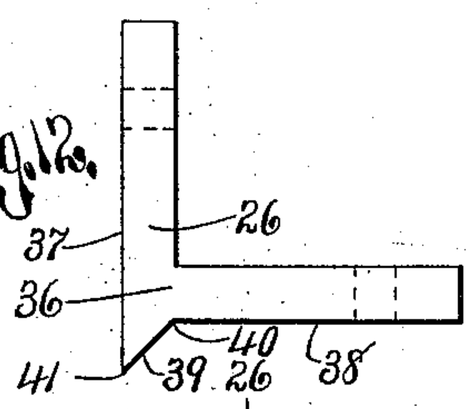



Fig. 14.

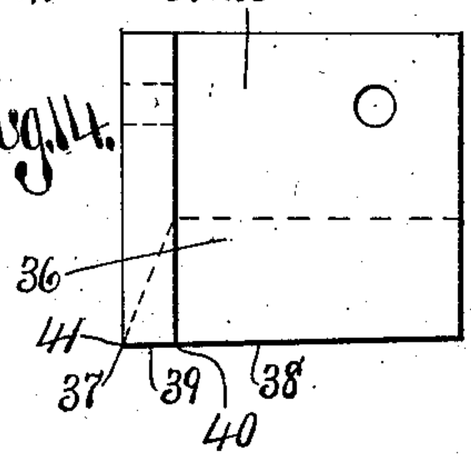



Fig. 13.

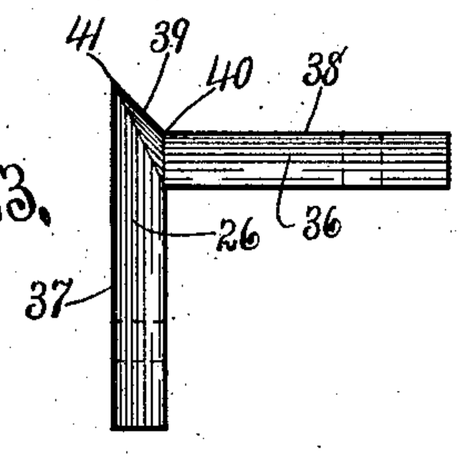



Fig. 16.

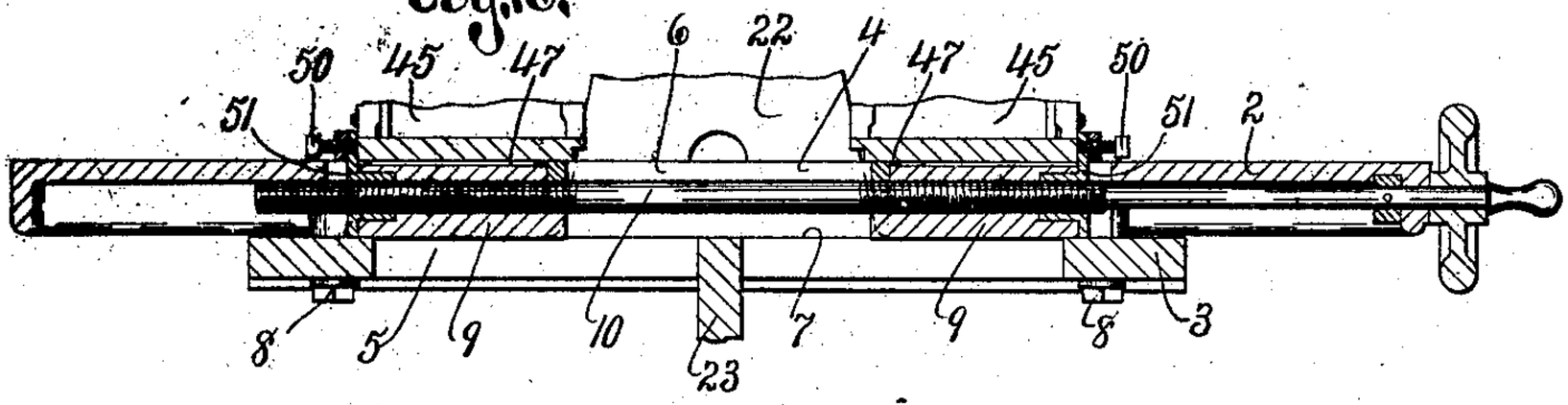
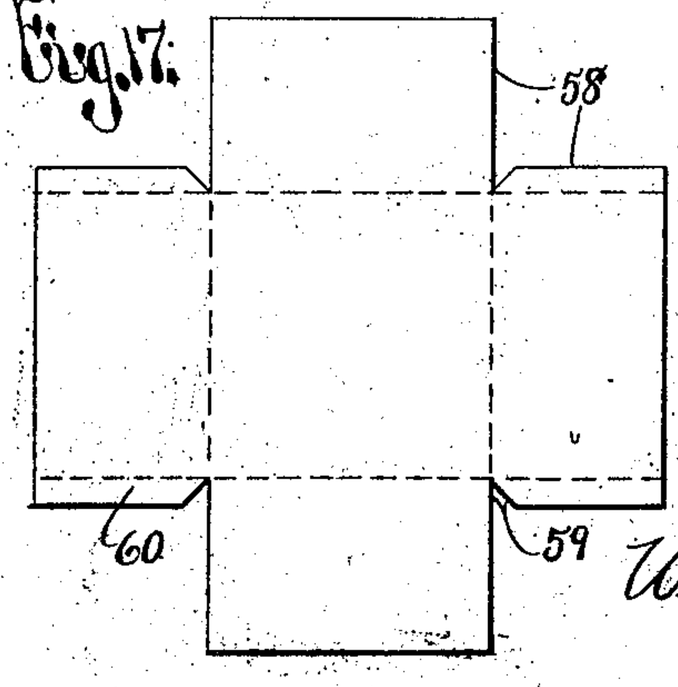



Fig. 17.

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# UNITED STATES PATENT OFFICE.

WILLIAM F. MORSE, OF ROCHESTER, NEW YORK, ASSIGNOR TO SAMUEL R. PARRY, OF ROCHESTER, NEW YORK.

## MACHINE FOR CUTTING BOX-FORMS.

No. 891,359. Specification of Letters Patent. Patented June 23, 1908.

Application filed June 20, 1904. Serial No. 213,264.

*To all whom it may concern:*

Be it known that I, WILLIAM F. MORSE, of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Machine for Cutting Box-Forms, of which the following is a specification.

My invention has for its object the production of a machine for cutting box-forms, which is particularly simple in construction, and highly practical, efficient and durable in operation; and to this end, it consists in the novel combinations, constructions and arrangements hereinafter fully set forth and pointed out in the claims.

In describing this invention, reference is had to the accompanying drawings, in which like characters designate corresponding parts in all the views.

Figures 1 and 2 are, respectively, front and side elevations of a preferable embodiment of my invention. Fig. 3 is an enlarged sectional view on line A—A, Fig. 2. Figs. 4 and 5 are sectional views, respectively, on lines B—B and C—C, Fig. 3. Fig. 6 is an enlarged sectional view, partly broken away, on line D—D, Fig. 1. Fig. 7 is an elevation, partly in section, showing most of the mechanism seen in Fig. 6. Figs. 8 and 9 are elevations of the detached sections of the main body of the cutter. Figs. 10 and 11 are sectional views, respectively, on lines E—E and F—F, Figs. 8 and 9. Figs. 12, 13 and 14 are, respectively, plan, inverted view and elevation of the knife. Figs. 15 and 16 are sectional views, respectively, on lines G—G and H—H, Fig. 2. Fig. 17 is a face view of one of the box-forms cut by my machine.

1 are uprights of any desirable form, size and construction, which support a table, here shown as composed of upper and lower sections 2 3 provided with openings 4 5 extending vertically therethrough in alinement with each other, the opening 5 in the lower section being of less width than that in the upper section, and the upper section having opposing bearing surfaces 6 at opposite sides of the opening 4 therein above the top face 7 of the section 3. These sections of the table may be secured together by any suitable means, as screws 8, Fig. 6.

9 are dies having shearing edges arranged at an angle to each other in conformity with the edges of the cutter hereinafter described. Said dies are movable toward and from each other in the opening 4, which serves as a guide for said dies, opposite sides of the dies engaging the opposing bearing surfaces 6 at the sides of the opening 4. The dies 9 are adjusted toward and from each other by any desirable means, as a screw 10 reversely-threaded at its ends, and are held in their adjusted position by clamping members 11 which are arranged in slots 12 formed in the lower section 3 of the table and extending parallel to the opening 4, and engage the dies 9 and said section 3. I usually provide the table of my machine with a scale 13 extending parallel to the path of movement of the dies 9 and having graduations progressing in opposite directions from a central point, and support on said table gages 14 movable along the scale 13 toward and from each other, and also a stop 15 arranged at the rear of the central portion of the scale. Said stop preferably moves crosswise of the table, and is provided with a rack 16 engaged by a pinion 17 mounted on a revoluble shaft having a suitable hand-piece.

18 is a head opposed to the dies 9 above the same and reciprocated toward and from said dies by any desirable power-transmitting mechanism, as a driving shaft 19 provided with a crank 20, and a pitman 21 connecting the crank 20 to the head 18. Said head and power-transmitting mechanism are mounted upon diverging arms provided at the upper end of a bracket 22 rising above the table supporting the dies and having a forwardly-projecting arm 23 formed integral with the lower section of said table and depending therefrom. The head 18 is guided in its movement by any suitable means, as the contiguous parts of the bracket 22. The shaft 19 is normally stationary, and loosely journaled thereon is a constantly-moving pulley 24 which is locked at will to said shaft by suitable clutch-mechanism supported by the hub of the pulley 24 and controlled by a treadle 25. Said clutch-mechanism forms no part of my present invention, and hence it is thought unnecessary to illustrate and describe the same herein.

26 are cutters which preferably depend from the head 18 toward the dies 9, coöperate with said dies, are adjusted laterally relatively thereto, and comprise main bodies and knives. The main bodies of the cutters consist of upper and lower sections 27 28, the up-

per sections 27 being movable lengthwise of the head 18 on a suitable guide 29 and having their lower portions provided with guides 30 arranged at right angles to the guide 29, and also provided with abutments 31 alined with the guides 30. The lower sections 28 are movable in the guides 30 and are provided with threaded openings 32 alined with the abutments 31. Adjusters 33 are movable in the threaded openings 32 and engage the abutments 31 for moving the lower sections 28 of the main bodies of the cutters in a direction at a right angle to the path of movement of the cutters along the guide 29. It will be noted that the guides 29 and 30 are formed with diverging side surfaces which tend to support the cutters and the lower sections thereof in position, and that the upper sections 27 of the main bodies of the cutters are provided with the usual gibs and adjusting screws 34 and 35, which may be utilized to hold the sections of the main bodies of the cutters in their adjusted position.

The knives 36 are each formed with cutting edges 37 38 39, the edge 37 being arranged at a right angle to the edge 38 and being separated therefrom, and having parts of unequal length extended beyond opposite sides of said edge 38, and the edge 39 being arranged at one side of the edge 37 at an angle to each of the edges 37 38, and extending from the end 40 of the edge 38 nearest the edge 37, to the outer end 41 of the part of the edge 37 of lesser length extended beyond the edge 38. As preferably constructed, said knives 36 are provided with portions meeting each other at substantially right angles and having their outer sides formed with the cutting edges 38 and the parts of the edges 37 of greater length extended beyond said edges 38, and these knives 36 are also provided at substantially the junction of said outer sides with parts formed substantially triangular in cross-section and having angularly-arranged cutting edges forming the edges 39 and the parts of the edges 37 of lesser length extended beyond the edges 38. The edges 37 and 39 as best seen in Figs. 6 and 7, usually incline upwardly from their point of junction 41 for reducing to a minimum the liability of the stock, being cut, binding between the opposing or inner surfaces of said edges. As best shown in Fig. 13, the edge 39 and the contiguous end of the edge 37 are disposed in straight lines, but it will be understood that they may be more or less curved. The cutting edges 37 38 39 coöperate with similarly-arranged edges 42, 43, 44, provided on the dies 9, the edges 42 being arranged at substantially right angles to the edges 43 and being separated therefrom, and having parts of unequal length extended beyond opposite sides of the edges 43, and the edge 44 of each die being disposed at an angle to each of the edges 42 43 of said die and extending from an end of the corresponding edge 43 to the outer end of the part of the edge 42 of lesses length extended beyond said edge 43.

As the head 18 reciprocates toward and from the dies 9, the cutters are guided in their reciprocal movement with the head by means, as uprights 45 normally fixed relatively to the dies 9 and preferably rising from the upper faces thereof and engaging directly with the cutter, the cutter having rearward extensions 46 of the upper sections 27 of the main bodies of the cutters. The uprights 45 are adjustable along guides 47 in the upper faces of the dies 9 extending parallel to the guide 29 and the direction of the lateral movement of the cutters, and at a right angle to the edges 37 of the cutters, and are provided with slots 48 which receive clamping means, as screws 49, for holding said uprights 45 in their adjusted position. Suitable adjusters 50 are supported by flanges 51 provided on the outer sides of the dies 9, and engage the uprights 45 for moving the same relatively to the dies 9 along the guides 47. The uprights 45 may be provided with the usual gibs 52 and adjusting screws 53, and are also provided at their contiguous or inner ends with laterally-projecting parts 54 arranged with their lower edges 55, Figs. 4 and 7, above the top faces of the dies and having upright bearing faces 56 projecting above the dies 9 and alined with the edges 42 of said dies. By utilizing means fixed to the dies for guiding the cutters, the liability of the non-alinement of the coöperating edges of the cutters and dies is reduced to a minimum, and by adjusting the knives relatively to the main bodies of the cutters in a line parallel to one of the edges 37, 38 and adjusting the cutters relatively to the dies in a line parallel to the other of said edges, the desired alinement of the coöperating edges of the cutters and dies can be readily and positively effected. Moreover, the cutters being guided by means fixed to the dies, and being unrestricted from movement lengthwise of the head 18 relatively to the dies when the screws 35 are loosened, are free to move with the dies as the same are adjusted by the screw 10. The parts 54 serve as gages for limiting the thickness of stock to be cut at a single operation, as indicators to determine the desired adjustment of the cutters relatively to the dies, and as strippers for preventing the stock from adhering to the knives when ascending. Moreover, the faces 56 of the parts 54 engage the contiguous surfaces of the knives 36 and tend to prevent non-alinement of the coöperating edges of the knives 36 and the dies 9 when in operation.

As an additional means for preventing non-alinement of the coöperating edges of the cutters and dies when in operation, the dies are provided with parts 57 projecting upwardly therefrom beyond the edges 42, 43,

44, and having upright bearing faces arranged in alinement with the edges 43.

Dies and cutters constructed and operated as described, cut box-forms of the shape shown in Fig. 17 having cutouts 58 at their corners provided with notches 59 at the junctions of the sides of the cutouts, and it will be understood by those skilled in the art, that when such box-forms are folded, corresponding sides of the cutouts 58 are provided with flaps 60 which are of a width equal to the depth of the notches 59, project from corresponding sides of the boxes and lap upon the contiguous surfaces of the sides of the folded forms meeting at an angle the sides provided with said flaps, thus presenting a particularly neat, workmanlike, and desirable appearance and facilitating the manufacture of the boxes and the securement of the box-forms in folded position. It will also be understood that the box-forms may be utilized to produce either the main bodies of the boxes, or their covers, or wrappers therefor.

The construction and operation of my machine will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be noted that more or less change may be made in the component parts thereof without departing from the spirit of this invention.

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

1. In a machine for cutting box-forms, a cutter provided with cutting edges, one being arranged at an angle to a second edge and extended beyond opposite sides of said second edge, substantially as and for the purpose described.

2. In a machine for cutting box-forms, a cutter provided with cutting edges, one being arranged at an angle to a second edge and having parts of unequal length extended beyond opposite sides of said second edge, substantially as and for the purpose specified.

3. In a machine for cutting box-forms, a cutter provided with two cutting edges arranged at an angle to each other, and a third cutting edge disposed at an angle to each of the other edges, substantially as and for the purpose set forth.

4. In a machine for cutting box-forms, a cutter provided with cutting edges, one being arranged at an angle to a second edge and extended beyond opposite sides of said second edge, and a third cutting edge disposed at an angle to each of the other edges and at one side of said second edge, substantially as and for the purpose described.

5. In a machine for cutting box-forms, a cutter provided with cutting edges, one being arranged at an angle to a second edge and separated therefrom and having parts of unequal length extended beyond opposite sides of said second edge, and a third cutting edge disposed at an angle to each of the first-mentioned edges and at one side of said second edge, the third edge extending from an end of the second edge to the outer end of the part of lesser length of the other of said first-mentioned edges extended beyond said second edge, substantially as and for the purpose specified.

6. In a machine for cutting box-forms, a cutter provided with portions meeting each other at substantially right angles and having their outer sides formed with cutting edges, the cutter being provided at substantially the junction of said outer sides with a part formed substantially triangular in cross-section and having angularly-arranged cutting edges, one forming a continuation of one of the first-mentioned cutting edges, and the other being arranged at an angle to both of said first-mentioned cutting edges, substantially as and for the purpose set forth.

7. In a machine for cutting box-forms, the combination of a cutter provided with cutting edges, one being arranged at an angle to a second edge and extended beyond opposite sides of said second edge; with a die having edges arranged similarly to said cutting edges and coacting therewith, substantially as and for the purpose described.

8. In a machine for cutting box-forms, the combination of a cutter provided with portions meeting each other at substantially right angles and having their outer sides formed with cutting edges, the cutter being provided at substantially the junction of said outer sides with a part formed substantially triangular in cross-section and having angularly-arranged cutting edges, one forming a continuation of one of the first-mentioned cutting edges, and the other being arranged at an angle to both of said first-mentioned cutting edges; with a die having edges arranged similarly to said cutting edges and coacting therewith, substantially as and for the purpose specified.

9. In a machine for cutting box-forms, a cutter provided with cutting edges arranged at an angle to each other, and a third edge disposed at an angle to each of the other edges, a die coöperating with the cutter, and means for adjusting the cutter relatively to the die in directions at right angles to the first-mentioned edges, substantially as and for the purpose described.

10. In a machine for cutting box-forms, a laterally-movable die, a head opposed to the die and reciprocating toward and from said die, a cutter carried by the die and projecting toward the die and coöperating therewith, said cutter being reciprocally movable with the head and being movable laterally with the die independently of the head, means fixed relatively to one of the laterally-movable elements and engaging the other of said

laterally movable elements, and means for moving said elements laterally, the last-mentioned means coacting directly with but one of the laterally-movable elements, the movement of the last-mentioned means being transmitted from one of the laterally movable elements to the other through the first-mentioned means, substantially as and for the purpose specified.

11. In a machine for cutting box-forms, a laterally-movable die, a head opposed to the die and reciprocating toward and from said die, a cutter carried by the head and projecting toward the die and coöperating therewith, said cutter being reciprocally movable with the head and being movable laterally with the die independently of the head, means fixed relatively to the die for engaging the cutter and guiding the cutter in its reciprocal movement, and means coacting directly with the die for moving the die and cutter laterally, the lateral movement of the die being transmitted to the cutter through the first-mentioned means, substantially as and for the purpose described.

12. In a machine for cutting box-forms, a laterally movable die, a head opposed to the die and reciprocating toward and from said die, a cutter carried by the head and projecting toward the die and coöperating therewith, said cutter being reciprocally movable with the head and being movable laterally with the die independently of the head, and means fixed relatively to the die for directly engaging the cutter and guiding the cutter in its reciprocal movement, substantially as and for the purpose specified.

13. In a machine for cutting box-forms, a laterally movable die, a head arranged above the die and reciprocating toward and from said die, a cutter depending from the head and coöperating with the die, said cutter being reciprocally movable with the head and being movable laterally with the die independently of the head, and means for guiding the cutter in its reciprocal movement, said means being fixed to the die and projecting above the same, substantially as and for the purpose set forth.

14. In a machine for cutting box-forms, a reciprocating head, a cutter carried by the head and having cutting edges arranged at an angle to each other, a die having edges cooperating with the first-mentioned edges, and means associated with the die for guiding the cutter in its reciprocal movement with the head, said means being adjustable relatively to the die in a direction at a right angle to one of the cutting edges of the knife, substantially as and for the purpose specified.

15. In a machine for cutting box-forms, a reciprocating head, a cutter carried by the head and having cutting edges arranged at an angle to each other, said cutter being reciprocally movable with the head and being movable laterally independently thereof, a die having edges coöperating with the first-mentioned edges, means fixed relatively to the die for guiding the cutter in its reciprocal movement with the head, said means being adjustable relatively to the die in a direction at a right angle to one of the cutting edges of the knife, and means for adjusting the first-mentioned means relatively to the die, substantially as and for the purpose set forth.

16. In a machine for cutting box-forms, a reciprocating head, a cutter carried by the head and reciprocally movable therewith, said cutter being also movable laterally relatively to the head, a die coöperating with the cutter and formed with a guide extending substantially parallel to the direction of the lateral movement of the cutter, a member for guiding the cutter in its reciprocal movement, said member being movable along the guide of the die and provided with a slot, an adjuster associated with the die for moving said member along its guide, and a clamping member associated with the die and arranged in the slot for holding said member in its adjusted position, substantially as and for the purpose described.

17. In a machine for cutting box-forms, a reciprocating head, a cutter carried by the head and movable laterally independently thereof, said cutter comprising a main body connected to the head and a knife having cutting edges arranged at an angle to each other movable relatively to the main body in a line at a right angle to the direction of the lateral movement of the cutter, and a die having shearing edges coöperating with the cutting edges of the knife, substantially as and for the purpose set forth.

18. In a machine for cutting box-forms, a reciprocating head, a cutter carried by the head and movable laterally independently thereof, said cutter comprising a main body connected to the head and a knife having cutting edges arranged at an angle to each other, said knife being movable relatively to the main body in a line at a right angle to the direction of the lateral movement of the cutter, and having one of its cutting edges disposed at a right angle to the direction of said lateral movement, and a die having shearing edges arranged at an angle to each other for coöperating with the cutter, substantially as and for the purpose specified.

19. In a machine for cutting box-forms, a reciprocating head, a cutter carried by the head and movable laterally independently thereof, said cutter comprising a main body connected to the head and a knife movable relatively to the main body in a line at a right angle to the direction of the lateral movement of the cutter, a die coöperating with the cutter, and means associated with the die for guiding the cutter in its reciprocal movement with the head, said means directly engaging

the main body and being adjustable relatively to the die in a line at a right angle to the direction of movement of the knife relatively to the main body, substantially as and for the purpose set forth.

20. In a machine for cutting box-forms, a cutter comprising a main body consisting of two sections, one being formed with a guide and an abutment alined with the guide, and the other section being movable lengthwise of the guide and provided with a threaded opening extending lengthwise of the guide, a knife secured to the section provided with the threaded opening and a screw movable in the threaded opening and engaged with the abutment, and a die coöperating with the knife, substantially as and for the purpose described.

21. In a machine for cutting box-forms, two members, one comprising a cutter, and the other a die having edges coöperating with the cutter, one of the members being movable toward and from the other, and the die being provided with a part projecting toward the other member beyond said edges of the die and having a bearing face for engaging the cutter prior to the operation of the cutter and edges of the die for cutting the box-forms, the bearing face being arranged in alinement with one of said edges of the die, substantially as and for the purpose specified.

22. In a machine for cutting box-forms, a die provided with edges, one being arranged at an angle to a second edge and separated therefrom and having parts of unequal length extended beyond opposite sides of said second edge, and a third edge disposed at an angle to each of the first-mentioned edges and at one side of said second edge, the third edge extending from an end of the second edge to the outer end of the part of lesser length of the other of said first-mentioned edges extended beyond said second edge, a part fixed to the die and having a bearing face arranged in alinement with said second edge, and a cutter having cutting edges cooperating with said edges of the die, substantially as and for the purpose set forth.

23. In a machine for cutting box-forms, two members, one comprising a cutter, and the other a die having edges coöperating with the cutter, one of the members being movable toward and from the other, and the die being provided with means projecting toward the other member beyond said edges of the die, and having a lateral extension separated from the die and formed with a bearing face arranged in alinement with one of said edges of the die, substantially as and for the purpose described.

24. In a machine for cutting box-forms, two members, one comprising a cutter, and the other a die having edges coöperating with the cutter, one of the members being movable toward and from the other, and the die being provided with means projecting toward the other member beyond said edges of the die, and having a lateral extension separated from the die and formed with a bearing face arranged in alinement with one of said edges of the die, and means for adjusting the cutter relatively to the die in a direction at a right angle to said bearing face, substantially as and for the purpose specified.

25. In a machine for cutting box-forms, a table provided with a guide, a die supported by the table and movable along the guide, a cutter having edges arranged at an angle to each other coöperating with the die, and means for moving the cutter with the die, substantially as and for the purpose set forth.

26. In a machine for cutting box-forms, a table provided with an opening extending through upper and lower faces thereof and having opposing bearing surfaces, a die supported by the table and movable in the opening, said die being guided in its movement by the opposing bearing surfaces of the opening, a cutter having cutting edges arranged at an angle to each other coöperating with the die, and means for moving the cutter with the die, substantially as and for the purpose described.

27. In a machine for cutting box-forms, a table comprising upper and lower sections provided with openings extending vertically therethrough in alinement with each other, the opening in the lower section being of less width than that in the upper section, and the upper section having opposing bearing surfaces at opposite sides of the opening therein, a die movable in the opening in the upper section of the table, said die being supported on the upper face of the lower section of the table and guided in its movement by said opposing bearing surfaces, a cutter coöperating with the die, and means for moving the cutter with the die, substantially as and for the purpose specified.

28. In a machine for cutting box-forms, a table provided with a lengthwise opening and a slot substantially parallel to the opening, a die supported on a face of the table and movable lengthwise of the opening, a clamping member arranged in the slot and engaging the die and the table for holding the die in its adjusted position, a cutter coöperating with the die, and means for moving the cutter with the die, substantially as and for the purpose set forth.

29. In a machine for cutting box-forms, a table provided with a guide, dies supported by the table and movable in the guide toward and from each other, cutters cooperating with the dies, and means for moving the cutters with the dies, substantially as and for the purpose described.

30. In a machine for cutting box-forms, a

table provided with a guide, dies supported by the table and movable in the guide toward and from each other, a head opposed to the dies and reciproctaing toward and from said dies, cutters carried by the head and projecting toward the dies and coöperating therewith, said cutters being movable laterally independently of the head, and means fixed to the dies for guiding the cutters in their reciprocal movement with the head, substantially as and for the purpose specified.

31. In a machine for cutting box-forms, a table, dies supported by the table and movable toward and from each other, a scale on the table arranged substantially parallel to the path of movement of the dies, said scale having indicating characters progressing in opposite directions from a central point, gages movable on the table along the scale, and cutters coöperating with the dies, substantially as and for the purpose specified.

32. In a machine for cutting box-forms, a cutter provided with cutting edges, one being arranged at an angle to a second edge and separated therefrom and having parts of unequal length extended beyond opposite sides of said second edge, and a third cutting edge disposed at an angle to each of the first-mentioned edges and at one side of said second edge, the third edge extending from an end of the second edge to the outer end of the part of lesser length of the other of said first-mentioned edges extended beyond said second edge, said third cutting edge and said part of lesser length of the other of said first-mentioned edges extending upwardly from the junction thereof, substantially as and for the purpose described.

In testimony whereof, I have hereunto signed my name in the presence of two attesting witnesses, at Rochester, in the county of Monroe, in the State of New York, this 16th day of June, 1904.

WILLIAM F. MORSE.

Witnesses:
ARTHUR E. PARMS,
ROY C. WEBSTER.