

No. 700,480.

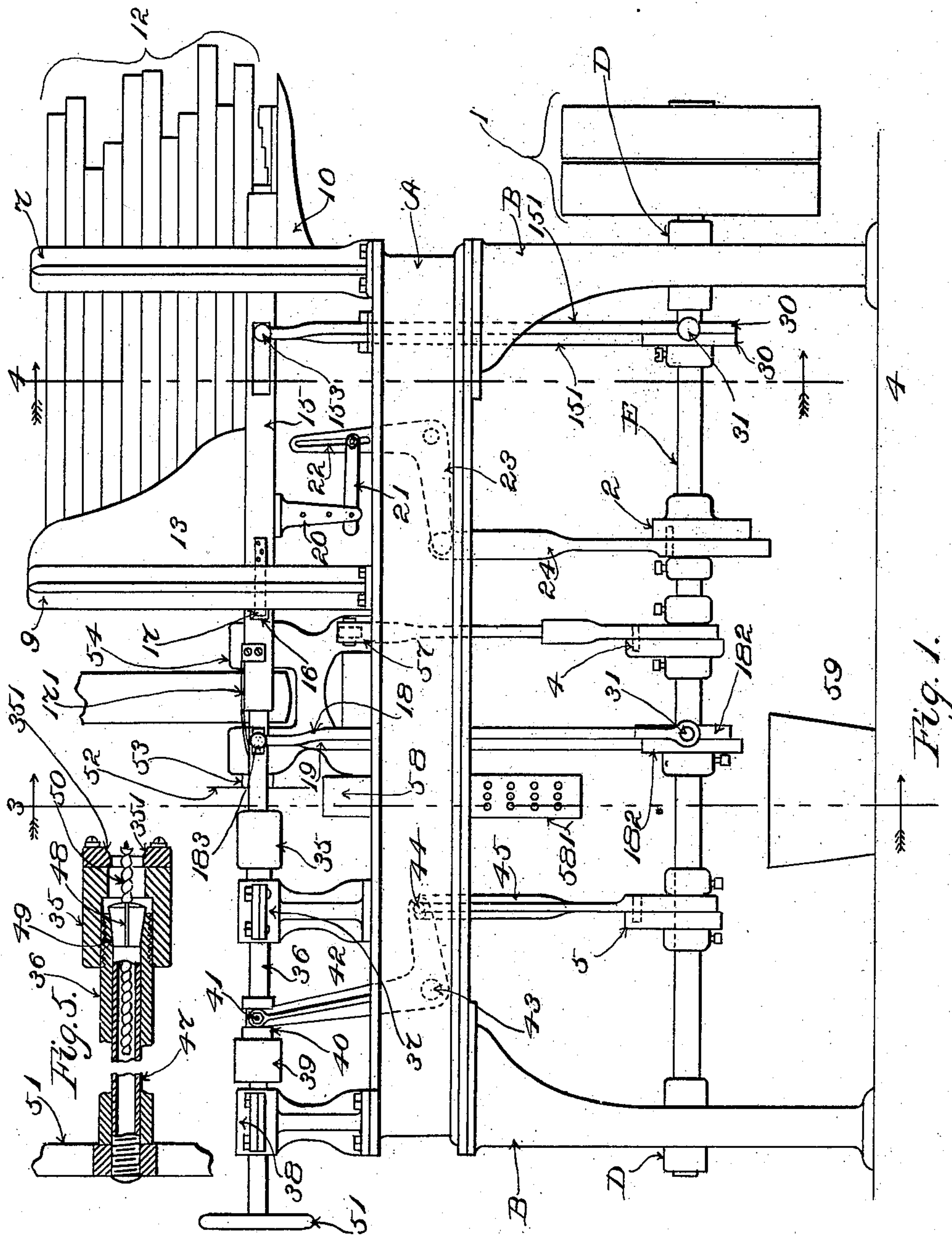
Patented May 20, 1902.

J. W. CARVER.
MACHINE FOR MAKING SPOOL BLANKS.

(Application filed Aug. 14, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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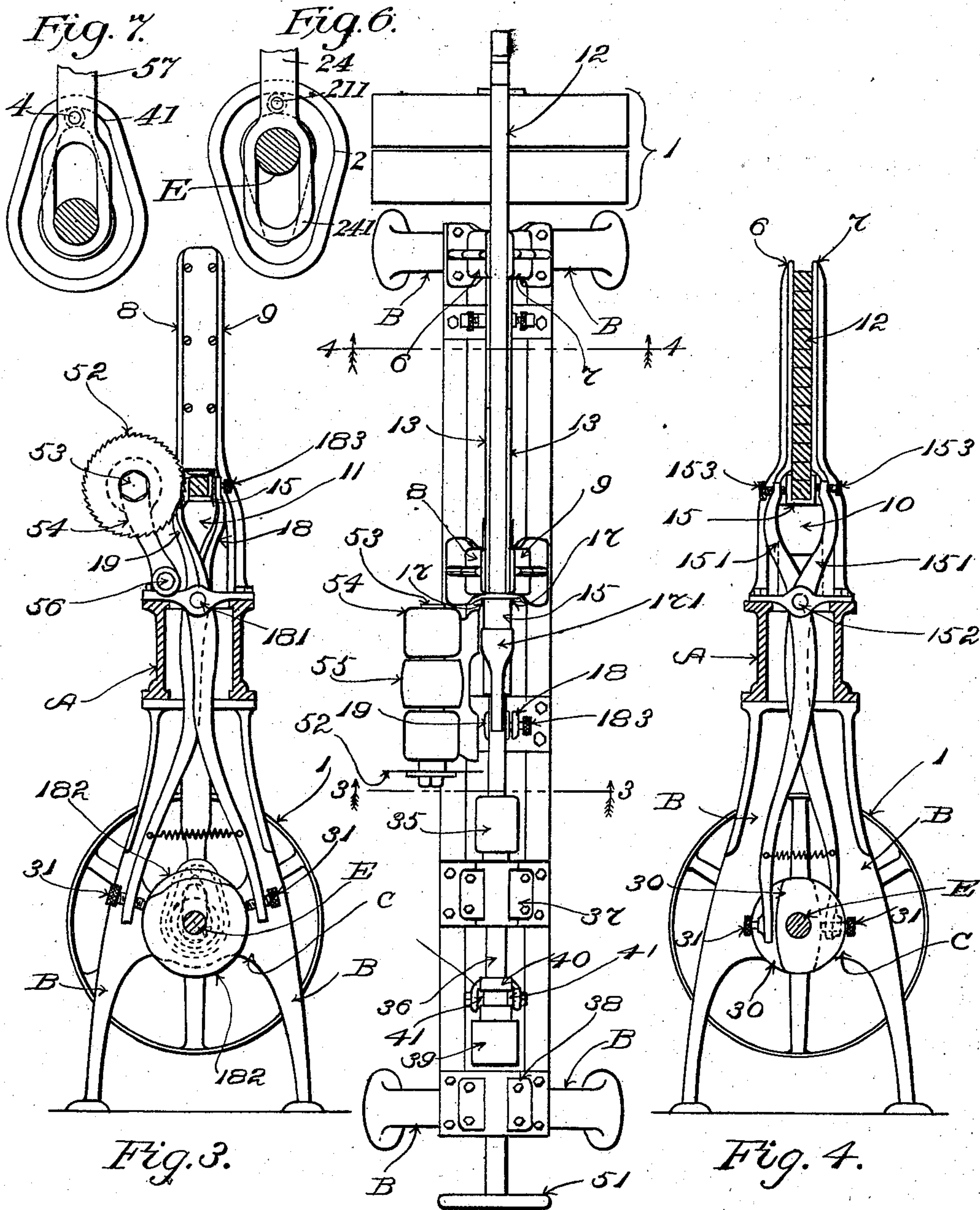
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(Application filed Aug. 14, 1899.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:

Oscar F. Hill
 Lepine & Rice

Fig. 2.

Inventor:

James W. Carver
 by Marcus Baker & Randall
 his Attorneys.

UNITED STATES PATENT OFFICE.

JAMES W. CARVER, OF AUBURN, MAINE.

MACHINE FOR MAKING SPOOL-BLANKS.

SPECIFICATION forming part of Letters Patent No. 700,480, dated May 20, 1902.

Application filed August 14, 1899. Serial No. 727,203. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. CARVER, a citizen of the United States, residing at Auburn, in the county of Androscoggin and State of Maine, have invented certain new and useful Improvements in Machines for Making Spool-Blanks, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has for its object to provide an improved automatic machine for forming spool-blanks.

The invention consists in a machine comprising means for receiving and holding one above the other a number of pieces of wood, preferably squared strips, from which the spool-blanks are formed, which pieces may be of different lengths, means for seizing and feeding forward successively the lowermost piece or stick of the pile or stack, means for turning or cutting to shape a sufficient portion of the forward end of the stick which is being fed to form a spool-blank and simultaneously boring a hole longitudinally there-through, means for severing the blank thus formed from the stick, and means for conveying the blank thus formed to a proper receptacle or holder, all said means coöperating in an organized machine to form spool-blanks continuously and automatically from prepared sticks or pieces which are placed in a stack or pile one above the other in the said holder or receiver.

In the following specification I will describe a machine embodying my invention, and in the claims at the close thereof I will point out and clearly define the novel features of my invention.

Reference is to be made to the accompanying drawings, in which—

Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a top plan view thereof. Fig. 3 is a transverse vertical section on line 3 3 of Fig. 1. Fig. 4 is a transverse vertical section on line 4 4 of Fig. 1. Fig. 5 is a detail view in section of the cutter-head and connected parts. Fig. 6 is a detail view of the cam 2 and connections. Fig. 7 is a detail view of the cam 41 and connections.

A is the frame of the machine, which preferably is supported by legs B B. The said legs are connected together in pairs by the

cross-pieces C C, which latter support the journal-boxes D D of the driving-shaft E, the said shaft being located directly beneath the frame of the machine.

The driving-shaft E is provided at one end thereof beyond the frame with fast and loose pulleys 1 of usual character.

Upon driving-shaft E are secured the various cams, by means of which the various operative parts are actuated.

At one end of the frame A is placed the receiver and holder for the stack of squared sticks 12, from which the spool-blanks are to be formed. This holder comprises uprights 6, 7, 8, and 9, which are bolted to frame A. These uprights are placed together in pairs, the pair consisting of the uprights 6 and 7 being at one extreme end of frame A, while the pair 8 and 9 is at a distance from the former corresponding substantially with the length of the shortest sticks or pieces which are intended to be handled. The uprights forming each pair are spaced apart widely enough to permit free movement of the sticks or pieces 12 between them.

Each of the uprights 8 and 9 is provided with a projecting wall or wing 13, the said walls or wings extending toward the pair of uprights 6 and 7 on opposite sides of the stack or pile of sticks or pieces 12 and assisting to prevent lateral displacement of the said sticks or pieces. The lowermost stick in the stack or pile rests in a box-shaped feeder 15, which preferably is formed of metal and open at each end, the bottom of the said feeder at the forward end extending slightly beyond the sides thereof. The said feeder rests on the bottom pieces 10 11 and slides thereon as it is reciprocated toward and from the cutter-head. In each side wall of the said feeder an opening 16 is formed, through which projects the inwardly-curved forward extremity of a spring-dog 17, which latter is secured at its rear end to the side of the feeder. The serrated ends of the said inwardly-curved extremities of the dogs 17 17 engage the stick which lies in the feeder, and as the feeder is moved toward the cutter-head the stick is fed forward thereby between the jaws 18 and 19 of the clamp which is adjacent the cutter-head. During the reverse movement of the feeder the toothed dogs slide along the sides

of the stick, which at this time is held securely between the clamping-jaws 18 and 19. Another spring-dog 171, provided with a downwardly-bent serrated end, is located on top of the feeder at the forward end of the latter, the rear end of said spring-dog 171 being enlarged sufficiently to extend across the top of the feeder over the stick which lies therein and being rigidly secured to the sides of the feeder. The downwardly-bent forward end of this dog engages with the top or upper surface of the stick within the feeder and assists in effecting the forward movement of the stick as the feeder is advanced. When the feeder is moving in the reverse direction, the said spring-dog is dragged back over the surface of the stick in the same manner as are the side dogs.

The reciprocation of the feeder is effected as follows: To the under side thereof is secured a downwardly-projecting arm 20, to which is pivotally connected one end of a link 21, the other end of said link being pivotally connected with the vertically-extending arm of the bell-crank 23, which latter is pivoted within the frame A of the machine. Slot 22 in said vertical arm provides for adjustment of the link to enable the extent of the feed movement of the feeder to be varied. To the horizontally-projecting arm of the said bell-crank is pivoted a link 24, the latter having a yoke-shaped or slotted portion 241 at the lower end thereof fitting over shaft E and provided with a pin 211, working in the groove of the cam 2 on the said shaft. As the shaft revolves the link 24 is vertically reciprocated, swinging the bell-crank on its pivot and by means of the connection 21 and arm 20 reciprocating the feeder 15. In consequence of being pushed forward at each advance of the feeder and of being held by the clamp 18 19 during each retraction of the feeder the stick which lies within the feeder is fed forward step by step, the extent of feed at each step being proportioned to the length of spool-blank which it is desired to form. When the stick of wood within the feeder has been fed forward, so that its rear end clears the forward end of the stick lying immediately above it, the latter stick drops into position in the feeder-box; but since the forward end of said latter stick is not yet in a position to be seized by the clamping-jaws 18 and 19 the said stick would simply be moved backward and forward as the feeder reciprocates without being fed forward step by step, as is desired, unless other means were provided to prevent the backward movement thereof. To provide against this backward movement of the stick which last entered the feeder, an auxiliary clamping device is provided, which comprises two levers 151 151, crossing each other substantially in the manner of a pair of tongs. These are pivoted at 152 within the frame A. The upper ends of said levers operate through longitudinal slots in the sides of the feeder, the said ends hav-

ing applied thereto screws 153 153. The points of the said screws are intended to engage with the stick lying within the feeder. The lower arms or tailpieces of the clamp-levers 151 151 bear upon the peripheries of a pair of cams 30 30, secured on the main shaft E. As the shaft revolves the said cams operate to spread apart or separate the lower ends of the clamp-levers, thereby causing the upper ends thereof to close upon the stick lying within the feeder to hold said stick and prevent it from moving backward during the reverse movement of the feeder.

The screws 153 153 are provided on the upper ends of the clamp-levers 151 151 in order to permit adjustment to be made to accommodate pieces of wood of varying thickness and, further, in order to permit a fine adjustment of the pressure exerted by the auxiliary clamp.

The main clamp comprises the clamp-levers 18 19, which are pivoted at 181, the lower arms or tailpieces of the said clamp-levers being engaged by cams 182 182 on shaft E. The upper arms of said clamp-levers preferably are provided with adjustable screws, as 183 183, for engagement with the stick of wood which is between such arms.

The cams 182 182 are so timed as to insure the engagement of the wood by the said clamp-levers 18 19 during the time when the feeder is moving rearwardly and while the cutter-head is forming and boring a blank and the saw is severing the blank thus formed from the stick.

The lower ends or tailpieces of the clamp-levers 151 151, 18, and 19 are each provided with a screw 31, the end of which comes in contact with the periphery of the corresponding cam. The said screws enable an adjustment of the space between the jaws of the auxiliary and main clamps to be effected to suit the widths of the sticks which are being operated upon.

A stick having been fed forward by the action of the feeder 15, so that a sufficient portion of its free end projects to form a spool-blank, the said stick is seized and held securely by means of the clamping-levers 18 and 19, as above described. The cutter-head is then moved onto the end of the said stick to cut the stick to shape, the said cutter-head operating to form a cylindrical spool-blank with a hole longitudinally therethrough, as is required in spools of common construction, such as are used for thread and the like.

The cutter-head is shown at 35 and is mounted on the end of the cutter-head shaft 36. The latter is journaled in two uprights 37 and 38, which are bolted on top of the frame A. The shaft 36 is provided with a pulley 39, by means of which power is applied. For the purpose of sliding the shaft toward and from the wood a sleeve 40 is secured on the said shaft, the said sleeve being provided with an annular groove which is entered by the inwardly-projecting pins 41 of the Y-shaped

upwardly-extending arm of the bell-crank 42. The bell-crank 42 is pivoted at 43 within the frame A. To the other arm of the bell-crank is pivoted at 44 a link 45, the lower end of which is slotted or yoke-shaped to fit over shaft E, the said link carrying a pin which works in the groove of cam 5. The cam 5 operates to cause the cutter-head to be advanced onto the wood to cut the spool-blank to shape and then to be withdrawn.

The cutter-head 35 is of well-known construction, being cylindrical in shape and provided with a knife or knives 351, so that as it advances onto the wood it cuts the portion of wood which enters within the head to cylindrical shape.

The shaft 36, which carries the cutter-head, is hollow, and within the same is fitted a tube 47, which is split, as shown at 48, at its forward end next the cutter-head, preferably at four equidistant points. The split end is formed with a slight external flare or reverse taper, which as the tube is drawn into the said cutter-head shaft makes contact with a correspondingly-beveled interior portion 49 at the end of the cutter-head shaft 36. The other end of the tube 47 projects beyond the corresponding end of the hollow cutter-head shaft 36. This projecting end is threaded, and upon the same is mounted a hand-wheel 51, having a correspondingly-threaded central eye. By means of the said hand-wheel the tube 47 may be drawn longitudinally into the cutter-head shaft, so as to compress the split end thereof within the inner end of the said cutter-head shaft. The said tube forms the holder for the auger 50, which bores the hole longitudinally through the blank. By placing the shank of the auger within the tube and turning the hand-wheel 51 the tube is drawn into the cutter-head shaft and the split end thereof caused to clamp the shank of the auger firmly and hold the auger securely in place. As will be clear, a very long auger may be employed, which is advantageous, since if the auger is broken or dulled it may be repeatedly reground and its life prolonged.

When the cutter-head has been moved away from the wood after completing the operation of cutting and boring the blank, it then remains to sever the blank thus formed from the stick. For this purpose I provide a circular saw 52, which is mounted on a shaft 53, the said shaft being journaled in a swinging frame 54 and provided with a pulley 55, by means of which power may be applied. The frame 54 is pivoted to the frame A at 56 and is provided with a projecting arm, to which is pivoted the upper end of a connection 57, Fig. 1, the lower end of which is slotted or yoke-shaped to fit over shaft E, as shown in Fig. 7. The cam 41 on the main shaft is grooved to receive a pin 4, projecting from said connection. As the shaft revolves the saw is moved by these means positively through the wood, severing the blanks, and is then

moved positively in the reverse direction into position for the next forward movement.

After the blank is severed it falls into a receiver 58 and thence passes downwardly through a conductor 581 to a receptacle 59, conveniently placed.

The small pieces at the end of a stick, which are too small for use in forming a blank, will when the last blank is cut therefrom and as the clamp-levers 18 and 19 are opened drop out of the jaws.

The operation of the machine is automatic and continuous, it being only necessary for the attendant to place pieces of wood which have been preferably formed in square sticks of proper size in the receiver or holder one above the other and to see that the supply of said squared sticks is renewed from time to time.

I claim as my invention—

1. An organized machine for forming spool-blanks and the like, comprising, essentially, guides for stock prepared in stick form, the reciprocating trough-shaped feeder provided with dogs to engage the stock within said feeder in the advance of the feeder, the cutter-head to shape the end portion of the stick, the tool to form the central hole in such end portion, the movable clamp members to engage with the stock adjacent the cutter-head, cam mechanism to operate the said movable clamp members, and means to sever the finished blank, substantially as described.

2. An organized machine for forming spool-blanks and the like, comprising, essentially, guides for stock prepared in stick form, the reciprocating trough-shaped feeder provided with dogs to engage the stock within said feeder in the advance of the feeder, the cutter-head to shape the end portion of the stick, the tool to form the central hole in such end portion, the movable clamp members to engage with the stock adjacent the cutter-head, cam mechanism to operate the said movable clamp members, the supplementary clamp to engage the fresh piece of stock within the said feeder and hold the same during the return movement of the feeder and means to sever the finished blank, substantially as described.

3. An organized machine for forming spool-blanks and the like, comprising, essentially, guides for stock prepared in stick form, the reciprocating trough-shaped feeder provided with dogs to engage the stock within said feeder in the advance of the feeder, the cutter-head to shape the end portion of the stock, the auger to bore the central hole in such end portion, means to rotate and to advance said cutter-head and auger, the movable clamp member to engage with the stock adjacent the cutter-head, cam mechanism to operate the said movable clamp members, and means to sever the finished blank, substantially as described.

4. An organized machine for forming spool-

blanks, containing, in combination, guides
for stock prepared in stick form, the recip-
rocating feeder, the clamp to hold the stick
while being operated upon, the supplemen-
5 tary clamp to hold the fresh stick during the
receding movement of the feeder, the cutter-
head to turn the end portion of the stick, an
auger to bore a central hole in such end por-
tion, and a cutter to sever the blank from the
10 end of the stick, substantially as described.

5. The combination with the cutter-head,
and its hollow shaft, of the tube within the

said shaft and having the split end with ex-
ternal flare, the auger within the said tube,
and means to move the tube endwise within 15
the shaft to compress it upon the auger, sub-
stantially as described.

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

JAMES W. CARVER.

Witnesses:

WM. A. MACLEOD,
ALICE H. MORRISON.