

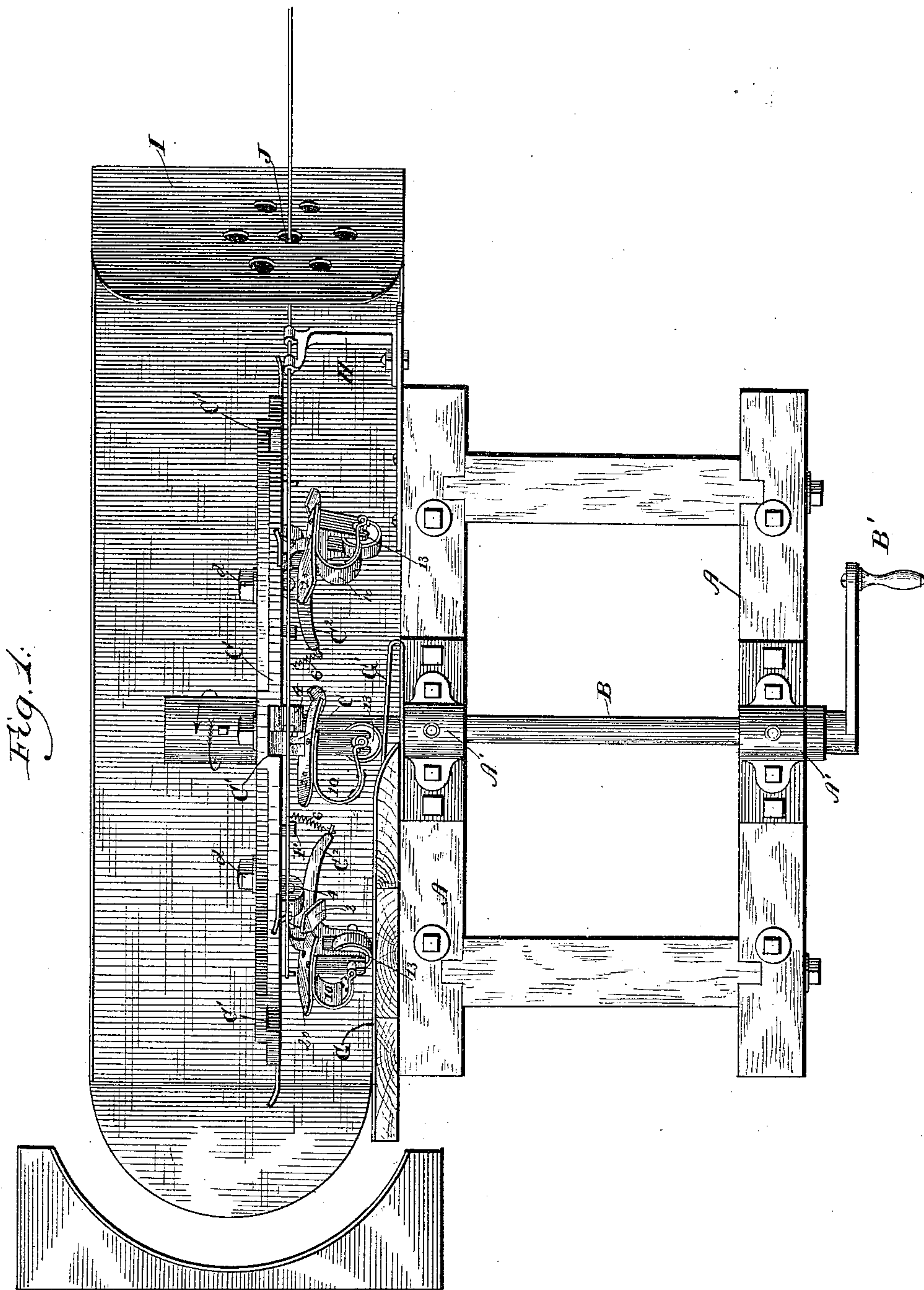
(No Model.)

3 Sheets—Sheet 1.

O. H. HICKS.
WIRE CUTTING MACHINE.

No. 362,746.

Patented May 10, 1887.



Witnesses:
Chas. E. Gaylord,
A. J. Stewart,

Inventor:
Olin H. Hicks
By *Clunch & Clunch,*
Attys.

(No Model.)

3 Sheets—Sheet 2.

O. H. HICKS.
WIRE CUTTING MACHINE.

No. 362,746.

Patented May 10, 1887.

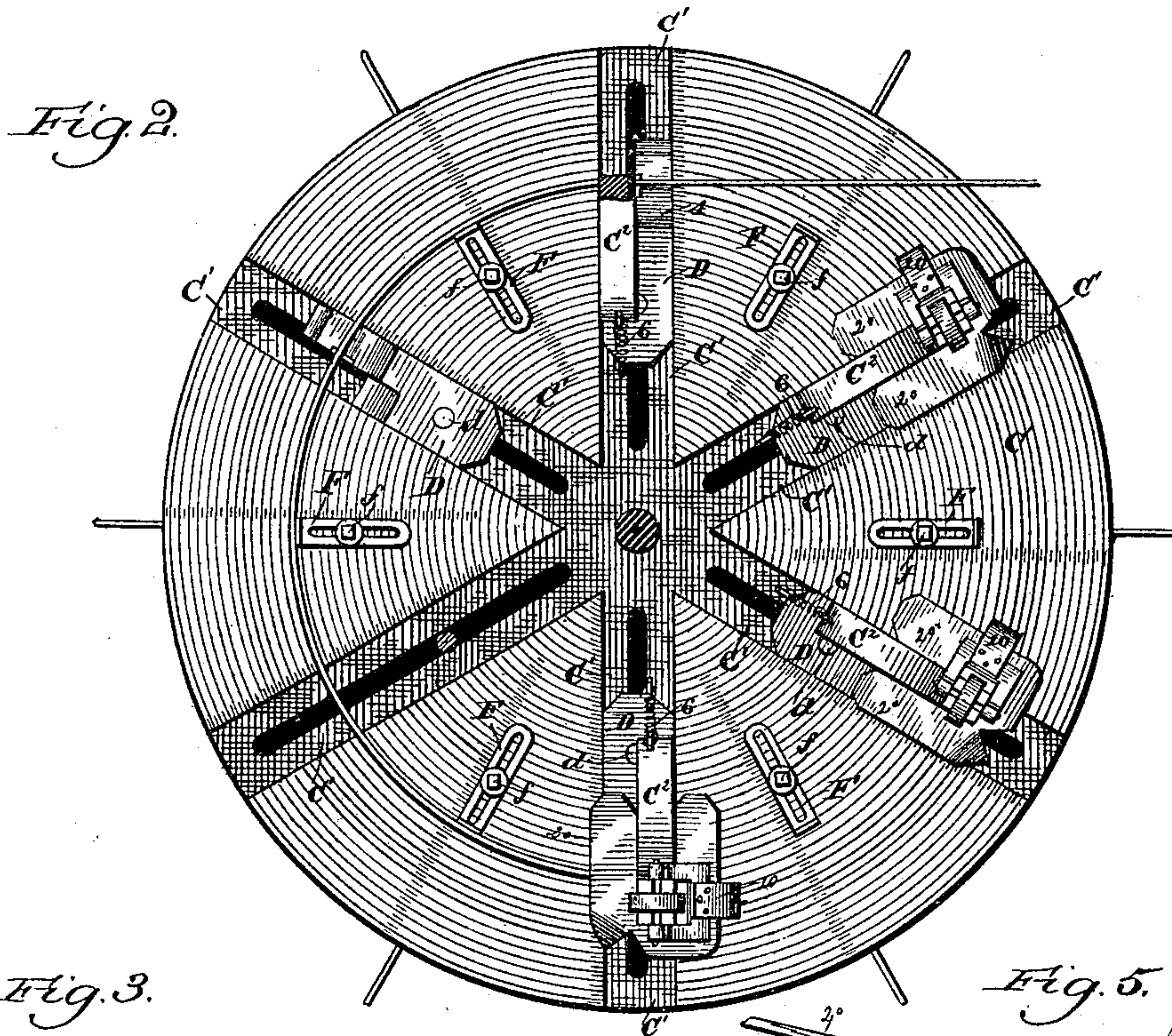


Fig. 3.

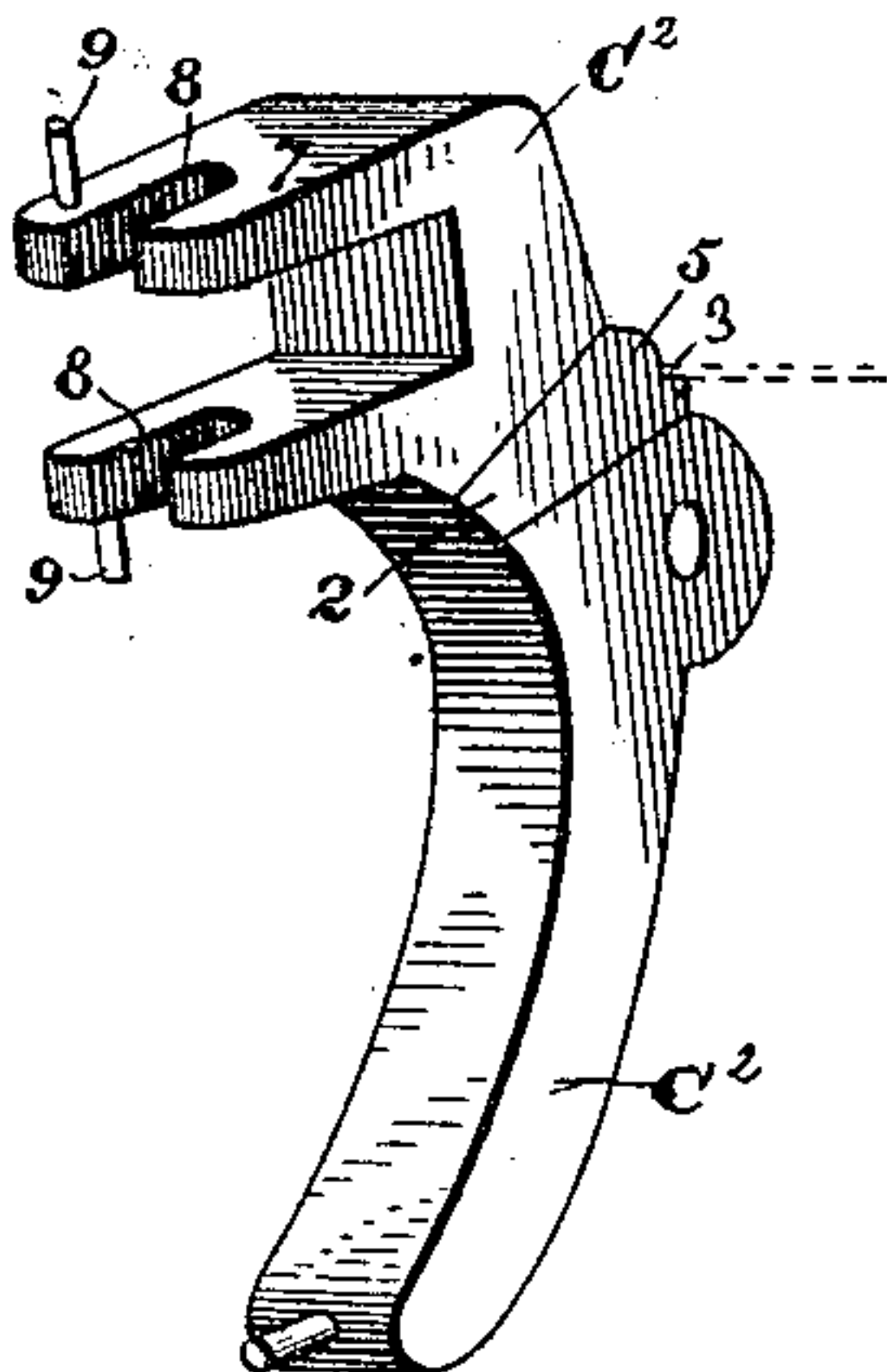


Fig. 4.

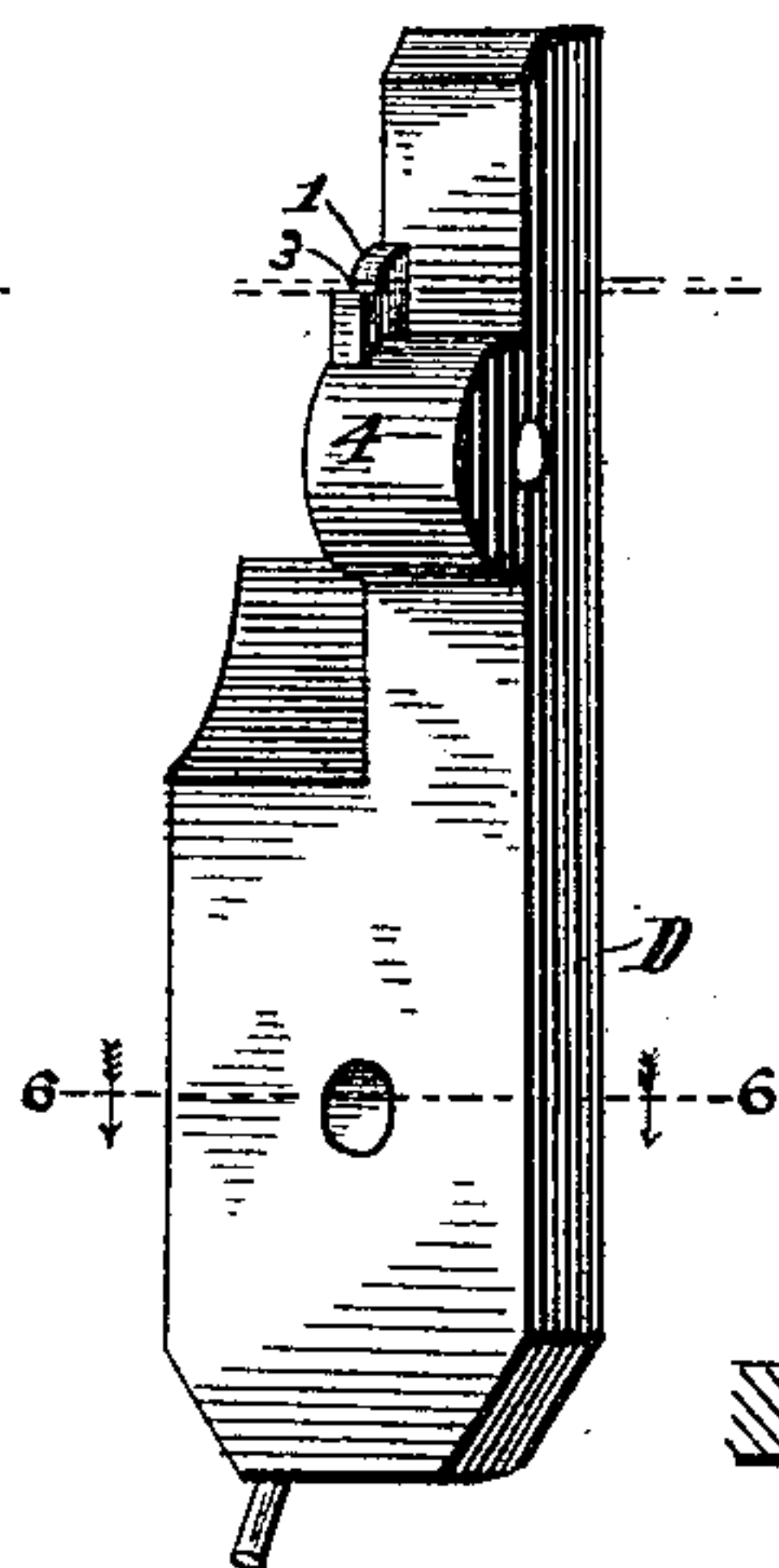


Fig. 5.

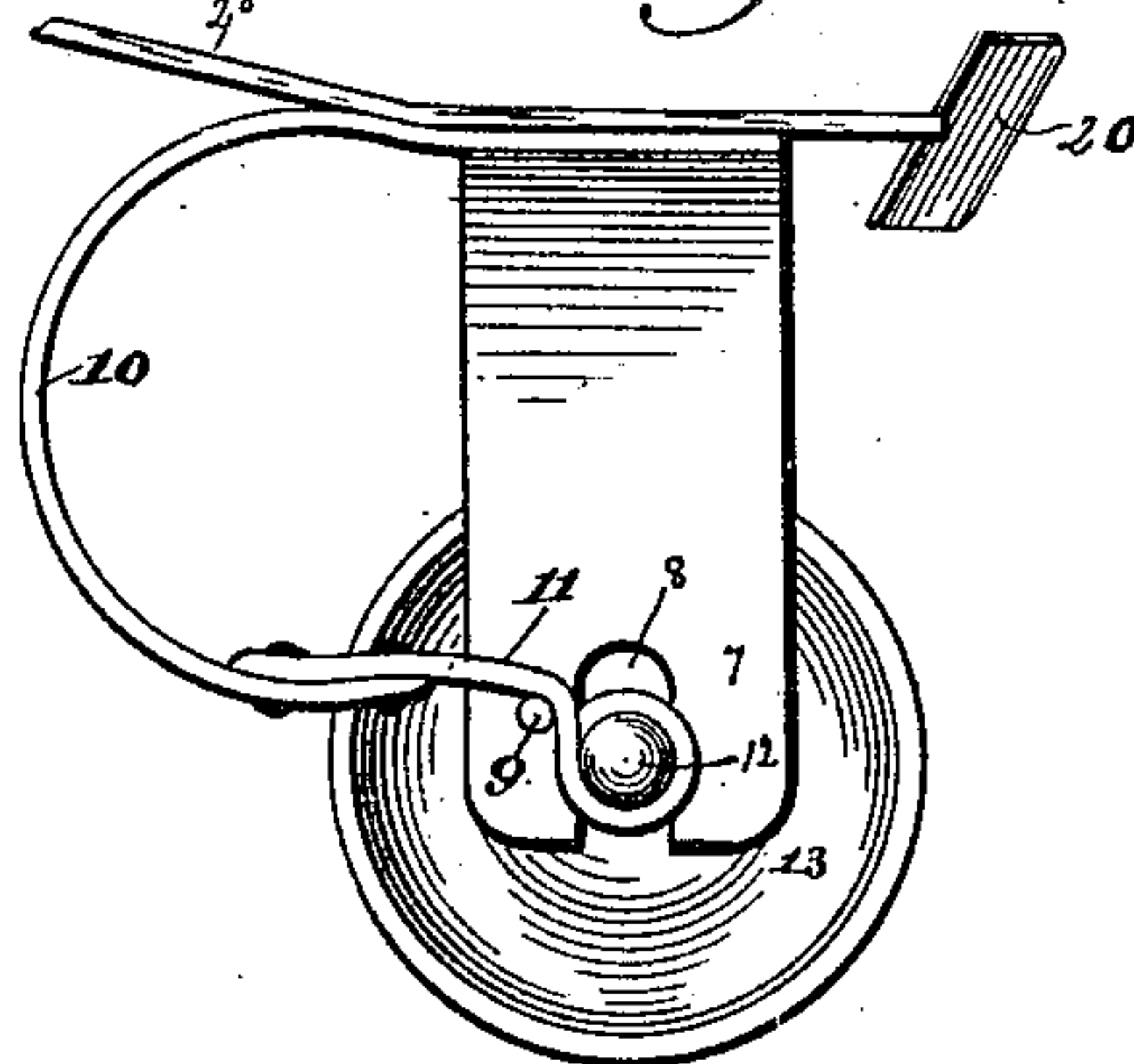
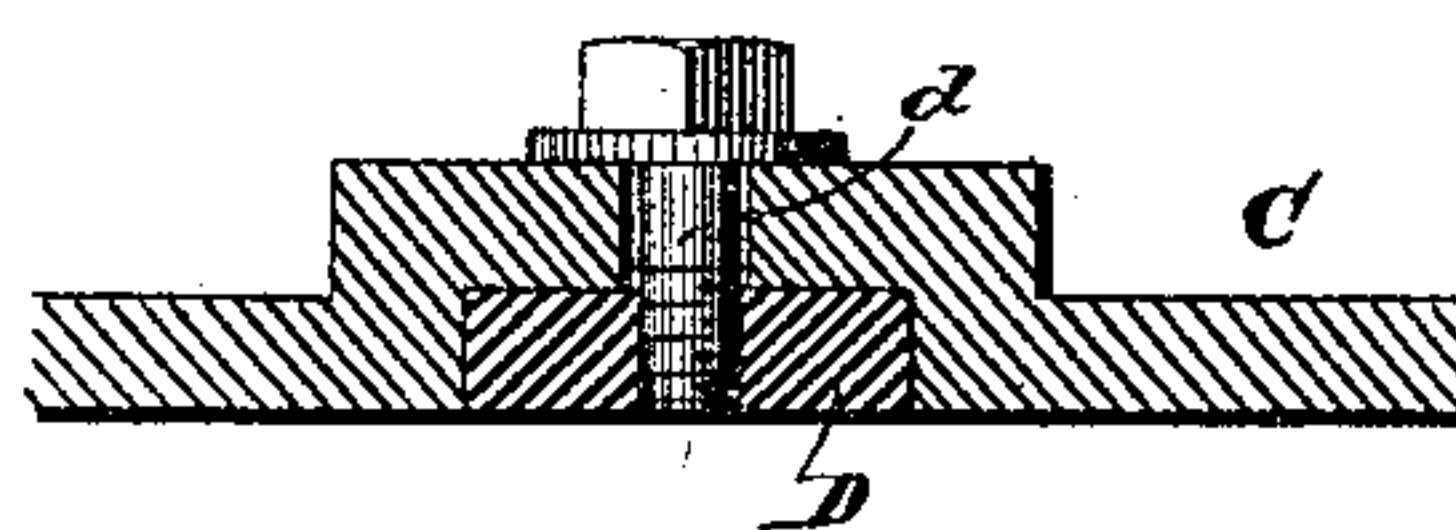


Fig. 6.



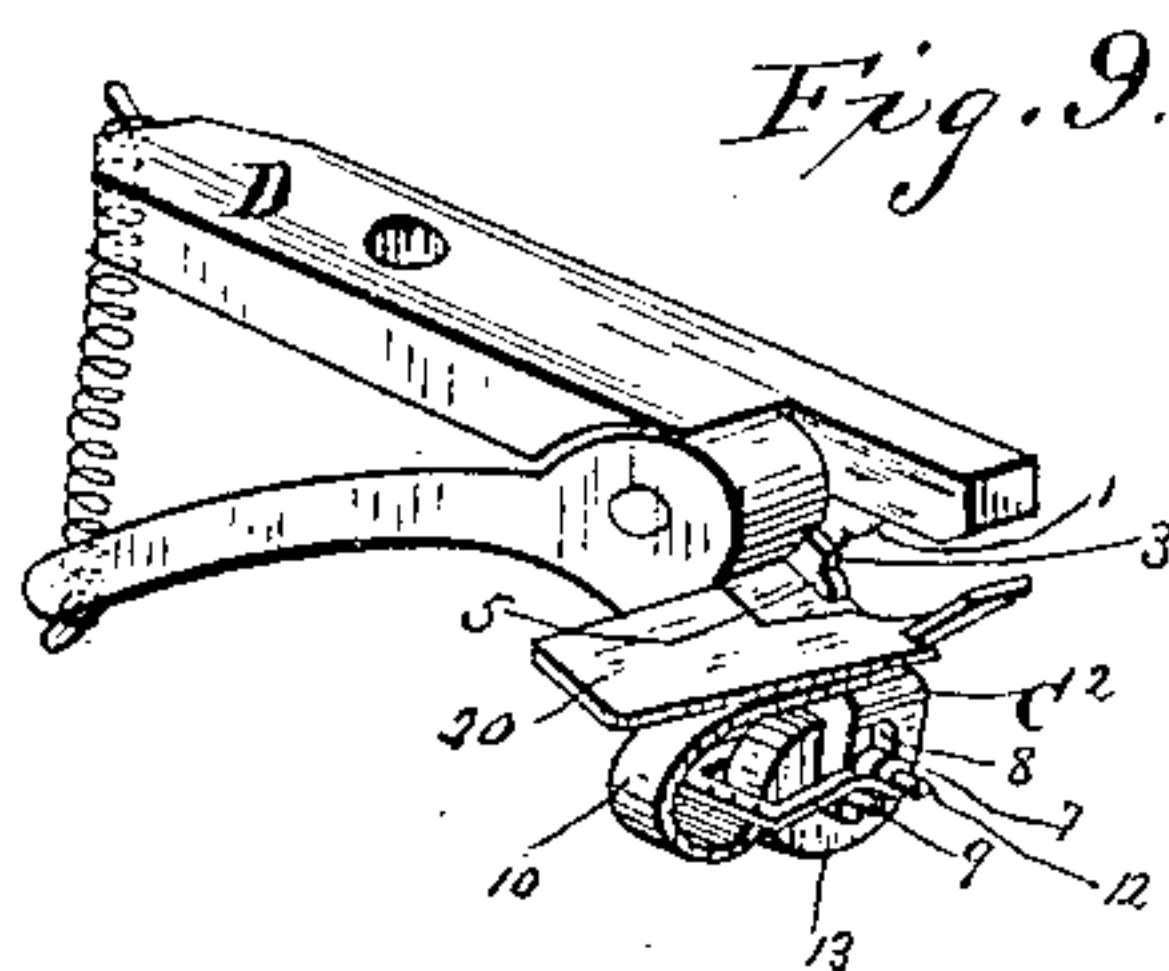
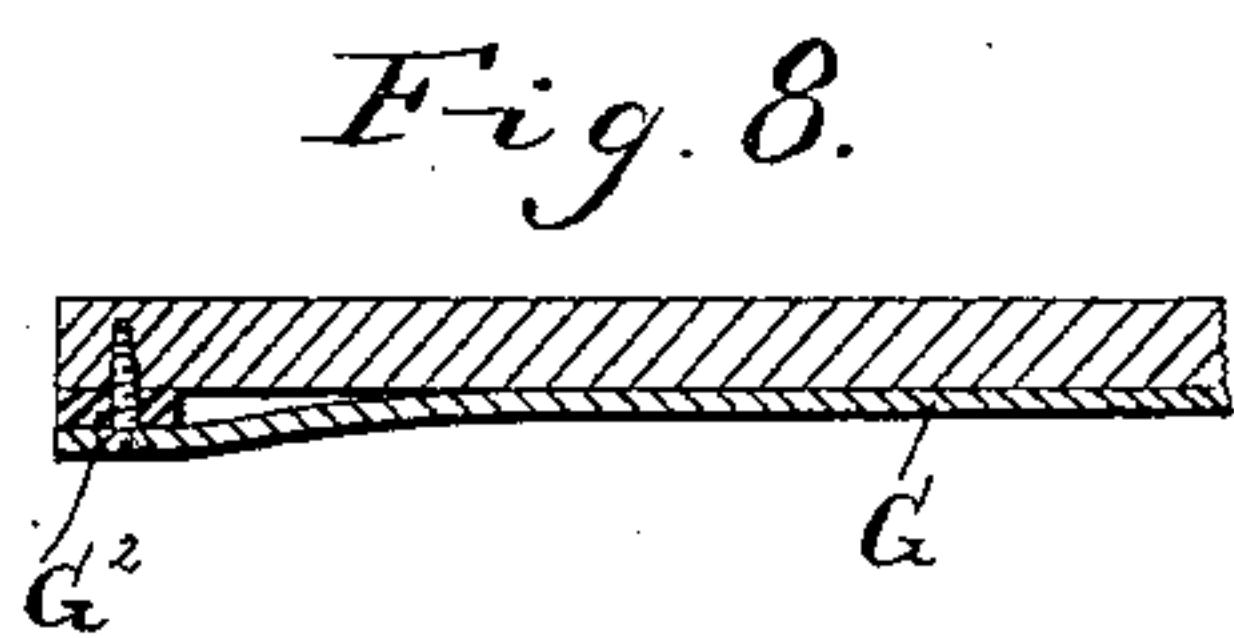
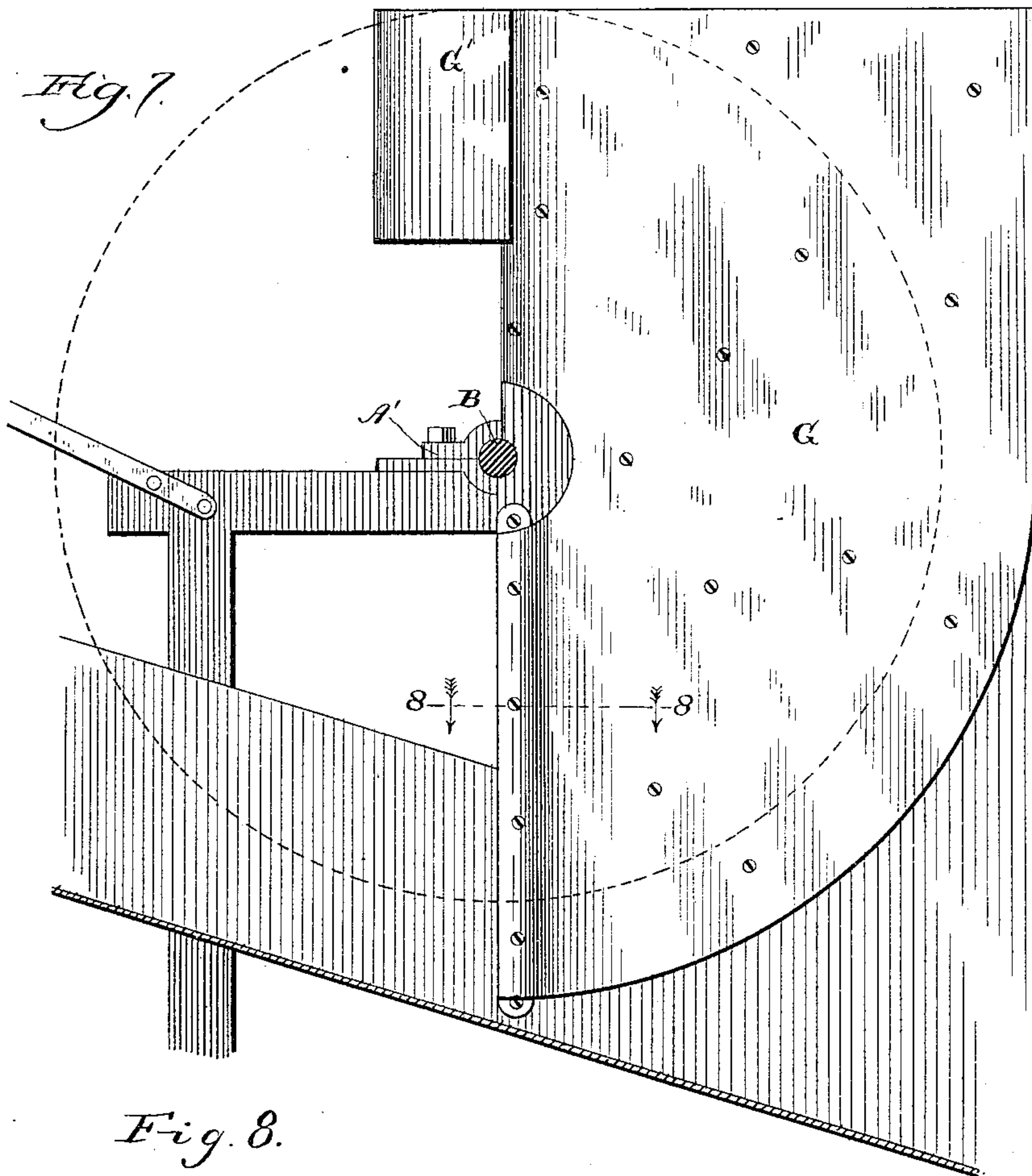
Witnesses:
Chas. E. Gaylord,
J. Stewart.

Inventor:
Olin H. Hicks
By
Church & Church
Attys.

O. H. HICKS.
WIRE CUTTING MACHINE.

No. 362,746.

Patented May 10, 1887.



Witnesses:
Chas. E. Gaylord,
A. J. Stewart.

Inventor:
Olin H. Hicks
—By Church & Church
Attys

UNITED STATES PATENT OFFICE.

OLIVER H. HICKS, OF CHICAGO, ILLINOIS.

WIRE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 362,746, dated May 10, 1887.

Application filed December 9, 1886. Serial No. 221,122. (No model.)

To all whom it may concern:

Be it known that I, OLIVER H. HICKS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful
5 Improvements in Wire-Cutting Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and
10 to the figures and letters of reference marked thereon.

My invention has for its object to provide a machine for automatically cutting wire or similar material into sections of predetermined
15 length, said sections being adapted to be used in the binding of books, securing paper boxes or buckets together, for bale-ties, or other analogous purposes; and it consists in certain novel constructions and combinations of parts,
20 whereby the wire is automatically drawn from its containing-reel, measured into the desired lengths, severed, and the sections dropped from the machine, the wire being drawn from the reel constantly, and all the operations taking
25 place in the order mentioned, one after another.

It further consists in certain novelties of construction and combinations of parts, all of which I will now proceed to describe, and point
30 out particularly in the claims at the end of this specification.

In the drawings, Figure 1 is a top plan view of a machine constructed in accordance with my invention. Fig. 2 is the disk or wheel
35 upon which the operating parts are mounted; Fig. 3, a view of the movable gripping and cutting jaw; Fig. 4, a view of the stationary gripping and cutting jaw; Fig. 5, a view showing the attachment of the roller to the movable gripping and cutting jaw; Fig. 6, a sectional view showing the manner of connecting the gripping and cutting jaw to the main disk.
40 Fig. 7 is a view of the cam-plate with which the gripping and cutting devices co-operate to cause the various operations of the machine, and Fig. 8 is a sectional view on the line 8 8 of Fig. 7. Fig. 9 is a perspective view of the gripping and cutting jaws.

Similar letters of reference in the several
50 figures indicate the same parts.

A A represents the main supporting-frame

of the machine, constructed in any suitable manner of wood or metal, having on its upper surface journal-boxes A' A', in which is mounted the main shaft B, provided at one
55 end with any suitable device for driving it, (a crank, B', being shown,) and at the other with a large disk, C, constructed, preferably, of metal, and secured thereto in any suitable manner, which disk carries the gripping and cutting
60 devices. Upon the inner side of the disk are provided a series of radial grooves, C', in which are adapted to be secured blocks or carriages D, for carrying the gripping and cutting devices. These blocks are preferably of a
65 shape in cross-section adapted to accurately fit the groove in the disk, so as to be prevented from turning therein, and they are capable of radial adjustment, being secured in adjusted position by headed bolts d, passing through
70 slots in the rear of the grooves and entering tapped recesses in the blocks, as shown in Fig. 6. One end (the outer) of the blocks is much smaller than the groove, and this radial end forms one of the jaws of the gripper and cut-
75 ter, being provided with a removable cutting-plate, 1, having the tapered shank 2 dovetailed into the block after the manner of removable cutters for pliers, and having the notch 3 in its outer side forming the cutting portion. 80

C² represents the movable gripping and cutting jaw, constructed as shown in Fig. 3, pivoted to the lug 4 on the block D, and having the removable cutting-plate 5, corresponding in shape and position relative to the pivot
85 with the one on the block D. The rear end of the jaw is connected with the block by means of a small spiral spring, 6, operating to draw said end down and separate the cutting-jaws, as will be readily understood. The forward
90 end of the jaw C² is bifurcated on its rear side, and each of the arms 7 7 thus formed is provided with a slot, 8, and pins 9 on one side thereof, as shown. Upon the under side of this end of the jaw is provided a spring-
95 plate, 10, bent around, as shown in Fig. 5, and connected to the bifurcated plate 11, which latter has its ends bent over and encircling the ends of a pin, 12, forming the axle of a roller or wheel, 13, mounted in the slot between the
100 arms 7 7. The tendency of the spring 10 is to force the wheel out of the slot; but this is pre-

vented by the pins 9, against which the plate presses. The slot being slightly deeper than the diameter of the axle, it will be seen that the latter is allowed a slight vertical movement therein, for a purpose to be explained.

Upon the under side of the movable jaw is secured a plate, 20, of sheet metal, which, as shown in Fig. 1, serves as a guide, and assists the wire in properly positioning itself between the jaws when the machine is in operation.

Between each of the blocks carrying the cutting devices are secured guide-plates F, having projections at their ends, and longitudinal slots, through which the headed bolt *f* projects, and adapted to be moved in or out, as desired, and secured in adjusted position by screwing in the bolt, as will be seen.

Upon one side of the main frame adjacent to the disk is formed a semicircular cam-surface for causing the gripping and cutting operations, preferably composed of a wooden backing, covered with a metal plate, as shown in Figs. 1 and 7, and the upper end of this semicircular plate is provided with an inclined plate or way, G' , which the rollers on the gripping-jaws strike and ride upon when the disk is rotated. This surface G is of equal height until the lower end is reached opposite the plate G' , where an abrupt rise is formed, as shown in Figs. 7 and 8, preferably by placing an additional piece of material beneath the edge of the plate, forming a shoulder.

H represents a suitable wire guide, secured to the main frame in any suitable manner, and it performs the function of, in a measure, straightening the wire before it is applied to the cutting-disk; and I represents a sheet-metal guard or hood for preventing the pieces of wire flying when the machine is operating rapidly. The length of wire to be cut being determined, the blocks D are adjusted radially in their slots until the distance between the cutting-jaws is just equal to the length, and then the end of the wire from the reel or coil is inserted through the perforation *j* in the hood and the guide H, and is placed between the cutting-plates 1 in the block and jaw C^2 , the roller 13 of which is just riding up the plate G' of the cam-surface. This movement of the roller is just sufficient to lift the plate 11 from the pins 9 and press the end of the jaw C^2 upward through the medium of the spring 10, thus causing the cutting-jaws to be pressed upon the wire by spring-pressure alone. The end of the wire now being held by the jaws the disk is rotated in the direction indicated by the arrows in Figs. 1 and 2, causing the wire from the guide to be pulled down upon the plates F, which are adjusted to the same radial positions as the cutting-blocks, and as the next cutting-block comes up the wire is drawn between its jaws, and when the roller rides up the incline the wire will be gripped by the jaws, and thus held at two points. This operation of gripping the wire is kept up by the succeeding gripping-jaws until the first one reaches the lower portion of the cam-surface

G , where the abrupt rise G^2 is situated. Now, when the roller strikes this rise, the slot in the movable cam not being deep enough, the pin on which the roller is mounted strikes the end of the slot and operates to press the jaw upward, causing the cutters to pass each other slightly and sever the wire between them. Then the roller runs off the cam-surface G , and the spring 6 opens the jaws, ready to receive the wire when the gripper reaches the proper position again. When the second gripping-jaw reaches the rise at the lower portion of the cam-surface, its roller is pressed inward, and, striking the end of the slots, causes the cutters to be operated and the wire to be severed, and this operation is repeated with respect to every succeeding cutter, the lengths of wire severed being equal to the peripheral distance between the cutters. The lengths of wire can, of course, be varied by moving the cutters in and out in the grooves in the disk, and securing them in adjusted position by means of the bolts, the guides F being removed correspondingly.

It will be noted that in the arrangement shown one cutter is operating as a cutter while others are operating simply as gripping devices, so that there will be ample pressure aggregated to hold and draw forward the heaviest wire or even metal rods, providing they have sufficient flexibility to be wound around the drum formed by the cutters and guides. It is not, however, absolutely necessary that as many of the gripping devices be in use at one time as I have shown, as the cam-surface G might be much smaller and only one device be gripping the wire, while the preceding one is cutting, or two, or any number desired; but I prefer to employ the arrangement shown for the reason that it is more convenient to have the wire pieces at the lowest portion of the machine when severed and dropped and also to feed the wire forward from the top.

The length of the wire pieces can, as stated, be varied by adjusting the cutters radially on the disk, or one or more might be removed—as, for instance, when it is desired to cut wire to be used for bale-ties, then only two cutters could be used, situated diametrically opposite each other, the upper one gripping the wire as the lower one severs it; or, further, if it is desired to make bale-ties and short sections, two of the opposite cutters are removed, and the sections produced will be alternately long and short. Upon the outer periphery of the disk are shown inclined pins adapted to guide the wire down the side of the disk should it become slightly loose or the guide H become out of line.

The machine can be operated by hand or power and with great speed, if desired, and the parts all being automatic in their operation require no attention, except the proper positioning of the grippers and starting, the wire being drawn from the reel and cut by the same operation of the disk with absolute certainty as to length.

If desired, the cutters might be used as cutters simply, and suitable gripping devices located near the cutters employed, operating either by spring-pressure or by a cam to grip and draw forward the wire; or these extra grippers might be used as auxiliary to the devices already described, the main idea of the invention being the drawing forward of the wire and severing it while in motion, all the devices operating continuously.

It will of course be understood that a similar set of gripping and cutting devices might be placed upon the other side of the disk and a correspondingly-arranged cam arranged in proximity thereto for operating, and also that any number of disks can be mounted on one shaft and operated simultaneously, cutting different lengths of wire, if desired.

While the invention is designed especially for light wire, it will be seen that by making the parts correspondingly heavier, even heavy iron rods could, if in a hot state, be bent and severed for forming teeth for horse hay-rakes or analogous purposes.

Various modifications of the device will at once suggest themselves to those skilled in the art, and I therefore do not desire to be confined to the exact construction of apparatus shown.

I claim as new—

1. The combination, with a series of pairs of gripping and cutting jaws, and means for operating said series in a circuitous path so as to bring each of the gripping devices into contact with the wire successively, of a cam for operating one of the jaws of each pair through the medium of a spring to grip the wire by spring-pressure when it reaches a certain point in its movement, and a cam for operating directly upon the jaw when it reaches another position, and causing a further movement and severing the wire, substantially as described.

2. The combination, with a series of pairs of cutting and gripping jaws, of means for operating said series in a circuitous path so as to bring each pair into contact with the wire successively, a cam operating to cause the said jaws to first clamp the wire and draw it forward, a cam operating when the next jaw has clamped the wire to cause the first to sever it, and suitable guides and supports between each pair of jaws for the wire, substantially as described.

3. The combination, with the disk adapted to be rotated, and a series of pairs of radially-adjustable gripping and cutting jaws mounted thereon, of a cam co-operating with the cutting-jaws for causing them to grip the wire and hold it during a portion of the rotation of the disk, and a cam operating upon the first jaws to cause them to sever the wire between them after the next succeeding pair has reached the first cam and gripped the wire, substantially as described.

4. The combination, with the disk adapted to be rotated, and the series of pairs of gripping and cutting jaws mounted thereon, one of the jaws of each pair provided with a spring-

pressed projection, of a cam with which it co-operates for moving the jaw into position to grip the wire through the spring, a stop with which said projection comes in contact upon a further movement operating the jaw directly, and a cam for operating upon this projection to cause the further movement, substantially as described.

5. The combination, with the stationary gripping-jaw, of the movable jaw co-operating with it, having the roller mounted upon the spring, the stop for limiting the movement of the roller, and a cam with which said roller co-operates, substantially as described.

6. The combination, with the stationary gripping-jaw, the movable jaw co-operating with it having the spring thereon, the roller mounted upon the axle connected to the spring, and the slot in the jaw in which the roller-axle moves, of two cams of different heights with which said roller co-operates, substantially as described.

7. The combination, with the rotary disk, the series of pairs of cutting and gripping jaws mounted thereon, one jaw of each pair having a roller mounted on a spring, a stop for limiting the movement of the roller, and a cutter, of two stationary cams of different heights, and a cam-surface of substantially uniform height between them, substantially as described.

8. In a wire-cutting machine, the combination, with a rotating disk, a series of gripping and cutting devices mounted thereon, and means for bringing them into contact with the wire in succession, of means for operating said gripping and cutting devices, whereby the first gripping and cutting device coming in contact with the wire will be caused to grip it, and after the next succeeding one has gripped it the first device will operate to sever the wire at or near the place first gripped, substantially as described.

9. In a wire cutting machine, the combination, with a series of pairs of jaws and means for carrying them in a circuitous path, of devices operating upon the jaws to cause them to grip the wire between them when at one point in their circuit, and devices operating upon the jaws, causing a further movement and severance of the wire between them after the next succeeding pair have gripped the wire, substantially as described.

10. The combination, with a series of gripping and cutting jaws, of means for causing them to first grip and then sever the wire between them, means for bringing said jaws in position to operate upon the wire in succession, and means for moving them forward in the direction of the movement of the wire, substantially as described.

11. The combination, with a series of gripping and cutting jaws, of means for causing them to first grip and then sever the wire between them, devices for carrying said pairs of jaws in a circuitous path, and means for operating said series so as to bring each of the gripping

devices into contact with the wire successively, substantially as described.

12. The combination, with a series of pairs of gripping and cutting jaws and means for causing
5 ing them to travel in a circuitous path so as to bring them into contact with the wire successively, of a cam for operating upon one of the jaws of each pair to cause it to grip the wire as it reaches a certain point in its movement,

and a cam for causing said jaw to make a further movement and sever the wire when it reaches another position, substantially as described.

OLIVER H. HICKS.

Witnesses:

J. W. DYRENFORTH,
GEORGE C. COOK.