

**No. 716,535.**

**Patented Dec. 23, 1902.**

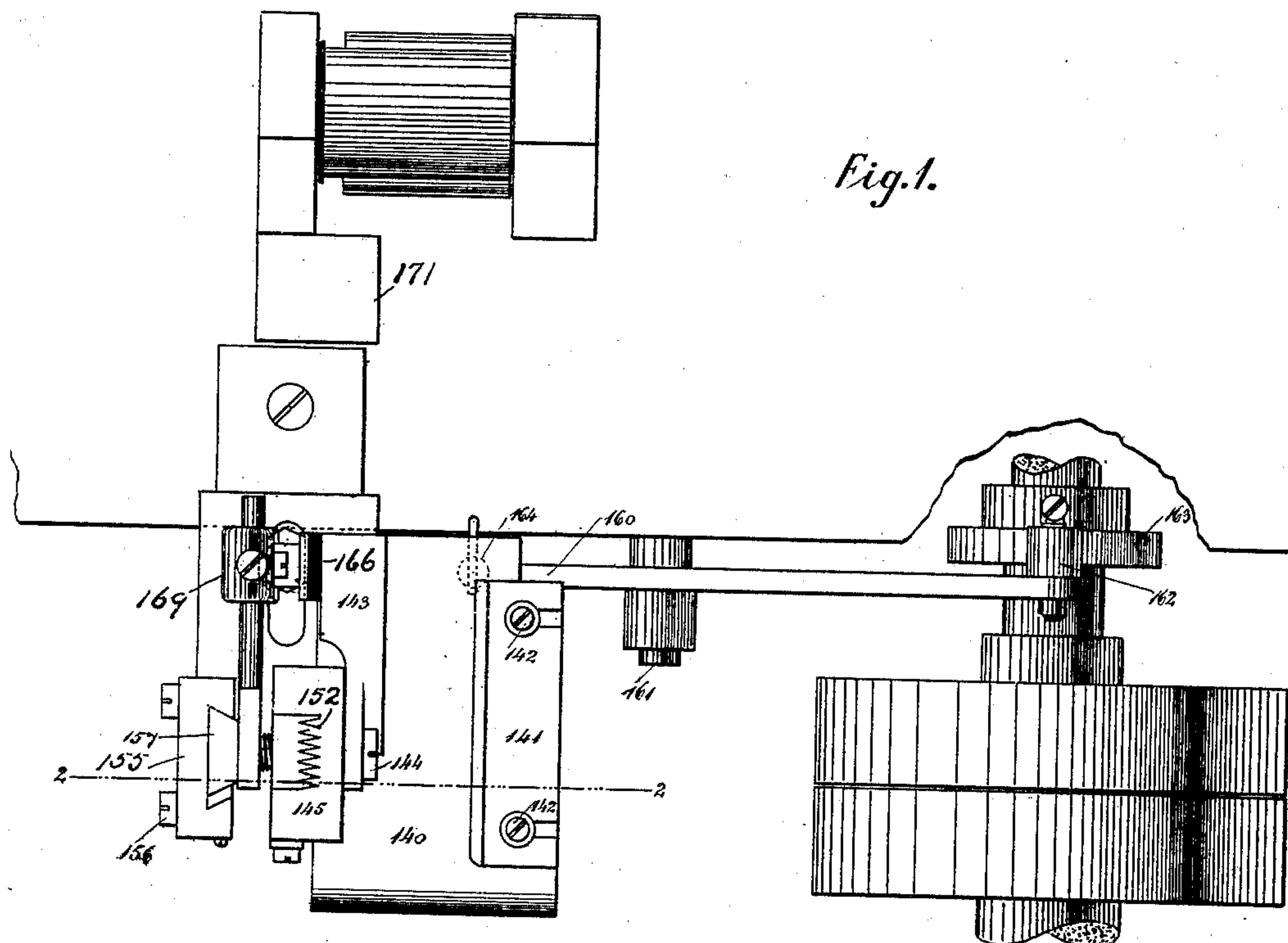
**K. HARNISCH.**

**CUTTING MECHANISM FOR FORMING PROJECTIONS ON MOUTHPIECE MATERIAL.**

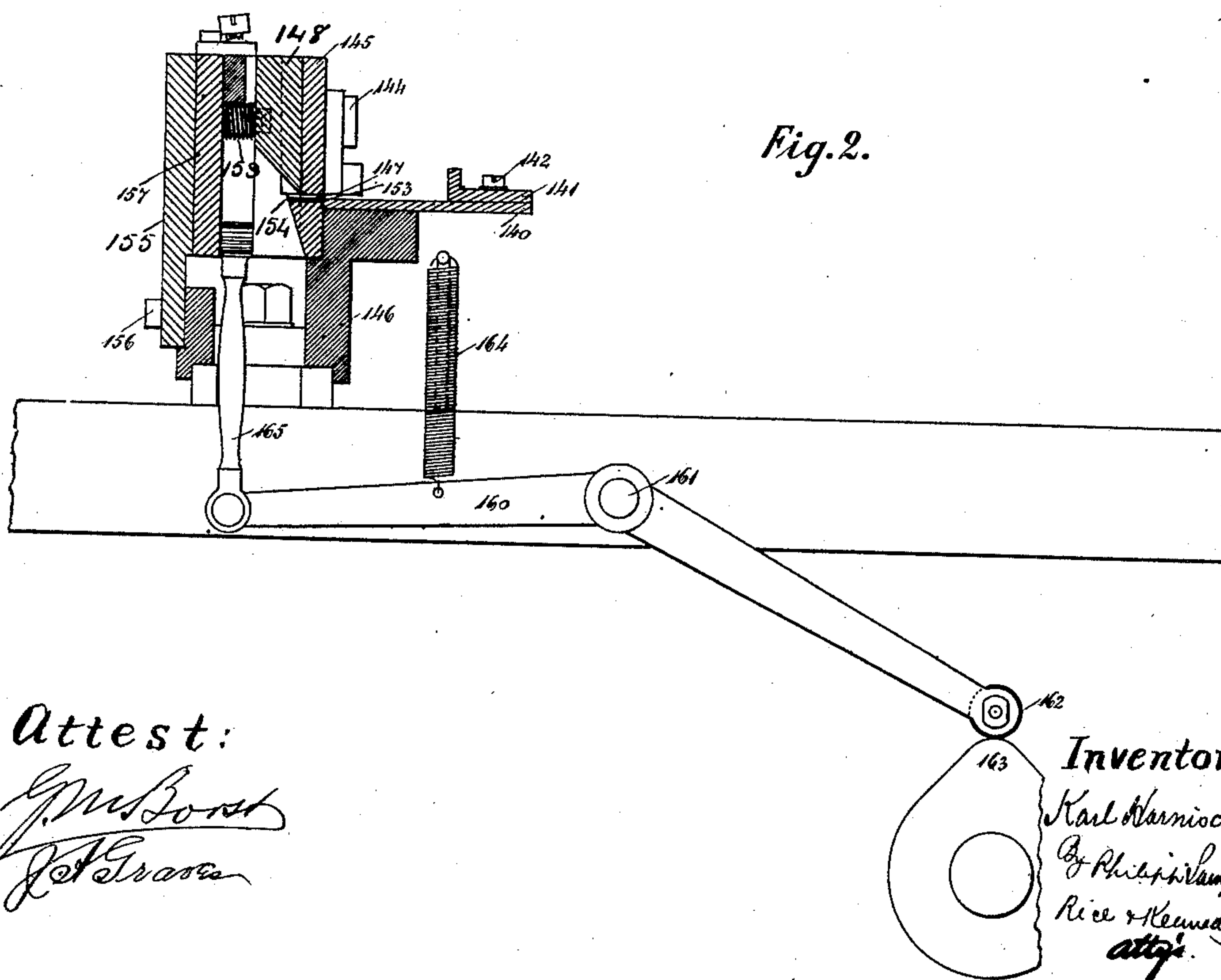
(Application filed May 14, 1902.)

(No Model.)

**2 Sheets—Sheet 1.**



*Fig. 1.*



*Fig. 2.*

Attest:

*Wm. L. Bond*  
*J. T. Graves*

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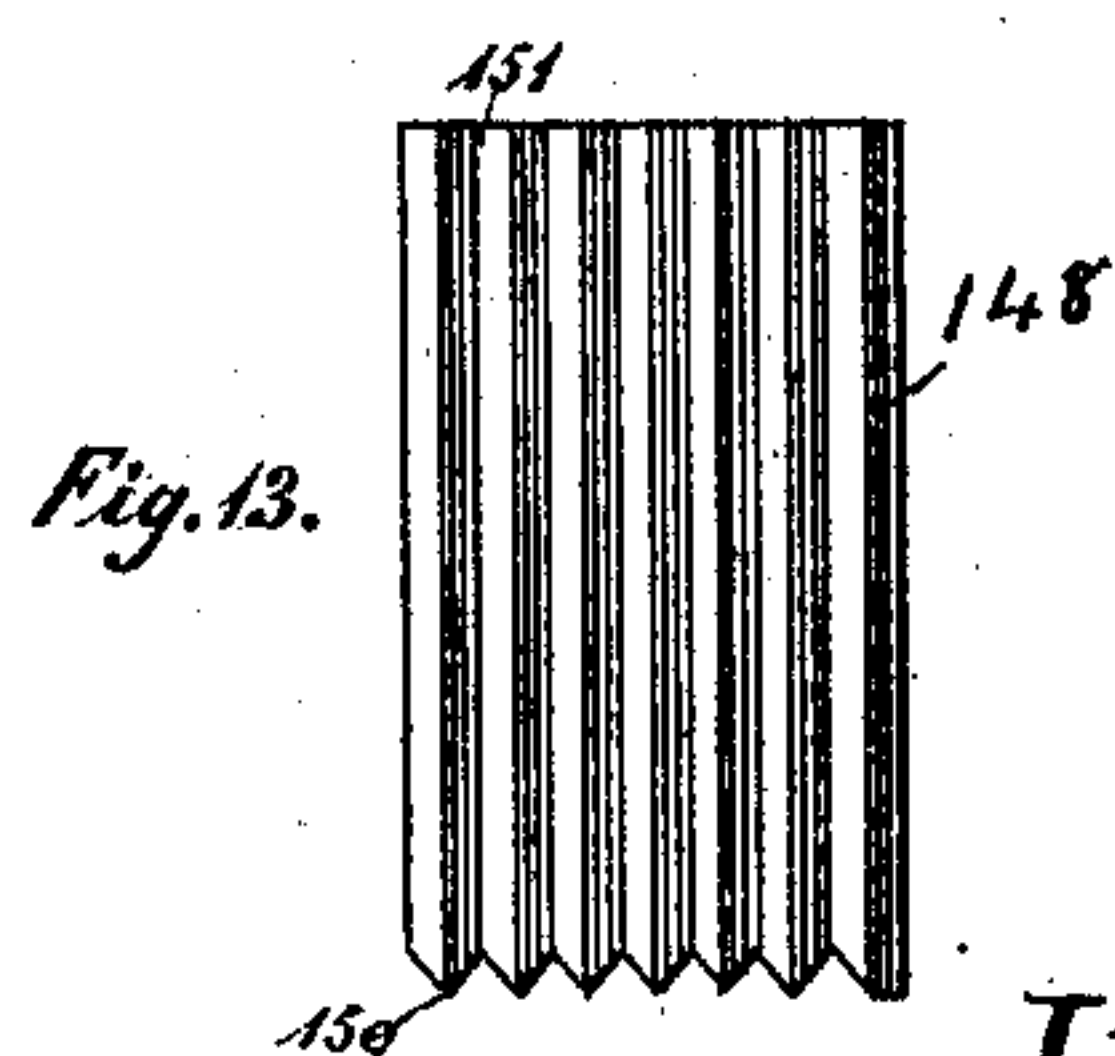
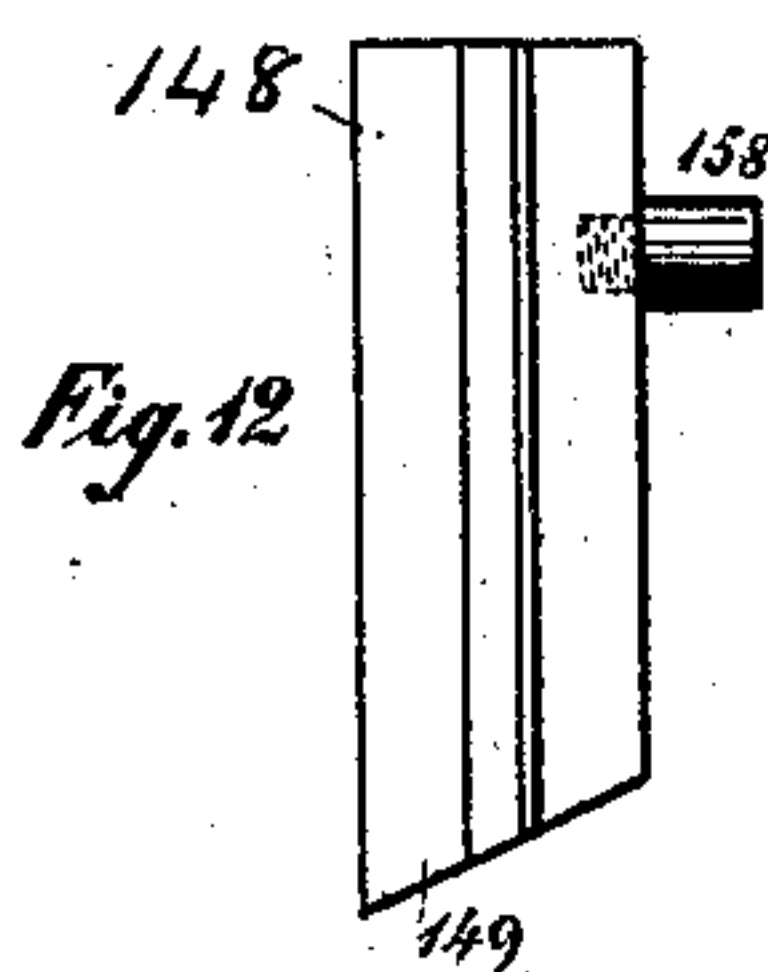
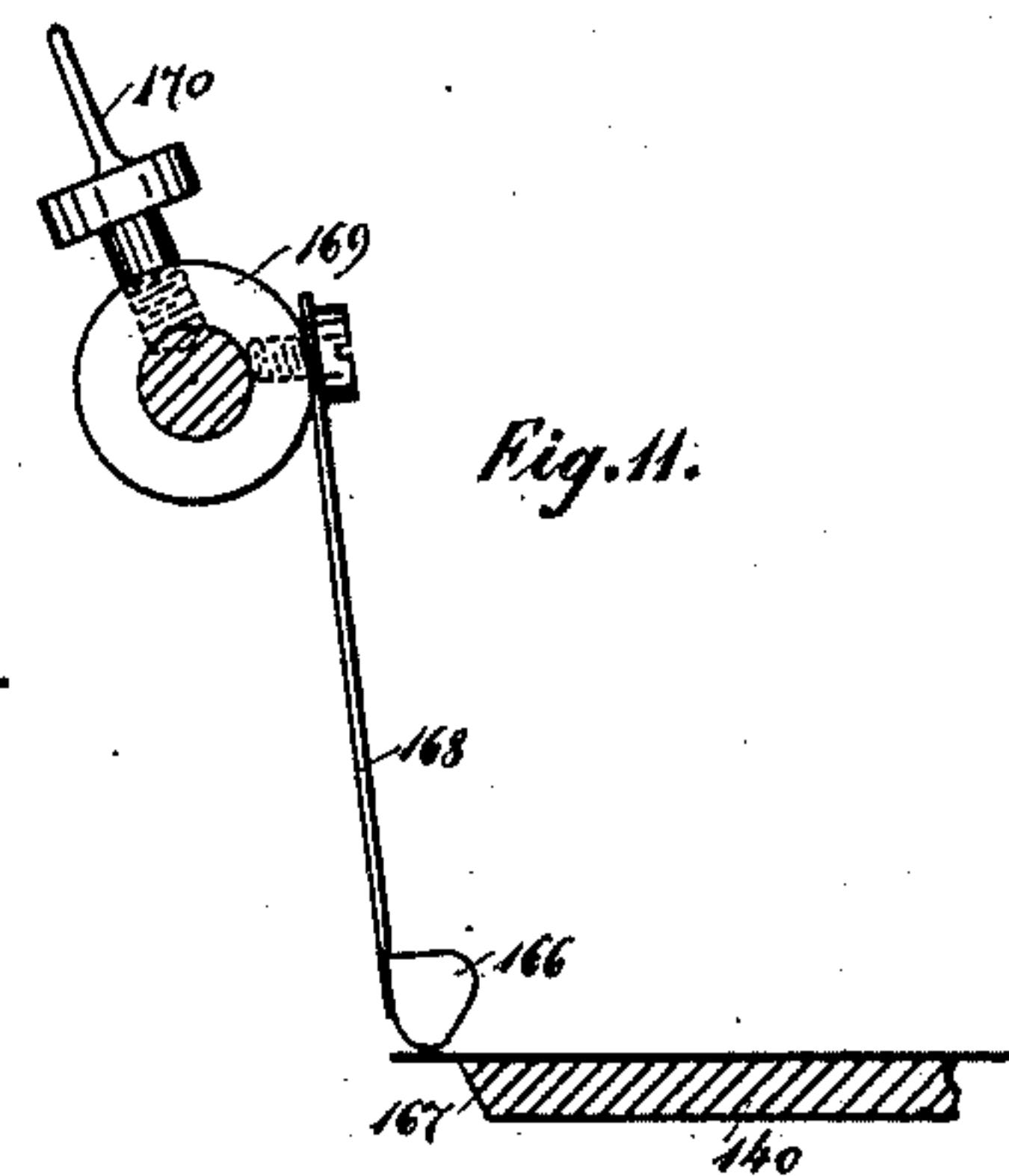
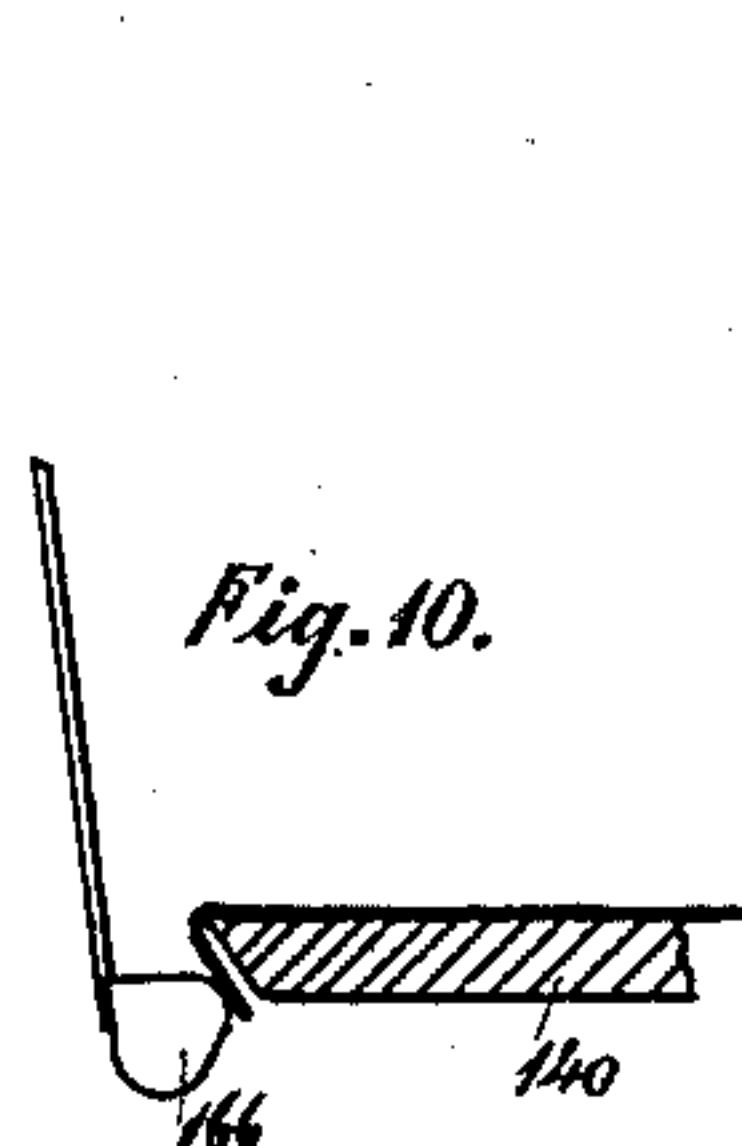
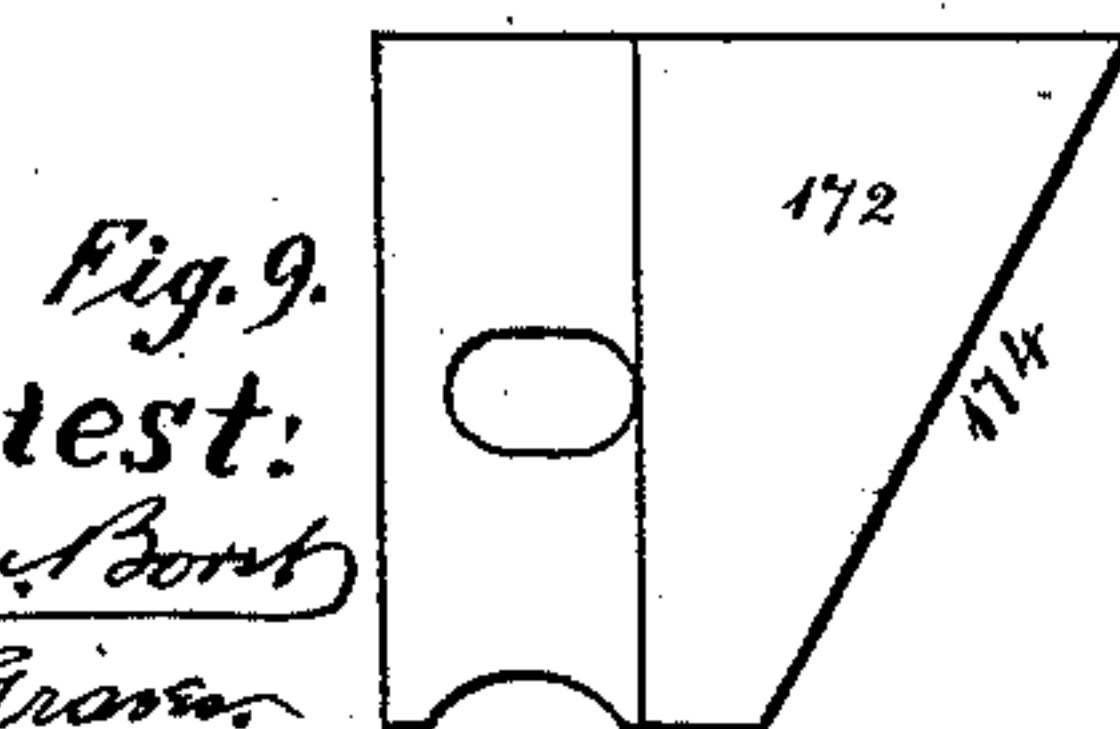
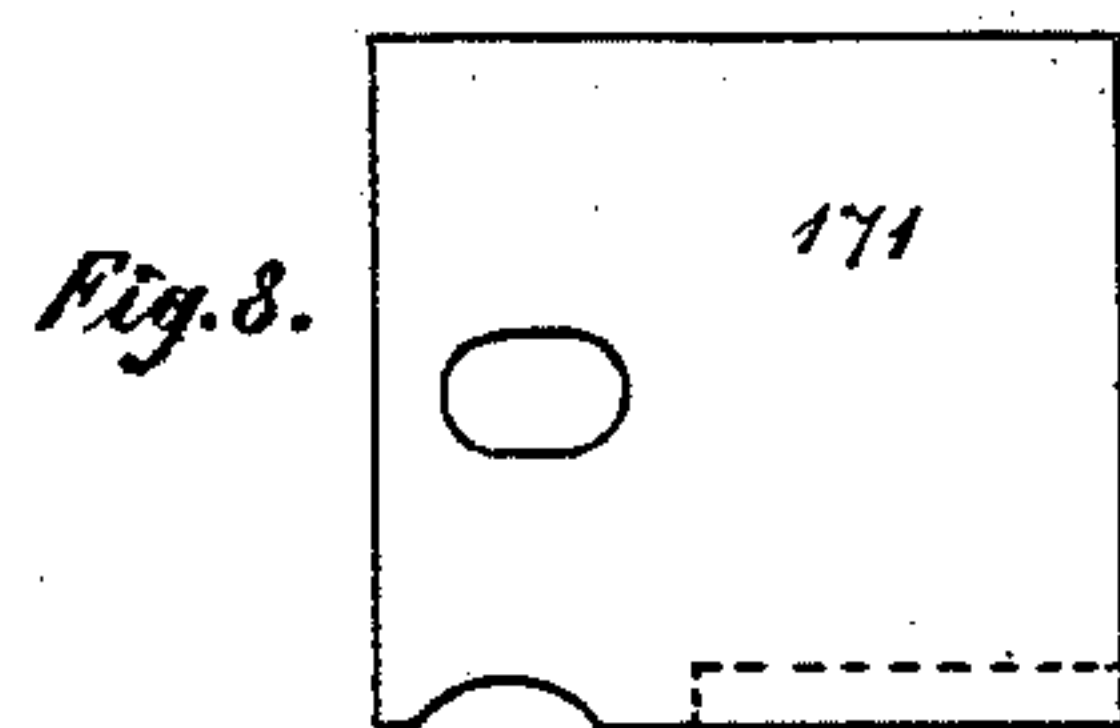
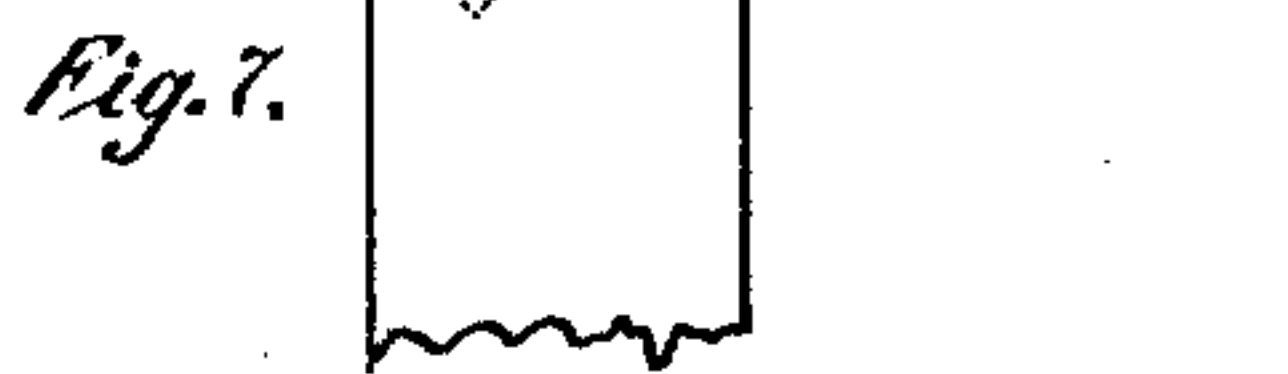
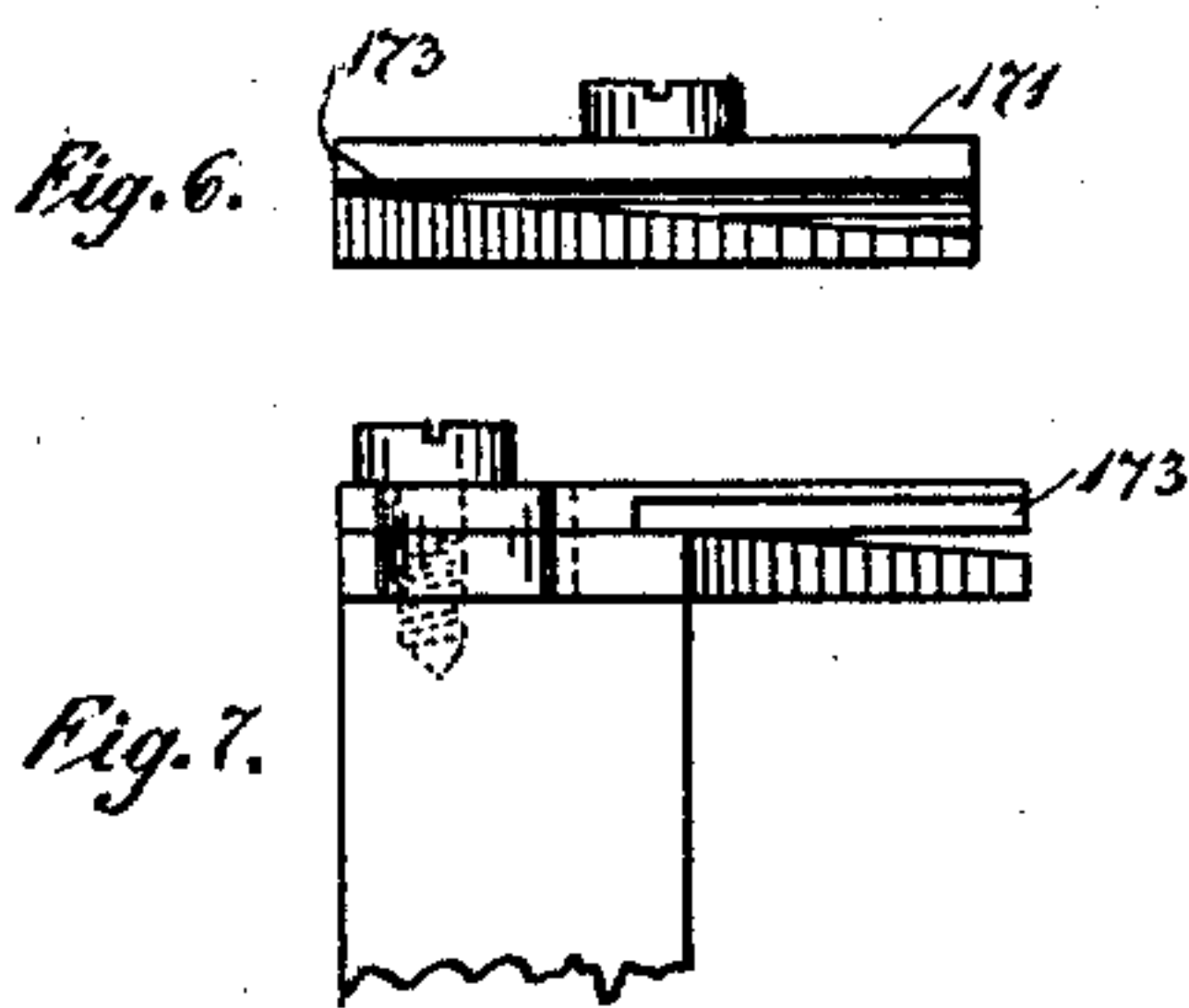
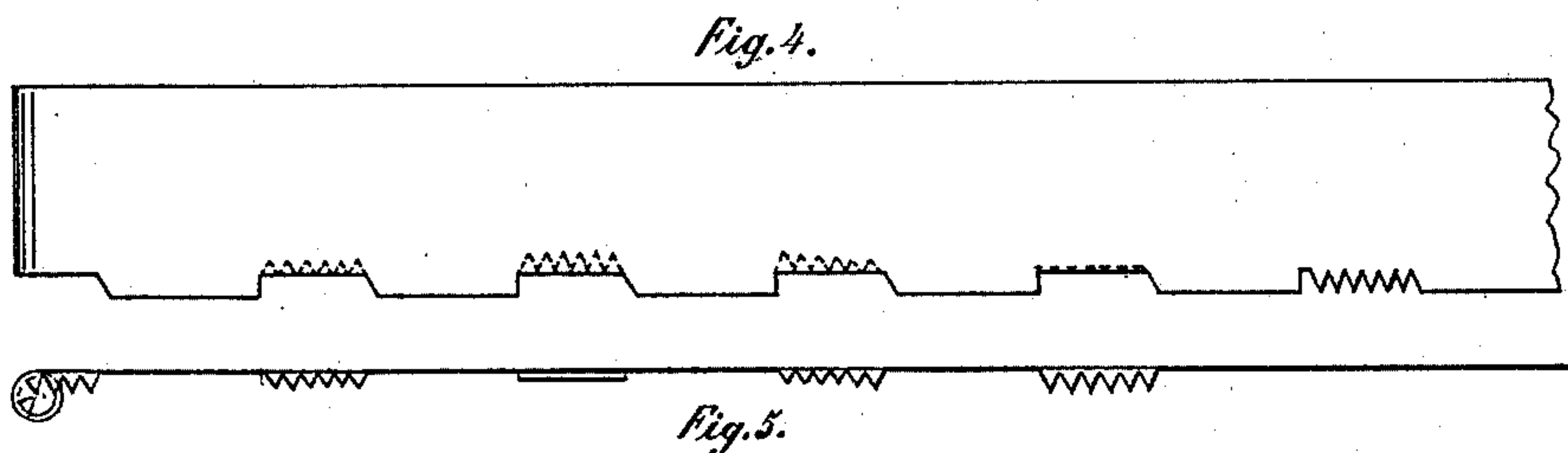
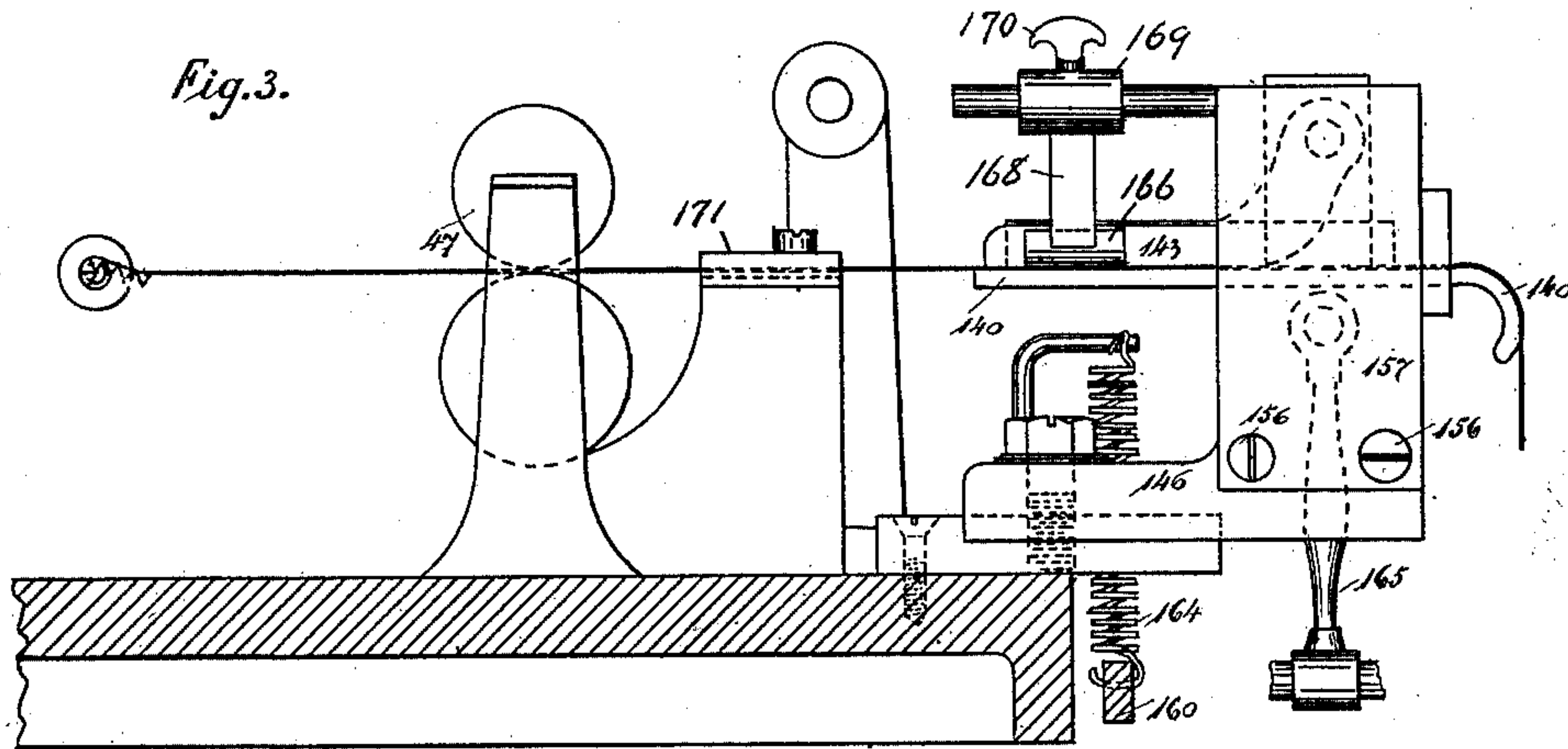
K. HARNISCH.

CUTTING MECHANISM FOR FORMING PROJECTIONS ON MOUTHPIECE MATERIAL.

(Application filed May 14, 1902.)

(No Model.)

2 Sheets—Sheet 2.



Inventor:  
Karl Harnisch  
By Philip Langer  
Rice & Kennedy  
Attys.



# UNITED STATES PATENT OFFICE.

KARL HARNISCH, OF ST. PETERSBURG, RUSSIA, ASSIGNOR TO THE AMERICAN TOBACCO COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

## CUTTING MECHANISM FOR FORMING PROJECTIONS ON MOUTHPIECE MATERIAL.

SPECIFICATION forming part of Letters Patent No. 716,535, dated December 23, 1902.

Application filed May 14, 1902. Serial No. 107,332. (No model.)

*To all whom it may concern:*

Be it known that I, KARL HARNISCH, a citizen of the Swiss Republic, residing at St. Petersburg, Russia, have invented certain new and useful Improvements in Cutting Mechanism for Forming Projections in Mouthpiece Material, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The invention relates to certain improvements in devices for forming retaining projections on mouthpiece material.

The mouthpieces of certain kinds of cigarettes have been heretofore provided with a series of tongues which project inwardly from the mouthpiece, said tongues forming a retaining-wall having a central orifice which prevents the tobacco in the cigarette from passing into the mouthpiece, but permits the smoke to be drawn therethrough. These retaining projections have been heretofore formed by means of pivoted cutters, which have been of such a shape that the projections produced thereby are generally rectangular in outline. The cutters referred to operate upon a strip of mouthpiece material, which is fed to them and which is afterward cut up into blanks. When, however, a blank which is provided with these rectangular projections is rolled up or coiled into a mouthpiece, the projections necessarily overlap. The result is that they do not fall readily into position and do not therefore form a perfect retaining-wall. Furthermore, it is necessary in the practical manufacture of cigarettes that the projections referred to before the blank are rolled up into mouthpieces be given a bend which is preferably greater than a right angle, so that the projections underlie the edge of the material. In the constructions heretofore employed the cutters have been depended upon to bend down the tongues, and it has been found difficult to so arrange the construction that the cutters both cut the material and effect the bending.

This invention has for one of its objects to produce an improved cutting mechanism for forming the projections on mouthpiece mate-

rial which operates to give a pointed form to said projections, so that they come readily into position when the mouthpiece is rolled up.

A further object of the invention is to produce an improved mechanism for bending the projections on mouthpiece material at an angle to said material after the projections have been formed and prior to the time when the mouthpiece is rolled up.

With these and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, as will be hereinafter described and then more fully pointed out in the claims hereunto appended.

Referring to the drawings which form a part of this specification, and in which like characters of reference indicate the same parts, Figure 1 is a plan view of the improved cutting and bending mechanism. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a side view. Figs. 4 and 5 are top and side views, respectively, of the strip of mouthpiece material; and Figs. 6 to 14, inclusive, are detail views.

The mechanism which has been selected to illustrate a concrete embodiment of the invention is designed to operate upon a strip of mouthpiece material, which is thereafter cut up into blanks which are coiled into mouthpieces.

In the drawings, 140 indicates a support or table over which the mouthpiece material may be fed in any suitable manner. In an organized machine the mouthpiece material may be given its movement by a pair of intermittently-operating milled feeding-rolls, which are indicated at 47, the operating devices for which have been omitted in the interest of clearness of illustration. The support will preferably be provided with suitable guiding devices, which operate to properly direct the strip in its movement over the table. As shown, these devices include a guide 141, which is preferably made adjustable by any desired means. As shown, the guide is slotted and is secured to the table 140 by means of screws 142. A presser-block 143 is also provided, said block being, as shown, se-



cured by a screw 144 to a block 145, said block being supported on a bracket 146, which is connected in any suitable manner to the bed-plate of the machine. This block 145 is preferably provided with a slot 147, through which the paper runs, the inner side of the slot acting as a guide for the paper.

The cutting devices employed may be varied in construction. In the construction shown they embody a movable cutter and a stationary cutter. The movable cutter comprises a block 148, which moves in ways in the block 145. The operating-face of this block, which is marked 149, is provided with a series of angular cutting projections 150. These projections are preferably formed by V-shaped grooves 151, and in the preferred form of construction these grooves will be long enough to form projections of the same length in the body of the block. As shown, the projections formed by the grooves extend the entire length of the block, although it is obvious they might be shorter, if desired. The block 145 is provided with grooves 152, which are engaged by the projections 150, so that the cutter-block 148 is accurately guided in its movement. Preferably, furthermore, the operating-face of the block 145 will be given a sharp bevel, as shown, so that the ridges and edges of the cutting projections form points. These points enter the paper in advance of the remainder of the cutting edges of the projection, and these in coöperating with the cutter, to be hereinafter described, produce a shearing cut. The coöperating cutter, which is in the present construction shown as stationary, consists of a block 153, said block being preferably seated in a recess in the bracket 146 and being secured thereto in any desired manner. This block is grooved, so as to produce cutting projections 154, which correspond in shape with the cutting projections on the block 148. These projections are, however, arranged so that they register with the grooves in the block 148. The operating-face of the block 153 preferably lies in the same plane with the face of the table 140. The projections, the face of which form the cutters on the block 153, preferably extend some distance from the face, but decrease in height, so that the clearance is given for the pieces of paper which are cut out by the cutter.

In the operation of the construction so far described as the cutter-block is moved downward by the mechanism to be hereinafter described its pointed projections first pierce the paper and engage the bottoms of the grooves between the cutting projections 154 on the block 153. The further downward movement of the block 148 causes the pieces of paper on the edge of the mouthpiece material to be severed with a shearing cut, and the pieces thus severed drop from the cutter, this operation being facilitated by the decrease in height of the projections on the block 153.

The means for operating the movable cut-

ter may be of any suitable description. As shown, there is provided a bracket 155, which is secured by screws 156 or in any other suitable manner to the bracket 146. This bracket is provided with dovetailed ways in which moves a slide 157. This slide has extending from it a pin 158, which engages a recess in the cutter-block 148. In the preferred construction the block 148 is held yieldingly against its guiding-block 145, and, as shown, this is effected by means of a spring 159, which surrounds the pin 158. The reciprocating movements of the slide may be produced in any desired manner. In the construction shown they are effected by means of a bent lever 160, said lever being pivoted to the bed-plate of the machine at 161 and being provided with a cam-roll 162, which runs on the surface of the cam 163, mounted on a shaft of the machine. A spring 164 is provided to produce the movement of the lever in opposition to the cam. This lever 160 is connected to the slide 157 by means of a connecting-rod 165.

After the cutters have operated to produce the pointed projections on the edge of the paper the paper is moved forward and is operated upon by a bending mechanism, which is independent of the cutter. This bending mechanism may be widely varied in construction. As shown, it embodies a bending-block 166, this block being preferably beveled, as shown. The block coöperates with an abutment which may be formed by the edge of the support 140, and in the preferred construction the edge of the abutment will be undercut, as shown at 167. The bending-block may be mounted and operated in any desired manner. Preferably, however, it will be yieldingly mounted, and in the construction shown it is carried on a spring-plate 168, said plate being secured, by means of a set-screw or in any other desired manner, to a hub 169. This hub 169 is adjustably mounted, by means of a set-screw 170 or in any other suitable manner, on an arm which is secured to the slide 157, the connection being effected by means of a screw or in any other desired manner. As the slide 157 reciprocates, therefore, the bending-block will be given reciprocating movements and striking the projections formed by the cutters on the edge of the paper will bend them under the edge of the abutment.

While the bending device so far described may be sufficient to bend down the projections, it is preferable to give the projections a still further bend, so as to insure that they do not fly up when the mouthpiece material is rolled, and an auxiliary bending device is employed for this purpose. This auxiliary bending device may be of any suitable character. In the construction shown it consists of a pair of overlying plates 171 172, which are arranged to form a space between them. The plate 171 is beveled on its edge slightly, as indicated at 173, to permit the strip of paper to easily enter between the plates, and



the plate 172 is provided with an angular edge 174, across which the pointed projections travel. This edge lies at an angle to the line of movement of the strip, which is preferably an obtuse angle. The projections thus ride easily across the edge of the plate 172 without catching on it, and as the strip passes between the plates the projections are bent still farther under the edge of the strip, as is shown in Figs. 4 and 5.

While the mechanism which has been described is particularly adapted for operating upon a strip of mouthpiece material, it is obvious that the invention could be applied to machines in which mouthpiece-blanks are separately fed to the cutting devices. It is also obvious that many changes could be made in the relations and operation of the several parts. The invention is not, therefore, to be limited to the specific construction which has been hereinbefore described.

What is claimed is—

1. The combination with means for forwarding mouthpiece material, of a cutter operating upon one edge of the material and constructed to form angular cuts which produce pointed projections or tongues and means for bending the tongues at an angle to the material.

2. The combination with means for forwarding a strip of mouthpiece material, of a cutter operating upon one edge of the material and constructed to form angular cuts which produce pointed projections or tongues and means for bending the tongues at an angle to the material.

3. The combination with a pair of cutters, the operating-face of each cutter being composed of a series of angular projections having sharp edges and the projections of one cutter registering with the spaces between the projections of the other cutter, means for moving one of the cutters with relation to the other, of means for feeding mouthpiece material between the cutters so that its edge is presented to them and means for bending the pointed projections produced by the cutters at an angle to the body of the material.

4. The combination with a pair of cutters, the operating-face of each cutter being composed of a series of angular projections having sharp edges and the projections of one cutter registering with the spaces between the projections of the other cutter, of means for moving one of the cutters with relation to the other, means for feeding a strip of mouthpiece material between the cutters so that its edge is presented to them and means for bending the pointed projections produced by the cutters at an angle to the body of the material.

5. The combination with a pair of cutters, the operating-face of each cutter being composed of a series of angular projections having sharp edges, the projections of one cutter registering with the spaces between the projections of the other cutter and the operating-face of one of the cutters being beveled

to produce sharp points, whereby the material is severed with a shearing cut, of means for feeding mouthpiece material to the cutters so that its edge will be presented to them, and means for moving one of the cutters with relation to the other.

6. The combination with a pair of cutters, the operating-face of each cutter being composed of a series of angular projections having sharp edges, the projections of one cutter registering with the spaces between the projections of the other cutter and the operating-face of one of the cutters being beveled to produce sharp points, whereby the material is severed with a shearing cut, of means for feeding a strip of mouthpiece material to the cutters so that its edge will be presented to them and means for moving one of the cutters with relation to the other.

7. The combination with a pair of cutters, the operating-face of each cutter being composed of a series of angular projections having sharp edges, the projections of one cutter registering with the spaces between the projections of the other cutter and the operating-face of one of the cutters being beveled to produce sharp points, whereby the material is severed with a shearing cut, of means for feeding mouthpiece material to the cutters so that its edge will be presented to them, means for moving one of the cutters with relation to the other, and means operating to bend the pointed tongues produced by the cutters at an angle to the body of the material.

8. The combination with a pair of cutters, the operating-face of each cutter being composed of a series of angular projections having sharp edges, the projections of one cutter registering with the spaces between the projections of the other cutter and the operating-face of one of the cutters being beveled to produce sharp points, whereby the material is severed with a shearing cut, of means for feeding a strip of mouthpiece material to the cutters so that its edge will be presented to them, means for moving one of the cutters with relation to the other, and means operating to bend the pointed tongues produced by the cutters at an angle to the body of the material.

9. The combination with a guide, of a cutter moving therein, the operating-face of said cutter being composed of a series of angular projections having sharp edges, a cooperating cutter having similar projections registering with the spaces between the projections of the other cutter, the operating-face of one of the cutters being beveled, whereby the projections are pointed, of a support for mouthpiece material, suitable guides for directing the material to the cutters so that its edge will be acted upon thereby and means for bending the pointed tongues produced by the cutter at an angle to the body of the material.

10. The combination with a guide, of a cutter, the operating-face of said cutter being



composed of a series of angular projections having sharp edges, a spring for holding the cutter against the guide, means for moving the cutter in the guide, a cooperating cutter  
 5 having similar projections registering with the spaces between the projections of the other cutter, the operating-face of one of the cutters being beveled, whereby the projections are pointed, of a support for mouth-  
 10 piece material, suitable guides for directing the material to the cutters so that its edge will be acted upon thereby and means for bending the pointed tongues produced by the cut-  
 15 ter at an angle to the body of the material.

11. The combination with a guide-block provided with a series of guiding-grooves, of a cutter, the operating-face of said cutter being composed of a series of angular projec-  
 20 tions having sharp edges said projections engaging the grooves of the guide-block, means for moving the cutter in the guide-block, a cooperating cutter having similar projections registering with the spaces between the pro-  
 25 jections of the other cutter, the operating-face of one of the cutters being beveled whereby the projections are pointed, a support for mouthpiece material, suitable guides for di-  
 30 recting the material to the cutters so that its edge will be acted upon thereby and means for bending the pointed tongues produced by the cutter at an angle to the body of the ma-  
 terial.

12. The combination with a guide-block provided with a series of guiding-grooves, of  
 35 a cutter the operating-face of which is composed of a series of angular projections having sharp edges, which projections engage the grooves of the guide-block, means for moving the cutter in the guide-block, a spring  
 40 for holding the cutter in position in the guide, a cooperating cutter having similar projections registering with the spaces between the projections of the other cutter, the operating-  
 45 face of one of the cutters being beveled whereby the projections are pointed, a support for mouthpiece material, suitable guides for directing the material to the cutters so that its edge will be acted upon thereby and means  
 50 for bending the pointed tongues produced by the cutter at an angle to the body of the material.

13. The combination with a stationary cutter, of a movable cutter, the operating-face of each cutter being composed of a series of angu-  
 55 lar projections having sharp edges and the operating-face of one of the cutters being beveled to produce sharp points, whereby the material is severed with a shearing cut, means for operating the movable cutter, a support, guid-  
 60 ing means cooperating with the support and arranged to direct material to the cutter so that its edge will be operated upon thereby and bending means including a bending device actuated by the cutter-operating means.

65 14. The combination with a support for material to be cut, of a stationary cutter having its operating-face composed of a series of an-

gular projections having sharp edges, a mov-  
 able cutter having its operating-face com-  
 posed of a series of angular projections hav- 70  
 ing sharp edges said projections engaging between the projections of the stationary cutter, a guide for the movable cutter, means for reciprocating said cutter across the plane of the  
 75 support, guiding means operating to direct material to the cutter so that its edge will be acted upon thereby, a bending device and means for reciprocating said device across the plane of the support, said device cooperating with an edge of the support to bend  
 80 down the projections produced by the cutters.

15. The combination with a support for material to be cut, of a stationary cutter having its operating-face composed of a series of an-  
 85 gular projections having sharp edges, a movable cutter having its operating-face composed of a series of angular projections having sharp edges and beveled faces, said projections engaging between the projections of the stationary cutter, a guide for the movable  
 90 cutter, means for reciprocating the cutter across the plane of the support, guiding means operating to direct material to the cutter so that its edge will be acted upon thereby, bending means including a bending device con-  
 95 nected to the operating device for the cutter, whereby said bending device is reciprocated across the plane of the support and cooperates with an edge thereof to bend the pointed  
 100 projections produced by the cutters.

16. The combination with means for forwarding mouthpiece material, of cutting devices acting upon the edge of the material and operating to produce a series of tongues  
 105 thereon, and means independent of the cutting devices for turning the tongues at an angle to the body of the material.

17. The combination with means for forwarding a strip of mouthpiece material, of cutting devices acting upon the edge of the  
 110 material and operating to produce a series of pointed tongues thereon, and means independent of the cutting devices for bending the tongues at an angle to the body of the material.  
 115

18. The combination with means for forwarding mouthpiece material, of cutting devices operating upon the edge of the material to produce a series of tongues thereon, a bend-  
 120 ing-block operating to bend the tongues thus formed and an abutment with which the bending-block cooperates.

19. The combination with means for forwarding mouthpiece material, of cutting devices operating upon the edge of the material  
 125 to produce a series of tongues thereon, a bending-block operating to bend the tongues thus formed, an abutment with which the bending-block cooperates, and means for giving the tongues a further bend.  
 130

20. The combination with means for forwarding mouthpiece material, of cutting devices operating upon the edge of the material to produce a series of tongues thereon, a yield-



ingly-mounted bending-block operating to bend the tongues thus formed and an abutment with which the bending-block coöperates.

5 21. The combination with means for forwarding mouthpiece material, of cutting devices operating upon the edge of the material to produce a series of tongues thereon, a yield-  
10 ingly-mounted bending-block operating to bend the tongues thus formed, an abutment with which the bending-block coöperates, and means for giving the tongues a further bend.

22. The combination with means for forwarding mouthpiece material, of cutting devices operating upon the edge of the material to produce a series of tongues thereon, a bending-block having a beveled edge operating to  
15 bend the tongues thus formed and an abutment with which the bending-block coöperates.  
20

23. The combination with means for forwarding mouthpiece material, of cutting devices operating upon the edge of the material to produce a series of tongues thereon, a bending-block having a beveled edge operating to  
25 bend the tongues thus formed, an abutment with which the bending-block coöperates, and means for giving the tongues a further bend.  
30

24. The combination with means for forwarding mouthpiece material, of cutting devices operating upon the edge of the material to produce a series of tongues thereon, a yield-  
35 ingly-mounted bending-block having a beveled edge operating to bend the tongues thus formed and an abutment with which the bending-block coöperates.

25. The combination with means for forwarding mouthpiece material, of cutting devices operating upon the edge of the material to produce a series of tongues thereon, a yield-  
40 ingly-mounted bending-block having a beveled edge operating to bend the tongues thus  
45 formed, an abutment with which the bending-block coöperates, and means for giving the tongues a further bend.

26. The combination with means for forwarding mouthpiece material, of cutting devices operating to produce a series of tongues on the edge of said material, bending means operating to turn the tongues at an angle to  
50 the material, and a pair of spaced plates between which the material passes said plates operating to give the tongues a further bend.  
55

27. The combination with means for forwarding mouthpiece material, of cutting devices operating to produce a series of tongues on the edge of said material, bending means  
60 operating to turn the tongues at an angle to the material, and a pair of spaced bending-plates between which the material passes, the edge of the plate across which the tongues travel lying at an angle which is other than a  
65 right angle to the line of movements of the tongues.

28. The combination with means for forwarding mouthpiece material, of cutting devices operating to produce a series of tongues on the edge of said material, a bending-block  
70 operating to turn the tongues at an angle to the material, an abutment with which said block coöperates, and a pair of spaced bending-plates between which the mouthpiece material passes.  
75

29. The combination with means for forwarding mouthpiece material, of cutting devices operating to produce a series of tongues on the edge of said material, a bending-block operating to turn the tongues at an angle to  
80 the material, an abutment with which the said block coöperates, and a pair of spaced bending-plates between which the material passes, the edge of the plate across which the tongues travelling at an angle which is other  
85 than a right angle to the line of movements of the tongues.

30. The combination with means for forwarding mouthpiece material, of cutting devices operating to produce a series of tongues on the edge of said material, a bending-block operating to turn the tongues at an angle to  
90 the material, an abutment with which said block coöperates, and a pair of spaced bending-plates between which the material passes, the edge of the plate across which the tongues travel lying at an angle which is other than a  
95 right angle to the line of movements of the tongues, the entrance-opening between the plates being flared.  
100

31. The combination with means for forwarding mouthpiece material, of cutting devices operating to produce a series of tongues on the edge of said material, bending means operating to turn the tongues at an angle to  
105 the material, and a pair of spaced bending-plates between which the material passes, the entrance-opening being flared and the edge of the plate across which the tongues travel lying at an obtuse angle to the line of movements of the tongues.  
110

32. The combination with a stationary cutting-block, of a coöperating movable cutter, said cutter being shaped to produce tongues on the edge of the mouthpiece material presented thereto, a reciprocating head to which  
115 said movable cutter is connected, an arm extending therefrom, a spring connected to the arm, a bending-block carried by the spring, and an abutment with which the bending-block coöperates.  
120

33. The combination with a stationary cutting-block of a coöperating movable cutter, said cutter being shaped to produce tongues on the edge of mouthpiece material presented thereto, a reciprocating head to which said  
125 movable cutter is connected, an arm extending therefrom, a spring connected to the arm, a bending-block carried by the spring, an abutment with which the bending-block coöperates, and a pair of spaced bending-plates between which the material passes, the edge of  
130



the plate across which the tongues travel lying at an angle which is other than a right angle to the line of movements of the tongues.

34. The combination with a stationary cutting-block, of a cooperating movable cutter, said cutter being shaped to produce tongues on the edge of mouthpiece material presented thereto, a reciprocating head to which said movable cutter is connected, an arm extending therefrom, a spring connected to the arm, a bending-block having a beveled edge and an abutment having a beveled edge.

35. The combination with a stationary cutting-block, of a cooperating movable cutter, said cutter being shaped to produce tongues on the edge of mouthpiece material presented thereto, a reciprocating head to which said movable cutter is connected, an arm extending therefrom, a spring connected to the arm, a bending-block having a beveled edge, an abutment having a beveled edge, and a pair of spaced bending-plates between which the material passes, the edge of the plate across which the tongues travel lying at an obtuse angle to the line of movements of the tongues.

36. The combination with a support for the material to be cut, of a stationary cutter comprising a series of angular projections having sharp edges, a movable cutter comprising a block having a series of angular projections with sharp edges, the operating-face of said cutter being beveled so that the projections are pointed, a grooved guide in which the movable cutter-block travels, a reciprocating head, connections including a spring between the head and the cutter-block whereby the cutter is moved by the head and is held against the grooved guiding-block, an arm extending from the head, a spring-mounted

bending-block carried by the arm said block having a beveled edge, an abutment having a beveled edge with which the block cooperates, and suitable guiding means for directing mouthpiece material to the cutter and a pair of spaced bending-plates between which the material travels after leaving the bending-block.

37. The combination with a support for the material to be cut, of a stationary cutter comprising a series of angular projections having sharp edges, a movable cutter comprising a block having a series of angular projections with sharp edges, the operating-face of said cutter being beveled so that the projections are pointed, a grooved guide in which the movable cutter-block travels, a reciprocating head, connections including a spring between the head and the cutter-block whereby the cutter is moved by the head and is held against the grooved guiding-block, an arm extending from the head, a spring-mounted bending-block carried by the arm said block having a beveled edge, an abutment having a beveled edge with which the block cooperates, suitable guiding means for directing mouthpiece material to the cutter, and a pair of spaced bending-plates, the opening between the plates being flared at the entrance end and the edge of the plate on which the tongues, produced by the cutter, travel lying at an obtuse angle to the line of movements of the tongues.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

KARL HARNISCH.

Witnesses:

JAMES Q. RICE,

ERNST LOEWENSTEIN.