

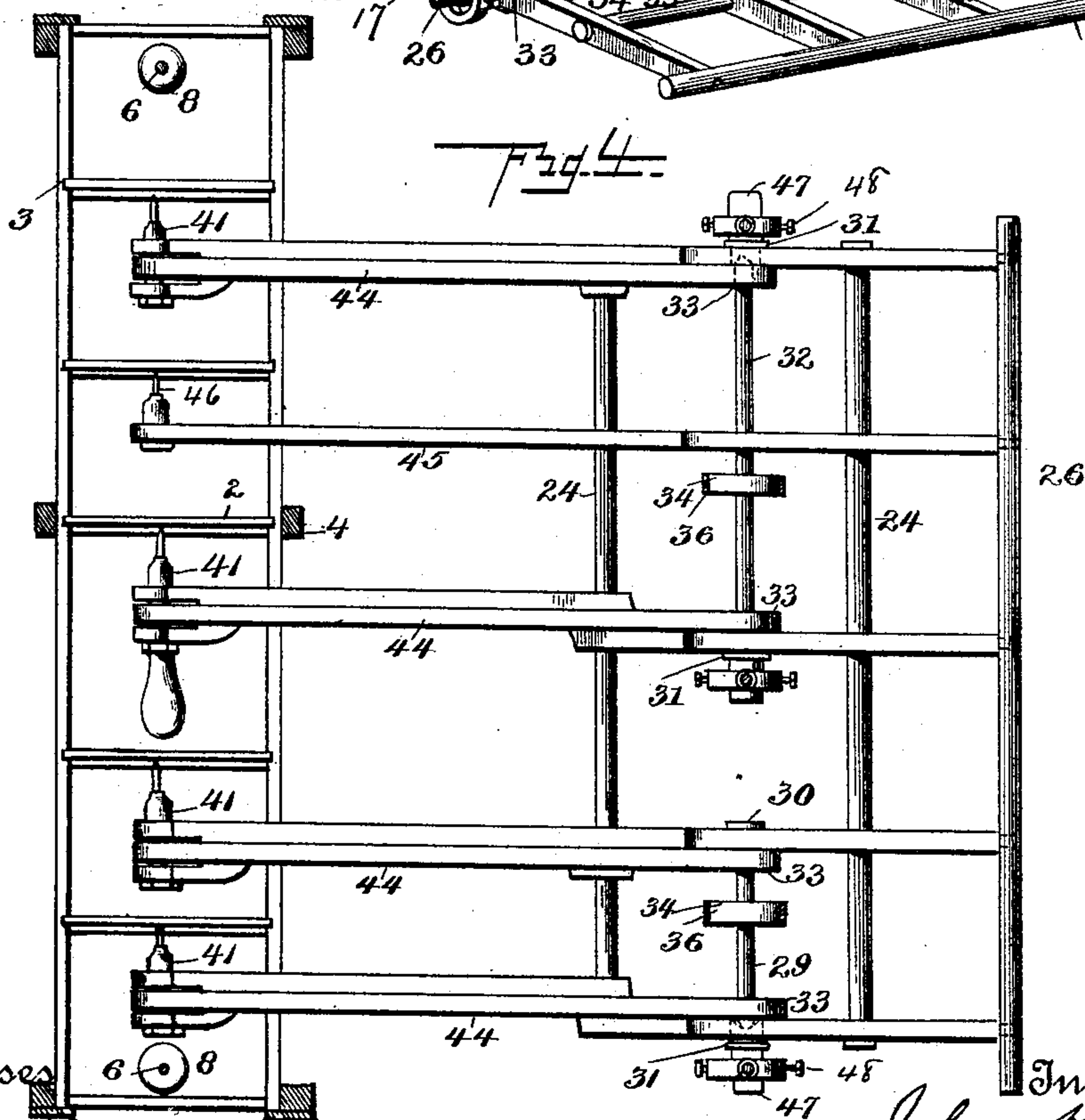
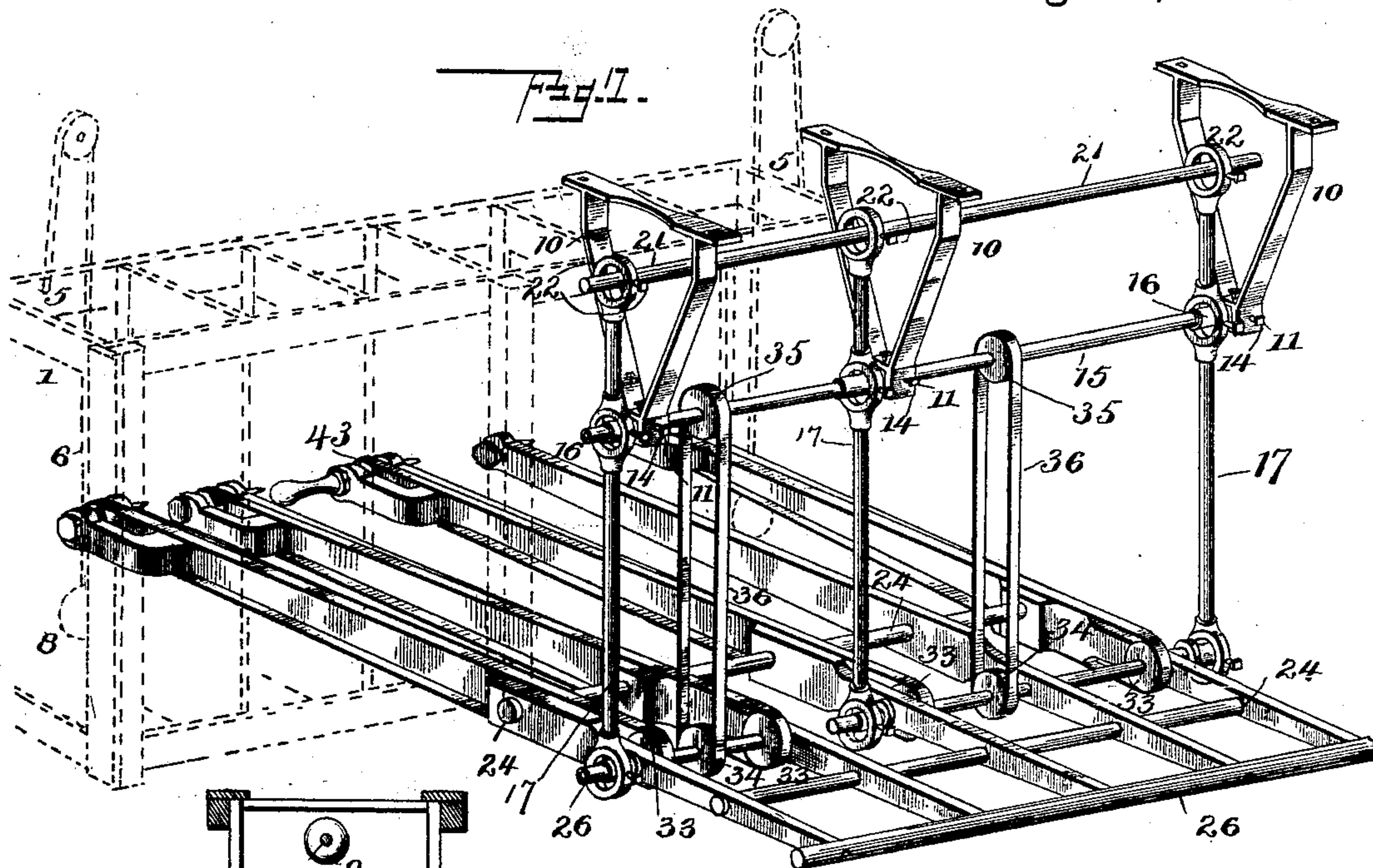
(No Model.)

2 Sheets—Sheet 1.

J. K. RISHEL.  
CARVING MACHINE.

No. 481,372.

Patented Aug. 23, 1892.



Witnesses

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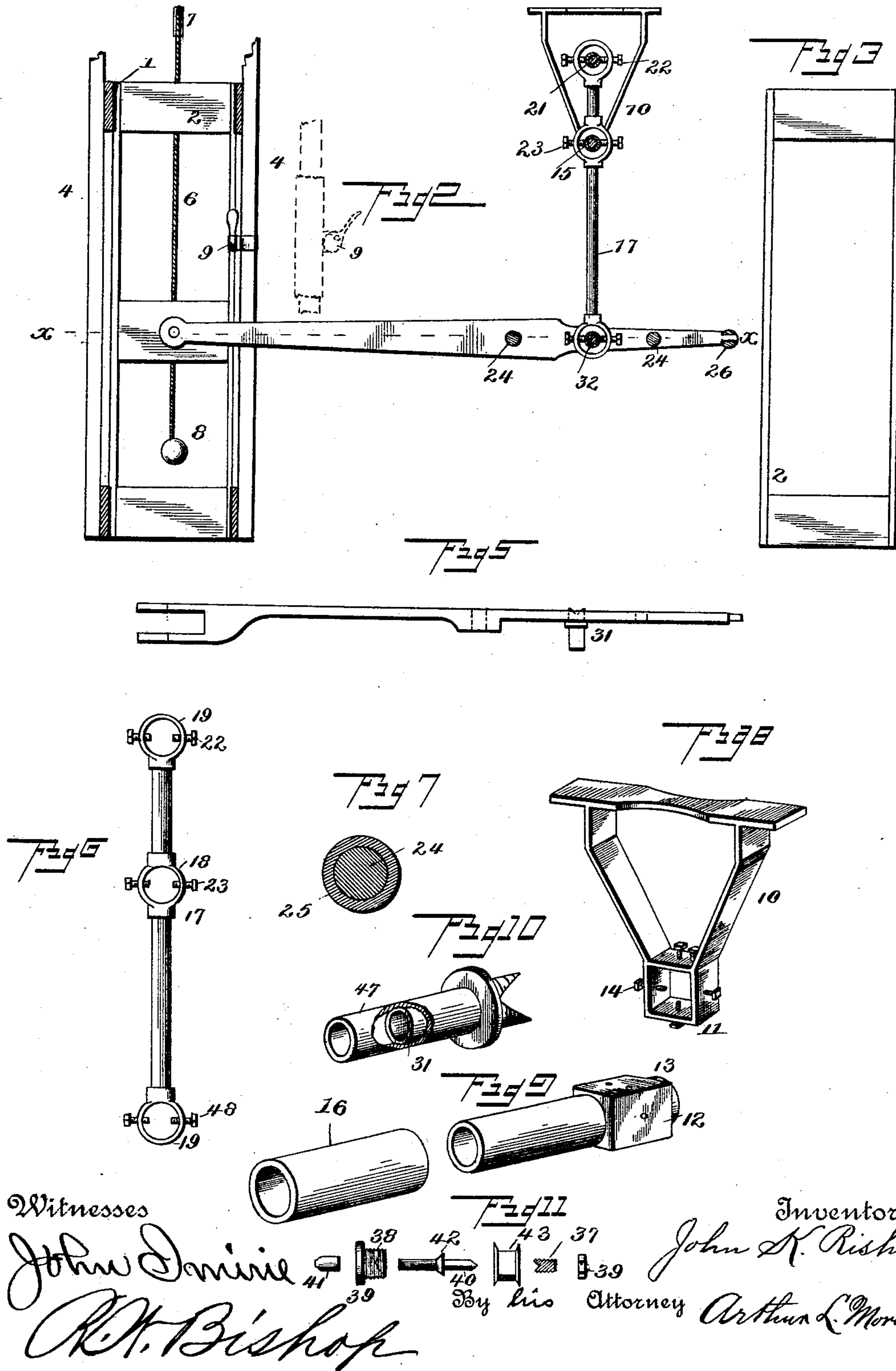
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# UNITED STATES PATENT OFFICE.

JOHN K. RISHEL, OF HUGHESVILLE, PENNSYLVANIA.

## CARVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 481,372, dated August 23, 1892.

Application filed November 11, 1891. Serial No. 411,556. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN K. RISHEL, a citizen of the United States, residing at Hughesville, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Carving-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in that class of devices known as "carving-machines."

The primary object had in view is the attainment in a novel manner of a free movement of the carving-arms in any and all directions and at the same time secure a perfect balance or equipoise thereof in order to facilitate this movement.

With the above and other objects in view the invention consists in the improved construction and combination of parts, as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a perspective view of the entire machine. Fig. 2 is a vertical sectional view. Fig. 3 is a side elevation of one of the sections for holding the material to be carved. Fig. 4 is a horizontal section on the line *xx*, Fig. 2. Fig. 5 is a plan view of one of the carving-arms. Fig. 6 is an elevation of one of the supporting-arms. Fig. 7 is a cross-section of one of the connecting-rods, showing the sleeve thereon. Fig. 8 is a detail view in perspective of one of the hangers or brackets. Fig. 9 is a detail perspective view of the journal-box with its sleeve removed. Fig. 10 is a detail view of one of the carving-arm journals with its sleeve in position thereon, a part of said sleeve being broken away. Fig. 11 is a detached view showing the cutting-tool spindle, its journal-bearings, and the tool-chuck.

Like figures of reference refer to like parts throughout the several views.

Referring to the drawings, the numeral 1 indicates the frame or casing, which contains the uprights or sections 2, upon which the

material to be carved is fastened in any desirable manner. These sections are secured in the casing or frame by means of grooves, as indicated at 3, the edges of said sections fitting snugly within the grooves.

The numeral 4 indicates guides or posts, between which the frame or casing 1 is adjustably secured.

At the top of the ends of the frame or casing, as at 5, I attach a rope or chain 6, which passes over a pulley 7, secured to the top or ceiling of the room in any desired manner. After passing over the pulley the rope or chain descends and has attached to its lower end a weight 8 to counterbalance the weight of the frame or casing 1 when the latter is raised above the floor, upon which it normally rests. To hold the frame or casing rigid in an elevated position, I provide set-screws or cams 9, attached to any or all of the posts 4.

The numerals 10 10 10 indicate brackets or hangers suspended from the ceiling of the room at points to one side of the frame or casing 1. These brackets are of the peculiar form shown in the drawings and provided at their lower ends with a square or rectangular frame 11 11 11.

The numerals 12 12 12 indicate journal-boxes, the bores of which are tubular throughout, while at their centers, exteriorly, are formed rectangular or square portions 13, which fit in the rectangular frame 11 and are held therein adjustably by means of set-screws 14.

Journaled in the boxes is a counter-shaft 15, and mounted upon the cylindrical stems of each of the journal-boxes upon one side only of the rectangular portions 13 are sleeves 16.

Fig. 6 of the drawings illustrates one of the supporting-arms, of which three are shown in the present illustration of my invention. These arms are designated by the numeral 17 and are preferably composed of a central eye or ring 18 and end loops or rings 19 19. Passing through the upper eyes of the supporting-arms is a counterbalance-rod 21, which is held in place by means of set-screws 22, passing through the eyes and extending into recesses in the shaft. The central eyes of the supporting-arms surround the sleeve 16 and are secured thereto by means of set-screws 23.



The carving-arms normally extend in a horizontal position and are connected together medially and formed into a rigid frame by transverse rods 24 24, which between the carving-arms are incased by metallic tubes 25, (see Fig. 7,) adapted to maintain said carving-arms the required distance apart. The carving-arms are further connected together at their outer ends by means of a counterbalancing-rod 26 and secured therein by any suitable means. It is of course obvious that, instead of securing the counterbalance-rods at the ends of the carving-arms and at the top of the supporting-arms, I could in place thereof provide weight-balls without departing from the spirit and scope of my invention. I prefer, however, to adopt the construction herein shown and described, inasmuch as not only a perfect counter-balance for the arms is secured, but, furthermore, said arms are made more rigid without adding to the weight of the machine.

The two outer carving-arms upon one side of the machine have turning therein a short shaft 29. The innermost of these two arms has secured therein a short socketed bearing 30, while the outermost one is provided with a longer socketed bearing 31, into which bearings the ends of the shaft project, so as to be free to turn therein on points fitted into the bearings. Socketed bearings similar to those numbered 31 are screwed through the central carving-arm and outermost arm upon the other side of the machine and in which the ends of a shaft 32 are free to turn. Upon the two shafts are mounted fixed pulleys 33 33 and intermediate pulleys 34 34, the latter being connected to corresponding pulleys upon the counter-shaft by means of belts 36 36. Sleeves 47 are loosely mounted on the longer bearings 31 and enter the lower rings or eyes 19, which are pivotally secured thereto by means of set-screws, as shown. The innermost ends of the carving-arms are bifurcated, and through each member of the furcate part screw-sockets 37 and 38 pass, the latter being tubular throughout and both held in proper position by means of jam-nuts 39. The cutting-tool spindle 40 has its pointed end bearing in socket 37, and its opposite end passes through tubular socket 38 and is screw-threaded to receive a universal tool-chuck 41. It will be noticed that the inner end of socket 38 is cut angularly to receive the part 42 of the spindle of an approximate truncated cone shape. Upon the cutting-tool spindles intermediate the bifurcated portions of the cutting-arms are located pulleys 43, which are connected to the pulleys 33 33 of shafts 29 and 32 by means of belts 44.

Intermediate two of the carving-arms is arranged the guiding-arm 45, through which shaft 32 freely passes. This guiding-arm is also made rigid with the carving-arms by means of the rods 24 24 and counterbalance-shaft 26, and its inner end is provided with

a lateral guide-pin 46 for following the outline of the pattern.

The above being a description of my improved carving-machine, its operation is as follows: Material to be carved being secured in position in one of the sections 2 by clamping, bolting, or otherwise, and the pattern to be followed having been placed in position for the guide-pin, the machinery is started, which causes the revolution of the counter-shaft 15 and its fixed pulleys 35 35. By means of belts 36 pulleys 34 34 and their shafts are caused to revolve. With the revolution of these shafts the cutting-tools are made to operate through the medium of the belts, connecting the pulleys of said cutting-tools with the pulleys 33. The machine being now running, the guide-pin is caused to follow the outlines of the pattern to be carved. As the guide-pin is fastened to one of the inner ends of the carving-arms and the whole number of carving-arms secured together, it is obvious that the point of each of the operating or cutting tools will bear exactly the same relation to the material to be carved as the point of the guide-pin bears to the pattern it is following.

By my improved construction above described it will be seen that I am able to move the carving-arms in all directions—in or out, up or down—thereby moving the cutting or operating tool in the same direction, and hence making it possible to carve more difficult designs with much greater ease than has heretofore been the case.

Another advantage of my machine is that if only one or two pieces are desired to be carved all that is necessary to be done is simply to detach one of the belts 36, so that the rotation of the counter-shaft will only be imparted to one of the lower shafts 29 or 32.

Although in this application I have only shown and described five carving-arms, I do not limit myself to this number, as it is obvious that I may employ any number of carving-arms in one machine, and through one or a plurality of shafts, similar to shafts 29 and 32, provide for operating as large a number of carving-arms as is necessary.

It will be seen that by causing the sleeves 16 to rotate on the stems of the journal-boxes 12 the supporting-arms will be made to vibrate in the planes of the carving-arms, and thereby bring the cutting-tools farther toward the front or rear of the material to be carved. The cutting-tools may be moved up or down by turning on the lower sleeves 47 without affecting the movement of the supporting-arms. A sidewise movement can also be given to the carving-arms in order to bring the cutting-tools toward or from the work when necessary, so as to stop the work altogether or permit of a deep or shallow incision by the cutting-tools. It will be understood that when not in operation the cutting-arms are balanced horizontally by the shaft 26 with



the cutting-tools a slight distance away from the work. Now if the cutters be pushed to the right or toward the work to be carved the upper counterweight-rod, by reason of its rigid attachment to the supporting-arms and the set-screws working pivotally on the loose sleeves, will be caused to be moved to the left, the set-screws 23 being the pivots or center of motion. The entire movement does not exceed, usually, more than two or three inches, except in very heavy work or thick pieces, so that the end movement is limited, but at the same time very important. While the arrangement permits the end movement freely to the right or left, the arms are all compelled to move at the same time, as the upper loops are secured to a rigid counterbalance-shaft. If the supporting-arms were not secured to this counterbalance-rod at the top, one cutter-arm might move forward and the other backward sufficiently to create a trembling of the cutters and produce a roughness in the work, as the cutters would not make a uniform incision.

It is to be further noted that the cutters are adapted to run in opposite directions or all one way, it being possible to run them in opposite directions by simply operating one of the section by a cross-belt.

By the adjustment of the cutting-tool spindle, herein shown and described, the spindle can be kept tight in its bearings, and at the same time run smoothly and without jar to the cutter-bits.

The carving-arms when not in use, if properly balanced, will hang parallel, although at right angles to the counter-shaft above supported by the three vertical arms; furthermore, when not in use and if properly balanced, the carving-arms stand at right angles to the vertical frame for receiving the pieces to be carved. By this adjustment and perfect balance of all the parts the arms will move in any direction easily and readily without dragging or pulling on the arms of the operator. By providing hangers with the lower rectangular frame to receive the correspondingly-shaped portion of the journal-boxes and having the supporting-arms on loose sleeves I avoid the danger of jar and trembling of the counter-shaft, the box being held firmly in position. If the sleeve were placed on the shaft direct, the jar and trembling, if any, would be communicated to the cutting-tool. By suspending the carving-arms in a counterbalanced horizontal position, as shown and described, the weight of the arms is removed entirely from the cutters and the wear on the bearings is reduced to a minimum, so that there is no sagging of the carving-arms and the cutting-tools will always operate easily, evenly, and smoothly.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination of a series of horizontally-disposed carving-arms adapted to os-

cillate in vertical planes, a counterbalancing-rod connecting said arms, a counter-shaft, means for suspending the carving-arms beneath the counter-shaft, a cutting or operating tool on the extremity of each carving-arm, and means for operating the counter-shaft and transferring its motion to the cutting-tools.

2. The combination of a counter-shaft, supporting-arms mounted thereon and adapted to oscillate thereon both from side to side and forward and backward, carving-arms carried by said supporting-arms, cutters on the ends of the carving-arms, and means for operating the counter-shaft and the cutters.

3. The combination of carving-arms, a counter-balance therefor, a shaft connecting said arms, supporting-arms having an eye or loop through which the counter-shaft passes and another loop or eye at their lower extremities wherein the shaft connecting the carving-arms is supported, cutters on the ends of the carving-arms, and means for operating the counter-shaft and the cutters.

4. The combination of counterbalanced carving-arms having their inner ends provided with cutters, a shaft connecting the carving-arms, arms for suspending the carving-arms, provided at their ends and intermediate said ends with eyes or loops, a counterbalance-rod secured in the upper eyes by set-screws, sleeves secured centrally in the intermediate eyes or loops and supporting the arms, sleeves secured centrally in the lower eyes or loops and in which lateral extensions from the carving-arms are journaled, and means for operating the cutters.

5. The combination of a shaft or shafts, means for rotating the same, carving-arms provided with fixed bearings for the journals of the shafts so as to have a pivotal movement independent thereof, sleeves loosely mounted on said bearings, and supporting-arms having eyes or loops in which said sleeves are pivotally secured.

6. In a carving-machine, the combination of carving-arms and an intermediate guiding-arm, socketed bearings passing through the carving-arms, said bearings upon the two outer arms and one of the intermediate arms being extended laterally, shafts having their ends journaled in said bearings and passing through the guiding-arm, sleeves loosely mounted upon the extended bearings, a counter-shaft above the carving-arms, supporting-arms provided with eyes or loops to receive the loose sleeves, and means for transferring the rotary movement of the counter-shaft to the shafts of the carving-arms and from the latter to the cutting-tools, substantially as set forth.

7. In a carving-machine, the combination of brackets provided at their lower ends with square or rectangular frames, journal-boxes having square or rectangular portions registering therewith, a counter-shaft provided



with pulleys and having its ends bearing in the journal-boxes, sleeves loosely mounted upon the cylindrical portions of the journal-boxes, counterbalanced supporting-arms provided with eyes or loops, one set of eyes or loops being secured to the loose sleeves by set-screws, sleeves fitting and secured within the lower eyes of the series, carving-arms provided with lateral extensions turning in the sleeves, a shaft or shafts journaled in said

carving-arms and carrying pulleys to receive one belt from the pulley of the counter-shaft, and also a belt connecting with the pulley of the cutting-tool, substantially as set forth.

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

JOHN K. RISHEL.

Witnesses:

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