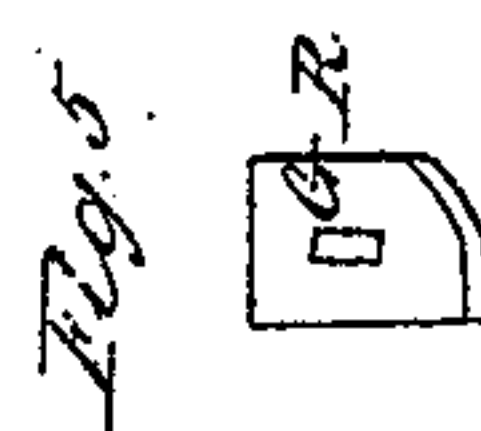
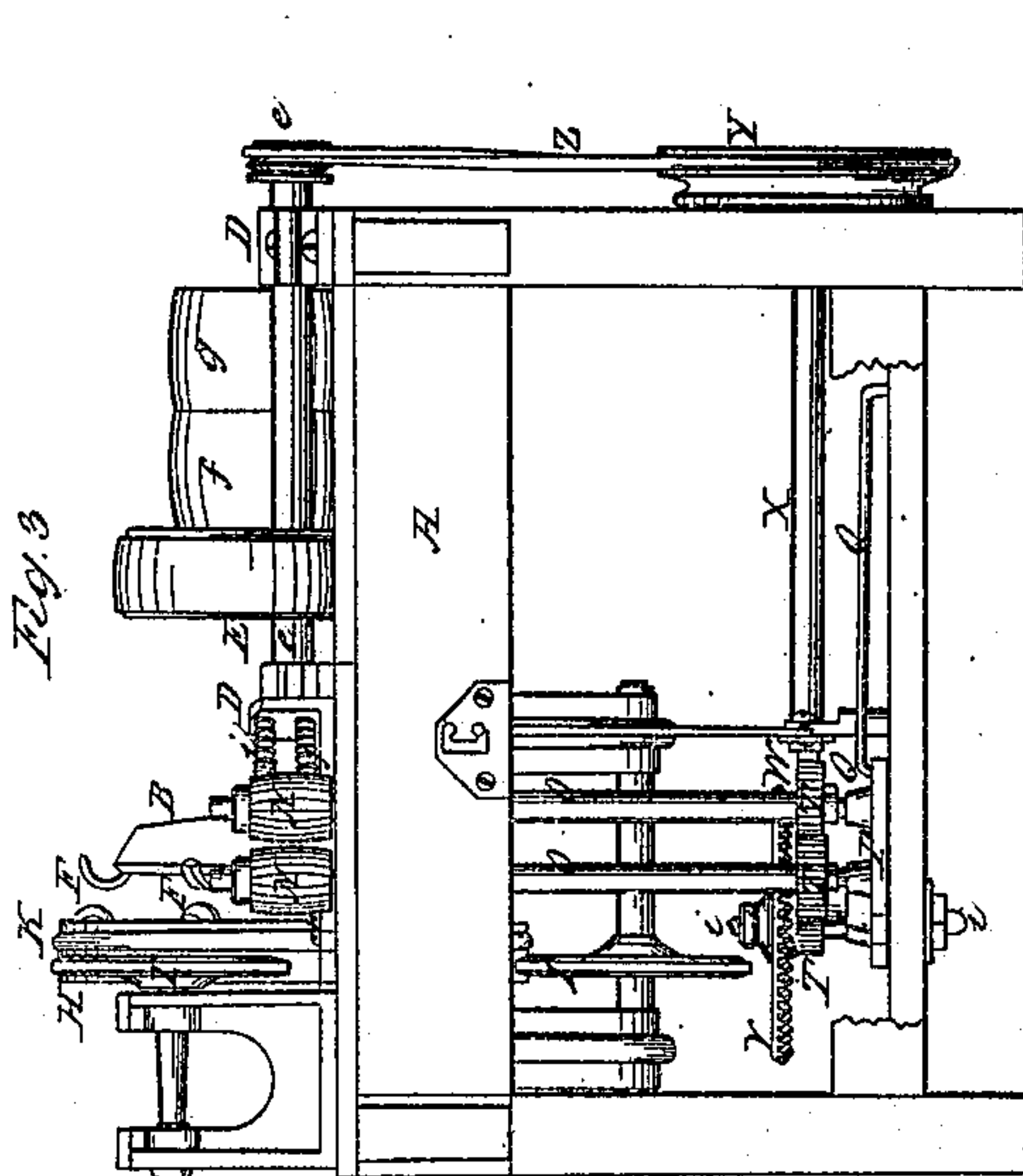
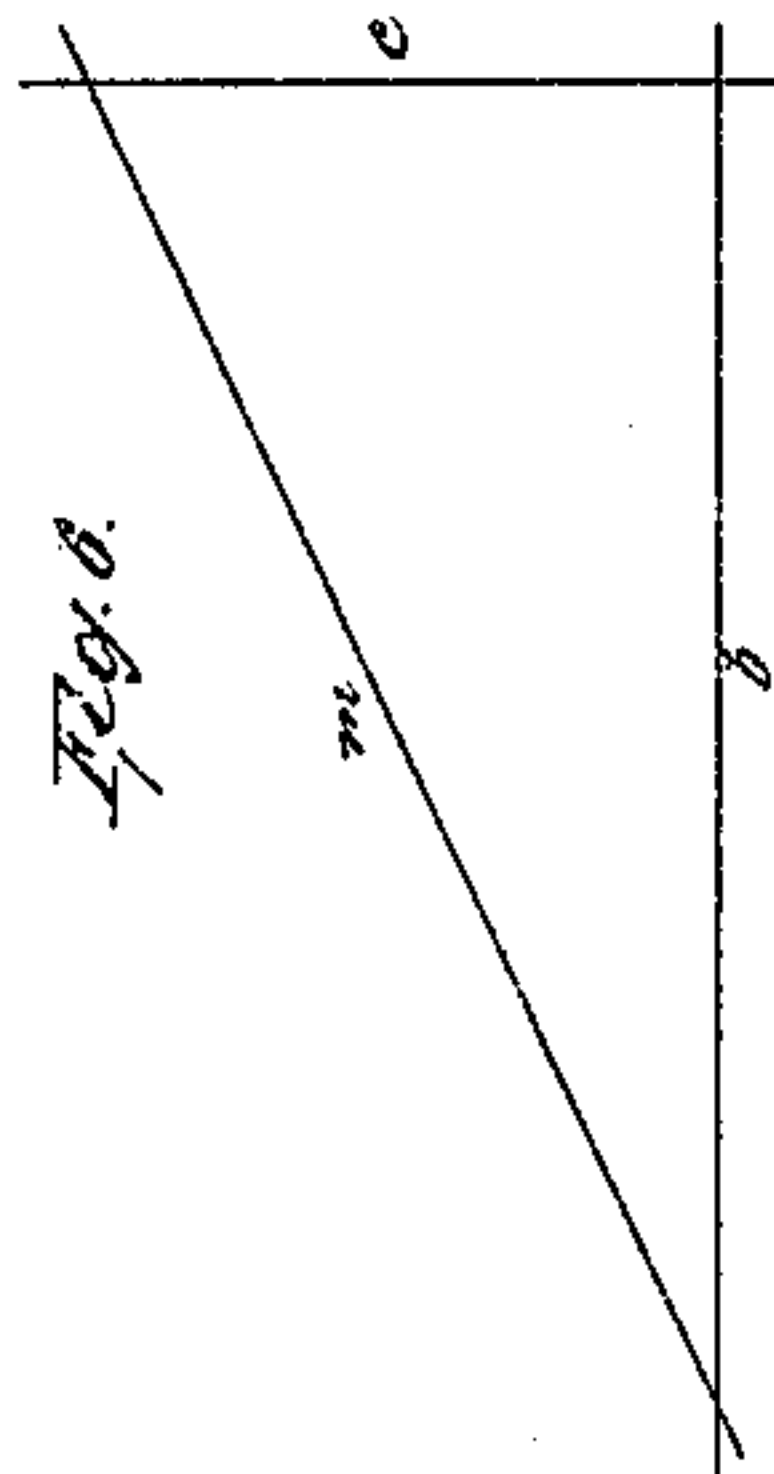
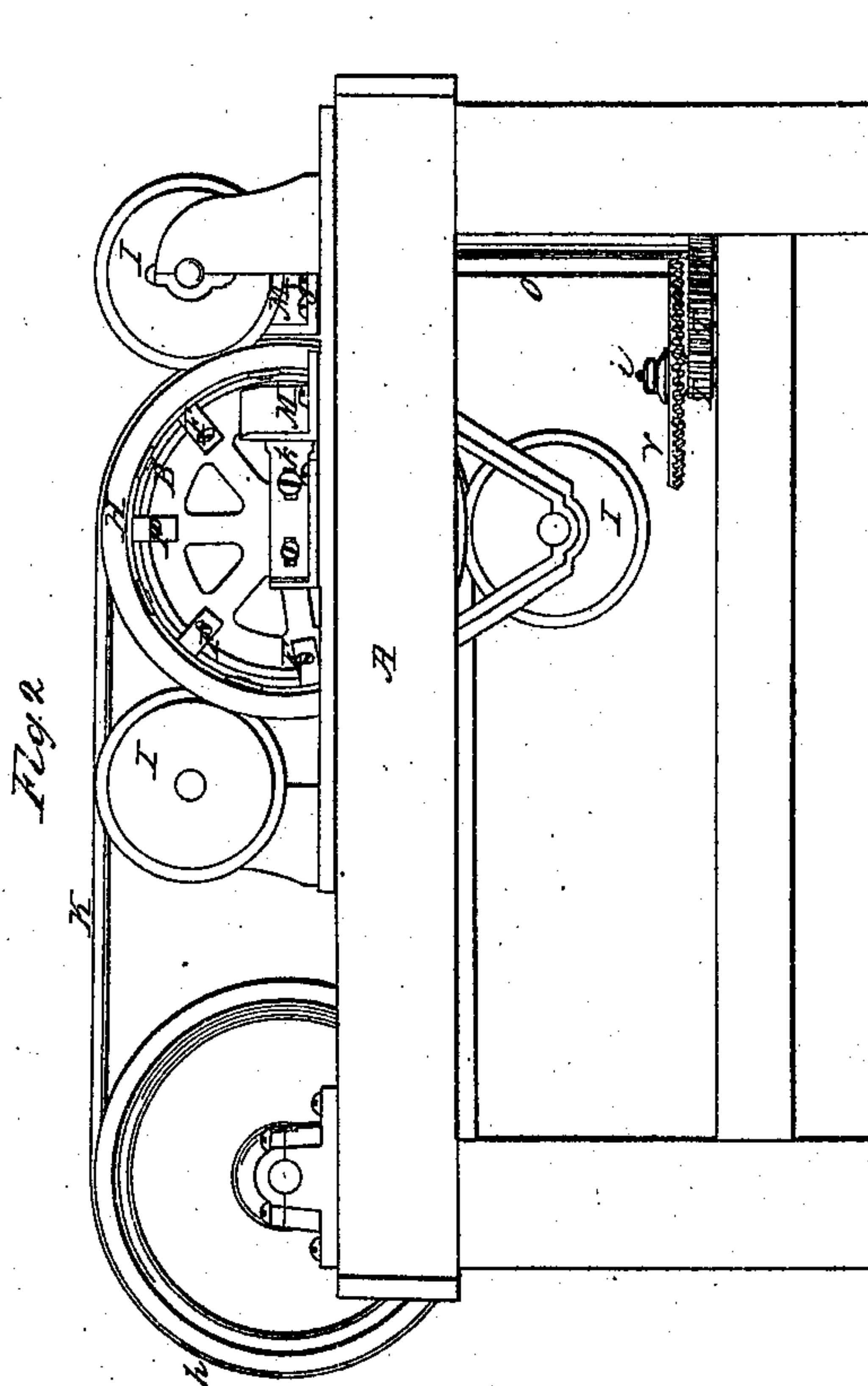
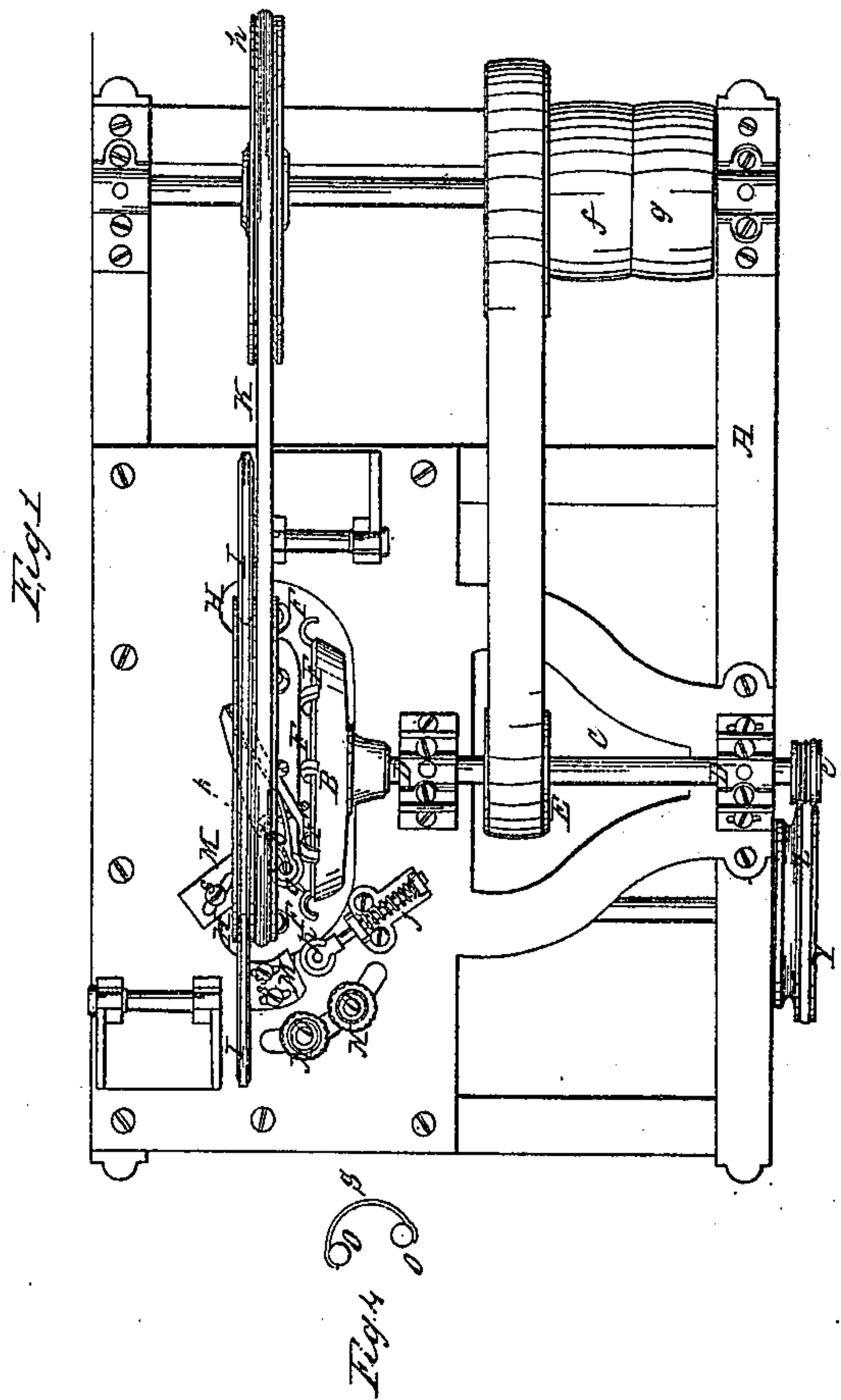


I. Judson,
Dressing Stares.

No 5099.

Patented May 1, 1847.



UNITED STATES PATENT OFFICE.

ISAAC JUDSON, OF NEW HAVEN, CONNECTICUT.

MACHINERY FOR DRESSING STAVES.

Specification forming part of Letters Patent No. 5,099, dated May 1, 1847; Reissued March 9, 1852, No. 211.

To all whom it may concern:

Be it known that I, ISAAC JUDSON, of the city and county of New Haven and State of Connecticut, have invented a new and useful improvement in machines for dressing the convex and concave sides of staves to any required curvature by means of two sets of rotary cutters turning in parallel planes, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

The nature of my invention and improvement consists in combining and arranging two revolving rings, or wheels, having cutters on their opposing surfaces or sides next each other for shaving the stave transversely and simultaneously on its inner and outer sides producing a stave the cross section of which is the segment of a circle; the diameter of which is to be greater than the diameters of the said rings, or wheels (the curve of the stave being variable at pleasure according to the sizes of the different kinds of casks for which the staves are intended), by changing the position of the stationary guides and feed rolls, and of the cutters on the parallel rings or wheels so as to change the angle of the position of the stave with the plane of the rings, or wheels, which forms the base of a right angled triangle, or section of a cone, and the axes of said wheels which forms the perpendicular of said right angled triangle, or the axis of a cone the straight line in which the stave moves toward the cutters being the hypotenuse of the right angled triangle or the inclined side of the cone (represented by line *m* in Figs. 6 which line is made changeable at pleasure in order to change the degree of curvature of the stave as stated. The angle of the side of the cone with its base being increased when the degree of the curve of the stave is to be decreased and when the angle of the cone is diminished the degree of the curvature of the stave is increased.

This principle of introducing a stave, or other piece of wood, obliquely between two series of revolving cutters at any required angle with the planes of the wheels or rings carrying the cutters for the purpose of cutting the stave or piece of wood transversely to the segment of any given circle corresponding with that of the intended cask,

constitutes my principal invention and improvement.

The nature of the second improvement consists in a new arrangement of two movable fluted or grooved feed rolls for driving the stave past, or between the revolving rings, or wheels of cutters, said rolls being held together by a spring or other means so as not to give to the stave any specific direction leaving it to be guided by stationary rests of short lengths so as to accommodate the crooks and winds of the grain of the wood to the position of the cutters.

Figure 1 is a plan or view of the top of the machine. Fig. 2 is an elevation or view of the side of the machine. Fig. 3 is an end elevation or view of the end of the machine. Fig. 4 is a sectional view of the shafts of the feed rolls showing the spring that embraces the shafts and keeps the rolls against the stave. Fig. 5 represents a flat cutter. Fig. 6 is a diagram showing the figures formed by the base and axis of the wheel intersected by the line of the guides for the stave.

Similar letters in the several figures refer to corresponding parts.

A represents the frame. This is made of any suitable form, size, and material for the purpose intended.

B is a circular revolving wheel, ring, or plate for carrying the cutters that cut and form the concave side of the stave.

C is the shaft to which said wheel is affixed.

D are the boxes in which said shaft C turns.

E is a pulley on said shaft C around which is passed an endless band leading to a pulley on the driving shaft.

F are the cutters for cutting, forming, and dressing the concave side of the stave to the required curvature and smoothness. These cutters are made of any suitable form or material and are secured to the face of the wheel opposite to the revolving ring (hereafter described) and next to, or against the perimeter thereof. The said cutters may be of the gouge form (as represented in Fig. 1) or of the form of a parallelogram with one corner cut off as shown at R Fig. 5, in which G represents an oblong mortise in the same, through which a screw bolt is passed

that secures the said cutter to the wheel. This form of cutter is preferred; its position on the wheel may be changed at pleasure, so as to correspond with any change of position of the stave for producing the various curvatures of the inner side of the stave. The gouge shaped cutter, represented in Fig. 1, is secured to the wheel in the same way. This cutter is found not to answer so good a purpose in all cases as some other forms that have been tried, but to remove the surplus material it answers very well. The cutters, however, may be made of any required form, and may be secured to the wheel in any convenient way and at the required angle for producing the desired result.

H, is a revolving ring, or rim, for carrying the cutters that cut, form, and shave the convex side of the stave. The axes of the ring and wheel coincide; but their vertical planes do not; they are, however, parallel. The ring is set back from the wheel the required distance to form the necessary space between them for the passage of the staves obliquely between the cutters at any required angle with the planes of the ring and wheel. The ring has no axle or shaft; it is supported by, and turns against, the peripheries of a number of antifriction wheels I, whose axles turn in boxes connected with castings fixed to the frame. The ring is sustained upon the peripheries of these antifriction wheels by means of a circular groove made in the periphery of the ring in which the said antifriction wheels turn and which prevent the ring from having any side motion during its revolving motion. It is turned by means of a flat endless band passed around it and leading to the driving power. Or by means of an endless round band K let into a corresponding groove made in the periphery of the ring and a similar groove made in a pulley *h* on the driving shaft. The cutters of this ring are made and arranged in the same manner as those above described for the wheel.

M, M, are two short right angled rests, or guides, fastened to the frame by means of segment mortises and set screws. The mortises are made in the horizontal portions of the rests or guides. The vertical portions constitute the guides against which the stave to be dressed is propelled. The faces of these guides are in a straight oblique line. This line when continued until it intersects a line drawn through the axis of the wheel and a line drawn through the base of the wheel will form the hypotenuse of a right angled triangle or the side of a section of a cone—the base of the triangle corresponding with the base of the wheel, and the perpendicular corresponding with the axis of the wheel. In Fig. 6 these lines are represented at *m*, *b*, *c*—*m* being the hypotenuse, *b*, the base, and *c* the perpendicular. In dressing

staves for casks of various diameters the line of the guides must be varied. To cut the stave the segment of a larger circle the line of the guides must be changed so as to diminish its angle with the base.

A contrary result takes place when the stave is to be dressed for a smaller cask. This is effected by simply unscrewing the set screws, *s*, and moving the guides to the required position, and again making them fast. The staves are propelled forward to the cutters by means of two feed rolls N, N, whose axes are nearly parallel and vertical, and between which the stave is placed. These rolls are above the frame and their shafts O, O, extend down through the frame to an adjustable segment plate P turning on a center *i* in the frame; in which plate the lower ends of the shafts are stepped or placed and adjusted or moved to the right or left in the arc of a circle by moving said segment plate which is held in any required position by a catch Q attached to the frame and dropped into a notch or hole in the segment plate. The upper ends of the shafts are loose and have a swing motion to the right and left and are borne toward each other by a spring S which embraces the shafts.

The shafts are thus placed for the purpose of allowing the feed rolls to accommodate themselves to the crooked forms of the staves to be dressed. The shafts are turned by means of cog-wheels T' T² fixed to them which are geared together, and to an intermediate cog-wheel T³, which is geared with a pinion T⁴ on a vertical axle *i* on which there turns a large bevel wheel V that works into a small bevel pinion W on a horizontal shaft X turning in suitable boxes in the frame, there being on said shaft a pulley Y around which is placed a cross band Z leading around a pulley *e* on the axle *c* of the wheel of cutters.

f is a fast pulley on the main or driving shaft.

g is a loose pulley on said shaft of the usual form, arrangement, and operation.

p and *q* are two antifriction rollers for bearing the stave against the guides.

j and *k* are springs for extending the rollers outward toward the guides. When a stave is inserted between the guides and rollers the springs *j* and *k* contract to allow the rollers to recede. In Fig. 1 the rollers *p* and *q* are represented as extended so as nearly to touch the guides—no stave being represented in the machine.

When a stave is to be dressed it is placed edgewise upon the frame with one end between the feed rolls N—the machine being put in motion, the feed rolls propel the stave between the guides and bearing rollers to the cutters on the opposing faces of the wheel and ring and in passing between the cutters

it is shaped and dressed smooth—concave on one side and convex on the opposite side. Another stave being inserted between the feed rolls and propelled forward in the same manner strikes against the stave next before it and propels it through the space between the wheel and ring. In this manner the operation of the machine is kept up.

10 The stave or other piece of wood may be dressed to a concave or convex form on one side only, by introducing it in an oblique direction to either the wheel or ring of cutters used singly.

15 What I claim as my invention, and desire to secure by Letters Patent, is—

20 The manner of arranging the wheel and ring of cutters in parallel planes forming a space between them for the introduction of the stave to be dressed simultaneously on both sides—concave on one side and convex on the other, and to any degree of curvature required, according to the position of

the guides in relation to the cutters on the wheel, and ring, as herein set forth; the stave, or other piece of wood being introduced obliquely between the two series of revolving cutters at any required angle with the planes of the wheels, or rings, carrying the cutters, for the purpose of cutting the stave or piece of wood transversely to the segment of any given circle corresponding with that of the intended cask, or barrel, of which the stave is to form part, changeable at pleasure by changing the position of the stave, the feed rollers being made to swing to the right and left in the arc of a circle for the purpose of accommodating themselves to the irregular shapes of the pieces of wood to be dressed into staves.

ISAAC JUDSON.

Witnesses:

LEONARD PARDEE,
FRANCIS S. COLLINS.

[FIRST PRINTED 1913.]