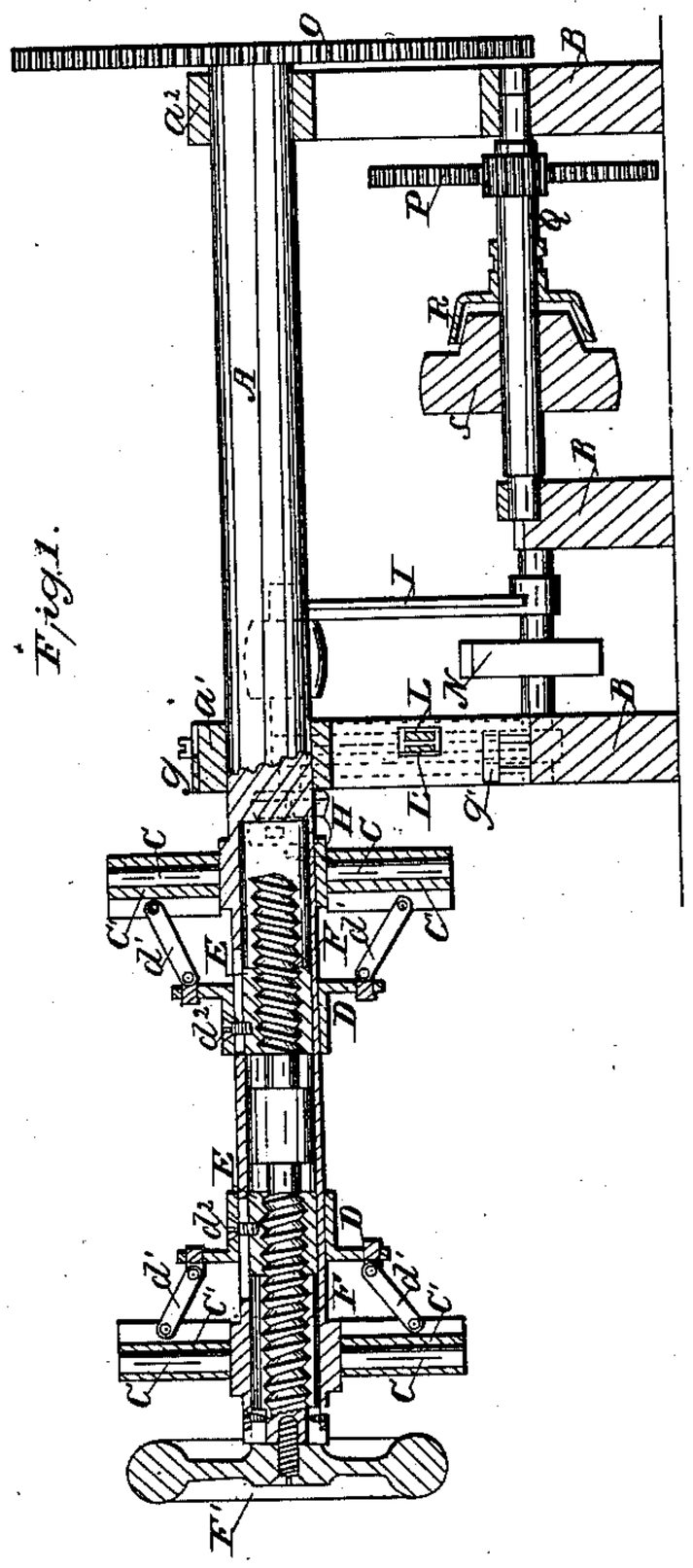
Sheet 1-3 Sheets.

E. & B. Holmes.

Crozing Staves,

No. 80,481. Patented July 28, 1868.

Fig. 1.



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Inventor:
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Sheet 2-3 Sheets.

E. & B. Holmes,

Crozing Staves.

No. 80,481. Patented July 28, 1868.

Fig. 2.

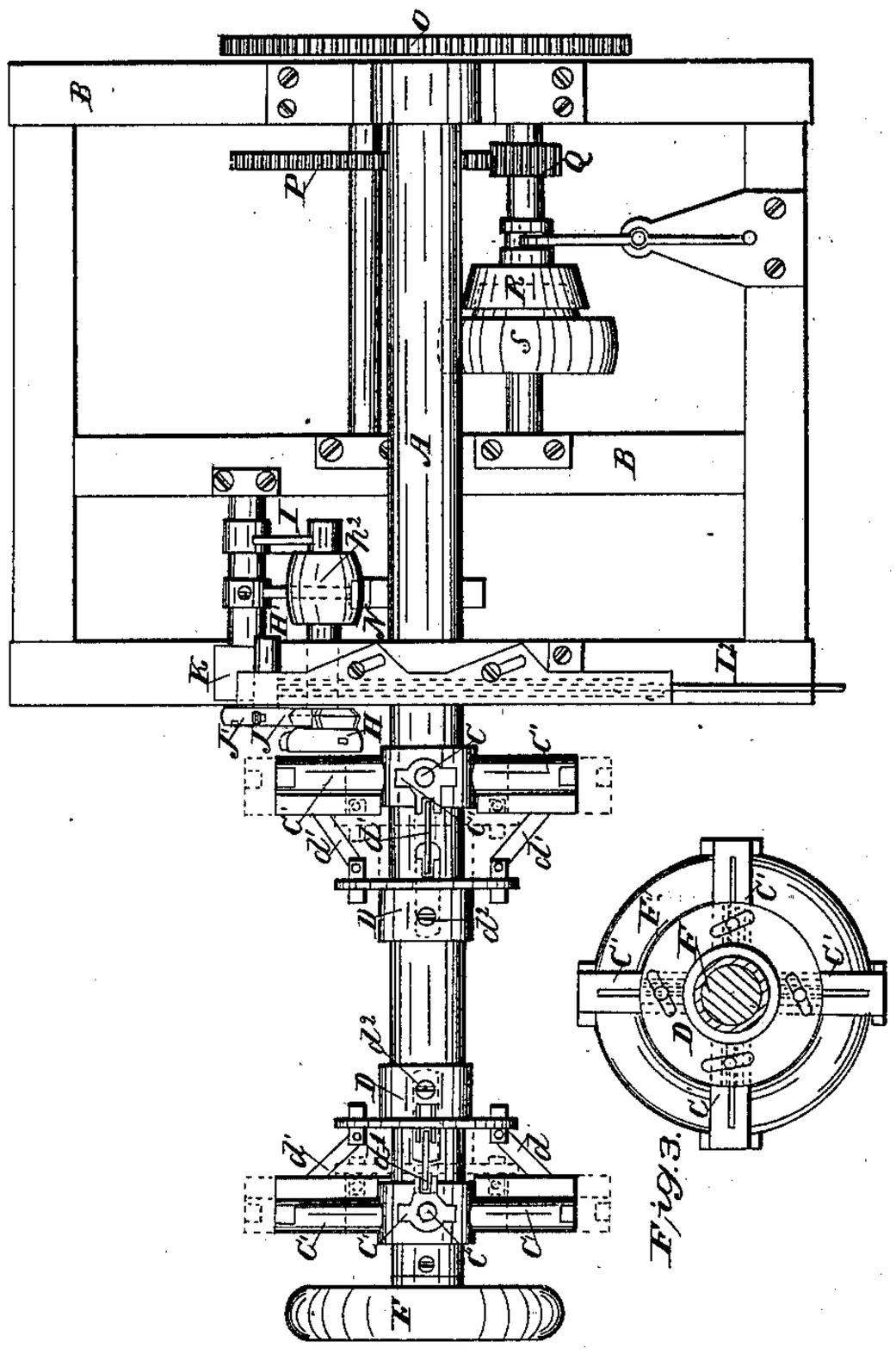

Fig. 3.

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Sheet 3 - 3 Sheets.

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Crozing Stave.

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Fig. 5.

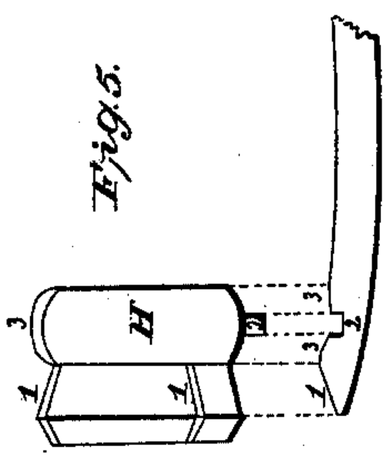
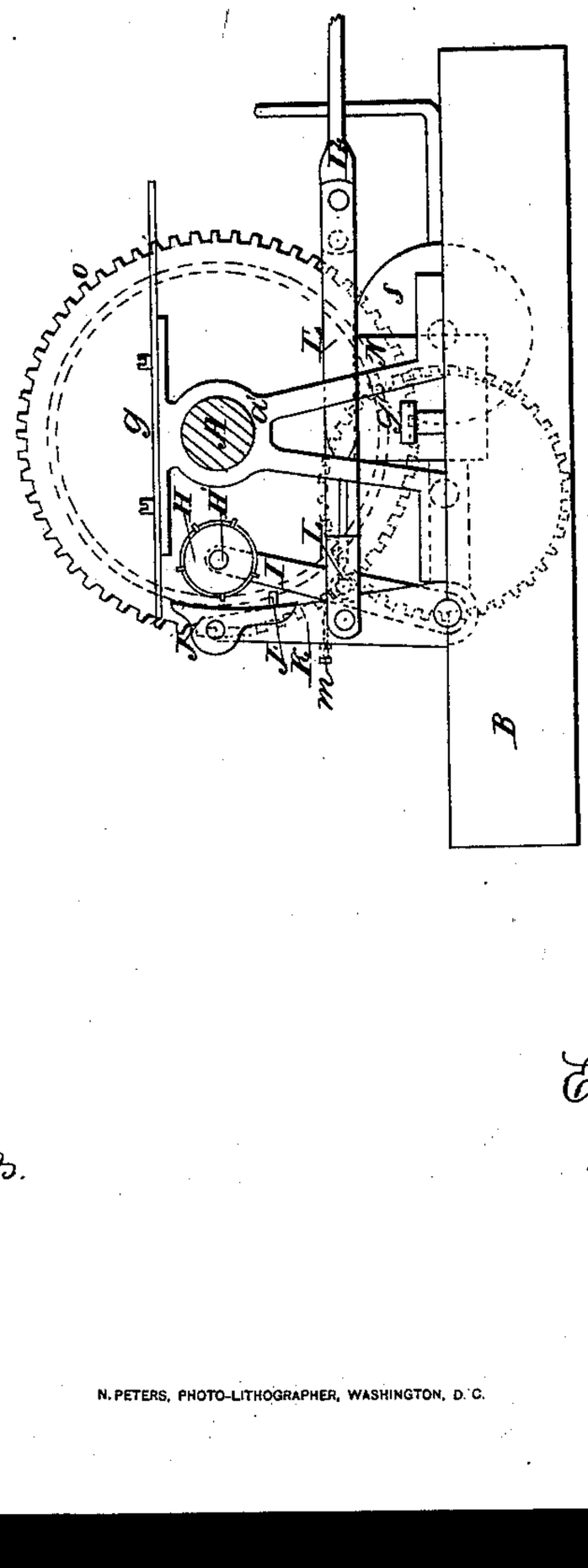


Fig. 6.



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Inventor:
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UNITED STATES PATENT OFFICE.

EDWARD HOLMES AND BRITAIN HOLMES, OF BUFFALO, NEW YORK.

IMPROVEMENT IN MACHINES FOR CROZING AND HOWELING BARRELS.

Specification forming part of Letters Patent No. **80,481**, dated July 28, 1868.

To all whom it may concern:

Be it known that we, EDWARD HOLMES and BRITAIN HOLMES, of the city of Buffalo, county of Erie, and State of New York, have invented a certain new and Improved Machine for Chamfering, Howeling, and Crozing Casks; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure I is a sectional elevation. Fig. II is a top plan view. Fig. III is a plan view of the radial adjustable arms. Fig. IV is a transverse vertical section. Fig. V is a diagram, showing the cutter-head and the end of a stave.

The nature of our invention consists in the combination of a guide-rest with a cutter-head carrying chamfering, crozing, and howeling cutters in such manner that the action of said cutters will be gaged from the exterior surface of the cask, and thereby a true and uniform chamfer, croze, and howel obtained, as will hereinafter more fully appear.

Letters of like name and kind refer to like parts in each of the figures.

The main shaft, which supports the cask, is represented at A. It revolves in bearings a' a^2, one of which is located near its center, and the other supports one end of the shaft, the opposite end overhanging upon one side of the machine, for the purpose hereinafter set forth.

B represents a rectangular frame constructed of suitable timber, upon which frame all the operating parts of the machine are supported.

The overhanging end of the shaft A is made hollow, as shown in Fig. I.

C C represent two sets of radial arms made fast to the shaft A, each series composed of three or more arms, and both adjusted to the shaft at a sufficient distance apart to take hold (when extended) near the ends of a cask upon the inside, in the manner represented in red dotted lines, Fig. II.

C′ C′ represent sleeves placed upon each of said stationary arms, which are made to slide in and out toward and from the center of the shaft by means of the sliding cross-heads D, to which the sleeves C′ are connected by the rods d'. The cross-heads D are made circular, and slide horizontally upon the outside of the shaft A. At the several points where the rods d' are attached the cross-heads have eccentric slots, through which the connecting-bolts pass, and by which means said bolts may be adjusted at different distances from the center, according to the size of the cask intended to be held by the said sleeves or arms. Each circular cross-head D is, by means of a set-screw, d^2, connected to a nut, E, upon the inside of the shaft, the set-screw passing through a slot cut longitudinally in the shaft A for that purpose. Hence neither the cross-head D nor the nut E is allowed to revolve around the shaft, but both may move longitudinally. The cross-heads D being located in the middle between the two series of arms, it is necessary that, in order to expand or contract both series of arms simultaneously, the cross-heads have to move also simultaneously, but in opposite directions. This is accomplished by means of the right-and-left screw F, passing through and operating both nuts E, as is clearly represented in Fig. I. A hand-wheel, F′, upon the end of the shaft is connected to and operates this screw F in a manner to expand or contract all the radial arms C′ C′ simultaneously. Now, in order to properly center and secure the cask upon these arms in position to receive the chamfer, croze, and howel, the hand-wheel, and hence the screw F, are first turned in a direction to contract the arms C′, then the cask is placed over the end of the shaft and upon the arms, and the screw is revolved in the opposite direction, by which means the arms expand and gradually raise the cask until all the arms take hold of the inside of the cask and keep it firmly in position. While the cask is raised as aforesaid the edge thereof which is contiguous to the bearing a^2 is retained in the proper vertical position by means of the top and bottom guides, g and g', so that when the cask is firmly connected to and held by the arms its axis will be coincident, or nearly so, with the axis of the shaft.

H represents the cutter-head, to which all the cutting-knives are connected which are required for chamfering, crozing, and howeling the ends of the cask. This cutter-head is represented in detail in Fig. V, together with a section of one end of a stave when finished. In Fig. V the several cutters attached to the head H and the corresponding cut produced by

them upon the end of the stave are represented by corresponding figures. 1 represents the chamfering-knives and the chamfer upon the stave; 2, the crozing-knife and the croze upon the stave, and 3 the howeling-knife and the howel upon the stave. The cutter-head is attached to the overhung end of the shaft H′, carrying the driving-pulley h^2, by which it is revolved. The shaft H′ is supported upon a swinging frame, I, composed of two upright standards, their lower ends being hinged to the frame B and the upper ends forming bearings for the shaft H′. The purpose of this swinging frame and its operation will be hereinafter described.

J represents a "rest," as we call it. It consists of a curved piece of metal, which is hinged in the middle, its ends projecting toward the center of the main shaft A. This rest is supported upon a swinging upright lever, K, which is hinged to the main frame. The object of the rest J is to govern the action of the chamfering, crozing, and howeling cutters upon the cask.

The inside of a cask generally presents a very irregular and broken surface, owing to the unequal thickness of the staves employed in its formation, while the outside of the cask, owing to the effect of the hoops which secure it, always presents a smooth and uniform surface. Consequently the depth of cut requires to be gaged from the exterior surface of the cask. The rest is kept in close contact with the exterior surface of the cask as it revolves by the action of a weighted lever, N, which is an extension at right angles from the rest-lever K.

By means of a lever, L^2, connecting with the frames I and K through the rods L L′, the frames I and K may be thrown to or from each other, as desired. When thrown toward each other the lever L^2 will occupy the position shown in Fig. IV, in which position, owing to its joints with the levers L L′ being in line with each other and with the joints which connect said levers to frames I and K, said frames I and K will be securely locked and held together, and will oscillate upon their common axis as one frame. Hence the rest J, in following the external surface of the cask, will cause the cutter-head to follow parallel thereto, so that the chamfer, croze, and howel will leave a uniform thickness of material.

By means of a set-screw, *m*, applied to lever *k*, and against which lever I will strike, the depth of cut of the chamfering, crozing, and howeling knives may be regulated as required.

The necessity of supporting the cutter-head in the swinging frame and combining therewith the rest J arises from the fact that sometimes the casks have not a true circular form and cannot be centered truly upon the shaft A, owing to the different thickness of the staves. The cutter, if supported in stationary bearings, would cut the chamfer, &c., true with the axis upon which the cask rotates, and consequently could not cut true with the cask itself.

A knife, J′, is attached to the rest J, projecting therefrom at right angles to the axis of revolution of the cask, in a manner to cut off and level the end of the cask and remove the rough edge caused by the action of the chamfering-cutter.

O P Q represent gear-wheels, by means of which motion is given to the shaft A; and R is a friction-clutch, and S the main driving-pulley, which furnishes the required motion.

The operation of this machine is as follows: The required number of staves having been formed in the shape of a cask, and the ends thereof firmly held in place by the truss-hoops and leveled, the same are placed upon the arms C C′, gaged by the guides *g* *g*′, and by means of the expanding arms firmly attached to the shaft A, as above described. Then, by means of the compound levers L L′ L^2, the cutter-head and rest are brought together in such manner that the cutter-head comes in contact with the inside and the rest bears upon the outside of the stave. The cutter-shaft being set in motion, the knives upon the cutter-head will chamfer, croze, and howel the end of the stave, and the leveling-knife upon the lower end of the rest cut off the sharp edges formed at the ends of the stave by the chamfering-knife. The set-screw *m* regulates the depth of cut the cutting-knives are required to make in the end of the stave, and keeps the axis of the cutter-head a certain distance from the rest. The main shaft A being slowly revolved, the staves are one after the other fed to the cutter. One whole revolution of the shaft is sufficient to finish one end of the cask. Then the arms C C′ are contracted, the cask turned around, and the other end finished in like manner.

What we claim as our invention, and desire to secure by Letters Patent, is—

The combination of the cutter-head H, supported by the swinging frame I, with the rest J, supported by the swinging frame K, oscillating upon a common axis with the cutter-frame, when said frames K and I are provided with a locking mechanism by which the cutter-head may be held at a definite distance from the rest, and thereby made to follow the curvature of the cask, substantially in the manner and for the purpose set forth.

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