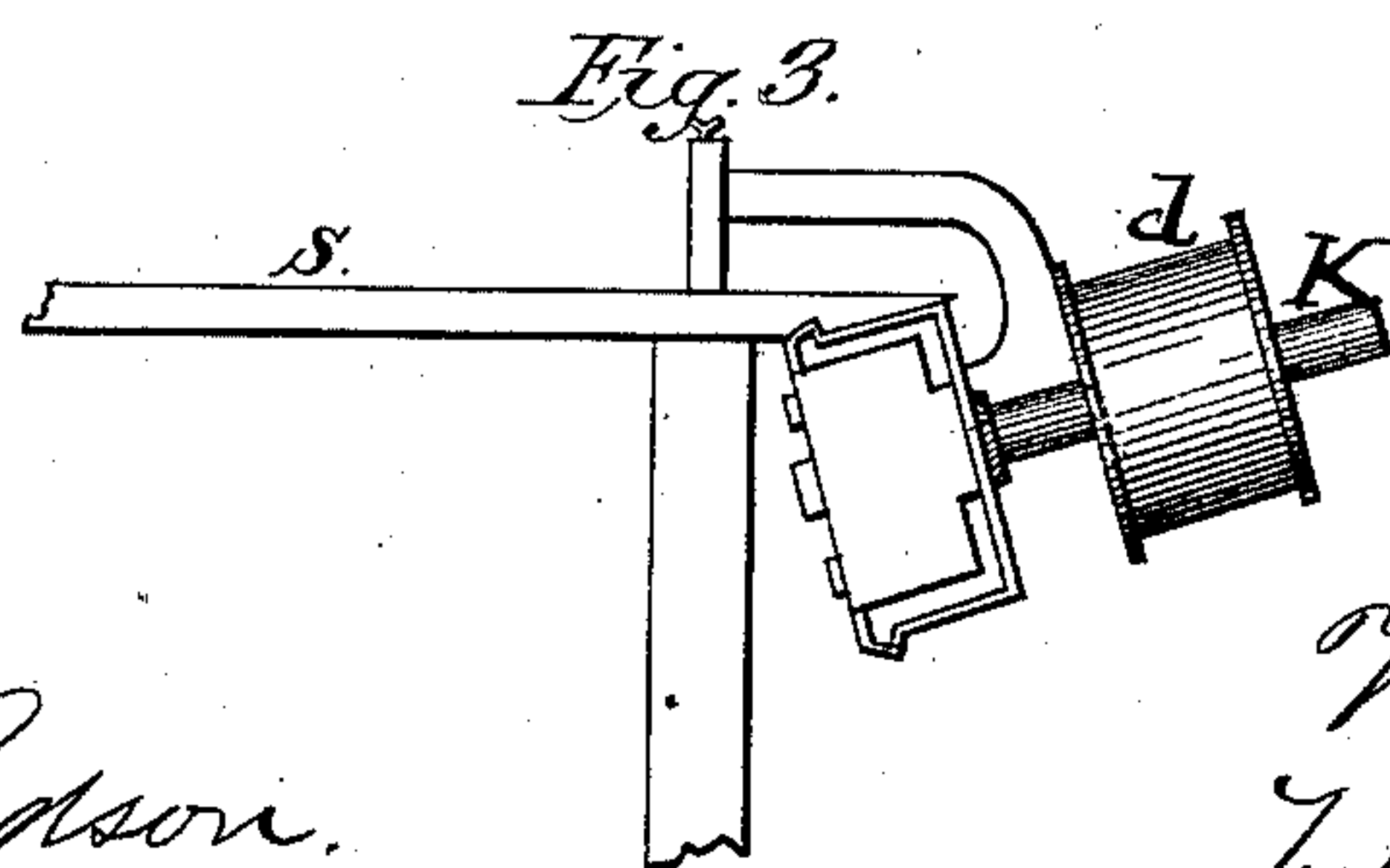
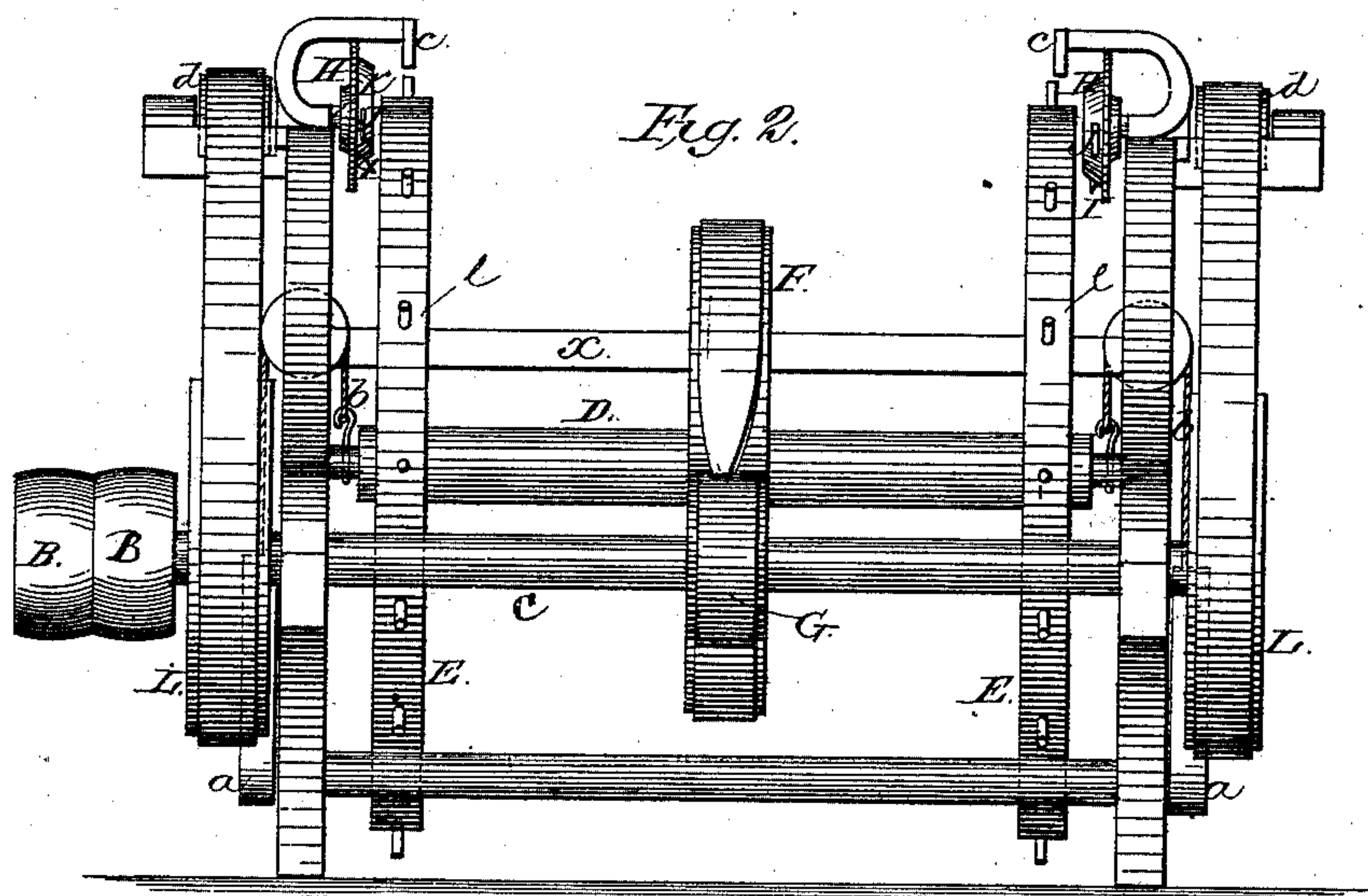
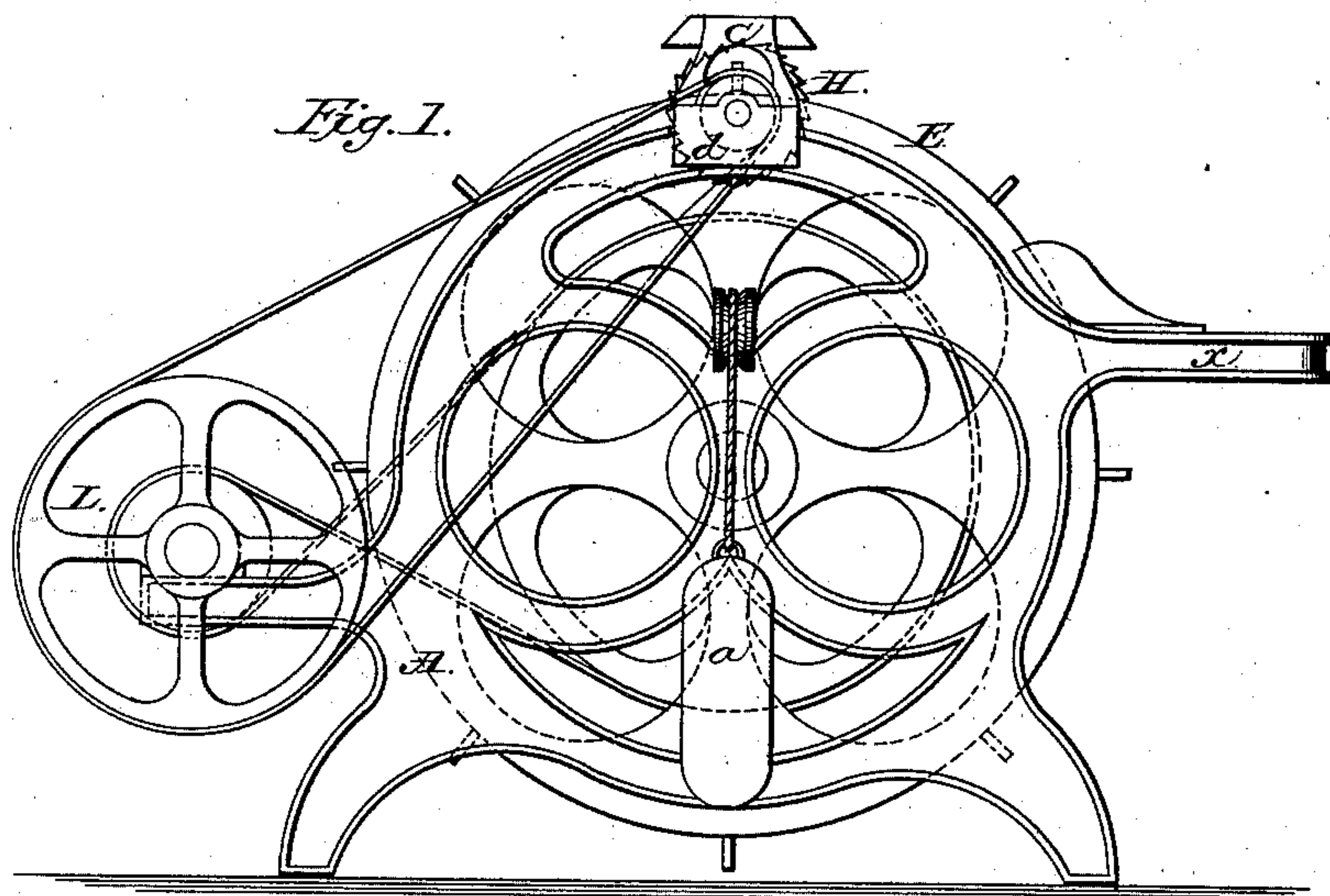


W. C. GARDNER & W. STEPHENSON.  
Machine for Chamfering and Crozing Staves.

No. 216,786.

Patented June 24, 1879.



Witnesses:  
*W. C. Gardner*  
*John Henderson.*

Inventors:  
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# UNITED STATES PATENT OFFICE

WILLIAM C. GARDNER AND WILLIAM STEPHENSON, OF NORTHVILLE, MICH.

## IMPROVEMENT IN MACHINES FOR CHAMFERING AND CROZING STAVES.

Specification forming part of Letters Patent No. **216,786**, dated June 24, 1879; application filed October 22, 1878.

*To all whom it may concern:*

Be it known that we, WM. C. GARDNER and WM. STEPHENSON, of the village of Northville, county of Wayne, State of Michigan, have invented certain new and useful Improvements in Machines for Preparing the Ends of Staves for Barrels, of which the following is a specification.

Our invention relates to an improvement in chamfering and crozing machines, the object being to provide a machine of simple and durable construction which shall be capable of feeding the staves to the saws and knives and subject the staves to the processes of chamfering, crozing, and equalizing the several operations to be effected automatically and in a rapid and uniform manner; and to this end our invention consists in the several details of construction and combinations of parts, as will hereinafter be described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of our improved machine. Fig. 2 is a rear-end view of the same, and Fig. 3 is a sectional view of one of the adjustable mandrels.

A is the frame of the machine, which is made of sufficient weight and strength to resist the vibratory movement of the operating mechanism. B is a driving-pulley fixed to the counter-shaft C, which latter may be supported in bearings connected with the frame of the machine; or said bearings may be supported in any other suitable manner. D is the shaft of the self-adjustable feed-reel, the journals thereof being journaled in vertically-sliding boxes, which move within guideways formed in frame A.

The shaft D is raised and upheld by means of weights *a a*, which connect with the sliding boxes by means of cords *b b*, the latter passing over suitable pulleys located in the frame.

Instead of cords and weights being employed in raising and supporting the shaft D, springs or weighted levers may be substituted therefor, though we prefer the employment of the weights and cords, substantially in the manner illustrated in the drawings.

Upon the ends of shaft D, within the frame, are rigidly secured the feed-reel ends E E,

which are furnished with any desired number of pins or lugs, *e e*, the latter serving as supports for the staves while they are carried forward to the action of the knives or cutters, the staves being fed to the feed-reel from the table *x*. The staves are fed to the upper side of the feed-reels, and the upper surfaces of the ends of the staves are held in direct contact with the adjustable guides *e e*, and, in view of the self-adjustability of the feed-reel, the latter will automatically adjust itself to the variable thicknesses and inequalities of the staves to be operated upon.

Shaft D is provided with a pulley, F, the latter receiving motion by a belt from the band-wheel G on the counter-shaft C.

H H are saws for severing the ends of the staves, so that they shall all be of equal length. I I are croze-knives, which may be formed in single piece with the chamfering-knives J J, or made separate and independent thereof, and any desired number of croze and chamfering knives may be employed. These knives are hung or adjusted to operate simultaneously on the opposite ends of the staves.

Mandrels K, on which the saws and cutters heretofore described are secured, are furnished with pulleys *d d*, to which motion is imparted by belts from the band-wheels L L on the counter-shaft C.

S represents a stave, and in Fig. 3 the mandrel is adjusted to the desired angle to effect the bilge required.

The mandrel K, as shown in Fig. 3, may be adjusted at any desired angle by means of mechanism not necessary to describe in detail, as we make no claim to any particular construction of adjusting mechanism for such purpose.

As the staves are carried to the saws and cutters by the self-adjusting feed-reel, the saws and cutters, being rapidly rotated in a direction toward the advancing staves, operate to saw, chamfer, and croze the staves to the proper length, thickness, and angle at a single operation. The mandrels to which the cutters are connected, being arranged in an adjustable manner, enable the bilge-curve to be effected without bending the stave endwise.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a chamfering and crozing machine, the combination, with a feed-reel consisting of a vertically-adjustable axle having wheels or disks secured at its opposite ends, said wheels being provided with lugs or pins for carrying the staves to the point to be operated upon, of vertically adjustable or sliding boxes and cords and weights for automatically adjusting said feed-reel, substantially as set forth.

2. The combination, with suitable knives and saws, in a chamfering and crozing machine, of a feed-reel journaled in vertically-sliding boxes, said feed-reel having the peripheries of its end wheels or disks furnished with lugs or pins for carrying the staves to the point to be operated upon, substantially as set forth.

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Witnesses:

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