

H. M. ROUNDS.
Machine for Making Staves.

No. 202,964.

Patented April 30, 1878.

Fig. 1.

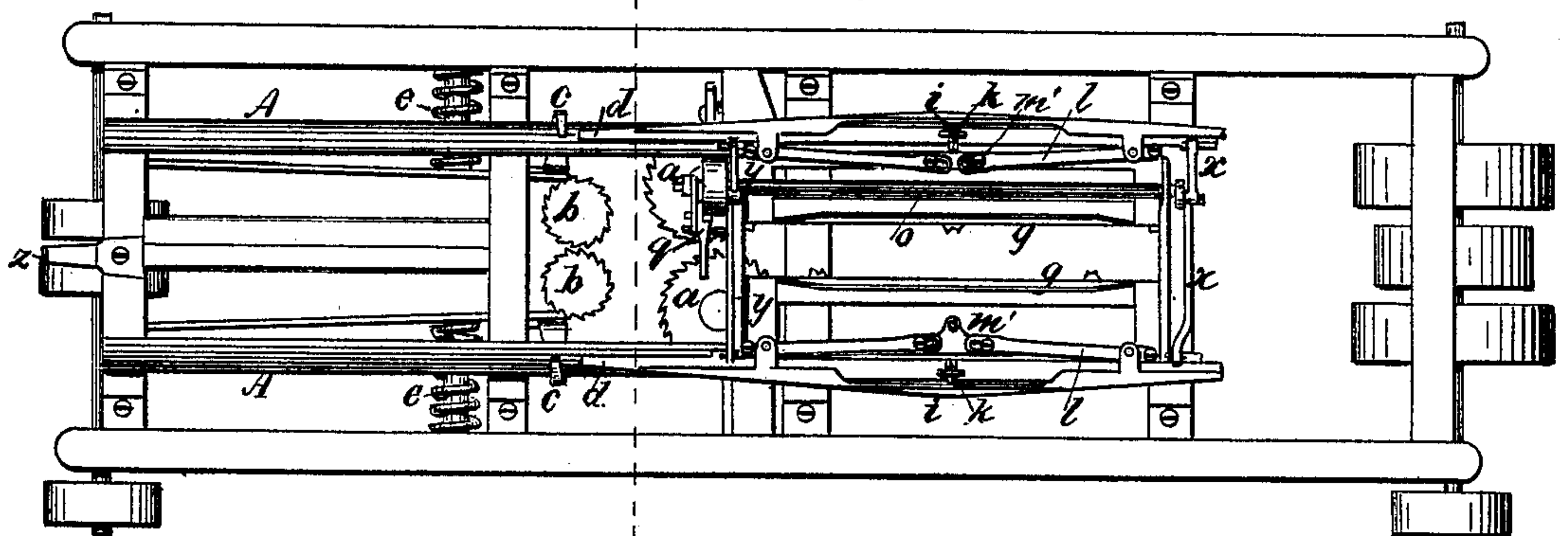


Fig. 2.

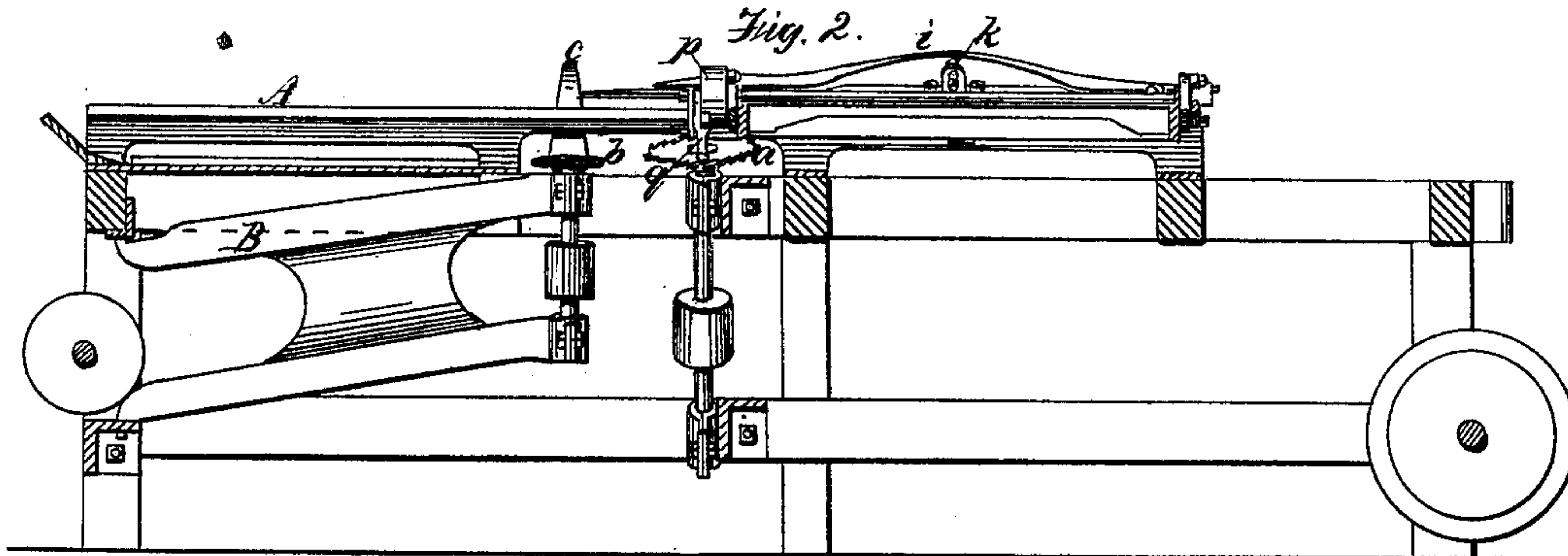


Fig. 3.

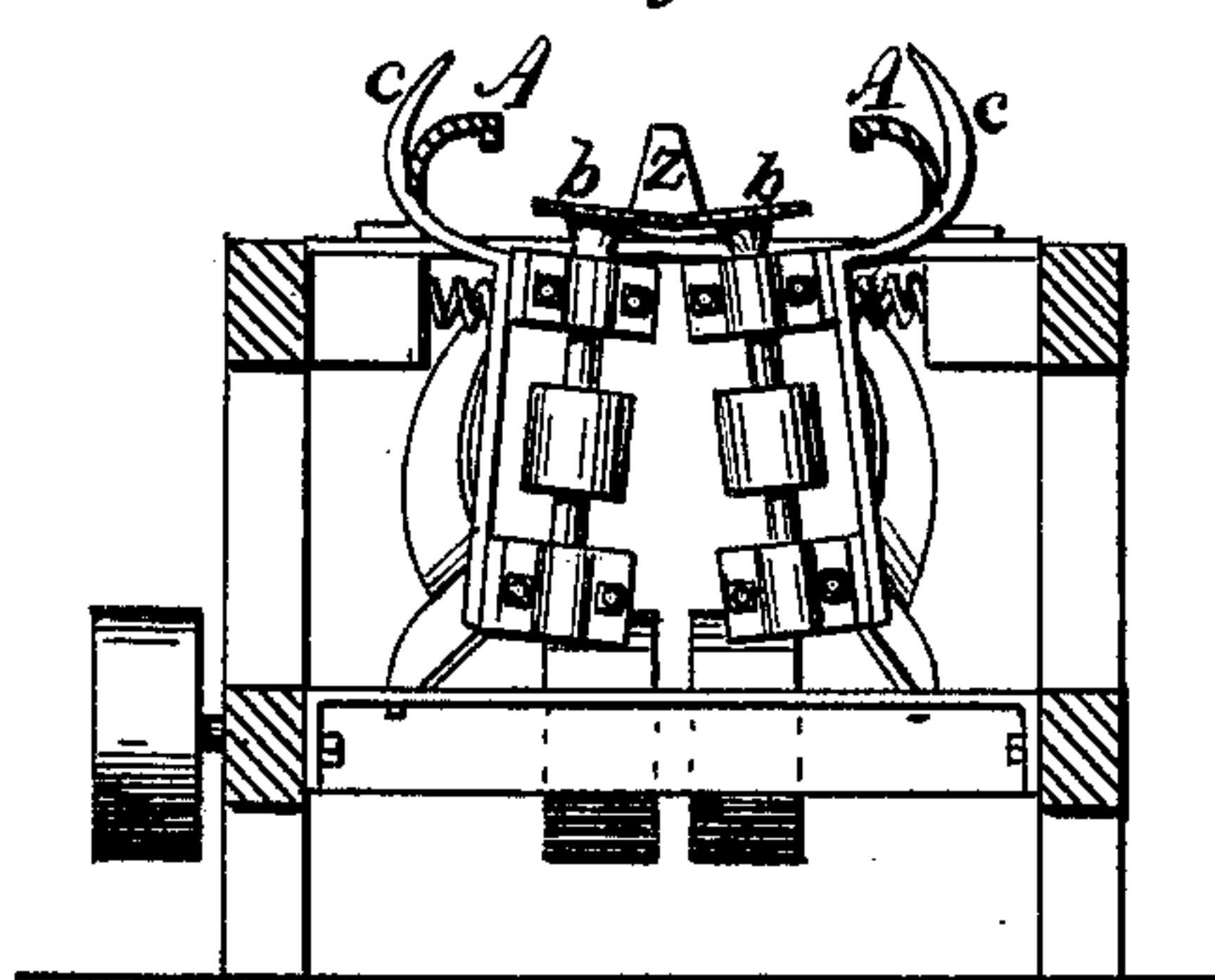
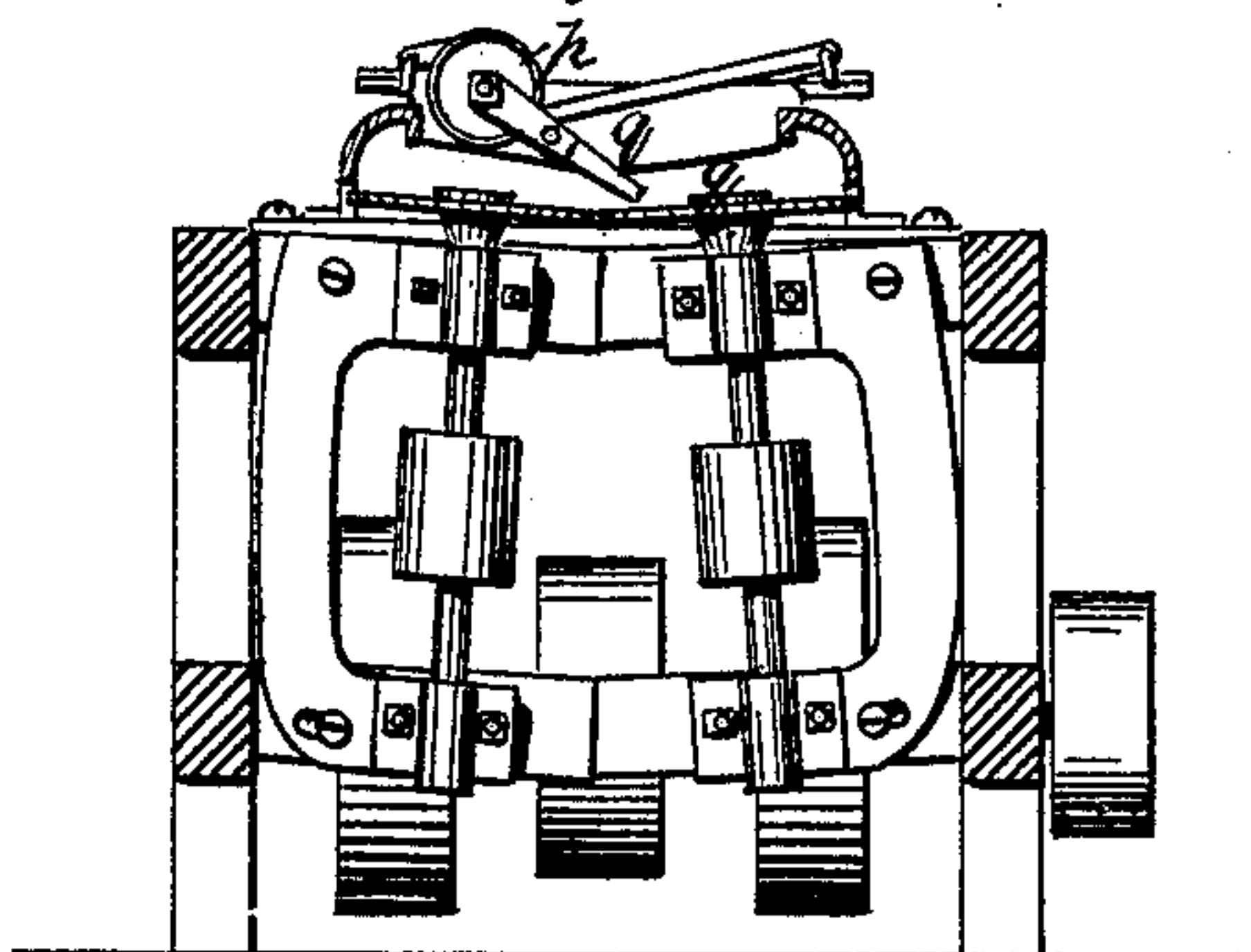


Fig. 4.



Witnesses;
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UNITED STATES PATENT OFFICE.

HARLEY M. ROUNDS, OF MANAWA, WISCONSIN.

IMPROVEMENT IN MACHINES FOR MAKING STAVES.

Specification forming part of Letters Patent No. **202,964**, dated April 30, 1878; application filed January 17, 1877.

To all whom it may concern:

Be it known that I, HARLEY M. ROUNDS, of Manawa, in the county of Waupaca and State of Wisconsin, have invented a new and useful Improvement in Stave-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of the specification.

My invention relates to machines for jointing and sawing staves; and consists in certain improved details of construction of the various parts, which I will now proceed to describe, and point out in the claims.

In the drawings, Figure 1 is a plan view, Fig. 2 a longitudinal section, and Figs. 3 and 4 transverse sections, of the machine, these views being hereinafter referred to and fully explained.

In the manufacture of barrel-staves the joint is usually formed by a second operation subsequent to that of severing the stave from the bolt. This process is defective in this respect, that when the cutter moves from the end toward the center and partially across the grain of the wood it is liable to tear or split the wood, and thus leave a rough and imperfect joint. To remedy this defect, I have devised a method of cutting the edges of the bolt with a narrow rabbet on that side from which the stave is to be next sawed, so as to form thereby the joints or edges of the stave before it is sawed from the bolt. In this way all tearing and splitting of the stave are avoided, being prevented by the contiguous wood of the bolt. In order effectually to perform this operation, I have devised the arrangement of saws and revolving cutters shown in the drawing. These saws and cutters are shown in plan view more clearly in Fig. 1.

The saws are represented at *a a*, and the revolving cutters that form the rabbet at *b b*. The carriage which holds the bolt moves with it on guideways *A A*, carrying the bolt in the operation of sawing from left to right. The bolt therefore first passes between the revolving cutters *b b*. These are made to yield laterally in a manner hereinafter explained, and as the bolt passes between them they cut rabbets laterally into the lower corners of the bolt, and

thus form the edges or joint of the stave before it passes to the saws *a a*, by which it is severed from the bolt.

These saws *a a* are of ordinary construction, are mounted upon arbors, so as to be slightly tipped toward each other, and are driven in the ordinary manner.

The cutting-heads *b b* have also similar inclination, and are mounted and driven in the same manner as the saws, except that the arbors are held in frames which are pivoted at some distance toward the end of the machine, and which swing laterally, so as to leave a space wider or narrower between the cutting-heads. By means of this hinging the revolving cutter-heads may be made to cut upon the line of any given curve as the bolt passes through between them, and, whatever the given curvature may be, the wide and narrow staves will have the same bevel or angle at the joint. In order that they may be automatically opened, I have added to the hinged frames bent arms *c c*, which rise up therefrom at a point near the cutting-heads, and bend slightly over on the outside of the guideways *A A*. These may be moved by guides *d d* on the carriage. These guides are of proper width and curve to give the requisite curve to the stave, and as the carriage passes from left to right they impinge against the arms *c c* and press them outwardly, and with them the cutting-heads, so that they cut the bolt in its passage on a line corresponding exactly with the curve of the guides aforesaid.

It should be observed that the arms *c c* are held firmly against the guides attached to the clamp-frames by springs or by weights, thereby not only holding the cutter-heads in proper position for jointing the edge of staves, but also holding the bolt firmly while the operation of jointing and sawing is being performed.

Inasmuch as the curve given to the edges of the stave depends upon the curvature of the guides that press outward the arms *c c*, and by them the cutting-heads, it is manifest that the staves, whether wide or narrow, will receive the same curvature, unless the guiding and equalizing bars be varied in the amount of their curvature. This object is very desira-

ble, since, when the wide and narrow staves all receive the same amount of curve, it is necessary, as is well known, to select the larger and smaller staves with great care in making up the barrels, in order to preserve uniformity of bilge.

I am aware that this object has been attained by machinery which operates automatically upon the edges of staves, giving them an amount of curve proportioned to their width; but this has been done only in machines adapted for the purpose of jointing alone, and in which the jointing was a separate and independent operation. I accomplish the same result in my sawing and jointing machine by mechanism which I now proceed to describe.

The bolt is held upon the carriage between two clamps, *g g*. These clamps are attached to frames that extend outside the carriage, and move outward and inward upon ways on the latter. To these frames are attached the guides, and as the clamps are opened or closed it brings them nearer together or farther apart, and thereby the cutter-heads in exact proportion to the width of the bolt at a point close to where the stave is formed; but, in order to vary the curve in proportion to the width of stave, some further provision is necessary. To accomplish this I have provided spring guide-bars *i i*, which may, as shown in Fig. 1, overlie the frame of the clamps, and which extend outside them, so as to impinge against the arms *c c*. These spring-bars rest at the center thereof against adjustable screws *k k*, which pass through studs on said frame. The ends of the spring-guides are held to levers *l l* by means of ears and suitable bolts, as shown at *m m*. The levers *l l* are pivoted at the outer ends to the frames of the clamps, and at the inner ends, by pins or bolts, to the carriage through slots, as shown at *m' m'*. The result of this construction is that when the frames are pushed outward the adjustable screws, bearing against the center of the spring-guides, push out the said centers, while the ends, being held inward by reason of their attachment to the levers *l l*, do not move out as fast as the center.

The amount of curvature given to the spring-guides will correspond exactly to the amount of outward movement of the clamps, and as the spring-guides in the passage of the bolt between the revolving cutters press outward the arms *c c*, and thereby the said cutters, it follows that the stave will have an amount of curve on its edge directly proportioned to its width. Staves thus jointed, as is well known, need not be selected when making up the barrel, but will give invariably the same amount of bilge, whether wide or narrow staves be used.

The amount of bilge may be regulated by adjustable screws *k k*, and by varying the leverage by means of shifting the position of bolts in slot at *m m'*.

In order to throw open the clamps for the removal or introduction or adjustment of the bolt, I have provided a shaft, *o*, mounted in bearings on the carriage. This shaft is connected to the clamps by means of equalizing-bars *x x y y*, said bars being connected to the shaft by arms or a disk, so that the revolution of the shaft one way shall throw the clamps outward, while the pressure on the guide-bars throws them inward, when the disk is released. On the forward end of the shaft is a wheel, *p*, provided with a horizontal rim or flange. The shaft projects through the wheel, and on the outer end a lever, *q*, is pivoted loosely. An offset of the lever bends underneath the flange and fits closely thereto, and on the outside of the flange a shoe, pivoted on the lever, slides in contact with the surfaces.

This construction permits the wheel to revolve, the flange sliding freely between the offset of the lever and the shoe when the lever is at rest; but any movement of the lever will cause the shoe to bind in the periphery of the flange and turn the wheel. This revolves the shaft and operates to open the clamps. On return of the carriage after the cut is completed, the lever *q* comes in contact with inclined plane *z*, causing the clutch to open the clamps and release the bolt, so that it falls upon the bed. This is so adjusted as to stop the bolt in position for the next cut while the carriage is reversing its motion from back to forward, and when the carriage has advanced so far as to release the lever on the inclined plane it rests upon its support, the disk is released, and the clamps come together by means of the springs or weights until they engage the bolt again close to the work, whether it be at a greater or less distance, according to the width of the bolt. The bolt is therefore released with a slight movement of the clamps, without regard to their position, not involving a full opening for a narrow stave, which would require an extra movement of carriage and long inclined plane.

I claim as my invention—

1. In a machine for sawing and jointing staves, the jointing-cutters *b b*, mounted in separate laterally-swinging frames *B B*, the arms *c c*, also mounted upon said frames, and the springs *e e*, by which said cutters are held to their work, in combination with the curved adjustable guides of the carriage, for the purpose of jointing staves of different widths at the same bevel or angle, substantially as described.

2. In combination with the arms *c c* of the frames carrying the jointing-cutters, the adjustable guides *i i* on the carriage, by which the cutters are made to curve the edges of the stave proportioned to its width, substantially as described.

3. The combination of the clamps and spring-guides connected thereto, whereby the guides are bent in proportion to the spread of the clamps, as set forth.

4. The combination of the clamps, made to move in and out in guideways, the levers, pivoted to the carriage at the inner end and to the clamp-frame at the outer, and attached to the spring-bars, as set forth.

5. The longitudinal shaft, the equalizing-bars connecting the said shaft to the clamps on both sides, and the wheel and clamping-lever, all constructed and operating together as set forth.

6. The combination of the jointing-cutters *b b*, the separate laterally-swinging frames B B, having the arms *c c*, and springs *e e*, with the two saws *a a*, the bolt-carriage, and the adjustable guides *d d*, substantially as described, and for the purposes specified.

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Witnesses:

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