O. BRIDGEMAN.

PLANING MACHINE.

No. 60,332. Patented Dec. 11, 1866.

Fig. 2

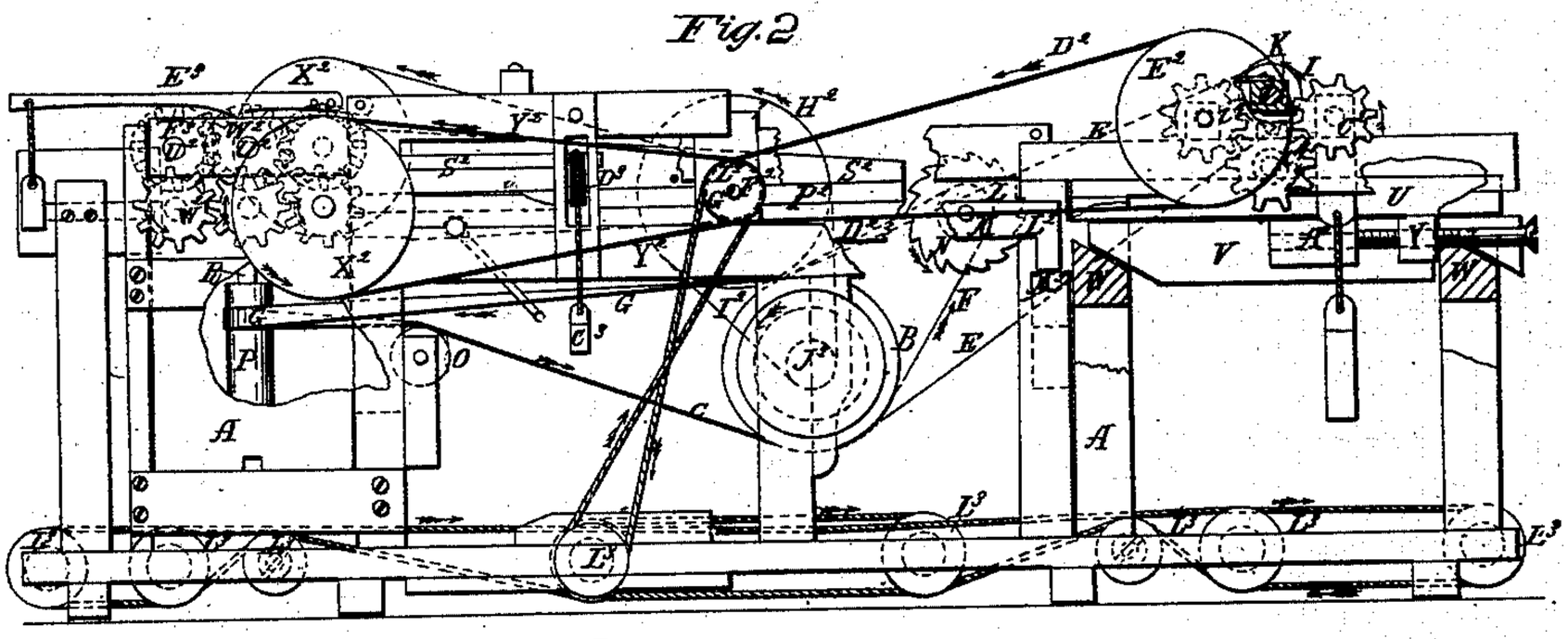


Fig. 1

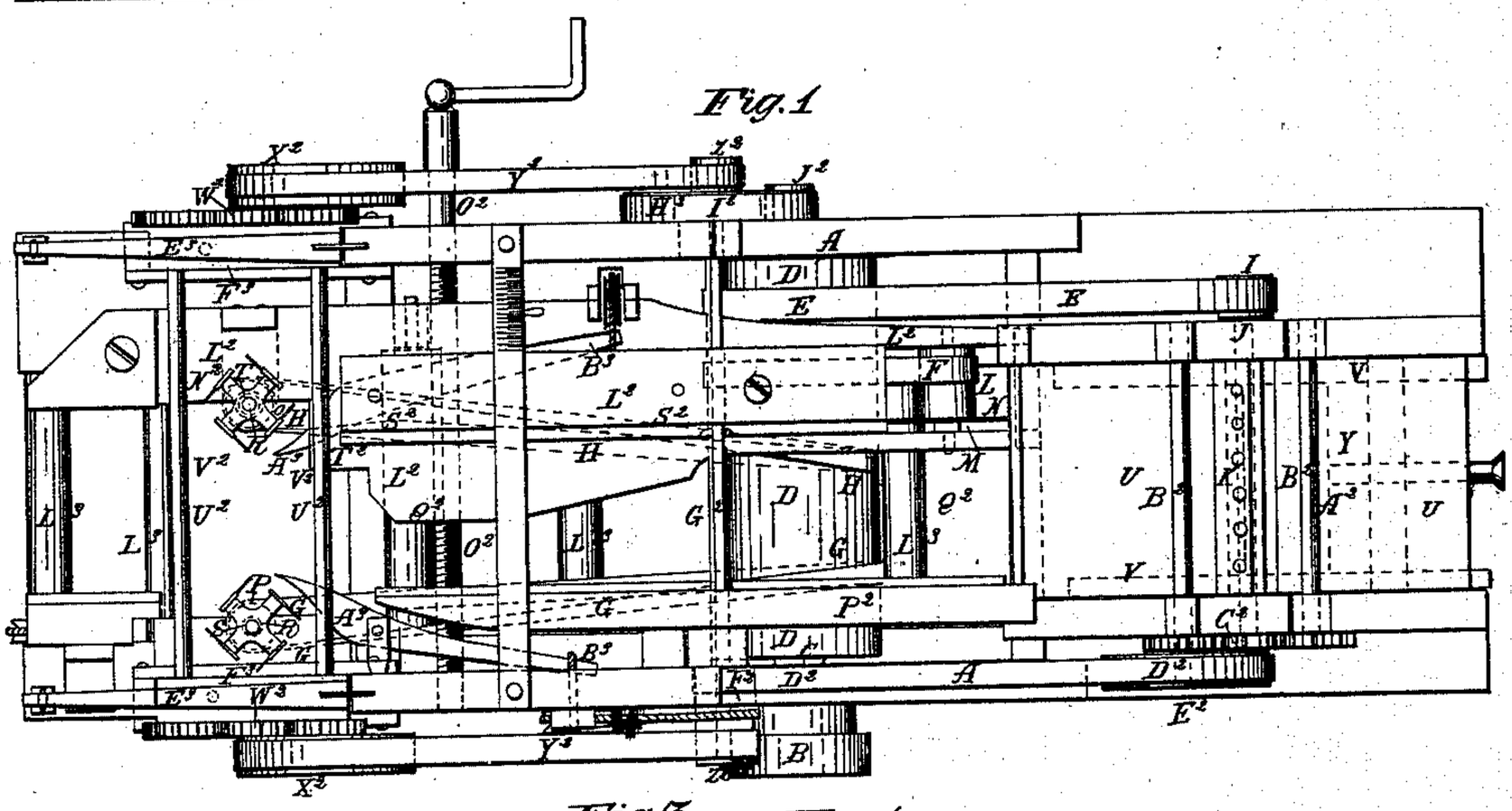


Fig. 3

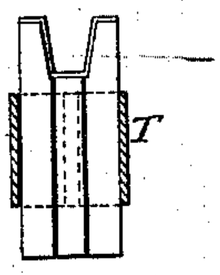
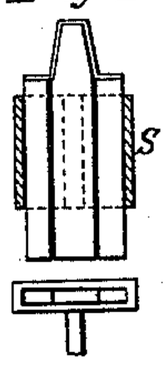


Fig. 4



Witnesses:

J. W. Harrington

Wm. Gretton

Inventor:

Otis Bridgeman

Per Munn & Co.

Attorneys

United States Patent Office.

IMPROVEMENT IN PLANING-MACHINES.

OTIS BRIDGEMAN, OF ADDISON, NEW YORK.

Letters Patent No. 60,332, *dated December* 11, 1866.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, OTIS BRIDGEMAN, of Addison, Steuben county, State of New York, have invented a new and improved Combined Lumber, Planing, Sawing, Tonguing, and Grooving Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification.

The present invention consists in combining in one and the same machine a revolving cutter-head for planing, a circular saw for sawing, and suitable revolving cutter-heads for tonguing and grooving, in such manner and in such position with regard to each other, that, by properly feeding the lumber into the machine at one end it will be in turn subjected to the action of the respective parts of the same, one after another, in the order above mentioned, so that when it passes out of the machine at the opposite end, the board will have been planed, sawed, tongued upon one edge and grooved upon the other, and thus ready for use.

In accompanying plate of drawings, my improved machine embraced in the present invention is illustrated.

Figure 1 being a plan or top view of the machine.

Figure 2, an elevation of one side of the same, with portions of its supporting framework broken out, to more fully show the operating parts; and

Figures 3 and 4, detail views.

Similar letters of reference indicate like parts.

A, in the drawings, represents the supporting framework of the machine, which may be of any suitable construction to accommodate and receive the various operating parts of the same. B, the driving-pulley of the machine, secured upon the outer end of a transverse horizontal shaft, *c*, turning in bearings of the framework, A, on which shaft, between the two parallel sides of the framework, A, is secured a drum, D. Around this drum, D, pass four endless driving-bands or belts, E F G and H, one, E, to and around the pulley, I, of horizontal transverse shaft, J, carrying revolving cutter-head, K, for planing; another, F, to and around the pulley L, of the arbor, M, of circular saw blade, N; the remaining two, G and H, over the upper side of the common horizontal transverse friction-roller, O, hung in bearings of the framework, and from thence respectively around the drums, P and Q, of vertical shafts or spindles, R, carrying upon their upper ends revolving cutter-heads, S and T, respectively adapted for tonguing or tenoning, and grooving boards. The revolving cutter-head, K, for planing the board, extends across the machine, turning in suitable bearings of its framework at each end. U, the feed table or platform, placed below and under the revolving cutter-head, K, and resting by its parallel wedge-shaped strips, V, extending in the direction of its length upon the bevelled or angular edge cross-bars, W, of the framework, A. Y, a lug upon under side of feed table, through which screws a set-screw, Z, coming to a bearing against the fixed cross-bar, A^x, of the machine, so that, if the said set-screw be screwed into or out of the said lug, Y, the table will be made to raise or lower upon its rests, W, and thus brought nearer to or farther from the plane of the revolution of the cutter-head, K. Above the feed table and across its width upon both sides of the cutter-head, K, are hung pressure and feed-rollers, B^2, in suitable adjustable bearings of the framework, A, which rollers at one end are geared together through a train of gear-wheels, C^2, so as to revolve at equal velocities, receiving their motion through an endless belt or band, D^2, passing around the pulley, E^2, of one of the said feed-rollers, B^2, and the pulley, F^2, on one end of a transverse horizontal shaft, G^2 with a pulley, H^2, on the other end, connected by an endless belt or band, I^2, with the pulley, J^2, upon the corresponding end of the driving-shaft, C. The arbor of the circular saw blade, N, is hung in suitable bearings of one end of a horizontal board or frame, L^2, resting at such end upon the cross-bar, M^2 of framework A. This frame, L^2, extends in the direction of the length of the machine, between its two upright side frames, and at its other end, N^2, carries the bearings for the revolving vertical drum, Q, having cutter-head, T, for grooving. Through the framework L^2, and the framework A, across the two screws, a shaft, O^2, having a square head at one end to receive a wrench or other suitable implement for turning it, the object of which arrangement will be presently explained. To the inner side of one of the side frames of the machine, a strip, P^2, is secured, which forms one side of a guide-way for the board or stuff being passed through the machine; the other side of which is produced by the raised parallel flange or strip, S^2, of the horizontal frame, L^2, herein before referred to, as carrying the

circular saw and cutter-head for tonguing. This flange extends in a parallel direction or line with the fixed side, and in a plane corresponding to the face of the saw blade, and is adjusted with regard to the fixed sides, so as to form a narrower or wider guide-way for the lumber, according to the width which it is desired to saw it, by screwing the screw-shaft, O^2, in the proper direction therefore, to either move it toward or away from the fixed side of the guide-way. The raised flange, S^2, of the adjustable frame gradually rises in height from the circular saw, N, to a point, T^2, near to the rotary cutter-head, for tonguing, where it terminates. Back of the said flange, S^2, the upper surface of the frame to which it is secured gradually rises, from its level at the circular saw, to the point at which the said flange, S^2, terminates, where it should be equal in height to, if not a little greater than, the upper feed rollers, U^2, of the two sets of transverse feed-rollers, V^2, (one set in front of the cutter-heads, S and T, and the other in the rear of the same,) between which the board passes to be acted upon by the cutter-heads above referred to. These feed-rollers, V^2, are geared together at each end by trains of similar gearing, W^2, (the train upon one side connecting the upper rollers of the two sets together, and that upon the side the lower rollers of the same,) which trains of gearing are connected through pulleys, X^2, one upon each side of the framework, A, and endless belts or bands, Y^2, passing around the same to the pulleys, Z^2, upon the outer ends of the transverse shaft, G^2, hereinbefore referred to. Upon each side of the guide-way, Q^2, for the lumber, projecting therefrom, just in front of the rotary tonguing and grooving, cutter-heads, S and T, are hung pressure-levers or arms, A^3, that to their inner ends, B^3, have weights, C^3, suspended, passing over friction-rollers, D^3, of the framework, A, in suitable position to cause the weights to act upon the said levers, A^3, in the proper direction, to bring and hold them up and against the edges of the board passing through the guide-way of the machine, the object of which will be presently explained. The upper feed-rollers, U^2, of the double set of feed-rollers, V^2, at the end of the machine having the cutter-heads, S T, are held down with an elastic and yielding pressure by means of weighted-levers, E^3, arranged to bear upon the bearing or journal-boxes, F^3, of such rollers.

Having thus described the general construction and arrangement of the various parts composing my improved machine, embraced in the present invention, I will now explain the manner in which the same operates and is used.

The board or plank or timber which it is desired to run through the machine for being planed, sawed, tongued, and grooved, is placed by one end upon the feed table, at the end of the machine carrying the revolving cutter-head, for planing, (first, however, having properly adjusted such feed table, and also the guide-way, Q^2 according to the width which it is desired the board should have,) when, by the action of the feed and pressure-rollers upon such end of the machine, the board is drawn through and under the said cutter-head, and being planed thereby, passes to the circular saw, by which it is sawed to the proper width; the board thus sawed, passing along the guide-way to the rotary cutter-heads, S and T, which acting upon the edges, the one upon one edge, and the other upon the other edge, respectively, tongues and grooves the same, as is obvious without any further explanation; the pressure-levers, A^3, by bearing against the edges of the board, just in front of the point at which the rotary cutter-heads act upon them, preventing their splitting or breaking away and securing a smooth and even tongue and groove. The strip of the board which by the action of the circular saw is cut from the main portion passing to the tonguing and grooving cutter-heads, moves along with the main portion of the boards, but upon the rear side of the raised flange, S^2, of the guide-way, and over the gradual rising portion of the guide-frame to the upper feed-rollers, U^2, over which it passes and falls from the machine, and is then reconveyed back to its front or feeding end by laying it upon the series of feed-rollers, L, hung in the lower portion of the framework, and suitably connected together by endless belts or bands, and to the driving-shaft of the machine, or in any other proper manner, to impart the desired and necessary motion thereto.

I claim as new, and desire to secure by Letters Patent—

1. The arrangement of the cutter-head K, adjustable rollers A^3, saw N, feed table U, cutter-head S and T, frame L^2, and its flange S^2, strip P^2, screw-shaft, O^2, arms A^3, and feed-rollers V^2, substantially as described for the purpose specified.

2. The arrangement of the frame L^2, carrying the circular saw blade N, and revolving cutter-head, suitable either for tonguing or grooving, substantially as described and for the purpose specified.

OTIS BRIDGEMAN.

Witnesses;
EDWIN H. LEWIS,
JAS. CURTIS.