(No Model.) 3 Sheets—Sheet 1.

S. C. GARDNER.

MACHINE FOR TRUING WEAVERS' SHUTTLES, PICKER STICKS, &c.

No. 296,552. Patented Apr. 8, 1884.

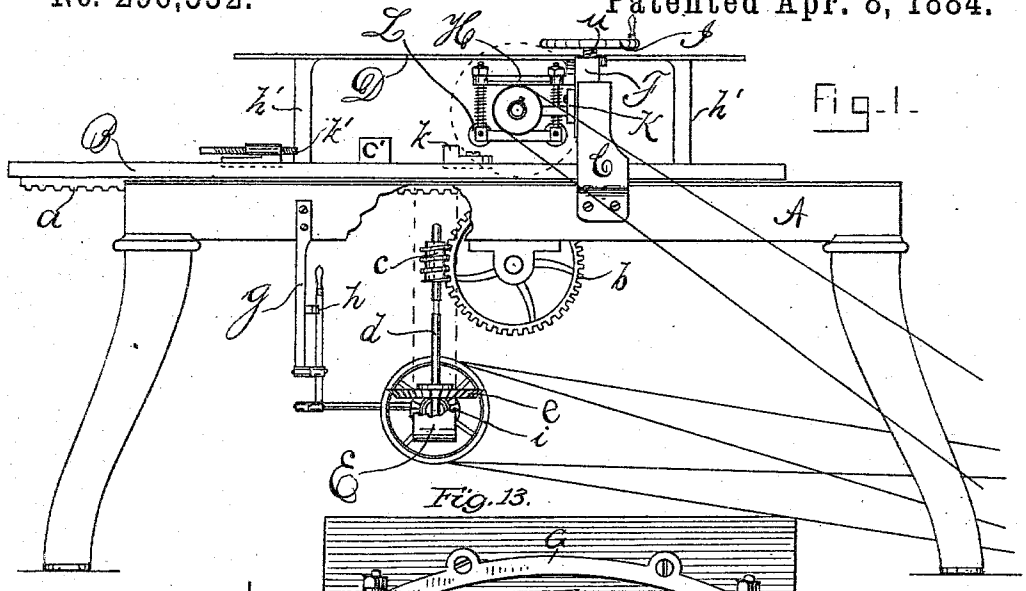


Fig. 1.

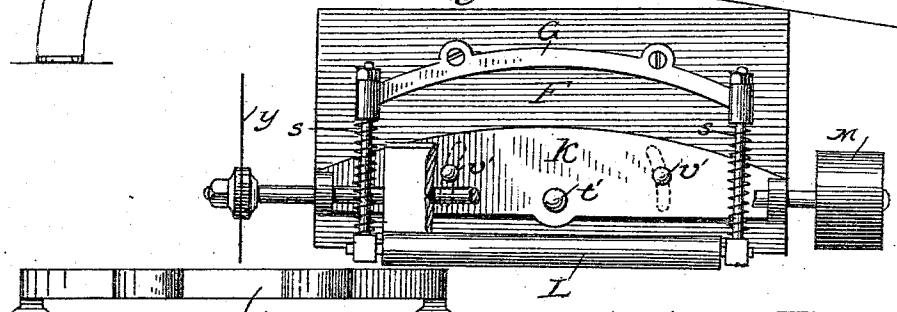


Fig. 13.

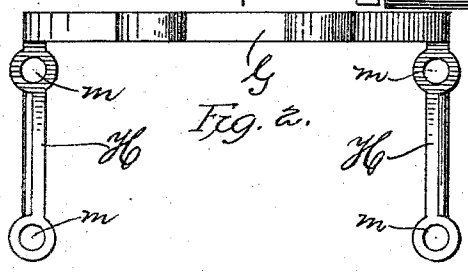


Fig. 2.

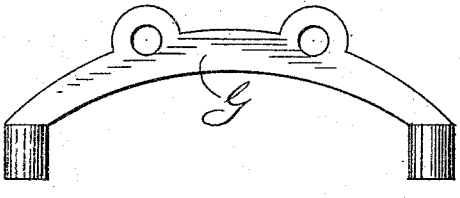


Fig. 3.

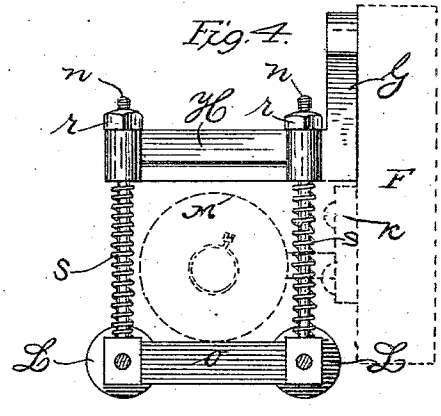


Fig. 4.

WITNESSES

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Fig. 5.

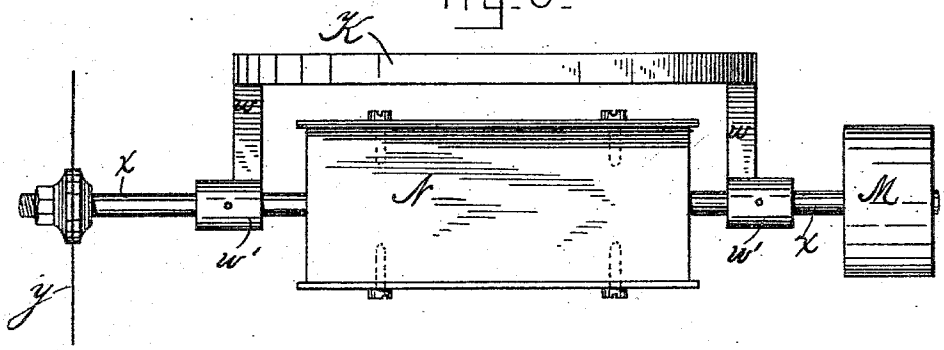


Fig. 6.

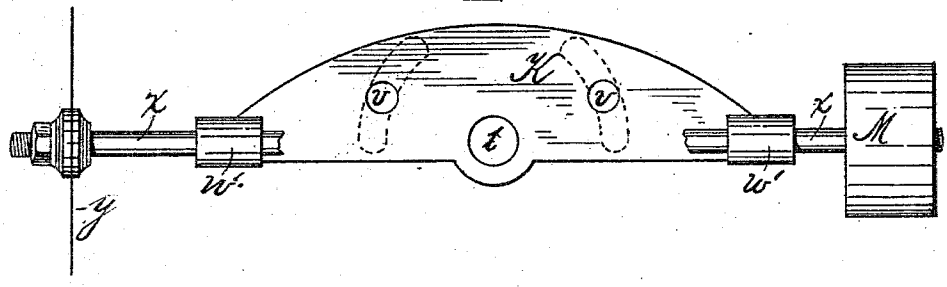


Fig. 7.

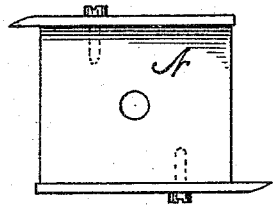
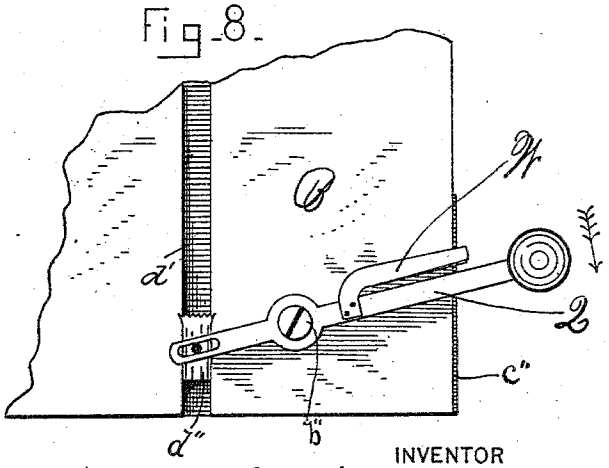


Fig. 8.



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MACHINE FOR TRUING WEAVERS' SHUTTLES, PICKER STICKS, &c.

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Fig. 9.

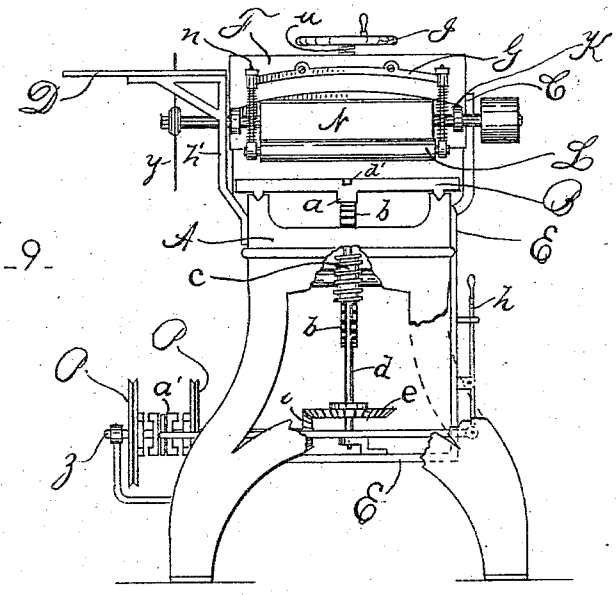


Fig. 12.

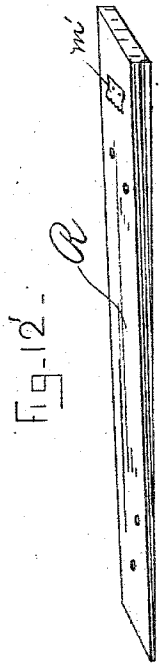


Fig. 10.

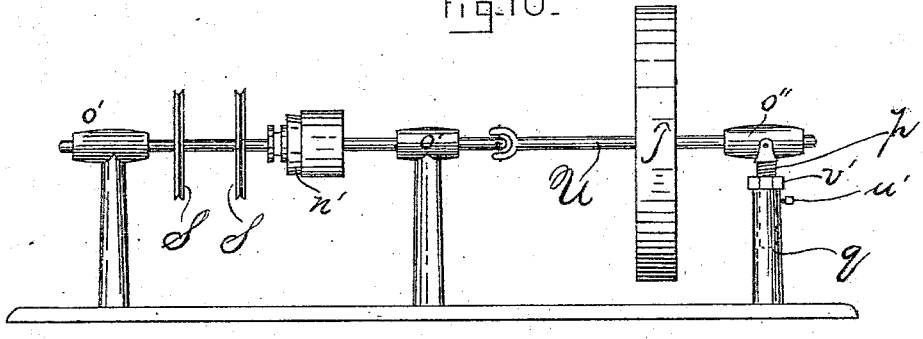
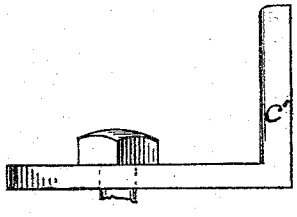
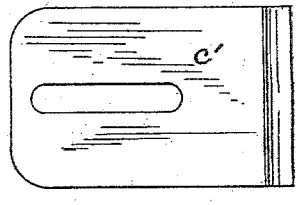


Fig. 11





WITNESSES

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UNITED STATES PATENT OFFICE.

STEPHEN C. GARDNER, OF EAGLEVILLE, CONNECTICUT.

MACHINE FOR TRUING WEAVERS' SHUTTLES, PICKER-STICKS, &c.

SPECIFICATION forming part of Letters Patent No. 296,552, dated April 8, 1884.

Application filed September 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN C. GARDNER, of Eagleville, Tolland county, Connecticut, have invented certain new and useful Improvements in Machines for Truing Weavers' Shuttles, Picker-Sticks, and Similar Articles of Wood, which improvements are fully set forth and described in the following specification, reference being had to the accompanying drawings.

My improvements relate particularly to a machine in which old and badly-worn shuttles may be squared up and made as good as new, my immediate object being to perform the work in a quicker, cheaper, and more satisfactory manner than can possibly be done by hand.

My invention consists in the improved devices and combination of devices hereinafter fully described and particularly claimed.

In the weaving of cotton and woolen fabrics the wearing of the shuttle as it travels back and forth across the loom has been heretofore a source of great annoyance and expense. To obtain the best results in weaving, the bottom and sides of the shuttle should be kept straight and square, so that, as it shoots across, it travels in a direct line, losing none of its momentum by contact with the sides of the shuttle-box. When its sides become worn, instead of shooting straight across, there is a tendency to vibrate or wabble, striking first on one side, then on the other, the friction thus generated causing the shuttle to slacken its pace. It then becomes necessary to remove the shuttle and have it trued or squared up. Heretofore this has been done by the mill-carpenter by the use of planes or other hand-tools; but owing to the hardness of the wood and the fact that there is no point to work from in squaring up, the work has of necessity been poorly done, and in most cases more stock has been removed than was really necessary. In the manufacture of cotton goods it is customary to have a second shuttle filled and ready to slip into place when the one in use runs out, so that no time may be lost by the loom remaining idle. In the weaving of woolen goods four or six shuttles are frequently used in the same loom, and to obtain anything like a satisfactory result the several shuttles which are to be used in a single loom should be trued up alike and be of approximately the same weight and size. In my new machine I hold the shuttle-tips in suitable female centers, thus finding a working-point, and bringing all the shuttles of a series to exactly the same shape and size and in the shortest possible time.

In the accompanying drawings, Figure 1 is a side elevation of my new machine, a portion of the bed being cut away to show more clearly the relative arrangement of the mechanism which carries the bed-plate B. Fig. 2 is a detached top view (somewhat enlarged) of the metal frame which supports my yielding friction-rolls, which are provided to hold picker-sticks and similar articles firmly on the bed-plate B. Fig. 3 is a front view of the same. Fig. 4 is a side view of the same, and also shows said yielding rolls, together with the other parts necessary to operate them, as more fully explained hereinafter. Fig. 5 is an enlarged top view of the frame which supports in proper bearings, the arbor carrying the cutter-head and its driving-pulley, Fig. 6 being a front view of the same with the cutter-head removed. Fig. 7 is a detached end view of said cutter-head. Fig. 8 is a top view of a portion of the bed B, showing my device for holding work to be formed on said bed. Fig. 9 is a view of my new machine from the left-hand end, as shown in Fig. 1. Fig. 10 is an elevation of my counter-shaft. Fig. 11 shows the gage or guide (elevation and top) which I use in squaring up shuttles. Fig. 12 is a perspective view of a detachable beveled plate which I provide to hold picker-sticks in proper position. Fig. 13 is a detail view, showing the manner of attaching the pressure-roller and cutter-frames to the same vertically-adjustable carriage.

In the several drawings like letters indicate like parts.

A represents the bed of my machine, supported by suitable legs, and having ways on which the bed-plate B travels back and forth when in operation. On the under side of B, and attached rigidly to it, is a toothed rack, *a*, which engages gear *b*, said gear *b* being hung in proper bearing underneath the bed A.

Attached to each side of the bed A are up-

rights C, forming guides or ways to support the carriage F, which is raised or lowered by the screw *u* and hand-wheel I, carrying with it my cutter-head, arbor, and yielding roll-frame. The general arrangement and action of the guides C, carriage F, screw *u*, and hand-wheel I is identical with the device used in planers for feeding the tool-stock up and down.

Secured rigidly to the carriage F is a metallic frame, G, having forward extensions H, with vertical holes *m*, to receive and support my yielding roll-frame *o*. Said frame *o*, as shown enlarged in Fig. 4, has threaded studs *n*, on which is placed spiral springs *s*, the studs being then passed upward through holes *m*, and held in place by nuts *r*. The rolls L are pivoted loosely in frame *o*. The degree of pressure exerted by said rolls is adjusted and regulated by tightening or loosening the nuts *r*, thus increasing or diminishing the expansive force of said springs.

Secured to the carriage F immediately below the frame G is a second frame, K, (shown enlarged in Figs. 5 and 6,) having a central or pivot bolt-hole, *t*, to receive a bolt, *t'*, on which it may be swung out of its normal horizontal position, and one or more other bolt-holes, *v*, which receive bolts *v'*, passing through slots, (shown in dotted lines, Fig. 13,) by means of which the frame K may be secured rigidly to the carriage F, after being properly adjusted to the required angle. Said frame K has arms *w*, (extending forward outside of arms H on frame G,) having proper boxes or bearings, *w'*, in which the arbor *x* rotates. Thus it will be seen from Fig. 13 that the carriage F carries with it as it is raised or lowered the rigid frame G, the adjustable arbor-frame K, and my yielding roller mechanism. The arbor *x* passes midway between the studs *n*, and carries the cutter-head N, which is made preferably as shown in Figs. 5 and 7.

Underneath the bed of my machine is a vertical shaft, *d*, having near its upper end a worm, *c*, to engage gear *b*, and near its lower end a beveled gear, *e*, to engage beveled gear *i* on horizontal shaft *z*, said shaft *z* being supported in a suitable frame suspended from the bed of the machine, and having pulleys P P operated by a clutch, as at *a'* in Fig. 9.

For convenience, a suitable shipper-rod passes across to the front of the machine, and is actuated by the lever-handle *h*, which, as it is moved forward or backward, causes said clutch to engage the pulleys P P.

Secured to the back side of bed A are brackets *h'*, supporting a saw-table, D, the saw *y* being carried by the same arbor which carries the cutter-head N. By thus causing the arbor *x* to carry the circular saw on its outer end I am able to provide a cheap and convenient device for light sawing.

The traveling bed-plate B is constructed with a lengthwise groove, as at *d'*, Fig. 9, the cup-centers *k* and *k'* being held in longitudinal alignment in said groove. *c* represents a guide or gage, which is secured to the bed-plate B by a suitable screw or bolt, said gage having a slot by means of which it may be adjusted on said bed-plate, and a right angular upward extension, against which the shuttle rests while being squared up.

In the act of truing up shuttles my machine is operated as follows: The shuttle is placed in the centers *k k'*, the latter being then screwed up firmly. The gage *c'* is now brought up against one side of the shuttle and fastened rigidly to the bed-plate, thus holding said shuttle firmly in position. The cutter-head N, which revolves at a high rate of speed, is lowered until, as the shuttle is moved across under it, a slight cut is made to even and to square the top side. Now, by loosening the gage *c'*, the shuttle is revolved a quarter or half turn, as desired, and the operation is repeated until all sides of the shuttle are trued. After having finished a shuttle, it is removed and another introduced without changing the adjustment of the cutter-head, so that all the shuttles of a series are brought to exactly the same size and shape.

In the manufacture of picker-sticks or other taper-work I use a tapered or wedge-shaped removable plate, R, as shown in Fig. 12, having holes for the screws, with which it is fastened to bed-plate B, and having at one end a bench-hook, *m'*, against which rests one end of the blank from which the picker stick is to be formed. Having screwed the tapered plate R to bed-plate B, I place one or more picker-stick blanks on R and adjust the cutter-head to secure the proper cut. I now unscrew the nuts *r*, and as the springs *s* expand the rolls L are carried downward until they rest on said blanks, holding them firmly on the plate R while being shaped. As the work is fed across, the cutter-head forms the picker-sticks with the same taper as the plate R, the springs *s* forcing the rolls downward and adjusting said rolls automatically to any inequalities in or unevenness of said blanks.

Several picker-sticks may be tapered at a single operation, the number being limited only by the width of plate R and cutter-head.

The frame K, which supports the cutter-head arbor is hung centrally on a pivot-bolt, as before stated, and may be swung out of its normal horizontal position for the purpose of truing up or forming work whose top and sides form acute or obtuse angles, instead of being square with each other. In such a case, if the counter-shaft remained in its horizontal position, it is evident that the belt which drives the cutter-head pulley M would refuse to follow said pulley. I have therefore constructed my counter-shaft substantially as shown in Fig. 10, that part of the shaft carrying the driving-pulley T being arranged to swing out of line to correspond with the cutter-head arbor *x*.

The pulleys S S, carrying straight and crossed belts to connect with pulleys P P, are located, together with the friction-clutch *n'*, on that part of my counter-shaft which is supported

by the fixed bearings o', said shaft being connected with the extension which carries the driving-pulley T by a knuckle or other suitable joint. The outer end of the adjustable shaft runs in the bearing o'', which bearing is supported by the threaded bolt p, said bolt extending downward into the standard q and carrying nut v'.

By adjusting the nut v' the outer end of shaft U is raised or depressed to correspond with the cutter-head arbor. If thought necessary, a set-screw, w', may there be used to hold the counter-shaft and bolt p rigidly in standard q.

In planing straight work, where the tapered plate R is not required, it is sometimes necessary to provide a means for holding such work at both ends. One end I hold by a fixed bench-hook attached to the bed-plate B, and find a convenient and efficient arrangement for holding the other end in the device shown in Fig. 8, which represents said device properly attached to a portion of bed-plate B. Attached to the side of the bed-plate is a thin plate, c'', having on its upper edge saw-teeth. Sliding in groove d' is a bench-hook, d'', having a stud to engage a slot in lever-handle Q. Said lever-handle is attached to bed-plate B by a screw, as at b'', and is also provided with a spring, W, which, riding on the serrated edge of c'', acts as a pawl to hold the lever-handle in any desired position. When the lever-handle is forced in the direction indicated by the arrow, the bench-hook d'' is carried in the opposite direction in groove d', entering the end of the wood to be formed and holding it firmly in position.

Having thus described my invention, I claim as new and wish to secure by Letters Patent—

1. In the described machine, the combination, with the bed-plate and suitable holding devices for the article to be operated upon, of the carriage F, vertically adjustable, suitable cutting devices secured to said carriage so as to be capable of adjustment in a circular direction, and the roller-frame o, constructed substantially as described, and secured to said carriage by means of the bracket G, all the parts operating in the described relation to each other, for the purpose set forth.

2. In combination with the bracket of the cutter-head, capable of angular adjustment, as described, the driving mechanism therefor, consisting of the counter-shaft U and pulley T, constructed and arranged substantially as described, whereby the same inclination may be given to the pulley T as that of the cutter-head, for the purpose described.

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Witnesses:

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C. D. LESTER.