No. 708,177. Patented Sept. 2, 1902.

W. S. SHERMAN.

BORING MACHINE.

(Application filed Jan. 6, 1902.)

(No Model.)

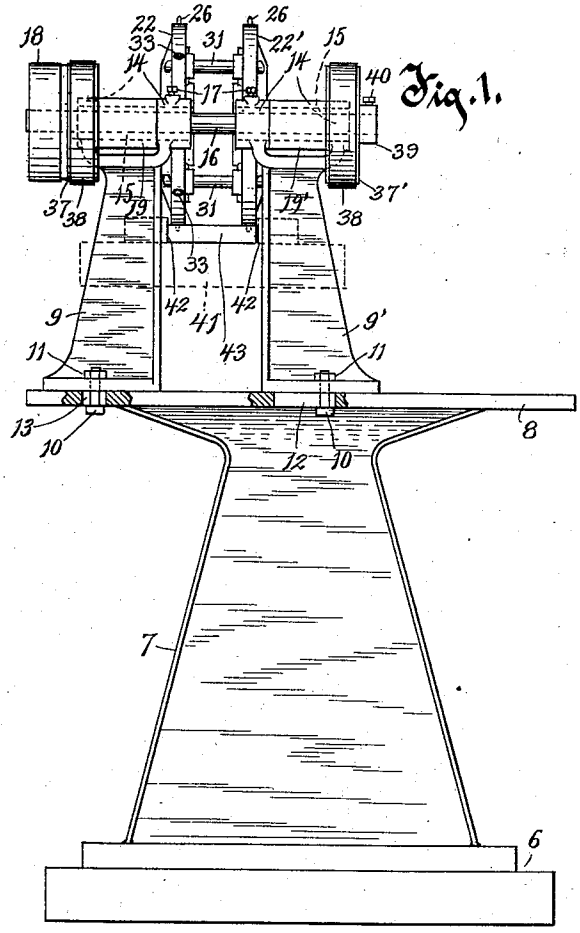


Fig. 1.

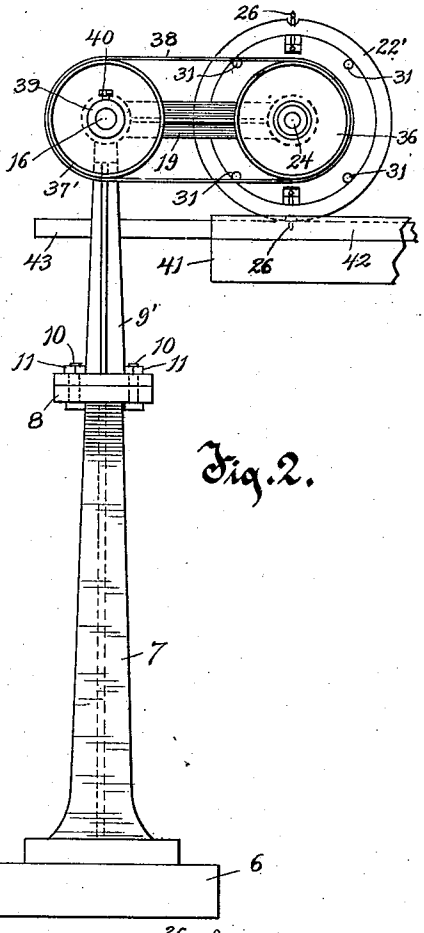


Fig. 2.

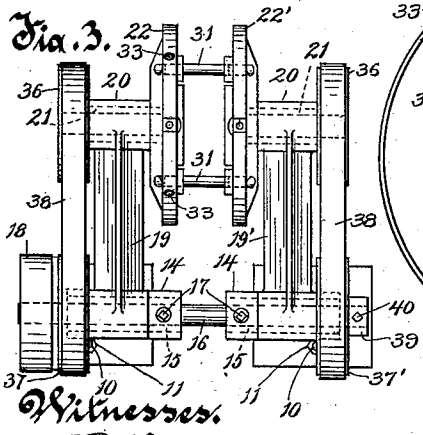


Fig. 3.

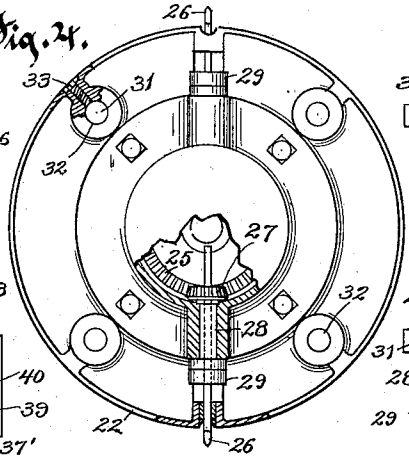


Fig. 4.

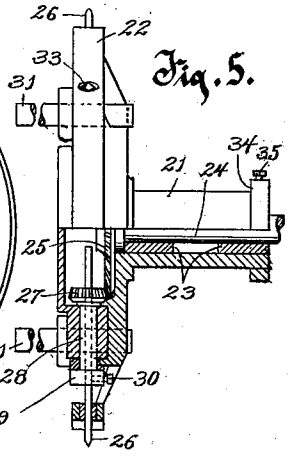


Fig. 5.

Witnesses.

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BORING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 708,177, dated September 2, 1902.

Application filed January 6, 1902. Serial No. 88,563. (No model.)

To all whom it may concern:

Be it known that I, WILLIS S. SHERMAN, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Boring-Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in boring-machines of the class designed more especially for boring nail-holes in jointed flooring-strips at certain distances apart for the convenient insertion of nails or other fastening devices in laying the flooring-boards.

The primary object of the invention is to provide an inexpensive construction which shall be capable of effecting the work intended in a simple manner.

A further object is the provision of a construction whereby by a simple adjustment the machine is made adaptable for boring holes at different distances apart transversely of the strip to be bored.

A further object is the provision of an improved construction whereby the machine is made to accommodate itself to different thicknesses of strips to be bored and also to irregularities in the strips.

A still further object resides in the provision of an improved construction whereby the machine is adapted for drilling opposite holes or holes set in zigzag relation to each other throughout the length of the strip.

With the above and other incidental objects in view the invention consists of the devices and parts or their equivalents, as hereinafter set forth.

In the accompanying drawings, Figure 1 is a back or rear view of the machine. Fig. 2 is a side elevation. Fig. 3 is a plan view. Fig. 4 is a detail view of one of the drill-heads, parts being broken away; and Fig. 5 is an elevation of Fig. 4, parts in section and parts broken away.

Any suitable framework for supporting the operative parts of the machine may be provided. In the drawings I show a base-piece 6, from which rises upwardly an upright 7, formed or provided at its upper end with a bed-plate 8. From this bed-plate extend upwardly two standards 9 and 9′, secured to the bed-plate, preferably by means of bolts 10 10, which extend upwardly through the bed-plate and through flanges at the lower ends of the standards, the upper ends of said bolts being threaded to receive nuts 11 11. The bolts which secure the standard 9′ pass through elongated slots 12 in the bed-plate in order to provide for the adjustment of the standard 9′ closer to or farther away from the standard 9, the adjustment being secured merely by loosening the nuts 11 of said bolts 10. The other bolts 10, which secure standard 9, may also pass through slots 13 in the bed-plate. These slots, however, are considerably less elongated than slots 12 and are only employed in order to properly adjust the standard 9 when the parts of the machine are first fitted together or in order to secure a slight adjustment of the standard 9 at any time in order to bring the drilling-tool the proper distance from the longitudinal edge of the flooring-strip. The upper end of each of the standards 9 9′ is bifurcated, the extremities of the furcate arms being in the form of tubular boxes 14 14, in which are fitted sleeves 15 15. These sleeves form bearings for a transverse shaft 16 and are held against rotation by means of set-screws 17 17, passing through two of the boxes 14 and impinging against the sleeves. On one end of shaft 16 is mounted a pulley 18, around which a belt (not shown) leading from any suitable source of power is passed. In lieu of the pulley 18 any other desirable means may be employed for rotating the shaft 16. Loosely surrounding the sleeves 15, between each set of boxes 14, are the eyed extremities of arms 19 19′. The sleeves therefore form pivots upon which these arms may turn. The opposite ends of the arms are formed with boxes 20 20. These boxes surround tubular journals 21 21, extending from the drill-heads 22 22′. Within these journals are bushings 23, and within these bushings in turn are shafts 24. The inner end of each of these shafts carries a beveled gear 25, disposed within an inner chamber of each drill-head. Radiating outwardly from this inner chamber and through and beyond the periphery of each drill-head are drilling or boring tools 26. Each drilling-tool carries thereon, within the inner chamber of its drill-head, a beveled pinion 27. These beveled pinions of

the tools of each head are in mesh with the beveled gear 25 relating thereto. In order to provide for adjusting the drill-tools outwardly when their lengths become shortened by grinding in the operation of sharpening said tools, I prefer to surround each tool with a tubular drill-spindle 28, each spindle being provided at its outer end with an integral collar 29, through which a set-screw 30 passes for the purpose of securing the spindle rigidly to the tool. The beveled pinion of each drilling-tool is secured fast to the inner end of each spindle by any desirable means, preferably by means of a threaded connection. Between the inner side of each collar 29 and the opposed surface of the drill-head a washer of any desired material, such as fiber, may be placed, as clearly shown in Fig. 5. The two drill-heads are adjustably connected by means of transverse pins 31. Any desired number of these pins may be used—one, two, or even more. In the accompanying drawings I have shown four of such pins. These pins extend into openings 32 in the opposite drill-heads and are made fast in the openings of one of the heads, say the head 22, by means of set-screws 33. The openings or holes 32 in the head 22′ are bored slightly larger than the holes in the head 22, so as to allow for play, and thereby avoid any danger of binding. While I have shown the pins as fastened in the head 22 and loose in the head 22′, it is obvious that this arrangement could be reversed, it only being necessary that when one of the heads is adjusted toward or from the other said pins are permitted to slip back and forth in one of said heads in order to accommodate the changed adjustment of the head.

Surrounding the outer end of the tubular journal 21 of the head 22′ is a collar 34, which is secured fast to said journal by means of a set-screw 35. The box 20 of the arm 19, which surrounds the tubular journal 21, is confined on said journal between the collar 34 and the outer side of the drill-head 22′. On the outer ends of the shafts 24 are pulleys 36 36, and these pulleys are connected up to similar pulleys 37 37′ on the shaft 16 by means of endless belts 38 38. Pulley 37′ is provided with an outwardly-projecting hub portion 39, which is held adjustably to its shaft 16 by means of a set-screw 40.

The numeral 41 indicates the tail end of a matcher or other suitable feeding device provided with the usual guides 42 42, between which the flooring-strip 43 is fed.

In the operation of the invention when the shaft 16 is rotated the shafts 24 24 are necessarily rotated by means of the endless belts 38. This rotation of the shafts 24 causes the drilling-tools to be rotated by reason of the intermeshing of the beveled gears 25 with the beveled pinions 27 27 on the drilling-tools. In view of the fact that the flooring-strip is fed along longitudinally it will by friction cause the drill-heads to be rotated, and as said heads are so rotated the drilling-tools will be successively brought into engagement with the strip, and by reason of the fact that said tools are constantly rotating they are caused to drill holes in the strip. They are shown in the drawings as set in position to drill opposite holes in said strip. In the drawings also the drill-heads are shown as adjusted apart to the farthest extreme. If now it is desired to adjust said heads closer together for narrow strips or for the purpose of decreasing the distances apart of the holes to be drilled, all that is necessary to be done is to loosen the nuts 11 on the upper ends of the bolts 10, which pass through the elongated slots 12. This permits the standard 9′ to be moved inwardly, and consequently thereby bring the arm 19′ closer to the arm 19 and the head 22′ closer to the head 22, the pins 31 slipping through the holes of the head 22′. This movement of the head 22′ carries therewith the integral tubular journal 21. Under the adjustment just referred to if no means were provided to guard against such a contingency the pulley 37′ would be left in the position shown in the drawings, and hence out of line with the pulley 36. It is therefore necessary that with each changed adjustment of the head 22′ the pulley 37′ should also be adjusted. This is accomplished merely by loosening the set-screw 40 and then moving the pulley on the shaft 16 until it abuts against the end of the box 14 in the newly-adjusted position of said box.

As previously stated, the drawings show the drill-heads adjusted in such manner as to provide for drilling opposite holes in the flooring-strips. If it is desired to drill zizgzag holes, the bolts 10, which pass through the elongated slots 12, are removed and the set-screw 40 loosened. The standard 9′ is then slid outwardly, so as to disengage the pins 31 from the head 22′. When the pins are thus disengaged, the head 22′ is free to be turned independent of the head 22. In order to secure the zigzag drilling, the said head is turned one-fourth of a turn, which is sufficient to bring other holes 32 in the head in line with the pins. By now shoving the head back and readjusting the bolts 10 and the set-screw 40 the drilling-tools will be so arranged as to effect a zigzag drilling. In the drawings I show two of the drilling-tools for each head. Any desirable number of these tools, however, may be employed. For instance, if only one drilling-tool is used in each head, then in order to effect the zigzag drilling it is necessary to turn the head one-half of a turn, or, again, where four drilling-tools are used in each head then it is necessary to have the holes in the head spaced apart the distance of one-eighth of the circumference of the head and turn the head one-eighth of a turn.

From the foregoing description it will be seen that I provide a construction which is inexpensive and at the same time capable of effecting most efficient work. Not only does it possess the advantage of providing for the

adjustment of one of the drilling-heads closer to or farther away from the other drilling-head in order to regulate the distance apart of the holes to be drilled, but it also provides for carrying said heads pivotally, so that they may rise or fall, and thereby automatically adjust themselves to irregularities in the strip or adjust themselves to different thicknesses of strips.

What I claim as my invention is—

1. In a boring-machine, rotatably-mounted drill-heads disposed opposite to each other and arranged to be rotated together, each head carrying a drilling-tool extending beyond the outer rim thereof.

2. In a boring-machine, rotatably-mounted drill-heads disposed opposite to each other and arranged to be rotated together, and each head carrying a plurality of drilling-tools extending beyond the outer rim thereof.

3. In a boring-machine, the combination with rotatably-mounted drill-heads disposed opposite to each other and arranged to rotate together, and each head carrying a drilling-tool, extending beyond the outer rim thereof, of means for adjusting one of the heads so as to bring its tool out of transverse line with the tool of the other head.

4. In a boring-machine, the combination with rotatably-mounted drill-heads disposed opposite to each other, and arranged to rotate together, and each head carrying a plurality of drilling-tools extending beyond the outer rim thereof, of means for adjusting one of the heads so as to bring its tools out of transverse line with the tools of the other head.

5. In a boring-machine, the combination with rotatably-mounted drill-heads disposed opposite to each other, and arranged to rotate together, each head carrying a drilling-tool extending beyond the outer rim thereof, of means for adjusting one of the heads closer to or farther away from the other head.

6. In a boring-machine, pivotally and rotatably mounted drill-heads disposed opposite to each other, and arranged to be rotated together, each head carrying a drilling-tool extending beyond the outer rim thereof.

7. In a boring-machine, the combination of pivotally and rotatably mounted drill-heads disposed opposite to each other, and arranged to rotate together, each head carrying a drilling-tool extending beyond the outer rim thereof, of means for adjusting one of said heads closer to or farther away from the other head.

8. In a boring-machine, the combination of rotatably-mounted drill-heads disposed opposite to each other, and one of said heads provided with a plurality of openings, a pin secured to one of the heads and adapted to extend into one of the openings of the other head, in accordance with the extent to which said head is rotatably adjusted, and a drilling-tool carried by each head and extending beyond the outer rim thereof.

9. In a boring-machine, the combination of rotatably-mounted drill-heads disposed opposite to each other, and one of said heads provided with a plurality of openings, pins secured to one of the heads and adapted to extend into any of the openings of the other head, in accordance with the rotatable adjustment of said head, and a drilling-tool carried by each head and extending beyond the outer rim thereof.

10. In a boring-machine, the combination of rotatably-mounted drill-heads disposed opposite to each other and one of said heads provided with a plurality of openings, a pin secured to one of the heads and adapted to extend freely into one of the openings of the other head, in accordance with the extent to which said head is rotatably adjusted, means for adjusting the latter head closer to or farther away from the other head, and a drilling-tool carried by each head and extending beyond the outer rim thereof.

11. In a boring-machine, the combination of rotatably-mounted drill-heads disposed opposite to each other, and one of said heads provided with a plurality of openings, a pin adjustably secured to one of the heads and adapted to extend into one of the openings of the other head, in accordance with the extent to which said head is rotatably adjusted, and a drilling-tool carried by each head and extending beyond the outer rim thereof.

12. In a boring-machine, the combination of standards or bearings, a shaft supported therein, arms pivotally mounted on said shaft, drill-heads rotatably carried at the forward ends of the arms, means for causing said heads to rotate together, and a drilling-tool carried by each head and extending beyond the outer rim thereof.

13. In a boring-machine, the combination of standards or bearings, one of said standards or bearings being adjustably secured so as to be brought closer to or farther away from the other standard or bearing, a shaft supported in the standards or bearings, arms extending from the shaft, drill-heads rotatably carried at the opposite ends of said arms, means for causing the heads to rotate together, and a drilling-tool carried by each head and extending beyond the outer rim thereof.

14. In a boring-machine, the combination of standards or bearings, the upper ends thereof being bifurcated, and the furcate arms provided at their extremities with boxes, sleeves arranged within said boxes, a shaft supported in the sleeves, arms provided at their ends with eyes surrounding the sleeves between the boxes of the furcate arms of the standards, drill-heads rotatably carried at the opposite ends of the arms, means for causing said heads to rotate together, and a drilling-tool carried by each head and extending beyond the outer rim thereof.

15. In a boring-machine, the combination of a bed-piece or support, standards or bearings extending therefrom, the upper ends of said standards being bifurcated, and the furcate

arms provided at their extremities with boxes, and one of said standards being adjustably secured to the bed-piece or support so as to be brought closer to or farther away from the other standard or bearing, sleeves arranged within the boxes, a shaft supported in the sleeves, means for securing the sleeves and boxes together, arms provided at their ends with eyes surrounding the sleeves between the boxes of the furcate arms of the standards, drill-heads carried at the opposite ends of the arms, means for causing said heads to rotate together, and a drilling-tool carried by each head and extending beyond the outer rim thereof.

16. In a boring-machine, the combination of standards or bearings, a drive-shaft mounted in the upper ends thereof, means for rotating the shaft, arms pivotally mounted on said shaft, the opposite ends of the arms provided with boxes, driven shafts mounted in said boxes, drill-heads disposed opposite to each other and arranged to rotate together, a drilling-tool carried by each head and extending beyond the outer rim thereof, a gearing between said drilling-tool and each driven shaft, and connections between the driven shafts and the drive-shaft, whereby the rotation of the latter is imparted to the former.

17. In a boring-machine, the combination of standards or bearings, a drive-shaft mounted in the upper ends thereof, means for rotating the shaft, pulleys mounted on the shaft, one of said pulleys being adjustable thereon, arms pivotally mounted on the shaft, the opposite ends of said arms provided with boxes, drill-heads provided with outwardly-extending journals which pass through said boxes of the arms, one of said drill-heads being adjustable toward and from the other, driven shafts mounted in said journals, a drilling-tool carried by each drill-head and extending beyond the outer rim thereof, a gearing between each drilling-tool and each driven shaft, pulleys mounted on the driven shafts, and endless belts connecting said pulleys with the pulleys of the drive-shaft.

18. In a boring-machine, the combination of a bed-piece or support, standards or bearings extending therefrom, the upper ends of said standards being bifurcated, and the furcate arms provided at their extremities with boxes, and one of said standards being adjustably secured to the bed-piece or support so as to be brought closer to or farther away from the other standard, sleeves arranged within the boxes, means for securing the boxes to the sleeves, a drive-shaft supported in the sleeves, means for rotating said shaft, pulleys mounted on the drive-shaft, one of said pulleys being adjustable thereon, arms provided at their ends with eyes surrounding the sleeves between the boxes of the furcate arms, drill-heads disposed opposite to each other and provided with outwardly-extending tubular journals, a drilling-tool carried by each head and extending beyond the outer rim thereof, driven shafts mounted in the said journals, a gearing between each of said shafts and the drilling-tool of the head relating thereto, a pulley mounted on each of said shafts, endless belts connecting said pulleys with the pulleys of the drive-shaft, and means for adjusting one of the drill-heads toward or from the other.

19. In a boring-machine, the combination of rotatably-mounted drill-heads disposed opposite to each other and arranged to be rotated together, rotatable shafts each carrying at its inner end a beveled gear, and a drilling-tool carried by each drill-head and provided with a beveled pinion meshing with the beveled gear of each shaft the outer end of said tool projecting beyond the outer rim of the head.

20. In a boring-machine, the combination of rotatably-mounted drill-heads disposed opposite to each other and arranged to be rotated together, each head provided with an outwardly-extending journal, a rotatable shaft in each journal, each shaft carrying at its inner end a beveled gear, and a drilling-tool carried by each drill-head and provided with a beveled pinion meshing with the beveled gear of each shaft the outer end of said tool projecting beyond the outer rim of the head.

21. In a boring-machine, the combination of rotatable carriers, a drilling-tool carried by each carrier, the axes of the tools lying in the plane of rotation of the carriers, and means for adjusting the distance apart laterally of said carriers.

22. In a boring-machine, the combination of rotatable carriers, a drilling-tool carried by each carrier, the axes of the tools lying in the plane of rotation of the carriers, means for adjusting the distance apart laterally of said carriers, and means for adjusting one of the carriers so as to advance its tool with relation to the tool of the other carrier.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIS S. SHERMAN

Witnesses:
A. L. MORSELL,
ANNA V. FAUST.