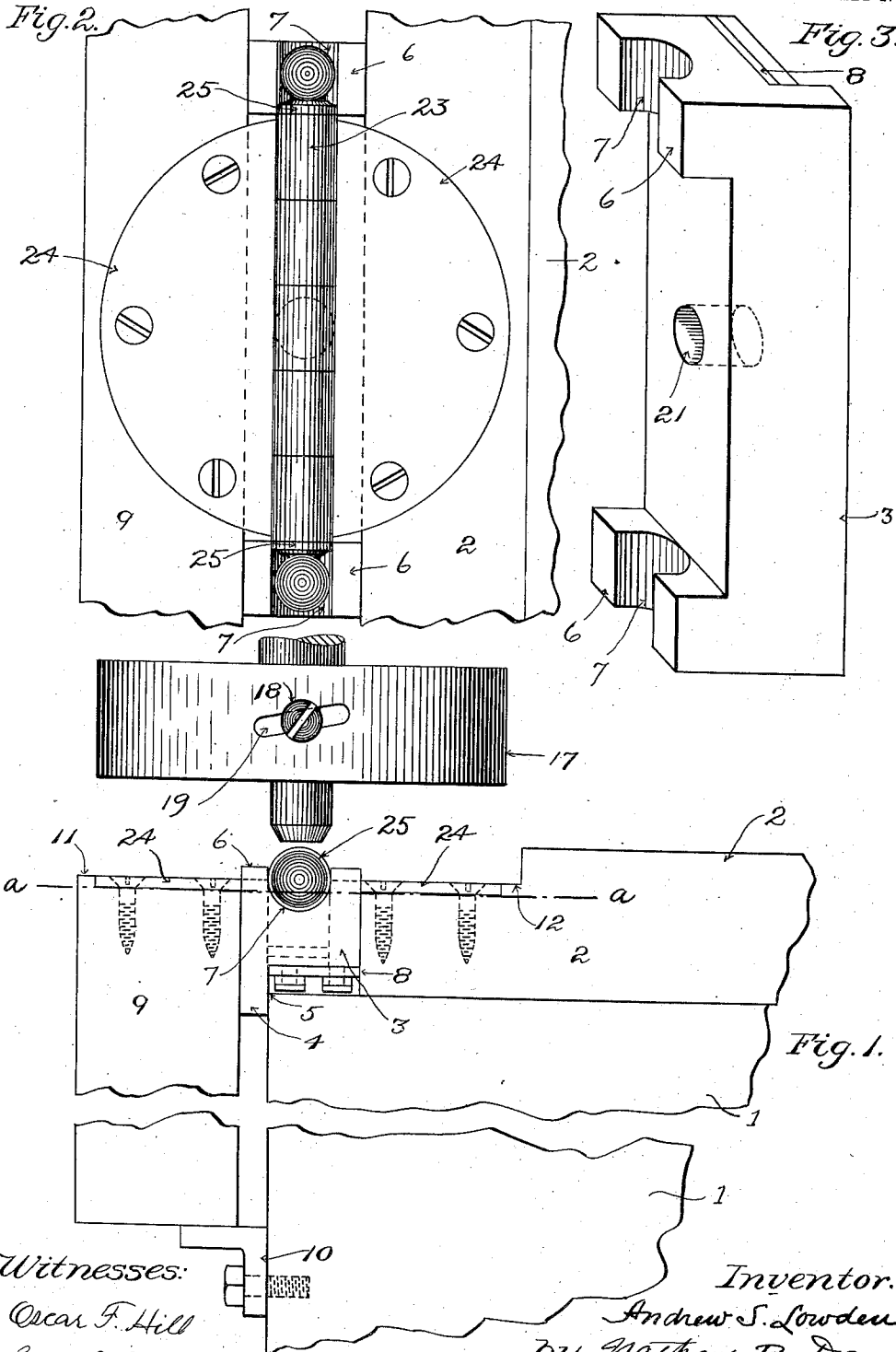


A. S. LOWDEN.
METHOD OF APPLYING HINGES.
APPLICATION FILED APR. 21, 1911.

1,016,341.

Patented Feb. 6, 1912.

2 SHEETS—SHEET 1.



Witnesses:
Oscar F. Hill
Ellen O. Spring

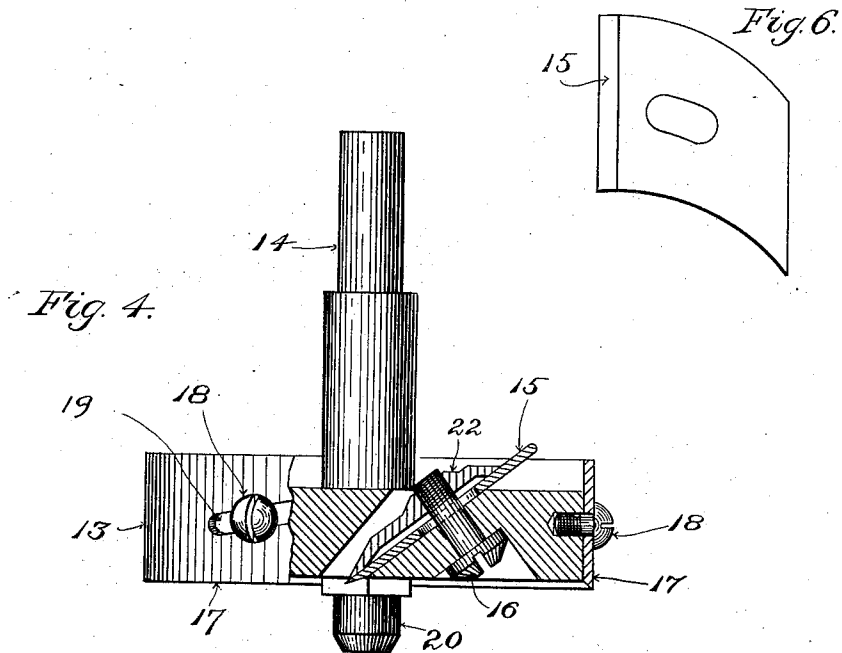
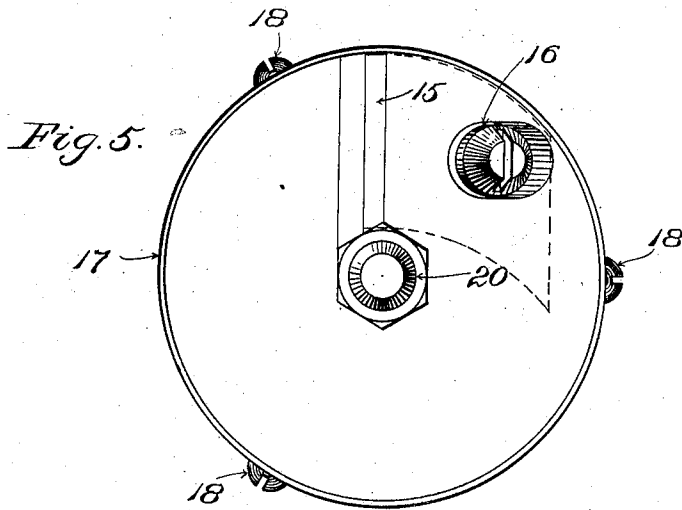
Inventor:
Andrew S. Lowden,
by Nathan B. Day
Attorney.

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UNITED STATES PATENT OFFICE.

ANDREW S. LOWDEN, OF CONCORD, MASSACHUSETTS.

METHOD OF APPLYING HINGES.

1,016,341.

Specification of Letters Patent.

Patented Feb. 6, 1912.

Application filed April 21, 1911. Serial No. 622,443.

To all whom it may concern:

Be it known that I, ANDREW S. LOWDEN, citizen of the United States, residing at Concord, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Methods of Applying Hinges, of which the following is a specification.

My invention relates to a new and improved method of applying hinges to the parts designed to be connected thereby, and more especially has to do with the forming of hinge seats for hinges of the type commonly known as "butt-hinges," having wing portions or flaps which are designed to be sunk into the faces of the parts to which they are attached so that their external faces are flush with the surfaces of the same.

So far as I am informed the method by which hinge seats or gains are formed at the present time involves the manual operations of aligning the hinge in its proper position, of marking out the position of the hinge seats, and of thereafter excavating each hinge seat separately by manually operated cutting tools, all of which operations call for the skill of workmen trained in the art of wood working. Afterward, when the hinge is secured in the hinge seats, further adjustment of its position may be necessary to secure a final correct alinement of the same. Hence in the manufacture, on a large scale, of doors or of other articles of furniture requiring the attachment of a hinged connection, the cost of the skilled manual labor required to excavate the two hinge seats separately and to perform the other operations incident to applying hinges may constitute an appreciable item of the total cost.

It is therefore the object of my invention to devise an improved method of applying hinges of the character described, by which the necessity for manual labor in the various operations may both be largely eliminated, and relegated to relatively unskilled workmen.

I secure my object by providing means by which the parts to be hinged together may be positioned in such relation that when a seat excavating tool is applied thereto the hinge seats may be excavated preferably simultaneously, in both said parts, so as to be left in readiness for securing the flaps of the hinge therein with-

out further excavation. Preferably also means are employed for use in controlling the relative positions of the parts which are to be hinged together, which serves not only to position the parts correctly with respect to each other, but also serves as a guide in properly locating the position of the excavating tool with respect to the two parts in which the seats are to be cut, and in thereafter further serving to aline the position of the hinge in the hinge seats with substantially absolute accuracy. In this manner the application of the hinges may be reduced to a method involving a few relatively simple mechanical operations which may be easily performed by unskilled labor and at a relatively small cost.

In the drawings are shown the preferred means by which my method of applying hinges may be carried into effect.

In such drawings,—Figure 1 is a side elevation showing the parts which are hinged together positioned in their proper relation under the hinge seat excavating tool. Fig. 2 is plan view of the said parts also showing a hinge positioned in the hinge seats. Fig. 3 is a perspective view of the separator block which is preferably employed in connection with my invention. Fig. 4 is a side elevation partly in section illustrating the preferred form of the said excavating tool. Fig. 5 is a plan view looking at the bottom of the same. Fig. 6 is a plan view showing the outline of the preferred form of cutting knife embodied in said excavating tool.

Referring to the drawings,—1 represents a bench, adapted to support one of the parts which are to be hinged together, as for example, the door jamb 2, and to locate the same in such a position that the portion of the jamb which is to form the perspective bottom of the hinge seat to be excavated, is preferably parallel with the top of the bench. Said jamb 2 abuts against the rear side of a separator block 3, having the functions hereinafter set forth. Said separator block as shown more clearly in Figs. 1 and 3 comprises essentially a rectangular block having a rib 4 projecting from its lower surface and forming a corner adapted to fit over the front edge of the bench and thereby to aline the block in parallelism with the top and front surfaces of said bench. From the top of the separator block extend the projections 6, having preferably circular depressions 7

formed in their upper surfaces, and so positioned therein that an axial line passing through the centers of the curvature of said depressions will be substantially in coincidence with the axis about which the door and jamb are to swing. The height of such axial line above the top surface of the bench may be varied, by making the bottom of said separator block detachable, and by providing shims 8 of varying thickness which may be inserted as required. A central hole or recess 21 is formed in upper surface of the center of the separator block.

15 The door 9 which is to be hinged to the jamb 2 is positioned against the front side of the separator block 3, and is located at such a height, preferably by means of a stop 10, as to bring that portion of the same which is to form the prospective bottom surface of the hinge seat to be excavated into the same plane with that portion of the jamb which is to form the prospective bottom of the hinge seat to be excavated therein said plane being indicated at *a-a*. It may be here noted that where the thickness of the two hinge flaps are equal and where the flaps themselves are everywhere of the same thickness, it is generally a sufficiently accurate practice to locate the door so that the edge 11 of the same in which one hinge seat is to be cut, is located in substantially the same plane with the surface 12 of the jamb in which the other hinge seat is to be formed.

The door and jamb, with the separator block between the same substantially at the point selected for attaching the hinges having been positioned as aforesaid, they are clamped securely together by any approved means; such means, however, not being shown in the drawings, and the two parts are now ready for the excavation of the hinge seats. This is effected by a rotating seat excavating tool or borer, preferably making a circular cut and of which the preferred construction is more clearly shown in Figs. 4 and 5. Referring to said figures, said tool or borer comprises a body 13 having an axial shank 14 by which it may be secured in a boring machine of any approved type, either power or hand operated, by which the same may be rotated. In said body is slantingly secured a cutting knife 15 having a cutting edge extending substantially radially across the lower face of the body of the boring tool and projecting slightly below the lower face of same. Said knife 15 is preferably of the curved outline shown in Fig. 6 and has capacity for removal or adjustment in any approved manner, being secured in the body by the screw 16 engaging the cap 22. Around the body of the said tool is fitted a circular cutting rim 17 which is secured to said body by

means of the screws 18. Inclined slots 19, through which the screws 18 extend, are preferably provided in the cutting rim as shown, so that when the said rim is circumferentially rotated relative to the body, the movement of the securing screws in said inclined slots operates to adjust the vertical position of the edge of the cutting rim relative to the edge of the cutting knife 15. Preferably said rim is adjusted to a position slightly lower than the edge of the cutting knife. Said cutting rim is of considerable value in the cutting tool, as it serves to steady the tool as the cutting knife in its rotation passes from the door to the jamb and also serves to cleanly cut the marginal portion of the hinge seat. The shank of the borer is extended for a short distance below the cutting rim as shown, forming an axial spindle 20. Centrally located in the top of the separator block is a recess 21 Fig. 3, in which said spindle extension 20 of the boring tool is adapted to engage, said recess constituting a tool centering means for positioning the tool relative to the door and jamb.

In excavating the hinge seats, the position of the boring tool relative to the separator block and the door and jamb is so adjusted that as the tool is forced downward, the spindle 20 will enter into the recess 21 in the separator block 3, thus centering the boring tool and correctly positioning the same with reference to the position of the door and jamb to be excavated for hinge seats. When the tool is rotated, and forced to move downwardly, it operates to cut a circular excavation; one segmental portion of which is formed in the door, and another segmental portion of which is formed in the jamb. The depth of said cut may be preferably controlled by placing washers or liners of the desired thickness in the bottom of the central recess 21 of the separator, so as to limit the downward movement of the excavating tool, or in any other suitable manner.

When the hinge seats have been excavated to the desired depth, the seat excavating tool is removed and a hinge 23, having hinge wings or flaps 24 substantially lying in planes intersecting at the hinge pin or axis, and extending radially therefrom, of which the portion of its radial face designed to be located in a hinge seat forms a segment of a circle having substantially the same diameter as that of the circular cutting tool, is placed with the radial faces of the flaps lying in the segment shaped hinge seats. In its preferred form, as shown, the hinge in its open position is of a general circular outline, the periphery of the flap portions being of substantially the same diameter as that of the cutting rim of the seat excavating tool.

In order to correctly aline the hinge, the end portions 25 of the hinge pin are designed to closely engage within the circular depressions 7 formed in the projections 6 at the top of the separator block 3. The hinge pin will therefore be alined coincident with the axis about which the door and jamb swing. It is hence apparent that the hinge positioned in this manner will be mechanically alined in a correct position as to the door and the jamb by the separator block. When so positioned the positions of the screw holes may then be marked and formed. When the hinge flap is finally secured in said hinge seats the hinge will be found to be in correct alinement, and the door properly swung upon the jamb.

It is my idea to provide a special seat excavating tool for use in connection with each size of hinge which it is expected to be called upon to apply, although specially formed blocks and tools having a capacity for adjustment in size may be employed if desired.

Furthermore while I have described my process as preferably carried into effect in connection with a circular hinge, it is equally applicable in case of a hinge having flaps whose contour departs from that of the true circle, providing a rotating cutter, specially constructed to cut the hinge seats of a corresponding outline, be used.

It is thus apparent that my method of applying hinges serves to eliminate a large portion of the skilled labor hitherto required for this process, and where many such hinges are to be applied the work may be expeditiously and easily performed.

I claim as my invention:—

1. The method of applying a hinge to the parts to be connected thereby which consists; firstly, in securing the said parts in such position that the prospective bottoms of the hinge seats to be formed in said parts and which are to be engaged by the radial faces of the hinge wings or flaps lie in the same plane; secondly, in simultaneously excavating both said hinge seats by a cutting tool rotating upon an axis perpendicular to said plane; and finally in securing within the said hinge seats a hinge having flaps conforming in outline to the outline of the cut made by the said tool on a plane perpendicular to its axis.

2. The method of applying a hinge to the parts to be connected thereby which consists; firstly, in securing the said parts in such position that the prospective bottoms of the hinge seats to be formed in said parts and which are to be engaged by the radial faces of the hinge wings or flaps lie in the

same plane; secondly, in simultaneously excavating both said hinge seats by a cutting tool rotating upon an axis fixed with reference to said parts and perpendicular to said plane; and finally, in securing within the said hinge seats a hinge having flaps conforming in outline to the outline of the cut made by said tool on a plane perpendicular to its axis.

3. The method of applying a hinge to the parts to be connected thereby which consists; firstly, in securing the said parts in such position that the prospective bottoms of the hinge seats be formed in the said parts and which are to be engaged by the radial faces of the hinge wings or flaps lie in the same plane; secondly, in simultaneously excavating in the said parts, by the single application of a cutting tool rotating on a fixed axis perpendicular to said plane, hinge seats which constitute segments of the circular cut excavated by said rotating tool; and finally, securing within the hinge seats a hinge having the free edges of the portions of its flaps which are designed to be secured in said hinge seats of a segmental outline conforming to that of the hinge seats.

4. The method of applying a hinge to the parts to be connected thereby which consists; firstly, in securing the said parts in such position that the prospective bottoms of the hinge seats to be formed in said parts and which are to be engaged by the radial faces of the hinge wings or flaps lie in the same plane, said parts having a separating block interposed between the same at the point of hinge attachment, said block embodying tool centering means adapted to position the said excavating tool, and further embodying hinge alining means adapted to engage the hinge and to position the hinge pin of the same substantially in coincidence with the axis about which the parts are to swing; secondly, in simultaneously excavating in the said parts, by the single application of a cutting tool rotating on a fixed axis perpendicular to said plane, hinge seats which constitute segments of the circular cut excavated by said rotating tool; and finally, securing within the hinge seats a hinge having the free edges of the portion of its flaps which are designed to be secured in said hinge seats of a segmental outline conforming to that of the hinge seats.

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

ANDREW S. LOWDEN.

Witnesses:

NATHAN B. DAY,
CHAS. F. RANDALL.