H. O. TAYLOR.

MACHINE FOR REPAIRING CUES AND THE LIKE.

APPLICATION FILED FEB. 10, 1920.

1,395,236. Patented Oct. 25, 1921.

Fig. 1.

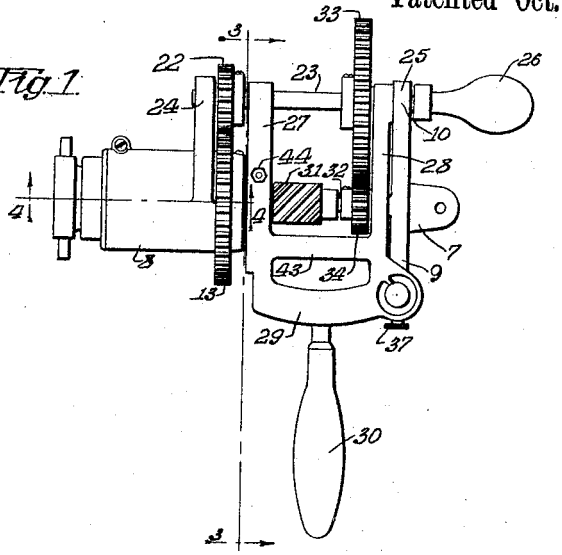


Fig. 2.

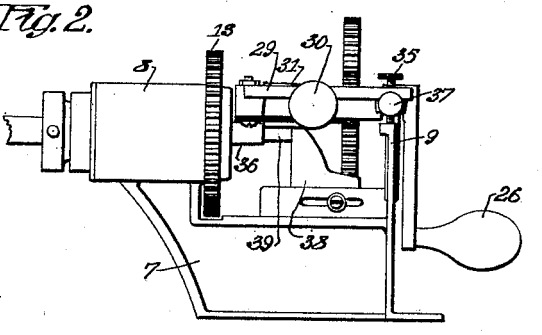


Fig. 5.

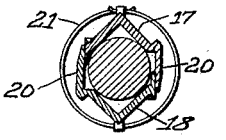


Fig. 3.

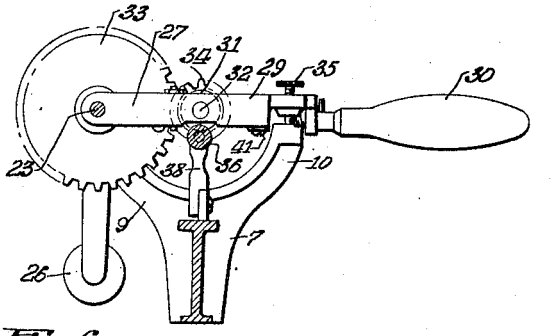


Fig. 4.

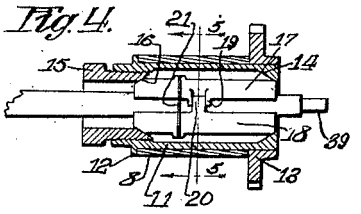
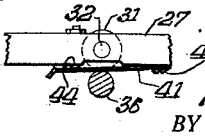


Fig. 6.



INVENTOR.

Henry O. Taylor

BY

Ira J. Wilson

ATTORNEY.

UNITED STATES PATENT OFFICE.

HENRY O. TAYLOR, OF ROCKFORD, ILLINOIS.

MACHINE FOR REPAIRING CUES AND THE LIKE.

1,395,236. Specification of Letters Patent. Patented Oct. 25, 1921.

Application filed February 10, 1920. Serial No. 357,495.

To all whom it may concern:

Be it known that I, HENRY O. TAYLOR, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Machines for Repairing Cues and the like, of which the following is a specification.

The primary object of the present invention is to provide a simple and novel machine for repairing billiard or pool cues, and more particularly, the points of such cues. In this regard, it is desired after a cue point or ferrule tip has been worn, broken off or become loosened, to turn a dowel or tenon on the end of the cue for the reception of a new point, and then to turn the new point to the same diameter as the end of the cue. My improved machine is designed to perform these operations quickly and to a fine degree of precision, so that the new point will be effectually secured in position and will be neatly fit to the cue.

Another object of my invention is the provision of a machine of the character described, which shall be embodied in such simple and practical form as to enable economical production thereof as a commercial article and which shall serve in a satisfactory manner the conditions and requirements of the trade.

Still another object is to provide a cue-working machine which shall be semi-automatic in its action in that after it is properly adjusted, it will, when put into operation, perform the desired turning with accuracy and precision.

I have also contemplated the provision of a cue-working machine having a suitable rotary chuck for holding a cue, and a cutter-carrying frame movable into and out of cutting relation with the cue carried by the chuck, and of means for revolving the cutter and regulating its approach to the cue, and consequently, the depth of cutting. In this connection, I have also aimed to utilize the cutter-driving movement to revolve the cue chuck in timed relation, so as to perform the turning operation with considerable accuracy.

Other objects and attendant advantages will be appreciated as the invention becomes better understood by reference to the following description when considered in connection with the accompanying drawing, in which—

Figure 1 is a plan view of a machine embodying my improvements;

Fig. 2, a front elevation of the machine;

Fig. 3, a sectional view taken on the line 3—3 of Fig. 1;

Fig. 4, a sectional view taken on the line 4—4 of Fig. 1;

Fig. 5, an enlarged sectional view taken on the line 5—5 of Fig. 4; and

Fig. 6, a fragmentary view of the near side of the cutter frame shown in Fig. 3, and showing the finished cutter gage in position.

My improvements are carried by a frame or bracket designated generally by character 7, adapted to be rigidly secured to a table or support in any suitable manner. The bracket is shaped to provide a cylindrical chuck barrel 8 disposed on a horizontal axis and a transverse end portion, at present in the form of upwardly reaching arms 9 and 10. Within the barrel 8, I have revolubly mounted a chuck of novel construction, peculiarly adapted to grip and revolve a billiard or pool cue for the purpose of properly presenting the small end thereof to a cutter which will be presently described.

The chuck consists of a spindle 11 revoluble in the barrel 8 and having an annular shoulder 12 engaging one end of the barrel and carrying a fixed spur gear 13 at the opposite end of said barrel, so that the same is held against lengthwise displacement. One end of the spindle has an internal tapered face 14, and the opposite end is internally threaded for the reception of a collar 15 having an internal tapered face 16, inclined oppositely to the face 14. Between these tapered surfaces 14 and 16 is interposed a pair of jaws 17 and 18, each relatively V-shaped in cross section throughout its length so as to fit cues of different diameters. These jaws are held in coöperative relation by interfitting parts 19 and 20 which hold the jaws against relative lengthwise displacement and also permit relative tilting movement between the jaws so that they may conform to the taper of the cue. A spring element 21 embraces and connects the jaws, tending to separate them. It will be obvious that with a cue disposed between the jaws as

shown in Fig. 4, the same may be clamped upon the cue by screwing the collar 15 inwardly. This compresses the jaws at each end between the inclined faces 14 and 16 and clamps the jaws throughout their length to the cue. When the collar 15 is loosened the spring 21 will expand the jaws, permitting withdrawal of the cue.

Means is now provided for revolving the chuck, which consists of a spur pinion 22 meshing with the gear 13 and fixed to a shaft 23, which is mounted in the bearings 24 and 25. By means of a hand crank 26 fixed to the shaft 23, the gears 22 and 13, and consequently the chuck may be revolved.

I have now provided a revoluble spiral cutter and shiftable cutter-carrying frame, by means of which the cutter may be instantly moved into and out of operative position, not only for the purpose of inspecting the work being done, but also for permitting certain adjustment which will be presently described. The cutter-carrying frame is at present in the form of laterally spaced arms 27 and 28 pivotally mounted at one end on the shaft 23 and joined at their opposite ends by a cross portion 29, the latter of which is equipped with a handle 30, by means of which the frame may be raised and lowered upon and about the shaft 23. A spiral cutter 31 fixed to a shaft 32 interposed between and mounted upon the arms 27 and 28, is adapted to be revolved by means of spur gears 33 and 34 fixed to the shafts 23 and 32 respectively. It will be obvious that upon turning the crank 26, the cutter 31 and the cue chuck will be revolved simultaneously, the cutter at a considerably higher speed than the chuck, and it will be further observed, viewing Fig. 3, that the handle 30 may be swung in a counter-clockwise direction about the shaft 23, thereby withdrawing the cutter from operative position. Said operative position is determined by an adjustable screw or stop 35, passed through the outer end of the cutter frame portion 29 and adapted to seat upon the upper end of the bracket arm 10, as shown in Fig. 3. It will be observed from this figure that the cutter when in operative position is disposed directly above the cue 36 and will cut to a depth determined by the adjustment of the screw stop 35.

In order to turn a dowel or tenon on the end of a cue, the latter is inserted through the chuck until the end to be turned down overlaps beneath the cutter 31 a distance equal to the length of the tenon to be cut. This distance is determined by an adjustable stop 38, as will be obvious. To turn the tenon, the cutter frame is lowered onto the end of the cue, and the crank 26 turned. This will revolve both the cutter and cue in the manner mentioned above, and the end of the cue will be turned down to form a tenon of the requisite length and diameter as determined by the position of the stops 35 and 38. The cutter may be fed to the work by sufficient pressure on the handle 30. As the machine is set in this particular instance, a tenon 39 will be turned on the end of the cue. It will be manifest that in view of the fact that the cue is revolved simultaneously with the cutter and in the opposite direction to the travel of the cutting surfaces, the periphery of the tenon will be a true circle. Thus, it is possible to very accurately fit a point or ferrule, as the case may be, to a tenon.

After the point has been secured on the cue, it is desired to turn the point to the same diameter as that of the cue. To this end, I have equipped the cutter frame with a depth gage adapted to rest on the periphery of the cue so as to determine the depth of this finishing cut. This is done in the present instance by means of a plate 41 pivotally secured at 42 to the underside of the cutter frame arm 27, as shown in Fig. 6, and adapted to swing from an inoperative position crosswise of the frame under the cross portion 43 to an operative position parallel with and beneath the arm 27. In this latter position, the free end of the plate 41 rides upon the projecting end of a screw 44 so as to be held taut in operative position and also so as to permit adjustment of the plate to vary the position of the cutter relatively to the cue. It will be observed that the plate 41 is so positioned that it overlies and will rest upon the cue in close proximity to the point, and will limit approach of the cutter to the point, so that the latter will be turned or finished only to the diameter of the cue at its outer end. It will thus be seen that by simply raising the cutter frame and swinging the plate 41 either into or out of operative position the machine may be instantly converted from a tenon cutting to a finishing purpose, or for any analogous use.

Attention is called to the fact that when the screw 35 is set for a given sized tenon, the resulting tenon will always be of uniform diameter, irrespective of whether the diameter of the cue bodies vary.

It is believed that the foregoing conveys a clear understanding of the principles and objects of my improvements, and while I have illustrated and described but a single working embodiment thereof, it should be understood that various changes might be made in the construction and arrangement without departing from the spirit and scope of the invention as expressed in the appended claims, in which—

I claim:

1. In a cue-cutting machine, the combination of a frame having a chuck barrel and a

transverse portion beyond one end of the barrel, a chuck revoluble in said barrel, a gear fixed to said chuck, a crank shaft journaled on the frame and at one end on said transverse portion and equipped with a gear meshing with the chuck gear and with a second gear for driving a cutter, a cutter-carrying frame pivotally mounted at one end on said crank shaft between said transverse frame portion and the chuck barrel, a cutter shaft journaled on said cutter-carrying frame and equipped with a cutter and a gear meshing with said cutter driving gear, and a handle on the outer end of said cutter-carrying frame, whereby the cutter may be moved into and out of cutting relation with a cue carried by said chuck.

2. In a cue-cutting machine, the combination of a frame having a chuck barrel and a transverse portion beyond one end of the barrel, a chuck revoluble in said barrel, a gear fixed to said chuck, a crank shaft journaled on the frame and at one end on said transverse portion and equipped with a gear meshing with the chuck gear and with a second gear for driving a cutter, a cutter-carrying frame pivotally mounted at one end on said crank shaft between said transverse frame portion and the chuck barrel, a cutter shaft journaled on said cutter-carrying frame and equipped with a cutter and a gear meshing with said cutter-driving gear, a handle on the outer end of said cutter-carrying frame, whereby the cutter may be moved into and out of cutting relation with a cue carried by said chuck, an adjustable stop operable between the main frame and the cutter-carrying frame for limiting approach of the cutter to the axis of the article revolved by said chuck, and a depth gage plate carried by said cutter-carrying frame and adapted to be swung into and out of operative position, in the latter of which to engage the uncut portion of the periphery of the cue for determining the turning of a supplemental part on said cue.

3. In a cue-repairing machine, the combination of a frame, a chuck on the frame adapted for revolving a cue, a cutter-carrying frame mounted on said frame and equipped with a cutter adapted by movement of the cutter-carrying frame to be moved into and out of cutting relation to the cue carried by said chuck, means for revolving the cutter and the chuck, an adjustable stop for limiting the depth to which the end of a cue will be reduced by said cutter, and a second depth gage means operative between the cutter-carrying frame and the uncut portion of the cue for determining the depth of turning of a supplemental part mounted on the turned end of the cue.

4. In a cue-repairing machine, the combination of a frame having a chuck barrel and a transverse portion beyond one end of said barrel, a cue-carrying chuck revoluble in said barrel, a crank shaft mounted on the frame and having a bearing in said transverse frame portion, a cutter-carrying frame pivotally mounted on said shaft intermediate its frame bearings, a cutter shaft and cutter journaled on said pivoted frame, gears on the crank shaft one in mesh with the gear fixed to the cue chuck and the other in mesh with a gear fixed to the cutter shaft, said cutter-carrying frame adapted to be swung upon the crank shaft as a fulcrum for carrying its cutter into and out of operative relation to a cue carried by the chuck, an adjustable stop on the frame between the chuck barrel and the transverse frame portion for limiting axial movement of the cue in the chuck, to thereby properly aline the end of the cue with the cutter, and an adjustable stop operative between the frame and the cutter-carrying frame for determining the depth to which the end of the cue will be turned by the cutter.

5. In a cue-repairing machine of the character described, the combination of a frame, a cue chuck revolubly mounted on the frame, a cutter-carrying frame equipped with a spiral cutter and pivotally mounted on said frame, whereby the cutter may be moved into and out of cutting relation to the end of a cue carried by said chuck, means for revolving the cue chuck and spiral cutter, an adjustable stop operative between the frame and the cutter-carrying frame for limiting the depth to which the end of the cue will be turned by the cutter, and a second stop operative between the cutter-carrying frame and the uncut periphery of the cue and adapted to be moved into and out of operative position for determining in the latter the depth to which a supplemental part mounted on the turned end of the cue will be turned by the cutter.

6. In a cue-repairing machine, the combination of a cue chuck, a spiral cutter, a cutter-carrying frame adapted to move the cutter toward and from the cue, means for revolving the chuck and the cutter, depth gage means for determining the depth to which the end of the cue will be turned by the cutter, and a second depth gage means operative between the cutter-carrying means and the uncut periphery of the cue for determinating the depth to which a supplemental part mounted on said reduced end of the cue will be turned by the cutter.

7. In a cue repairing machine, the combination of a frame having a chuck barrel, a cue chuck revoluble in said barrel, a hand crank shaft journaled on the frame at one side of said chuck barrel, a cutter-carrying frame having laterally spaced arms pivotally mounted on said crank shaft and connected at its free end by a transverse por-

tion, a cutter shaft interposed between and journaled on said laterally spaced arms, a cutter fixed to said shaft, a pair of intermeshing gears intermediate said arms and fixed respectively to the crank shaft and cutter shaft, a second pair of intermeshing gears intermediate the chuck barrel and the adjacent arm of the cutter-carrying frame and fixed respectively to the crank shaft and the chuck.

8. In a machine of the character described, means for supporting a cue in a position to be turned at one end, a cutter-carrying frame equipped with a rotary cutter and adapted to be moved into and out of turning relation to said cue, means for revolving the cutter, means for limiting the depth of the cutting to turn a tenon on the end of the cue, and a depth gage plate 41 for limiting the turning operation to turn a surface corresponding in diameter to that of the cue adjacent to said end.

9. A machine of the character described, comprising a frame shaped to provide a chuck barrel and a transverse portion spaced longitudinally from said barrel, a chuck revoluble in the barrel, a gear concentric with and fixed to the chuck, a crank shaft mounted on the frame and having a bearing in said transverse portion, a gear fixed to the crank shaft and in mesh with said gear on the chuck, a cutter-carrying frame pivotally mounted on said crank shaft and equipped with a revoluble cutter adapted to be moved into and out of operative relation to a part carried by the chuck and adapted to be operated on by said cutter, gearing between the crank shaft and cutter, and means operative between the transverse frame portion and the cutter frame for limiting approach of the cutter frame to the axis of the chuck, whereby to limit the depth of the turning operation.

10. In a cue-cutting machine, means for supporting a cue, a cutter-carrying frame comprising laterally spaced arms pivotally mounted at one end and joined at their opposite ends by a cross portion, a handle fixed to said cross portion, a cutter interposed between and revolubly mounted upon and between said transverse arms and adapted to be brought into and out of cutting relation to an end portion of the cue by swinging the frame about said pivot axis, means for revolving the cutter, and a depth gage adjustably mounted upon the cutter frame and adapted to be moved into and out of a position in which to engage the periphery of the uncut portion of a cue so as to thereby limit the cutting depth of the cutter.

11. The combination of a frame carrying a revoluble chuck, a gear concentric with and fixed to the chuck, a crank shaft mounted on the frame in offset parallel relation to the chuck and equipped with a pinion meshing with said gear, a cutter-carrying frame pivotally mounted at one end on said crank shaft and equipped with a revoluble cutter adapted to be moved toward and from the axis of the chuck by movement of the chuck upon and about said crank shaft, a pinion fixed with the cutter, and a relatively larger gear meshing with said pinion and fixed to the crank shaft, whereby upon revolving said shaft the chuck and cutter will be simultaneously revolved, the latter faster than the chuck and in such direction that two cutting surfaces travel in the opposite direction to that of the work revolved by the chuck.

12. In a cue-repairing machine, the combination of a frame 7 carrying a chuck barrel 8 and a transverse end portion 9, a cue chuck journaled in said barrel, a crank shaft journaled on the frame including said transverse portion 9, a cutter-carrying frame having laterally spaced arms 27 and 28 pivoted on the crank shaft and equipped with a revolving cutter intermediate said arms and with a handle portion whereby the cutter may be swung into and out of cutting relation to a cue carried by said chuck, gears 33 and 34 connected respectively with the crank shaft and cutter, and gears 13 and 22 connected respectively with the cue chuck and the crank shaft.

13. In a cue-cutting machine, the combination of a frame, means thereon for revolubly supporting a cue, a crank shaft journaled on the frame, a cutter-carrying frame comprising laterally spaced arms 27 and 28 pivotally mounted at one end on said crank shaft and joined at the opposite end by a cross portion 29, a handle fixed to said cross portion, a cutter 31 revolubly mounted upon and intermediate said arms, and gearing between the crank shaft and the cutter, whereby the latter will be revolved by the crank shaft and may be moved into and out of cutting relation with a revolving cue by operation of said handle.

HENRY O. TAYLOR.