Feb. 3, 1925.

E. E. BUTTERFIELD

1,524,855

TABLE AND LATHE FOR MOTOR VEHICLE ENGINES

Filed Sept. 20, 1920

3 Sheets-Sheet 1

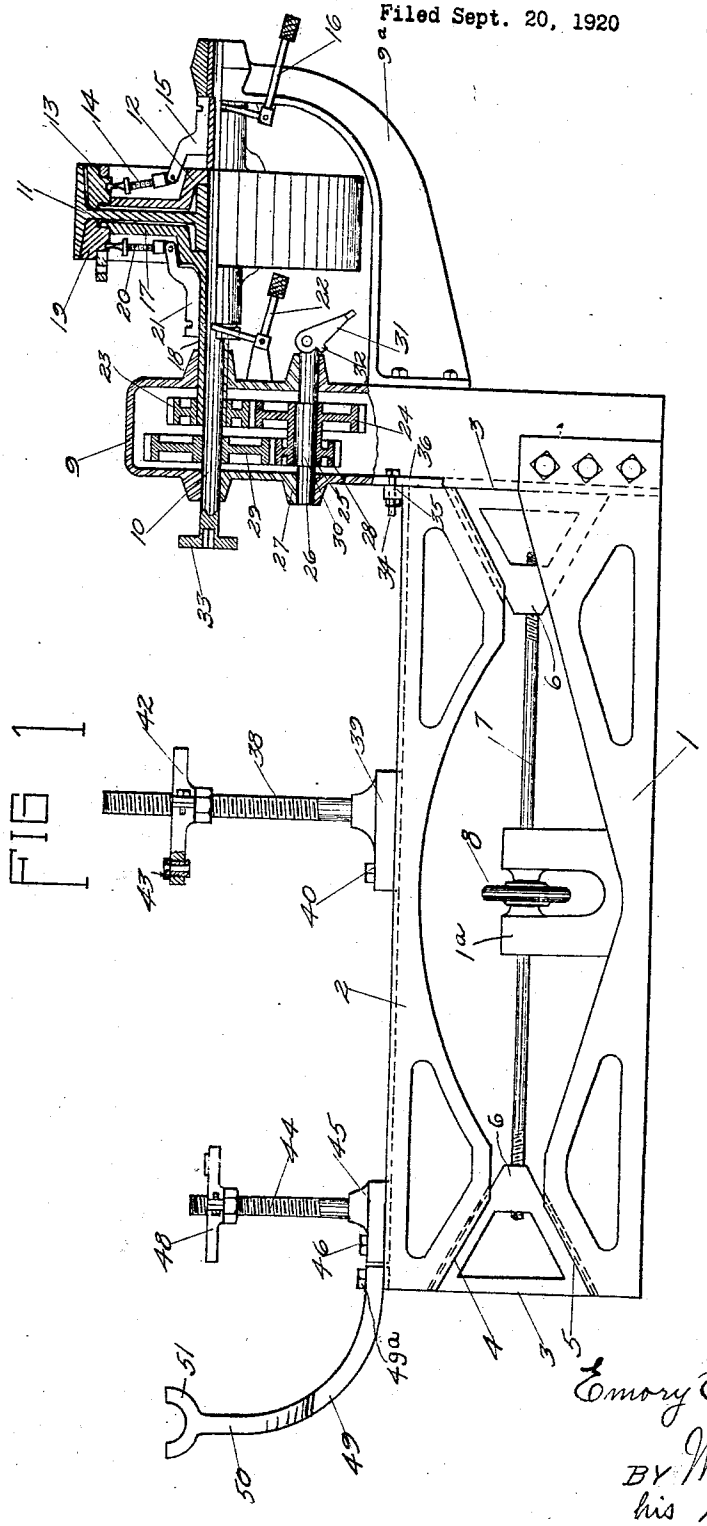


FIG 1

INVENTOR
Emory E. Butterfield
BY Walter N. Haskell
his ATTORNEY

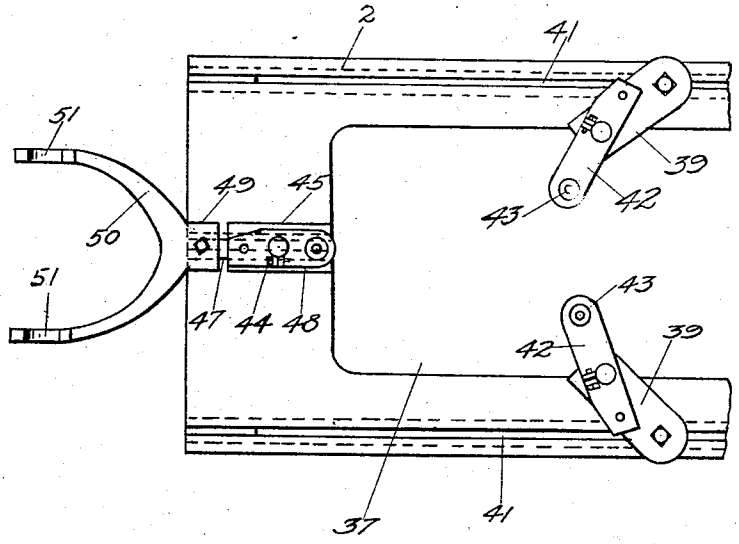
Feb. 3, 1925. 1,524,855

E. E. BUTTERFIELD

TABLE AND LATHE FOR MOTOR VEHICLE ENGINES

Filed Sept. 20, 1920 3 Sheets-Sheet 2

FIG- 2



INVENTOR
Emory E. Butterfield,
BY Walter N. Haskell,
his ATTORNEY

Feb. 3, 1925. 1,524,855

E. E. BUTTERFIELD

TABLE AND LATHE FOR MOTOR VEHICLE ENGINES

Filed Sept. 20, 1920 3 Sheets-Sheet 3

FIG 3

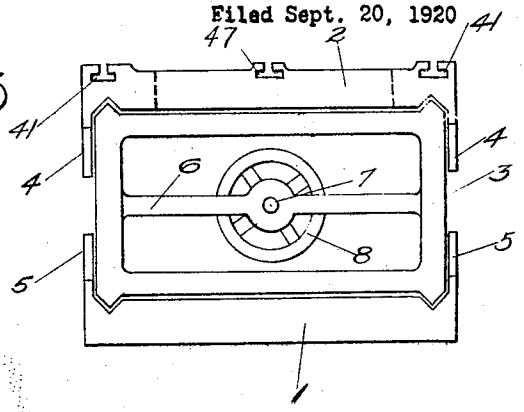


FIG 4

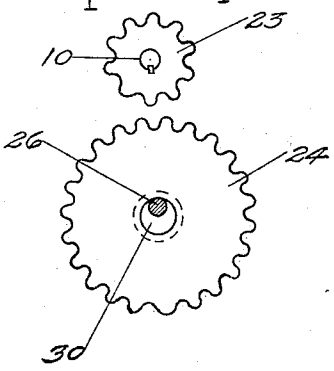
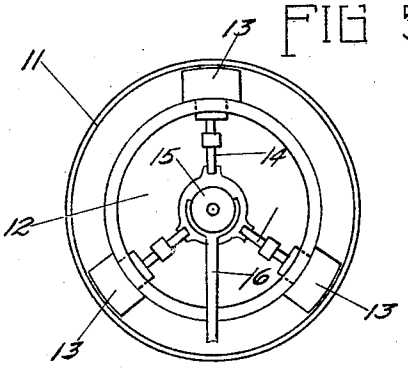


FIG 5



INVENTOR
Emory E. Butterfield.
BY Walter N. Haskell.
ATTORNEY

Patented Feb. 3, 1925. 1,524,855

UNITED STATES PATENT OFFICE.

EMORY E. BUTTERFIELD, OF LEWISTOWN, ILLINOIS.

TABLE AND LATHE FOR MOTOR-VEHICLE ENGINES.

Application filed September 20, 1920. Serial No. 411,687.

To all whom it may concern:

Be it known that I, EMORY E. BUTTERFIELD, a citizen of the United States, residing at Lewistown, in the county of Fulton and State of Illinois, have invented certain new and useful Improvements in a Table and Lathe for Motor-Vehicle Engines, of which the following is a specification.

My invention relates to a table and lathe for motor vehicle engines, and it is specially adapted for use in automobile repair shops and garages. Its chief purpose is to support the engine of a motor vehicle in a convenient position for being operated upon, and at the same time provide means for imparting movement to the crank-shaft of the engine, in what are known as the burning-in and working-out operations thereof. It can also be used for testing the action of the differential mechanism of an automobile, and making adjustments and corrections therein.

By the use of my device it is possible to hold the engine in a rigid manner, in either upright or inverted position, and at any desired height. The parts by means of which the engine is secured in place are also capable of adjustment to adapt the same to motors of various sizes and shapes.

Other features and advantages of the invention will more fully appear from the following specification, reference being had to the accompanying drawings, in which:

Fig. 1 shows the invention in side elevation, with some of the parts shown in section.

Fig. 2 is a fragmentary plan view of the table 2.

Fig. 3 is an end view thereof.

Fig. 4 is a detail of the gear-wheels 23 and 24, disengaged.

Fig. 5 is an outer end view of the pulley 11.

1 represents a base of rectangular form, upon which is supported a table 2, by means of triangular frames 3, the lower inclined edges of which rest upon similarly formed tracks at the ends of the base, while the upper inclined edges of such frames engage similar edges on the lower side of the table 2. Overlapping flanges 4 on said table hold the same from lateral movement on the frames, and said frames are in turn held from side play by flanges 5 on the base 1.

At their inner ends the frames 3 are provided with cross-bars 6, fitted centrally with threaded openings to receive similarly threaded ends of a rod 7, at a central point of which is a hand-wheel 8, by means of which said rod can be rotated. The threads on the ends of the rod are oppositely disposed, so that the rotation of such rod operates to move the frames 3 toward or from each other, as desired. This results in a corresponding raising or lowering of the table 2. Endwise movement of the rod 7 is prevented by means of a frame 1^a, supported from the base 1, the arms of which bear against the faces of the wheel 8.

Rigidly attached to one end of the base 1 is a hollow support 9, in the upper part of which is journaled one end of a shaft 10, the other end of said shaft being supported in a bearing in a bracket 9^a secured to the support 9. Mounted on the shaft 10, so as to rotate freely thereon, is a pulley 11, to which movement may be imparted by belting in the usual manner. On the outer side of said pulley is a web 12, in the outer flange of which are held shoes 13, engaged by the outer ends of pins 14, which have a pivotal connection with a clutch sleeve 15, slidable on the shaft 10 and rotatable therewith. The clutch sleeve is fitted with a clutch-lever 16 by means of which it can be moved inwardly on the shaft, forcing the shoes 13 into engagement with the rim of the pulley 11, and imparting the movement thereof to the shaft 10. The pins 14 also have a threaded connection with the sleeve 15, so that by rotating the same the shoes 13 can be varied in position with relation to the rim of the pulley.

On the opposite side of the pulley 11 from the web 12 is a similar web 17, connected with the end of a sleeve 18, loosely mounted on the shaft 10. In the outer flange of the web 17 are shoes 19, engaged by pins 20, pivotally connected with a clutch sleeve 21 slidable on the sleeve 18, and rotatable therewith. Said sleeve can be operated by means of a clutch-lever 22. On the inner end of the sleeve 18 is a gear-wheel 23, in mesh with a gear-wheel 24 of larger diameter on a sleeve 25, adapted to turn loosely upon a shaft 26, rotatable in bearings 27 in the housing 9. To the opposite end of the sleeve 25 is fixed a gear-wheel 28, adapted for engagement with a gear-wheel 29 of larger diameter, fixed on the shaft 10. By operation of the sleeve 21 the shoes 19 are forced outwardly into engagement with the pulley 11,

as shown in Fig. 1. By this means the movement of such pulley can be imparted through the gear-train 23—24—28—29, at a greatly reduced rate of speed.

The shaft 26 has a central enlarged portion 30, eccentrically disposed, and by turning such portion of the shaft downwardly, as shown in Fig. 4, the wheel 24 is moved away from the wheel 23, and the wheels 28 and 29 are similarly separated. The shaft 10 is then free to rotate without interference from said gearing. The shaft 26 may be inverted by means of a handle 31, having a lug 32 for engagement with a notch in the end of the bearing 27, whereby such shaft may be held from movement when the wheels are in mesh.

It is obvious that whenever either of the clutches 13 or 19 is in engagement with the pulley 11, the other one of said clutches must be out of engagement therewith. Nothing is claimed broadly herein on such clutch arrangement, as any suitable clutch devices could be substituted therefor.

On the inner end of the shaft 10, is a head 33, having a central angular opening to receive the similarly formed end of a motor crank-shaft. Such head can also be fitted with chuck devices, if desired, for engagement with the end of a shaft which it is intended to have rotated from the shaft 10.

When the table 2 has been adjusted at any desired height it can be held in place by means of bolts 34, passing through projections 35 on said table and slots 36 in one side of the support 9. Said table has a central opening 37, at the sides of which are secured standards 38, by means of feet 39, which have a pivotal connection with the table by means of bolts 40 passing through the ends of said feet and held in channels 42 in the table top, at the sides thereof. The standards 38 are threaded and provided with clamps 42, adapted to embrace the standards tightly and hold such clamps in adjusted positions thereon. Lock-nuts are also provided on said standards beneath the clamps to hold the same against downward pressure. The clamps 42 are fitted in one of their ends with hollow bolts 43, which may be brought to bear against parts of an engine which is supported on the table 2, to hold the same in place. Engines which have a four point support would be held in place by two pairs of the clamping devices, but for those having a three-point support one pair would be used at the sides, and at the end an additional standard 44, having a foot 45, in which is fixed a bolt 46, held in a channel 47 centrally of the table, at the outer end of the opening 37. The standard 44 is fitted with a clamp 48, similar to the clamps 42. Only the larger class of engines with a removable head can be secured on the table in this way. In the smaller types the hangers thereof are supported on the ends of the clamps 42, or on the ends of adjustment screws in the hollow bolts 43 thereof. The engine body is suspended in the opening in the table, and by adjustment of the clamps 42 and set-screws therein, fine variations can be made in the position of the engine, for bringing the crank-shaft thereof into alignment with the drive-shaft of the lathe, and for other purposes. The engine can also be conveniently reached from beneath, if desired.

For the burning-in operation the motor is supported on the table 2 in an inverted position and the table raised or lowered until the shaft 10 is in line with the crank-shaft of the engine, with which it is coupled, and the clamps 42 moved into position above the engine, and engaged therewith. It will be obvious that by loosening the bolts 40 the standards 38 are capable of adjustment longitudinally of the table 2, and also in a circular field with said bolts as centers. The clamps 42 also have a swinging adjustment upon the standards, and by these various adjustments it is possible to bring the clamps into any desired position with relation to the work on the table.

At the start of the burning-in operation the bearings are likely to be tight, and it is desirable to turn the crank-shaft more slowly and with a greater amount of power, than after they become worn a little. This is accomplished by means of the indirect transmission of the power through the train of gearing hereinbefore described. After the bearings become worn more the shaft 10 is driven directly from the pulley 11, at the increased rate of speed.

For the working out operation, and other work to be performed upon a motor, such motor is held on the table in its natural position, and it can be supported directly on the table, or upon the ends of the clamps 42. Where it is desired to do so, in place of using the hollow bolts 43, common bolts may be employed, passing through the hollow bolts and into convenient openings in the frame of the engine. A rigid connection can thus be secured between the engine and clamp arms.

When the motor is in an inverted position on the table 2 the pistons of such motor can be removed downwardly through the opening 37 in the table, and returned to position therethrough. This obviates the necessity of removing the crank-shaft, as frequently has to be done before the pistons can be taken out. Neither is it necessary to remove the transmission devices in order to drive the crank-shaft from the shaft 10, as the engine can be placed on the table with either end towards the shaft 10, and such shaft coupled directly with the crank-shaft or

with the universal coupling at the end of the transmission devices.

At the outer end of the table 2 is supported an arm 49, by means of a bolt 49ª held in the channel 47, the arm being formed into a fork 50, on the ends of which are bearings 51, for the support of the rear axle of an automobile, the drive-shaft of the car extending above the table 2 and being connected with the end of the shaft 10. By rotation of such drive-shaft the action of the differential can be observed and corrected, if necessary. By movement of the bolt 49ª in the channel 47 the fork 50 can be adjusted with relation to the end of the shaft 10.

It will be seen that with a table of suitable height, an engine or other parts supported thereon will be easy of access. By reason of the engine being held in place by devices at the sides thereof, parts of the engine, such as the engine block, crank-shaft, and other parts can be easily removed and replaced, there being no interfering cross-bars or other devices that have to be removed or replaced in taking out the engine parts.

The invention has been shown and described herein as being specially designed for use in connection with the engines of motor vehicles, but it is not limited to such use, as various applications and adaptations thereof can be made in connection with other uses, without departing from the spirit thereof.

What I claim and desire to secure, is:

A device of the class described, comprising a base; a table supported thereon so as to be vertically adjustable, provided with two or more channels longitudinally thereof and having a central opening adapted to receive an automobile engine; fastening devices adjustable in said channels; threaded posts having an eccentric connection with said fastening devices; clamping arms operable on said posts, and provided with means for tightly engaging the same, to hold said arms from movement; and a drive-shaft supported at one end of said table, said clamping arms also serving as adjustable supports for an engine supported in said opening.

In testimony whereof I affix my signature.

EMORY E. BUTTERFIELD.