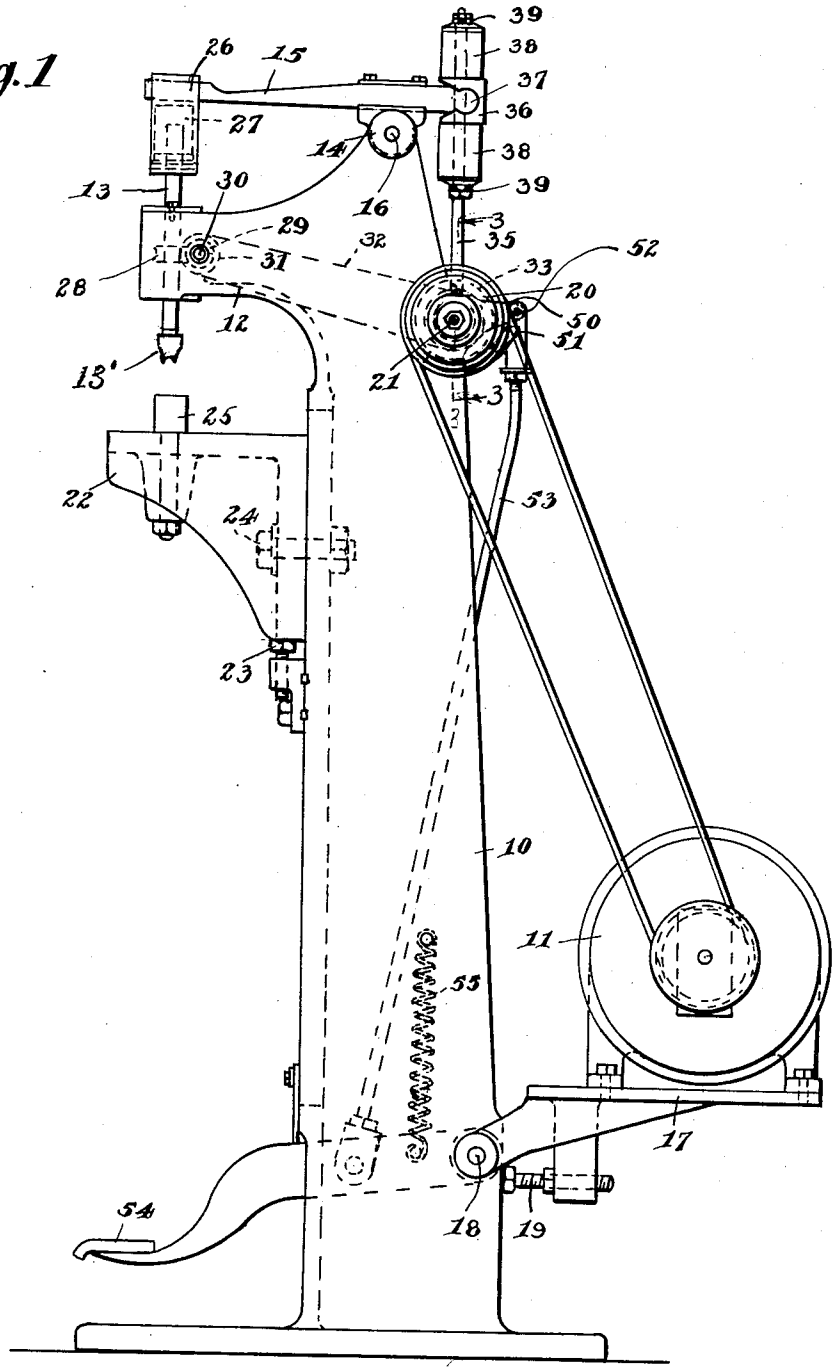
June 12, 1934. F. A. HEILMAN 1,962,715

VIBRATING RIVETER CONTROL

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Fig. 1



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VIBRATING RIVETER CONTROL

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Fig. 2

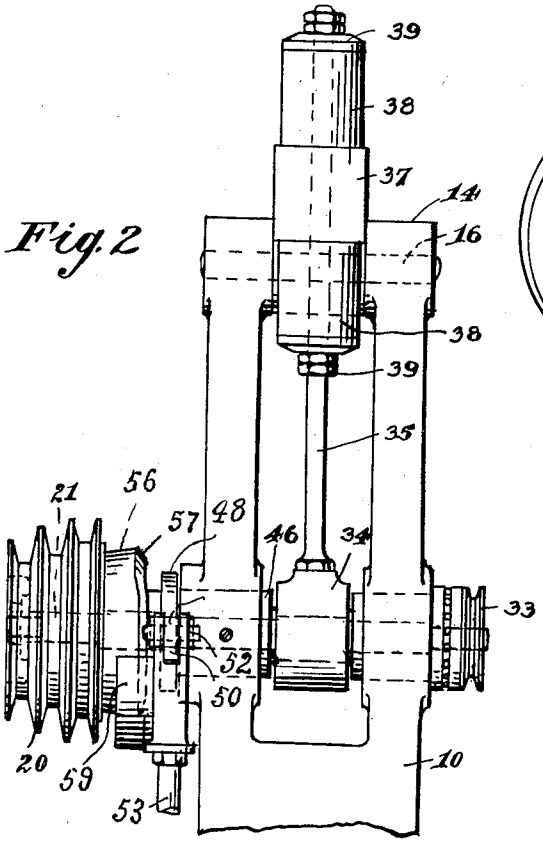


Fig. 5

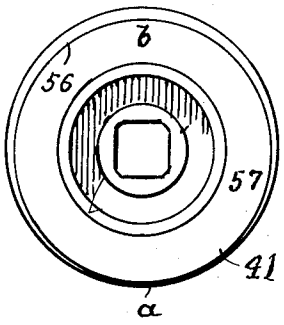


Fig. 6

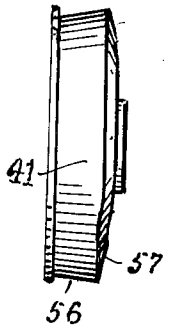


Fig. 7

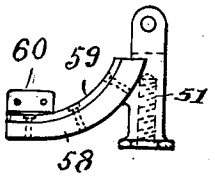


Fig. 8

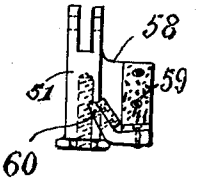


Fig. 3

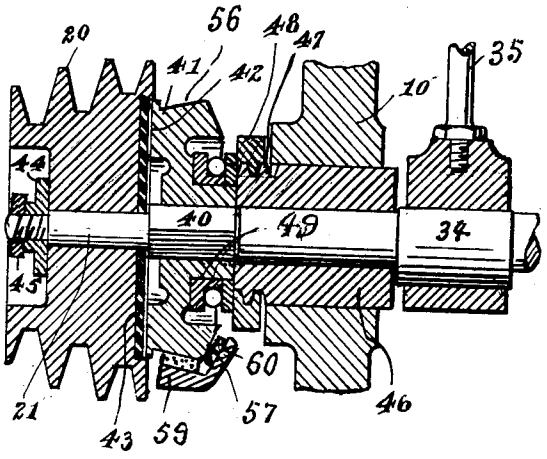
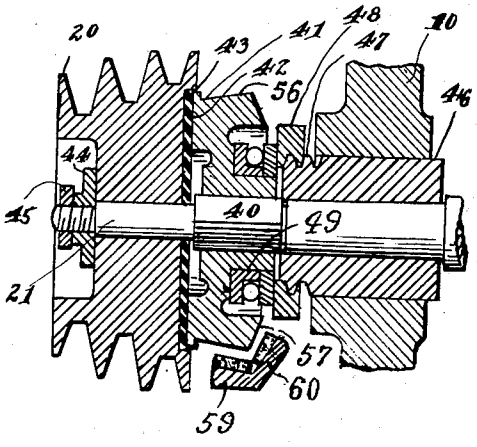


Fig. 4



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Patented June 12, 1934 1,962,715

UNITED STATES PATENT OFFICE

1,962,715

VIBRATING RIVETER CONTROL

Frank A. Heilman, Bridgeport, Conn., assignor to The Grant Manufacturing and Machine Co., Bridgeport, Conn., a corporation of Connecticut

Application September 15, 1933, Serial No. 689,602

5 Claims. (Cl. 192—17)

This invention relates to improvements in rotating vibrating riveters commonly employed for forming heads on rivets or other metal parts, the operations of forming the heads being produced by a rapidly reciprocating and rotating spindle carrying a hammer of suitable formation whereby the end of the rivet is spread.

These head operations are produced by bringing the work to the machine, placing it under the header of the machine for an instant, then withdrawing it and replacing the work if further riveting operations are required.

Some inconvenience has heretofore been experienced in the operation of machines of this type, in that when the machine is stopped at the completion of an operation, the spindle frequently stops at its low point, with the header upon the work which has just been headed so that it has frequently been difficult to remove the finished work without again starting the machine, with a view of having it stop next time, with the spindle and hammer in a raised position. It is therefore the purpose of my invention to provide a simple and dependable means for vibrating riveters of this class whereby when the machine is stopped, its reciprocatory and rotary spindle carrying the header will always stop in a raised position leaving the work free to be removed and replaced as occasion may require.

A further feature of the invention is to apply this improved device to the clutch mechanism so that it becomes effective immediately upon operating the clutch when starting and stopping the machine.

With these and other objects in view, the invention resides and consists in the construction and novel combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size, and minor details of construction within the scope of the claims may be resorted to without departure from the spirit, or sacrificing any of the advantages of the invention.

Similar characters of reference denote like or corresponding parts throughout the several figures of the accompanying drawings forming a part of this specification and upon which

Fig. 1 shows a side elevation of one of the commercial types of rotary vibrating riveters, to which my invention is shown applied;

Fig. 2 shows an enlarged rear elevation of the upper portion of the back of the machine better to illustrate the operating shaft, its connection with the helve, and the driving pulley and clutch through which the helve and hammer are operated;

Fig. 3 shows a further enlarged vertical cross-section taken on line 3—3 of Fig. 1, better to illustrate the driving pulley, clutch, and means for operating same;

Fig. 4 is a cross-sectional view somewhat similar to Fig. 3, except that the clutch member is shown engaged;

Figs. 5 and 6 show detached front and edge views respectively of the movable clutch member having cam faces;

Figs. 7 and 8 show a detached side view and edge view respectively of the brake shoe through which the cammed-face clutch member is operated.

While I have shown my invention applied to a light type of riveter, yet it will be obvious that it can be applied to other types of machines, such as heavy duty hammers, presses, and the like.

Upon the drawings, 10 indicates a pedestal that carries the several parts of the machine including an electric motor 11 for operating the machine, see Fig. 1. The pedestal is for the most part hollow and includes a forwardly projected arm 12 that forms a bearing for the spindle 13 mounted therein for vertical, reciprocatory and rotary movement, as will again be referred to. The pedestal further includes a pair of upwardly projected bearing portions 14, between which the helve 15 is pivotally supported upon a pin 16.

17 indicates a motor bracket which is hingedly supported on a rod 18 extending cross-wise through the lower portion of the pedestal and is provided with a screw 19 for vertically adjusting the bracket and its motor 11 in order to properly position the latter with respect to the driven pulley 20 on shaft 21.

22 represents a table that is adjustably secured to the face of the pedestal by means of an adjustable screw 23 and a bolt 24 so that the table and its mandrel 25 may be properly positioned to support the work, not shown, for riveting operations. The spindle 13 may be of the usual construction, provided with a hammer 13' upon its lower end, and mounted for both rotary and reciprocatory movement, the latter being accomplished through a strapped connection 26 with the long end of the helve 15, there being a suitable rubber cushion 27 positioned between the underside of the helve and the upper end portion of the spindle. A worm gear 28 is mounted upon the spindle within the forwardly projected

arm 12 of the pedestal and is keyed to permit the said spindle to reciprocate within the gear. This gear is engaged by a worm 29 upon a worm shaft 30 extending cross-wise through the arm of the pedestal and projecting from one side sufficiently to accommodate a belt pulley 31 which is connected by a belt 32 with a somewhat similar pulley 33 on the driven shaft 21 and whereby rotary movement for the spindle is obtained from the motor 11 through the said driving shaft 21.

This shaft includes an eccentric 34 that is positioned between the two side portions of the pedestal that form bearings 46 for the said shaft and is connected by a rod 35 with the short end of the helve through the medium of a socketed bearing block 36 that is recessed to receive the rounded short end portion 37 of the helve. Rubber cushion members 38 are mounted upon the rod 35, one above and the other beneath the block 36, and are held in clamped engagement with the said block by means of washers and nuts 39 that threadably engage the said rod. This connection, with the eccentric, obviously tends to impart a rocker movement to the helve and vibratory movement to the spindle.

The shaft 21 mounted in the rear portion of the pedestal is for the most part round, but in addition to the before mentioned eccentric 34 includes a squared portion 40 upon which the movable clutch member 41 is mounted for sliding movement so that its friction face 42 may be brought into and out of engagement with the disk 43 secured in the adjacent side of the pulley 20 which is otherwise free to be rotated upon the outer end portion of the shaft; said pulley being held thereon by means of an adjustable washer-nut 44 and a lock-nut 45. The disk 43 may be formed of asbestos, leather, or other suitable material.

The bearing member 46 for shaft 21 secured in the rear side of the pedestal, see Fig. 1, is provided with a threaded end portion 47 that extends out slightly from the side of the pedestal and upon it is mounted a threaded operating sleeve 48 adapted to turn and move thereon and to and from the side of the pedestal for the purpose of moving the clutch member 41 to engage the pulley and whereby the shaft is driven. A suitable ball thrust bearing 49 is employed between the said sleeve 48 and the clutch member. This sleeve is provided with a rearwardly extended arm 50 to which a brake member 51 is pivotally hung as at 52. One end of a rod 53 is connected to the said shoe while the other end is operatively connected to a foot pedal 54 that is hung to the before mentioned pin 18 in the pedestal. The said pedal is normally held in its raised position by means of a spring 55 which in turn means the raised position of the arm 50, and the released position of the sleeve 48 and the clutch member 41 operated thereby.

From the foregoing description, it will be seen that the clutch may be engaged and disengaged by the operation of the foot pedal to operate the riveting head, but that when the clutch is released the riveting head is liable to stop in one position or another and too frequently in the lowered position, as has heretofore been mentioned. I have therefore provided suitable cam faces 56 and 57 upon the clutch member 41, producing a raised surface as at "a" upon the periphery 56 of the clutch member and a raised cammed surface "b" on the bevelled side 57 of said member, which surfaces are specially positioned with respect to the object to be accomplished, namely that of stopping the spindle and hammer at their high point. In connection with the cam surfaces "a" and "b" of the movable clutch member, I provide an inwardly projecting arm 58 on the hinged brake member 51 and provide upon it two cam engaging shoes 59 and 60 that include suitable linings, the former of which is shaped to engage the conical peripheral surface 56 of the clutch member and the latter to engage the bevelled side surface 57 of the clutch member. These engagements take place of course when the operator removes his foot from the treadle to release the clutch and whereby the engaging surfaces of the shoes press against said surfaces of the clutch member in their respective orders and ride thereon, more or less causing the raised portions "a" and "b" to be alternately engaged, and whereby the clutch member, the shaft, helve, etc., are promptly stopped with the hammer in its raised position.

In this connection, the side shoe 60 engages and holds the high portion "b" of the clutch member until the spindle is in its uppermost position, at which time the said shoe reaches the lower or intermediate portion of the bevelled side face 57, see Fig. 3, when the brake shoe 59 automatically takes hold of the high portion "a" of the peripheral cam 56, which stops the spindle in its high position. The brake shoe 59 cannot contact with the conical peripheral surface 56 of the movable clutch member 41 while the side shoe 60 is in contact with the bevel side face 57. The conical peripheral cammed surface 56 of the movable clutch member 41 is formed at an acute angle with respect to the engaging surface of the clutch member, see cross section Figs. 3 and 4, so that when engaged by the shoe 59, it will insure its disengagement from the clutch face of the pulley when the brake shoe contacts with said conical peripheral cammed surface.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. The combination of a frame, a driving shaft mounted therein, a clutch face driving pulley normally loose on the shaft, a clutch member carried by the shaft for engagement with the pulley and having a beveled peripheral cam and an additional beveled cam side portion, means for operating the clutch member to engage the pulley, and additional means carried by said clutch operating member for engagement with other portions of the clutch member to automatically stop the same and shaft in predetermined positions.

2. The combination of a frame, a driving shaft mounted therein, a clutch face driving pulley normally loose on the shaft, a clutch member carried by the shaft for engagement with the pulley and having a conical shaped cam peripheral surface and a beveled cam side portion, a sleeve for operating the clutch member to engage the pulley, a brake member carried by the sleeve having separate shoes for engaging the conical and beveled cam portions of the slidable clutch member to stop the same and shaft in predetermined positions.

3. The combination of a frame, a driving shaft mounted therein, a clutch face driving pulley normally loose on the shaft, a clutch member slidably mounted on the shaft for the engagement with the pulley and having a conical shaped peripheral cam and a beveled cam side portion, a fixed bearing member, a sleeve in engagement with said bearing to operate the clutch member to engage the pulley, a brake member having separate shoes for engaging both the conical and the beveled cam

portions of the slidable clutch member to stop the same and shaft in predetermined positions.

4. In a vibrating riveter of the class described, the combination of a frame, a driving shaft, a clutch faced driving pulley normally loose upon the shaft, a movable clutch member carried by the shaft for engagement with the pulley, a threadably mounted means for operating the clutch member to engage the pulley, and additional means associated with said clutch operating means for engagement with other portions of the clutch member to stop the shaft in predetermined positions.

5. In a brake mechanism for machines of the class described, the combination of a frame, a driving shaft mounted therein, a clutch member carried by the shaft and having exposed side and peripheral faces, a fixed bearing member, a clutch operating member movably mounted with respect to the bearing member, means carried by the clutch operating member for engagement with both the side and peripheral face of the clutch member to stop the same and shaft in predetermined positions.

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