

Oct. 29, 1940.

R. J. LYON

2,219,484

SCREW DRIVING MACHINE

Filed June 9, 1937

3 Sheets-Sheet 1

FIG. 1.

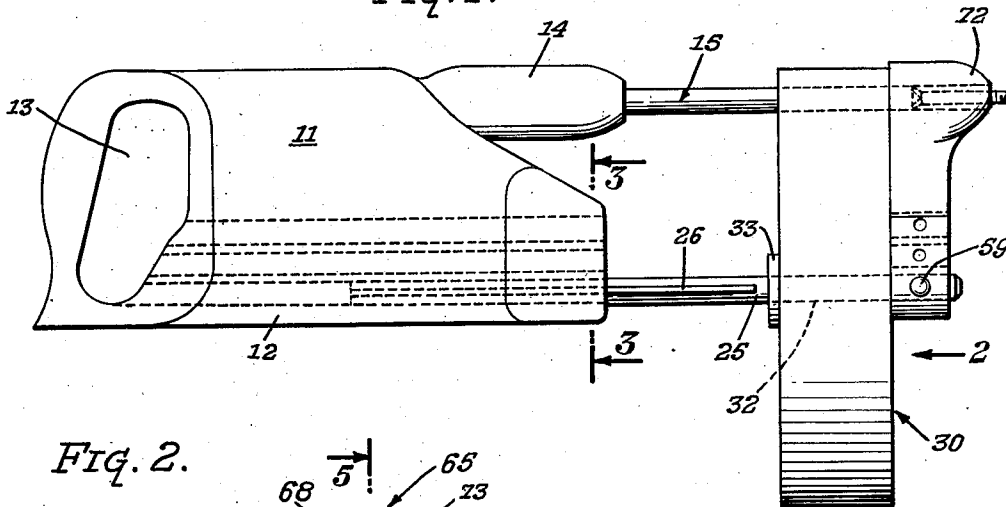


FIG. 2.

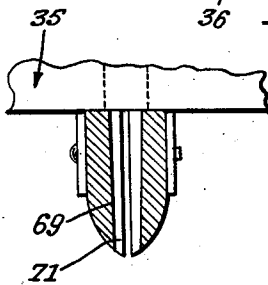
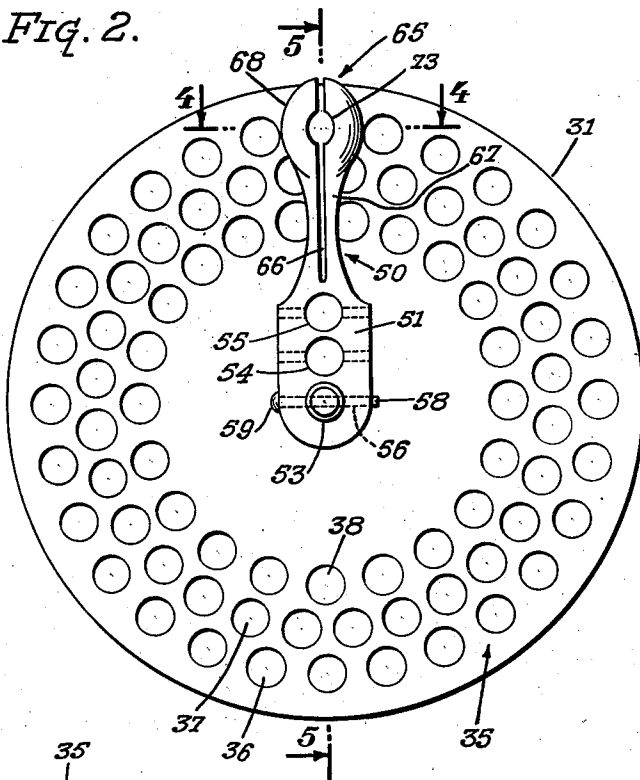
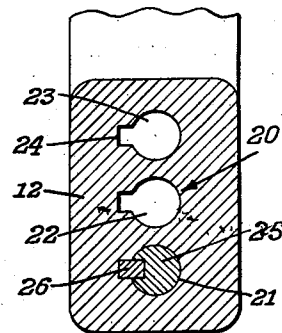


FIG. 4.

FIG. 3.



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FIG. 5.

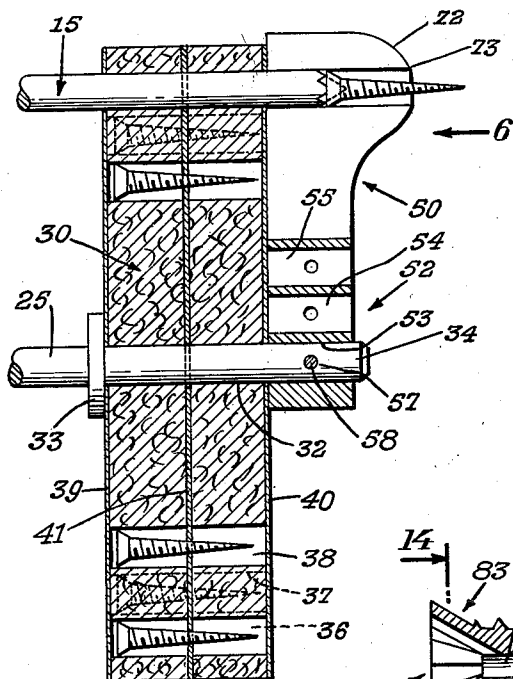


FIG. 15.

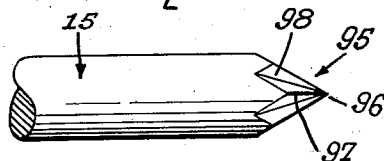


FIG. 14.

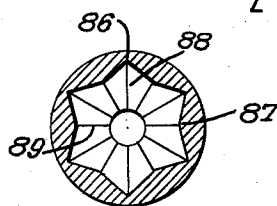


FIG. 13.

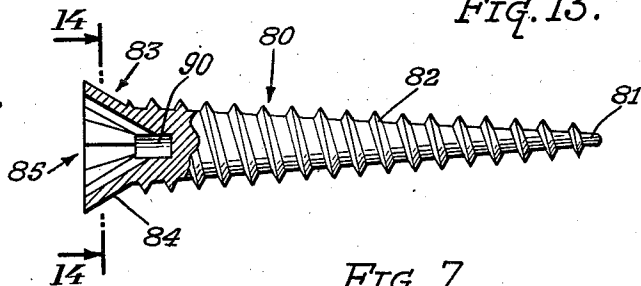


FIG. 6.

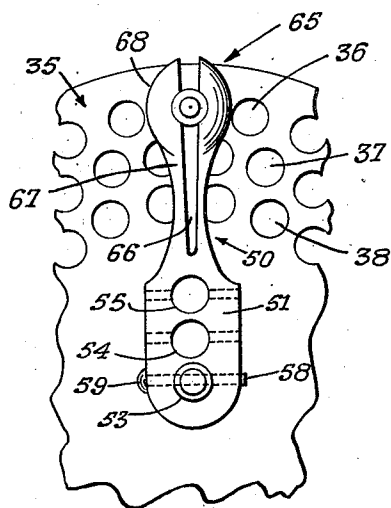
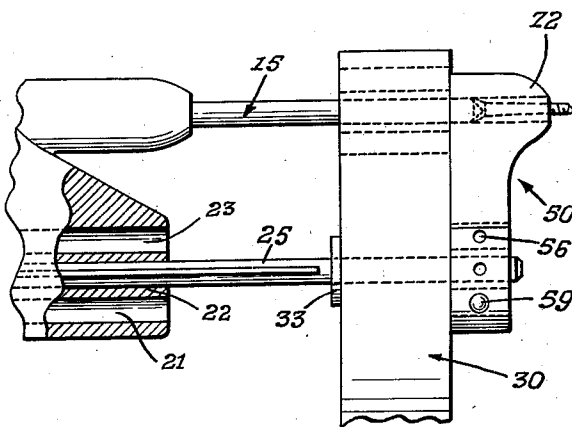


FIG. 7.



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Fig. 11.

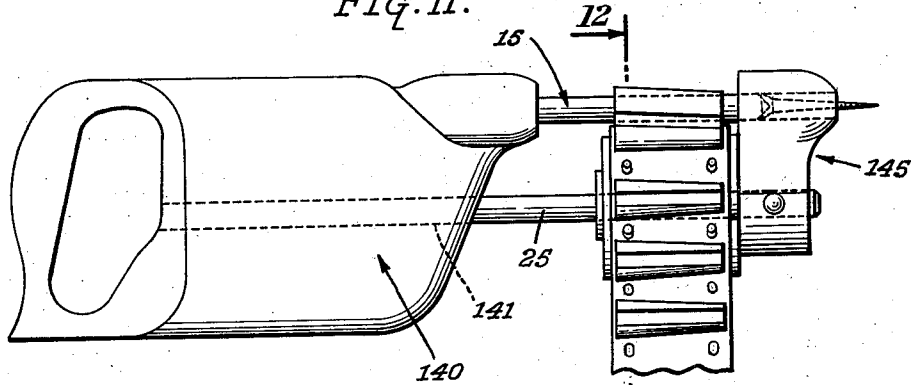


Fig. 10

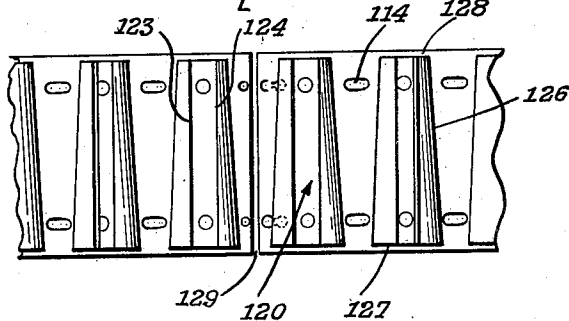


Fig. 12.

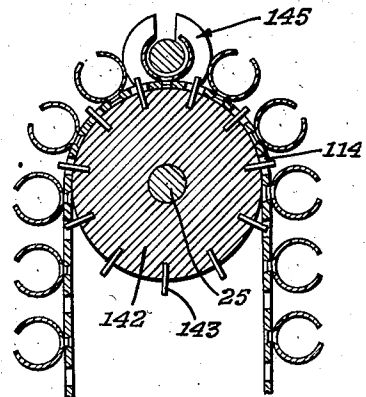


Fig. 8.

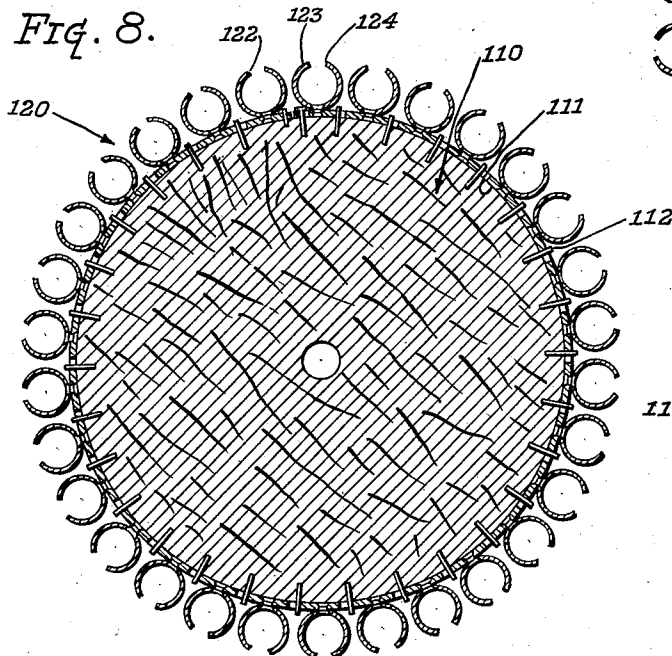
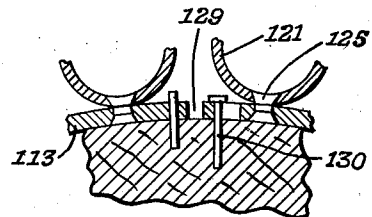


Fig. 9.



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UNITED STATES PATENT OFFICE

2,219,484

SCREW DRIVING MACHINE

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Application June 9, 1937, Serial No. 147,265

13 Claims. (Cl. 144—32)

My invention pertains to a magazine type of screw driver in which the screw driver is power driven as by an electric motor and having a mechanism by which screws may be fed to the work at any angle. In a number of different classes of work in which a large number of wood screws are used, many of the ordinary types of magazine feeds would be inoperative. For instance in building wooden boats, it is now quite the common practice to use wood screws instead of other fasteners and these have to be inserted for instance vertically downwardly, that is, with the head up, sometimes vertically upwardly with the head down, horizontally and at all angles in between. Therefore it is necessary to have a magazine from which the screws may be fed and engaged by the screw driver and driven into the work by the power drive. In this type of work it is usual to have small diameter drilled holes prepared in a prior operation into which the fastening wood screws are to be inserted and threaded into place. A characteristic therefore of the magazine feature of my invention relates to making this in a compact form with a number of pockets in which the individual screws are inserted prior to the magazine being assembled with the screw driver part of the implement, there being one screw in each pocket and the screws are held in the pockets so that they cannot become displaced or fall out of the magazine no matter at what inclination this is held in applying the screws to the work. Another characteristic of my invention is that the screws are located in the magazine in the pockets so that when in operation the axis of the pockets and hence of the screws is always parallel to the axis of the screw driver so that the screw driver may engage the head of the screw in a particular pocket and drive the screw into the work. A further feature of my invention resides in the characteristics of the magazine and the mounting of the screw-driver part of the implement so that the magazine is preferably moved to bring a screw pocket in alignment with the screw driver. Of course if desired the driver may be moved in reference to the magazine, the latter being held stationary.

Considered more specifically, a characteristic of one form of magazine is that such is made in the manner of a drum or circular block having screw pockets formed of a plurality of bores or openings from side to side of the block and arranged in a circle concentric with the axis of the block and each pocket parallel to the axis of the block. This type of magazine may then be

mounted for rotating and relatively sliding motion on a support connected to an electric motor or the like which is utilized to drive the screw driver. In this manner the magazine may be turned to align any pocket with the screw driver and the screw driver advanced through the pocket to pick up the screw and drive this into the work.

Another feature of my invention relates to a guide structure for the screws and the screw driver after the screws have been forced from the pockets of the magazine. This is mounted on the face of the magazine remote from the handle end of the machine and may be rotated to align the guide jaws with the pocket from which a screw is to be removed and guided to the work in the operation of the screw driver, this being advanced through the pocket of the magazine and through the guide. Another characteristic of the guide is that the jaws are resiliently mounted on a hub-like block. Such block is keyed to the shaft or support on which the magazine is mounted and connected to the motor frame and handle end of the implement. The resilient mounting of the guide jaws permits their spreading while the head of the screw is forced through the guide.

A further feature of my invention when using a drum-like magazine resides in a construction of the holder body which has the electric motor and clutch for the screw driver having a plurality of deep guide sockets for the shaft on which the magazine is mounted. Therefore this shaft may be shifted as to the radial distance between the shaft and the screw driver so that a plurality of circles of screw pockets may be formed in the magazine drum, these all being concentric to the axis of the drum. Therefore when working from an outside circle to an inside circle, the shaft is shifted to a socket lessening the radial distance from the shaft to the screw driver and also the guide jaws for the screw has a hub with a plurality of perforations for engaging the end of the shaft, thus changing the radial distance from the shaft to the axial line of the resilient jaws. Another feature of my construction resides in having a splined or similar connection between the shaft and the deep sockets so that the shaft is maintained from rotation and the drum rotates on the shaft being operated by hand therefore the guide jaws are secured to the shaft by a pin or the like to prevent rotation of the guide jaws and hold these always in alignment with the screw driver.

Another feature of my invention is making the

magazine for the screws in the form of a belt with resilient sockets preferably made of spring metal for holding the screws. Such a belt may be of a desired length to encircle the drum on its periphery, bringing the resilient sockets in alignment with the screw driver as the drum is rotated on the shaft. In this case the ends of the belt may form a butt connection on the periphery of the drum.

Another characteristic of my invention in using a belt type of magazine resides in having a long belt with the resilient spring jaw sockets mounted thereon and this belt may be fed over a relatively small drum, being properly guided by a sprocket like arrangement so that the individual pockets and their screws contained therein are in succession brought into alignment with the screw driver. In this case the belt may be a long strip or the ends of the strip may be connected together forming an endless type of belt.

A further feature of my invention relates to the construction of the wood screw and the screw driver, particularly the head of the screw and the driving point or end of the screw driver. Such head of the screw is preferably made conical on its outside surface to fit in a countersunk recess in the wood and an angular socket is formed in the end of the screw. This socket is preferably somewhat star-shaped having outwardly projecting points and inwardly extending projections, the point of the screw driver having a complementary somewhat cone shaped end with star-shaped projections and indentations so that this point centers itself in the socket of the screw and by the interfitting of the star-shaped point of the screw driver and the star-shaped socket of the screw, a rotational drive is delivered from the rotating screw driver to the screw for feeding such screw into the work. The socket of the screw driver preferably is provided with a cylindrical bottom of the socket to prevent the point of the screw driver touching the metal of the screw.

My invention is illustrated in connection with the accompanying drawings, in which:

Fig. 1 is a side elevation of one form of my invention showing the motor housing with a handle and having the deep sockets for different placements of the shaft, the drum-like magazine being shown as rotatable on such shaft, the screw driver is mounted parallel to the shaft.

Fig. 2 is a front elevation taken in the direction of the arrow 2 of Fig. 1.

Fig. 3 is a detail section on the line 3—3 of Fig. 1 showing the deep sockets for engaging the splined shaft.

Fig. 4 is a detail section on the line 4—4 of Fig. 2 through the resilient guide jaws of the screw guide.

Fig. 5 is a diametrical section taken on the line 5—5 of Fig. 2 in the direction of the arrows through the drum-like magazine and the screw guide.

Fig. 6 is an enlarged front elevation taken in the direction of the arrow 6 of Fig. 5 of the screw guide.

Fig. 7 is a partial elevation similar to Fig. 1 broken away to show the shifted position of the shaft and guide jaws when using the screw driver on the screws in an inner circle of pockets.

Fig. 8 is a section through a modified form of the drum having the screw pockets mounted on a belt, each pocket being provided with resilient jaws, the belt being flexible.

Fig. 9 is a partial view similar to Fig. 8 but on an enlarged scale showing the mounting of the screw pockets on the belt.

Fig. 10 may be considered a developed elevation of the belt and some of the screw pockets.

Fig. 11 is a side elevation of a modified construction showing the belt operating on a small drum and in which the shaft of the drum and the screw driver are retained at a constant radial distance.

Fig. 12 is a transverse section on the line 12—12 of Fig. 11 in the direction of the arrows.

Fig. 13 is an elevation partly broken away of my improved screw.

Fig. 14 is a detail cross section of the head of the screw taken on the line 14—14 of Fig. 13 in the direction of the arrows.

Fig. 15 is an elevation of the driving point end portion of the screw driver.

Considering the form of my invention illustrated in Fig. 1 and the associated figures, a combination motor housing and holder is indicated by the numeral 11. This has a substantial body portion 12 at the bottom, a handle 13 is at one end, a combination motor with a clutch assembly is located in the housing and has a journal extension 14 for the rotatable screw driver 15. This screw driver is of constant length and may be operated in the ordinary manner by means of a trigger-like device which may actuate an electric switch for energizing the motor and have also if desired a clutch so that the screw driver may be driven by a closed clutch connection or maintained without rotation when the clutch is open. These are more or less common characteristics of power actuated screw drivers of the electric drive type.

In the body portion 12 of the housing I provide a series of deep sockets 20 of which there are three illustrated, these being the lowest socket 21, the intermediate 22 and the uppermost socket 23. Each of these has a keyway 24 extending longitudinally of the deep socket. A single cylindrical shaft 25 has a spline 26 connected thereto and fits any of the sockets, the shaft sliding in such sockets but on account of the spline connection is non-rotatable. Rotatably mounted on the shaft I provide a magazine drum 30. This may be made of any suitable material of a relatively cheap character such as pressed fiber such as fiber board, a suitable grade of cardboard or if desired, of wood. The drum has a cylindrical periphery 31 and a central bearing perforation 32. A collar 33 on the shaft limits the position of the magazine drum when it is fitted over the end 34 of the shaft 25. The magazine is provided with a plurality of screw pockets 35, these being illustrated as arranged in concentric circles such as an outer circular row 36, an intermediate row 37 and an inner row 38. These pockets are of such size to receive the screws, preferably the heads of the screws having a snug fit in the pockets and in order to prevent the loss and displacement of the screws, the opposite faces of the drum may have coverings indicated at 39 and 40 which coverings are of preferably tough material such as oil paper, Cellophane or the like. The side 39 confines the heads of the screws and the covering 40, the points. If desired and in addition, the drum may be made up with an intermediate diaphragm 41 which may be of tough material such as paper, other fibrous structure or Cellophane through which in filling the magazine the screws are thrust thus perforating the diaphragm and

holding the screws in place. In constructing the drum with the diaphragm it is preferably made of two or more side pieces glued together with the screw pockets in proper alignment. It will be understood that the coverings 39 and 40 are sufficiently transparent so that the screws and the pockets are readily observable by the operator and that they may be engaged by the screw driver.

10 A screw guide jaw assembly 50 has a hub section 51 forming a substantial block with perforations 52, of which three are shown, there being an end perforation 53, an intermediate perforation 54 and a third perforation 55. The block is provided with a transverse pin receiving hole 56 for each shaft perforation and the shaft 25 is provided with a similar perforation 57 through which a holding pin 58 may be inserted. This pin has a large head 59 which may readily be engaged by the fingers for inserting and removing the pin.

The guide jaw assembly 50 has a pair of resilient jaws 65 formed by providing a split 66 in a laterally extending arm 67 which is connected to the hub and preferably formed integral therewith. The jaw ends 68 have substantially semi-circular tapered grooves 69, these being complementary, thus forming a relatively large opening substantially circular in cross section adjacent the outer face of the drum and having a smaller opening 71 when the jaws are together remote from the drum. The ends of the jaws have a somewhat conical shape projection 72 terminating in an edge 73 at the outer portion of the cone. The screws are forced through these resilient guide jaws in the manner hereinunder described by the operation of the screw driver and force the jaws apart as the screw is fed to the work somewhat as shown in Figs. 5 and 6.

40 The characteristics of a suitable screw and screw driver for use with my invention is illustrated particularly in Figs. 13, 14 and 15 in which the screw is designated by the numeral 80, such screw having the usual point 81 and screw threads 82, the head 83 has an outside conical surface 84 and a socket 85. Such socket tapers and is characterized as being somewhat star-shaped with projecting points 86 and inward projections 87, there thus being a series of outwardly extending angles 88 and the opposite series of angles 89. These terminate in a cylindrical depression 90 at the base of the socket or any suitable recess at the base of the socket may be provided to prevent the point of the screw driver engaging the metal of the screw. The screw driver 15 has a driving end 95 for the point 96. This is also somewhat star-shaped having a series of outer angles 97 and inner angles 98, these being complementary to the angles of the socket. This causes the screw driver to be self centering in the heads of the screws and on account of the interfitting of the somewhat star-shaped construction of the socket and of the driver point, a rotational drive may be communicated to the screw. As above mentioned, it is usual to have a series of small drill holes in the wood prior to inserting the screws and these to be countersunk to accommodate the screw heads so that the heads may be driven well below the surface of the wood.

In operating my magazine type of power screw driver and presuming that the magazine has all the pockets filled with screws and such screws are confined in the pockets to prevent loss, the drum is first assembled on the shaft 25, the guide

jaw assembly may then be attached to the end of the shaft and secured against rotation by the pin 58. Then presuming it is desired to first use the screws in the outer circle 36, the shaft 25 is inserted in the lowest socket 21 in the body 5 of the housing and is held from rotation by the spline 26. This gives the maximum radial distance between the screw driver and the shaft 25 and when making the assembly on account of the shaft being movable longitudinally of the holder, 10 the screw driver does not enter a screw pocket until it is desired to drive the screw in such pocket into the work.

On account of the drum being rotatable on the shaft 25 this may be turned by hand to bring 15 any one of the outer circle of pockets 36 in alignment with the screw driver and on account of the guide jaw assembly 50 being non-rotatable on the shaft 25, the conical shaped gripping surfaces at the jaw ends are always in alignment 20 with the screw driver. The operator may then thrust the driving end of the screw driver into a pocket, perforating the cover 39 where such is used and as this is preferably transparent, he may readily see the screw head, however the 25 pointer end is self centering in the socket of the screw. The rotational drive of the screw driver may be started either before or after the screw driver end is inserted in the socket. The shaft is by hand removed inwardly in the socket of 30 the holder and this causes the screw driver to force the screw out of its pocket into the opening in the guide jaws and on account of these jaws being resilient they grip the head of the screw, the point of the screw is then centered in the 35 work, preferably at a small drill hole and as the screw is driven into the work the wood contacting the cone shaped end 72 of the guide forces the shaft 25 inwardly into its deep socket or else this may be forced in by hand while the screw 40 is being rotated and driven into the work. Manifestly as the cone shaped head of the screw is forced through the guide jaws these are expanded or pressed apart somewhat as shown in Fig. 6. In this manner all of the screws may be driven 45 from the outer circle 36.

To remove the screws from the inner circle presumably from the circle 37, the shaft 25 is shifted to the intermediate deep socket 21, the pin 58 is removed so that the guide jaw assembly may be 50 assembled on the end of the shaft 25, this engaging in the perforation 54 and the pin is then replaced. This thus reduces the radial distance between the screw driver 15 and the shaft 25 so that the screws may be driven from the intermediate circle of pockets 37. In like manner the shaft may be shifted to the deep socket 23 and the screw guide shifted to bring the perforation 55 on the end of the shaft 25 and the 55 screws may be removed and driven from the 60 inner circle of pockets 38. It will thus be seen that by providing a plurality of circles of screw pockets in a cylindrical type of drum a large number of screws may be accommodated in the magazine and by reciprocating the shaft 25 with 65 the drum assembly thereon in reference to the screw driver and turning the drum and also making the radial change of distance between the screw driver and the shaft 25, it will be apparent that a large number of screws may be driven in 70 quite a rapid manner. The magazine drum is preferably made of inexpensive material so that when emptied it may be discarded. However if desired screws may be re-inserted in the pockets and covering such as 39 and 40 pasted on the 75

sides of the drum. The screw driver readily perforates such covers.

In the construction of Figs. 8, 9 and 10, instead of using the magazine drum with screw pockets formed therein, I utilize a drum 110 with a cylindrical periphery 111 from which project a series of pins 112, such pins preferably being without heads. A belt 113 which may be formed of leather, fabric or thin metal has a series of perforations or short slots 114. Spaced between these slots are resilient screw pockets 120, each of which is formed of a metal band bent in the form of an arch indicated at 121, the arch however being open as indicated at 122 between the edges 123 and 124. At the base of each arch two or more rivets 125 secure each strip to the belt. It will be noted that the screw pockets are somewhat cone-shaped having a taper as indicated at 126 from the head end 127 through which the screws may be inserted, the points of the screws being towards the end 128. The spring pockets have sufficient resiliency to engage and hold the screws by the heads. A belt of this type may be fitted on the drum by fitting the slots or perforations 114 over the pins or pegs. There is then left a space 129 between the two ends of the belt and adjacent each space the belt ends may be held by pins with heads indicated at 130 or screws extending through the end perforations 131 into the drum. In this case the drum may be made of wood or if desired of metal with provision for the end pegs 130. These may readily be removed for replacement of the belt.

In this construction the drum is fitted on the shaft 25 but in such case it is not necessary to move the shaft into the different sockets 20 as the screw pockets are all at the same distance from the center. Likewise the guide jaw assembly does not need to be shifted as to the radial distance from the shaft 25 to the screw driver 15. In operation the drum is turned by hand to align a screw pocket with the screw driver and this also aligns the guide jaws. The shaft 25 is then moved inwardly in the housing carrying the magazine so that the screw driver engages the head of a screw and presses this outwardly in the resilient screw pocket, such pocket forming a slight resistance to the feeding of the screw into the jaw guide and into the wood. The screw driver may extend completely and longitudinally through each screw pocket and also through the jaw guide until the screw is properly secured in the wood. By this construction it will be seen that a number of belts may be filled with the screws and as soon as one belt has been emptied, another belt may be placed on the drum.

In the construction of Figs. 11 and 12, the motor housing and holder 140 is somewhat the same as that shown in Fig. 1 except that there is only one socket, 141, for the shaft 25. In this case only a small drum indicated at 142 is utilized, this having a series of pins or pegs 143 which cause the drum to function as a sprocket wheel. The belt may be of the same general construction as depicted in Figs. 8, 9 and 10 and described in connection with such figures, having the series of screw pockets 120 with the perforations or slots 114 between adjacent pockets. In this case the resilient jaw assembly 145 is shorter than that illustrated in Figs. 1 and 2 as the radial distance between the shaft 25 and the screw driver may be considerably less. In this arrangement the belt may be quite long and if desired, the ends may be connected by any suitable connecting device. In this arrangement the screw pockets are

filled with screws and the drum may be turned by hand, the pegs 143 thus being operative to feed the belt to bring each screw pocket in its turn in alignment with the screw driver and the guide jaws. The device is then manipulated to force the screw driver through the screw pocket through the resilient guide jaws and thread the screw into the wood. It will therefore be seen that for certain types of work a large number of screws may be fitted in the screw pockets of the belt. Moreover on account of these pockets being made of resilient metal or the like a considerable variation in size of the screws may be accommodated. Various changes may be made in the details of the construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. In a screw driving machine a screw magazine having a shaft and a drumlike structure rotatably mounted thereon, said structure having flat opposite sides, a central diaphragm, a plurality of circles of screw pockets extending from side to side, each circle being concentric with the shaft, the diaphragm being adapted to be pierced by screws inserted in the pockets, a covering material on each side forming a closure for the screw pockets to confine screws therein, the covering on the side adjacent the heads of the screws being transparent whereby a screw driver may be engaged with the head of any screw, the screw driver being adapted to be forced through the transparent covering and force the screw through the diaphragm and the covering on the opposite side.

2. In a screw driving machine, a drum magazine having a shaft, the periphery of the drum being cylindrical, a flexible belt removably secured to the periphery of the drum, the belt having a series of screw pockets, each formed of a metal band in the form of a partial arch with an opening remote from the belt, each pocket being secured to the belt, the inside of each pocket being slightly tapered to engage and retain a screw and being of resilient material to permit spreading as the head of a screw is forced through the screw pocket.

3. A screw driver machine having a holder for a motor and a screw driver rotatably mounted in the holder driven by the motor and non-slidable in the holder, the combination of a support slidably mounted in the holder, a magazine rotatably mounted on said support with its axis parallel to the screw driver, said magazine having pockets concentric with the axis for screws with means to retain the screws from falling out of the pockets no matter in what position the magazine is held, the magazine on rotation aligning any pocket with the screw driver whereby on a movement of the magazine towards the holder, the screw driver engages a screw in a pocket and forces it out of such pocket into the work to have the screw attached, the support being guided in the holder for rectilinear but non-rotatable motion, a screw guide assembly having a hub portion attached to the said supporting structure and provided with radial resilient arms having a split therebetween extending radially from the hub, a jaw on each arm, the said jaws having tapered faces to conform to the shape of the screw and alignable with the screw pockets and the screw driver whereby after the screws are forced from the screw pockets by the screw driver they are forced through the jaws into the work.

4. A screw driver machine having a holder for a motor and a screw driver rotatably mounted in the holder and driven by the motor and non-slidable in the holder, the combination of a support slidably mounted in the holder, a magazine rotatably mounted on said support with its axis parallel to the screw driver, said magazine having pockets concentric with the axis for screws with means to retain the screws from falling out of the pockets no matter in what position the magazine is held, the magazine on rotation aligning any pocket with the screw driver whereby on a movement of the magazine towards the holder, the screw driver engages a screw in a pocket and forces it out of such pocket into the work to have the screw attached, the magazine having a series of concentric screw pockets, the said supporting structure having means for attaching same in different positions on the holder and thus at different radial distances from the screw driver, whereby the screw driver may be aligned with any of the concentric series of screw pockets.

5. A screw driver machine having a holder for a motor and a screw driver rotatably mounted in the holder driven by the motor and non-slidable in the holder, the combination of a support slidably mounted in the holder, a magazine rotatably mounted on said support with its axis parallel to the screw driver, said magazine having pockets concentric with the axis for screws with means to retain the screws from falling out of the pockets no matter in what position the magazine is held, the magazine on rotation aligning any pocket with the screw driver whereby on a movement of the magazine towards the holder, the screw driver engages a screw in a pocket and forces it out of such pocket into the work to have the screw attached, the magazine having a series of concentric screw pockets, the said supporting structure having means for attaching same in different positions on the holder and thus at different radial distances from the screw driver, whereby the screw driver may be aligned with any of the concentric series of screw pockets, the support being guided in the holder for rectilinear but non-rotatable motion, a screw guide assembly having a hub portion attached to the said supporting structure and provided with resilient arms having a split therebetween extending radially from the hub, a jaw on each arm, the said jaws having tapered faces to conform to the shape of the screw and alignable with the screw pockets and the screw driver whereby after the screws are forced from the screw pockets by the screw driver they are forced through the jaws into the work.

6. A screw driver machine as claimed in claim 5, the hub of the screw guide assembly having spacing means for attachment to the supporting structure spacing the jaws at variable radial distances therefrom to align the jaws with the concentric series of screw pockets.

7. In a screw machine a magazine including a rotatable drum combined with a flexible belt having one surface removably engaging the drum, the belt having a series of screw pockets on the side remote from that in contact with the drum, a resilient means connected with each pocket to retain a screw therein and to release by spreading as the head of the screw is forced through the screw pocket, each pocket being located and having a structure to retain the screws parallel to the axis of the drum.

8. A magazine belt for a screw-machine in-

cluding a flexible belt constructed and adapted to be removably secured to the periphery of a drum for shifting as the drum rotates, the belt having a series of screw pockets attached thereto each formed of a metal band in the form of a partial arch with an opening remote from the side of the belt to which the metal band is attached, the inside of each pocket being slightly tapered to engage and retain a screw and being of resilient material to permit spreading as the head of a screw is forced through the screw pocket, the axis of each partial arch forming the screw pocket being transverse to the belt and adapted to position screws parallel to the axis of the drum over which the belt is adapted to move.

9. In a screw driving machine, the combination of a holder for a motor, a screw driver rotatably but non-slidably mounted in the holder for actuation by the motor, a shaft offset from the screw driver connected to the holder and having a rotatable structure mounted thereon, a magazine having screw retaining pockets operatively connected to the said rotatable structure whereby on rotation of such structure, the screw driver may be aligned in succession with the screw pockets and the screws therein and means constructed and adapted for a relative rectilinear sliding motion of the said rotatable structure with the magazine and the holder including the motor and the screw driver whereby screws may be engaged by the screw driver and forced from the pockets into work to receive the screws, a screw guide assembly including a hub non-rotatably attached to the shaft and a split arm extending laterally therefrom with a pair of screw gripping jaws on the end, the said jaws being alignable with the screw pockets whereby screws thrust by the screw driver therefrom engage the jaws and are guided into the work to receive the said screws.

10. In a screw driving machine the combination of a holder for a motor, a screw driver rotatably but non-slidably mounted in the holder for driving by the motor, a shaft connected to the holder and parallel to the screw driver, a magazine rotatably mounted on the shaft and having a series of screw receiving pockets concentric to the shaft and forming at least a part of a circle, the magazine when rotated aligning the screw pockets in succession with the screw driver, a slidable mounting for the magazine and the holder on the shaft whereby the screw driver may engage screws in each screw pocket in a sequence and displace the screws for driving such screws into the work to receive the screws, the magazine having a plurality of circles of screw pockets concentric with the shaft, means to mount the shaft in a different position in a holder to vary the radial distance between the shaft, the screw driver and the series of pockets to be aligned with the screw driver.

11. In a screw driving machine the combination of a holder for a motor, a screw driver rotatably but non-slidably mounted in the holder for driving by the motor, a shaft connected to the holder and parallel to the screw driver, a magazine rotatably mounted on the shaft and having a series of screw receiving pockets concentric to the shaft and forming at least a part of a circle, the magazine when rotated aligning the screw pockets in succession with the screw driver, a slidable mounting for the magazine and the holder on the shaft whereby the screw driver may engage screws in each screw pocket

in a sequence and displace the screws for driving such screws into the work to receive the screws, the magazine having a plurality of circles of screw pockets concentric with the shaft, means
 5 to mount the shaft in a different position in a holder to vary the radial distance between the shaft, the screw driver and the series of pockets to be aligned with the screw driver, a screw guide assembly having a hub with screw guide jaws
 10 resiliently connected to the hub, the hub having means for attachment to the shaft whereby the radial distance from the shaft to the guide jaws may be varied to align the guide jaws with any one of the circle of screw pockets and with the
 15 screw driver.

12. In a screw driving machine the combination of a holder for a motor, a screw driver rotatably but non-slidably mounted in the holder for driving by the motor, a shaft connected to
 20 the holder and parallel to the screw driver, a magazine rotatably mounted on the shaft and having a series of screw receiving pockets concentric to the shaft and forming at least a part of a circle, the magazine when rotated aligning
 25 the screw pockets in succession with the screw driver, a slidable mounting for the magazine and the holder on the shaft whereby the screw driver may engage screws in each screw pocket in a sequence and displace the screws for driving
 30 such screws into the work to receive the screws,

the magazine having a belt secured to its periphery, such periphery being a circle and each pocket being formed on the belt and of resilient material adapted to engage and retain a screw
 5 whereby the screws may be discharged without destruction of the said pocket.

13. In a screw driving machine the combination of a holder for a motor, a screw driver rotatably but non-slidably mounted in the holder
 10 for driving by the motor, a shaft connected to the holder and parallel to the screw driver, a magazine rotatably mounted on the shaft and having a series of screw receiving pockets concentric to the shaft and forming at least a part
 15 of a circle, the magazine when rotated aligning the screw pockets in succession with the screw driver, a slidable mounting for the magazine and the holder on the shaft whereby the screw driver may engage screws in each screw pocket in a
 20 sequence and displace the screws for driving such screws into the work to receive the screws, the magazine comprising an elongated belt having a series of screw pockets formed of resilient material of at least partly circular form at any cross
 25 section, the resilient material being sufficiently rigid to prevent destruction by the displacement of the screws by the screw driver and there being a drum-like device rotatably mounted on the shaft engaging the said magazine.

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