

Feb. 10, 1925.

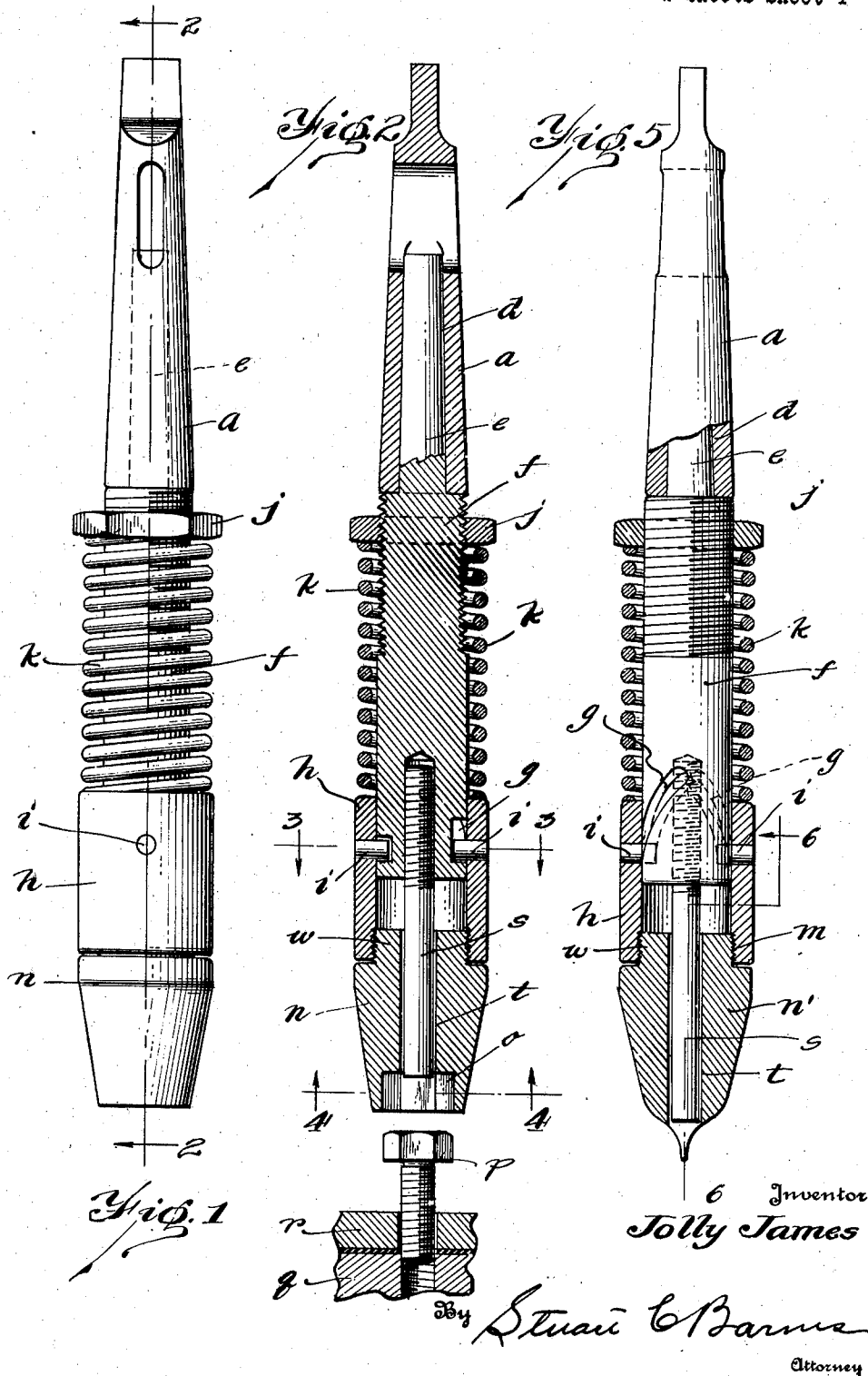
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J. JAMES

POWER DRIVEN TOOL

Filed Oct. 27, 1923

2 Sheets-Sheet 1



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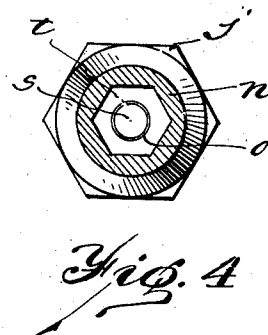
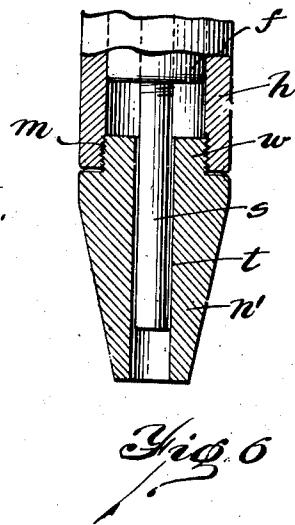
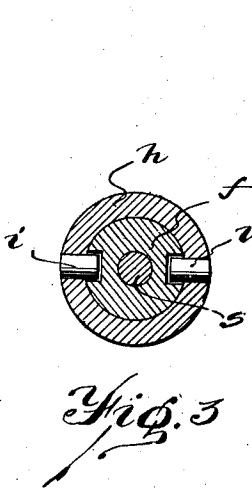
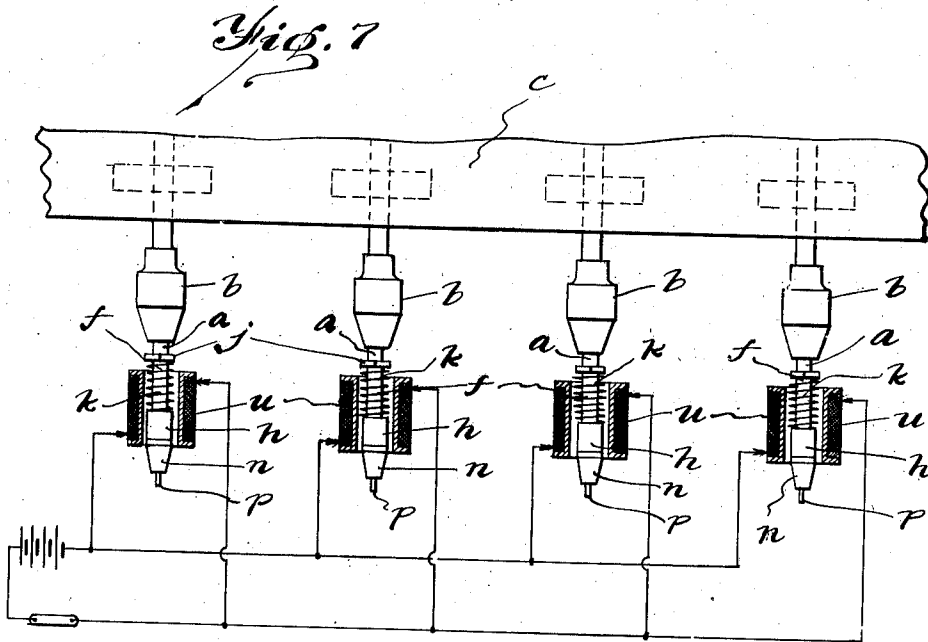
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

JOLLY JAMES, OF DEARBORN, MICHIGAN.

POWER-DRIVEN TOOL.

Application filed October 27, 1923. Serial No. 671,115.

To all whom it may concern:

Be it known that I, JOLLY JAMES, a citizen of the United States, residing at Dearborn, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Power-Driven Tools, of which the following is a specification.

This invention relates to a power driven tool that may be used with a drill press. The object of the invention is to provide a tool that is connected up in direct driving relation with a drill press for the purpose of performing an operation on a piece of work. One example shown in the drawings is the utilizing of this tool as a socket wrench whereby bolts may be screwed into a piece of work, as for instance, bolts screwed into a cylinder block for securing the cylinder head on the block.

Another object is to so arrange the mechanism that the tool will be retracted thereby causing the tool to be disengaged from the work when the bolt is screwed down. A further object is to interpose yieldable means between the driving shank and the tool whereby the latter may be driven directly but when the tool meets a resistance tending to stop the rotative movement of the tool, the tool will be retracted and will overcome the yieldable means tending to force the same in engagement with the work.

Another object is to provide the tool with a holder, whereby socket wrenches of different sizes may be detachably secured thereto and other tool heads such as a screw driver or other forms of wrenches may be used.

A further object is to provide means whereby the said tool may be utilized in connection with a multiple drill press for simultaneously screwing down a plurality of bolts. In this connection, means may be provided whereby the bolts may be set in the tool and held therein before the machine is set in operation.

In the drawings:

Fig. 1 is a side elevation of the tool.

Fig. 2 is a vertical longitudinal section there through taken on the line 2—2 of Fig. 1.

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 2.

Fig. 4 is a transverse section taken on the line 4—4 of Fig. 2.

Fig. 5 is a view similar to Fig. 2, partly

in section and showing another form of tool secured in the holder.

Fig. 6 is a section on the line 6—6 of Fig. 5.

Fig. 7 is an elevational view showing the tools used in connection with a multiple drill press and showing the magnets for retaining the bolts in the sockets.

The tool comprises a driving shank *a* which is adapted to be secured in the chucks *b* carried by a drill press *c*. The drill press may be a single or a multiple press. The driving shank is provided with a longitudinal hole *d* in which the tapered shank *e* of the tool support is fitted. The body of said tool support is of a larger diameter than the tapered shank *e*, the upper part of said enlarged portion being screw threaded as at *f*, while the lower portion is provided with the inclined grooves *g*. A sleeve *h* is slidably supported on this tool support and is provided with a pair of pins *i* which are adapted to engage in the grooves *g*, thereby retaining the sleeve on the tool support and providing a direct driving connection between the tool support and the sleeve. A nut *j* is screwed on the threaded portion of the tool support and a spring *k* is interposed between this nut and the sleeve tending to force the sleeve downwardly and hold the pins *i* at the bottom of the inclined grooves *g*. Obviously the compression in the spring *k* can be increased by screwing down the nut *j*.

The lower end of the sleeve *h* is interiorly threaded as at *m* and a tool *n* is provided with a threaded portion *w* adapted to engage the interior threads of the sleeve for detachably securing the tool to the sleeve *h*. This tool as shown in Fig. 2 and 4 is provided with a recess *o* hexagonal in cross section, which is adapted to fit over the hexagonal head of the bolt *p*. The bolt *p* is adapted to be screwed into a cylinder block *q* to secure thereto the cylinder head *r*. A pin *s* is screwed into the tool support and positioned centrally thereof, said pin projected downwardly through the opening *t* in the tool head. The said opening *t* connects with the recess *o*. The function of this pin will be more clearly understood when the operation of the tool is described.

At times it is desirable to use another tool head (Fig. 5). I have shown here a form of tool head *n* which has a screw driver

point for the purpose of screwing screws into a piece of work. Obviously any form of tool head may be used, depending upon the work that is to be done, said heads detachably secured to the sleeve *h*.

In the operation of the device the bolt *p* may be started in the threads and the tool brought down over the head of the bolt the said bolt head fitting into the recess *o* of the tool head. The spring *k* is compressed to such an extent that the resistance of the bolt, as it is screwed into the tapped hole carried by the cylinder block, is not sufficient to overcome the pressure exerted by the spring and the bolt will be screwed into the block as the driving shank *a* is rotatably driven. This forms a flexible driving connection between the driving shank *a*, and the sleeve *h* which carries the tool head *n*. However, as the bolt is driven home it will stop the tool head *n* from rotating. The pins *i* carried by the sleeve *h* to which the tool head is secured are engaged in the inclined grooves *g*. As the tool head is stopped these pins will be caused to ride up in the inclined grooves thereby carrying the sleeve *h* upwardly or retracting the same. The pin *s* however, is secured to the body on which the sleeve slides. As the sleeve and tool head are forced upwardly the said pin will strike the bolt head and knock it out of the socket or recess *o*. This will cause the tool head to be automatically disengaged from the work. The work may now be removed and since the resistance to the driving effort has been removed, the spring *k* will force the sleeve and tool head downwardly the pin *i* riding down the groove until it is stopped at the bottom of the tool head, the sleeve again rotating with the drive shank.

In Fig. 7 I have shown means whereby the bolt *p* may be first inserted into the tool head when it is desired to use the device in connection with a multiple drill press. Surrounding the tool I have provided the coil magnets *u* which may be energized at will. This will magnetize the tool, thereby causing the bolt to be held within the socket *o*. The multiple drill may now be set in operation and a plurality of bolts may be screwed into a piece of work simultaneously. The current through said magnets need not be one of very high voltage but only sufficient to hold the bolts in the socket. When the bolts are screwed down, however, the resistance is sufficient to overcome the magnetism and allow the tool to be forcibly disengaged from the bolt.

The bolts *p* may be screwed into the work at any desired degree depending upon the compression in the spring *k*. If it is desired to screw the bolts down real tight the compression in the spring *k* may be increased so that the tool head will not disengage from the work until the resistance

is sufficient to overcome the increased compressive force of the spring *k*, which yieldably holds the tool head in engagement with the bolt.

What I claim is:

1. In a device as specified, the combination of a driving shank, a tool head slidably supported thereon, means for connecting the tool head and shank in direct driving relation, means for yieldably forcing the said tool head in engagement with the work, and means for retracting the tool head from engagement with the work when the tool head encounters a resistance to the driving movement.

2. In a device as specified, the combination of a driving shank, a tool head slidably supported thereon, means for connecting the tool head and shank in direct driving relation, means for yieldably forcing the tool head into engagement with a piece of work, and means whereby the said tool head is automatically retracted and disengaged from the work when it encounters a resistance to the driving movement.

3. In a device as specified, the combination of a driving shank provided with an inclined groove, a tool head slidably supported thereon and provided with a pin adapted to be guided in said inclined groove to provide a driving connection between the shank and tool head, and yieldably means interposed between the driving shank and the tool head for forcing the said tool head into engagement with a piece of work, the pin carried by the tool head adapted to ride up said groove to disengage the tool head from the work when the driving force meets a sufficient resistance to overcome the means for forcing the tool head into engagement with the work.

4. In a power-driven wrench, the combination of a driving shank, a tool head slidably supported on said driving shank, and provided with means for gripping a piece of work, means for connecting the tool head in direct driving relation with the driving shank, means for yieldably forcing the tool head into engagement with a piece of work, and means for automatically retracting the tool head to disengage the same from the work when it encounters a resistance to the driving movement.

5. In a power-driven wrench, the combination of a driving shank, a tool head slidably supported on said driving shank and provided with a recess at one end adapted to grip a bolt head, means for connecting the tool head and driving shank in direct driving relation, means for yieldably forcing the tool head in engagement with the bolt head, and means for retracting the tool head from engagement with the bolt head when the driving movement of the tool head encounters a resistance sufficient to overcome

the means for forcing the same into engagement with the bolt head.

6. In a power-driven wrench, the combination of a driving shank, a tool holder 5 slidable on said driving shank, means for connecting the tool holder in direct driving relation with the driving shank, a tool head detachably secured to said tool holder and provided with means for gripping a piece 10 of work, means for yieldably forcing a tool holder and tool head into engagement with the piece of work, and means for retracting the tool head and holder to disengage the same from the work when the tool head encounters a resistance to the driving move- 15 ment.

7. In a power-driven wrench, the combination of a driving shank, a tool head slidably supported thereon, means for connect- 20 ing the tool head to the shank in direct driving relation, adjustable means for yieldably forcing the said tool head in engagement with the work, and means for retracting the tool head from engagement with the 25 work when it encounters a resistance to the driving movement.

8. In a power-driven wrench, the combination of a driving shank provided with inclined grooves, a tool head slidably sup- 30 ported thereon and provided with pins guided in said inclined grooves whereby the said tool head has a limited longitudinal and rotatable movement with respect to the driving shank, and means for yieldably 35 forcing the tool head into engagement with a piece of work whereby when the tool head encounters a resistance sufficient to retard its rotative movement the pins will ride in said grooves to retract the tool head for the 40 purpose of disengaging the same from the work.

9. In a power-driven wrench, the combination of a driving shank, a tool holder slidably supported thereon, means for connect- 45 ing the tool holder and drive shank in direct

driving relation, a tool head detachably secured to a tool holder and provided with means for gripping a piece of work, said tool head provided with a centrally located longitudinal hole therethrough, a pin carried by said driving shank and adapted to 50 project through the hole in the tool head, means for yieldably forcing the said tool holder and tool head in engagement with a piece of work, and means for retracting the 55 tool head and holder whereby the pin carried by the driving shank strikes the piece of work to release the same from the said gripping means carried by the tool head.

10. In a power-driven wrench, the combination of a driving shank, a tool head slidably supported on said driving shank and provided with means for gripping a piece of work, means for connecting the tool 60 head in direct driving relation with the driving shank, means for yieldably forcing the tool head into engagement with a piece of work, means for retracting the tool head when it encounters a resistance to the driving movement and means carried by the said 70 driving shank for disengaging the work from the tool head as the same is retracted.

11. In a power-driven wrench, the combination of a plurality of driving shanks, tool heads each slidably supported on said driv- 75 ing shanks and provided with recesses adapted to fit over bolt heads, means for connecting the tool heads and driving shanks in direct driving relation, means for yieldably forcing the tool head into engagement with 80 a piece of work, magnets positioned about said tool head arranged to magnetize said tool head when an electric current is passed through the magnets, and means for re- 85 tracting the tool head when it encounters a resistance to the driving movement for the purpose of disengaging the tool head from the said bolt head.

In testimony whereof I affix my signature.

JOLLY JAMES.