

No. 892,001.

PATENTED JUNE 30, 1908.

R. McCARTY.
CHUCK.

APPLICATION FILED JULY 17, 1907.

2 SHEETS—SHEET 1.

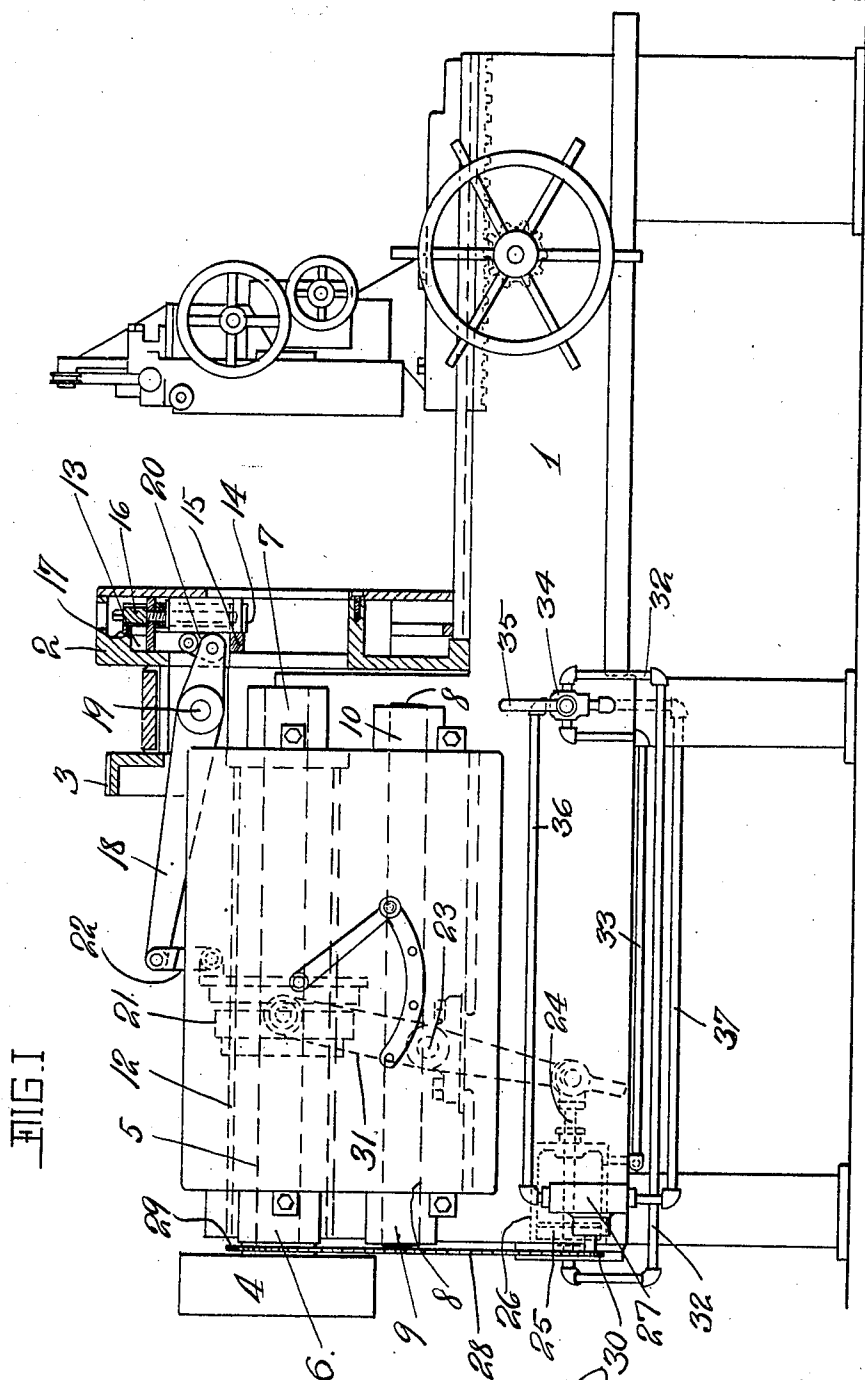


FIG. 1

Witnesses:

Edmund C. Duborg.
Heard Koffman.

Ralph McCarty
Inventor

By his Attorneys
Edwards, Sager & Wooster

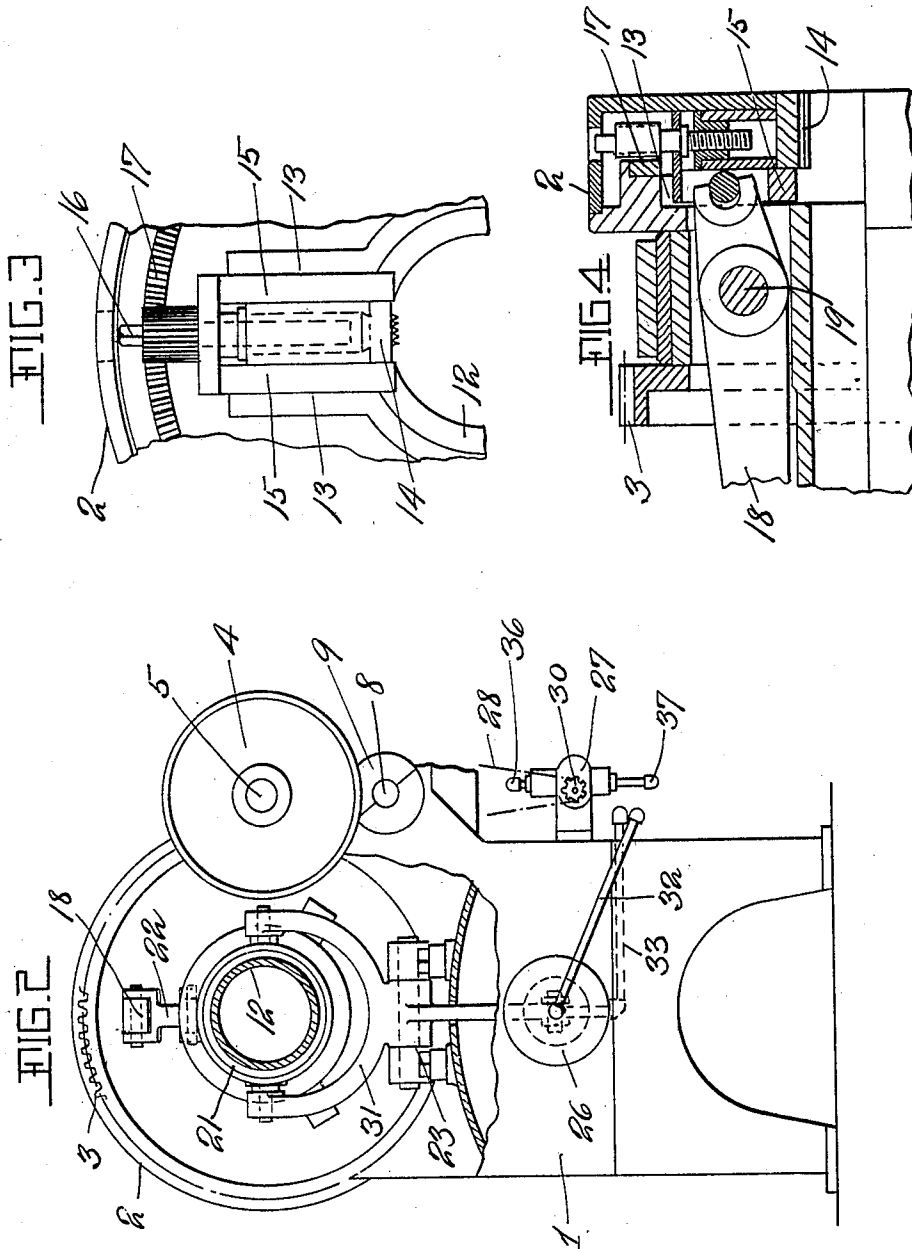
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2 SHEETS—SHEET 2.



Witnesses:
Edmund C. Duborg.
Geo. Hoffman

Ralph McCarty
Inventor

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UNITED STATES PATENT OFFICE.

RALPH McCARTY, OF LEBANON, PENNSYLVANIA, ASSIGNOR TO STOEVEY FOUNDRY & MANUFACTURING COMPANY; A CORPORATION OF PENNSYLVANIA.

CHUCK.

No. 892,001.

Specification of Letters Patent.

Patented June 30, 1908.

Application filed July 17, 1907. Serial No. 384,237.

To all whom it may concern:

Be it known that I, RALPH McCARTY, a citizen of the United States, residing at Lebanon, in the county of Lebanon and State of Pennsylvania, have invented certain new and useful Improvements in Chucks, of which the following is a full, clear, and exact specification.

This invention relates to chucks, and more particularly has reference to power driven chucks comprising jaws for gripping pipe, or other material for the purpose of threading or cutting off.

The object of the invention is to provide an improved chuck construction whereby the jaws may be opened and closed without stopping the machine, and thereby save the time required to start and stop the machine after setting the material in the chuck.

A further object of the invention is to provide a chuck operable by means of fluid pressure, in such manner that a pipe, for instance, may be firmly gripped without liability of exerting such a pressure as to crush the pipe. It has been proposed to operate a chuck by means of toggle connections which are set by straightening the toggle, but the objection is that the toggles exert a pressure varying with the diameter of the work, and in some cases exerting such a pressure as to crush a pipe.

According to this invention, the gripping pressure is applied to the jaws by means of lever connections operated by a fluid pressure cylinder, whereby the pressure can be controlled in such manner as to prevent crushing a pipe and still be sufficient to firmly grip it.

A further feature of the invention comprises a construction and arrangement whereby the oil pump which forces lubricating oil through the various parts of such a machine may be employed to supply fluid pressure to an operating cylinder connected with the chuck, and the chuck controlled by a valve according as the pressure is admitted to one or the other side of the actuating piston in the cylinder.

The invention will be more fully described in connection with the accompanying drawings, wherein

Figure 1 is a view in longitudinal eleva-

tion, partly in section, of a pipe threading machine embodying the invention; Fig. 2 is an end view partly in section; Fig. 3 is a detailed view of one of the jaws of the chuck; and Fig. 4 shows a slight modification of the actuating connections between one of the levers and the chuck jaw.

1 represents a bed having rotatably mounted at one end the head or chuck 2, which is hollow to permit the work to pass through, and is driven by a gear 3.

4 represents a driving pulley mounted on a shaft 5 having bearings 6, 7 and driving an intermediate shaft 8 mounted in bearings 9, 10. The shafts 5 and 8 are connected by variable speed gearing of any well known construction, which is not shown herein, and from the shaft 8 a pinion drives the gear 3 to rotate the head 2. The head 2 is mounted on a hollow shaft 12 which is journaled in the frame and rotates with the head. Mounted between pairs of guides 13 are jaws 14, being usually three, equi-distant from each other. These jaws 14 slide radially in blocks 15, and the jaws can be simultaneously adjusted in the blocks by means of screws 16 and the gear 17, for different sizes of material.

In order to operate the blocks, and thereby the jaws, levers 18 are provided pivoted at 19 in radial slots in the head. The levers 18 are preferably connected to the blocks 15 by means of links 19 pivoted thereto and to the lever 18, so that as the lever is oscillated the blocks carrying the jaws will be slid in and out.

In order to operate the jaws simultaneously a collar 21 is mounted to slide on the shaft 12, to which the head 2 is secured, and this collar 21 is connected by means of links 22 to the levers 18, so that as the collar is moved back and forth on the shaft 12, the jaws will be opened and closed.

In order to operate the collar 21 forked lever 31 pivoted on the frame at 23 is provided, and this lever is connected at the other end with a piston rod 24 having a piston 25 and moving in a cylinder 26 mounted on the machine frame.

It will thus be seen that as pressure is admitted to one side or the other of piston 25, the jaws will be operated, and that this can

be accomplished without cutting off the driving power from the pulley 4. 27 represents an oil pump of the kind commonly used on machines of this type for supplying oil to the tools and to the bearings, and a further feature of the invention relates to means for connecting the oil pump and the cylinder in such manner that it will supply actuating pressure for the piston 25, this pressure being predetermined so as not to cause the jaws to exert such a pressure as would crush a pipe which happens to be thin, and also to exert a sufficient pressure to cause the jaws to firmly grip the pipe, even though its diameter does vary, without requiring any adjustment.

In Fig. 4, the link between the lever and the block is omitted, and the slotted end of the lever engages a pin, to secure the rectilinear radial movement of the jaws.

The pump 27, as herein shown, is what is known as a gear pump, having one element driven at a constant speed from the main driving shaft 5 by a chain 28 and sprockets 29, 30. This pump operates when the power is on and is idle when the power is off pulley 4. Connected with the opposite ends of the cylinder are pipes 32, 33 leading to opposite sides of a four-way valve 34 having an operating handle 35.

36 is a pipe connected with the discharge side of the pump and the four-way valve 34, and 37 is a pipe connecting the four-way valve and the intake side of the pump.

Inasmuch as the pump is operating whenever the machine is running, it will create a constant pressure on one or the other side of the piston 25 according to the position of the controlling lever 35. In the position shown, pipes 33 and 36 are connected, and 32 and 37, thus putting pressure on the right hand side of piston 25 and closing the chuck jaws. If pipes 33 and 37 and 32 and 36 are connected, the fluid pressure will be applied to the left hand side of the piston and thus the jaws of the chuck opened. By reason of the connections heretofore described, it will be seen that the jaws can be operated while the machine is running, and the pressure maintained while the valve is held in one position. The links 22 between the levers 18 and the slide 21 act like toggles when in the position shown in Fig. 1, and may thus hold the jaws contracted without fluid pressure, but if the jaws are not correctly adjusted, either they would not contract enough to grip the pipe, or they would contract to such an extent as to crush the pipe. With forms of toggle chucks heretofore proposed, this has necessitated adjustment of the jaws whenever the diameter of the material varied, to prevent slipping or crushing.

With this invention, it is not necessary to straighten out the links 22 in order to hold the jaws set, since, by leaving the valve open,

the fluid pressure will be transmitted directly to the jaws and hold them as long as the pressure is maintained, without requiring any mechanical locking devices. This pressure will be proportioned so as not to exceed the strength of the pipe which may be used in the machine, but still sufficient to firmly grip it. Variation in the diameter of the pipe from point to point will not affect the holding power of the chuck, as the jaws will simply move towards the pipe in response to the fluid pressure until no more movement takes place, whereupon the fluid pressure will be maintained and hold the pipe until the pressure is cut off by changing the valve. With such an arrangement, it will not be necessary to keep adjusting the jaws by means of the screw 16 and the gear, as the continuously acting fluid pressure will be sufficient to hold the material whether the links 22 are straightened out or not. As the speed of the pump will be constant, the oil pressure will also be constant and not variable with the speed of the head, which latter, as before stated, can be run at different speeds by change gearing. This gives a constant holding pressure independent of the speed at which the head may be operating. Also, the use of manually controllable levers, or other arrangements requiring the attention of the operator to hold the material are avoided, and the entire operation of the chuck controlled by the hand valve 34, which will stay set without especial attention.

The invention is capable of various modifications and changes over the construction herein described, and I do not restrict myself to this specific construction.

Having thus described my invention, I declare that what I claim as new and desire to secure by Letters Patent, is,—

1. The combination in a machine tool, with a head having jaws mounted therein to move towards and from each other to clamp the work, of actuating connections for operating the jaws, fluid pressure actuating means, means for driving the machine, means driven thereby for producing fluid pressure, and means for controlling the fluid pressure to operate the jaws.

2. The combination with a head having jaws mounted to move therein, driving means therefor, fluid pressure actuated connections for operating said jaws, and a source of fluid pressure operated by said driving means.

3. The combination with an oil pump and driving connections therefor, of a rotary chuck connected to be driven by said driving means, an operating cylinder, connections between said cylinder and said chuck, and a fluid controlling valve controlling the passage of oil between said pump and said cylinder whereby to actuate said chuck.

4. The combination with a head having

jaws mounted to move therein, driving
means therefor, fluid pressure actuated con-
nections for operating said jaws, and a source
of constant fluid pressure separately oper-
ated by said driving means to permit being
5 driven thereby at a speed independent of the
speed of the head.

In testimony whereof I affix my signature,
in presence of two witnesses.

RALPH McCARTY.

Witnesses:

WM. ROBINSON,
HATTIE S. COOVER.