This invention relates to threading machinery, particularly to production threading machinery adapted for threading short lengths of pipe to form commercial pipe nipples.

Continued efforts over a great many years to increase the speed of production of threaded pipe nipples, and consequently the cost, have resulted in two basic types of machines which are employed in the trade. One type is known as a "hand machine," in that feeding, loading and control of the machine carriage is done by the operator. The other type of machine is a "full automatic" that threads both ends of lengths of pipe to form the nipples. It is a feature of the present invention that in comparison with the prior machines an unexpected increase in production, under safer working conditions is provided, these advantages being obtained by a novel combination and arrangement of machine elements that cooperate to form, in the preferred embodiment, a relatively simple, semi-automatic hand-controlled device, although many features of the invention may also be incorporated, with corresponding increase in production, in automatic machines. For example, one type of hand machine commonly found in the trade employs a manually reciprocable carriage carrying manually-operated chuck jaws or gripper for the nipples, and a rotatable self-opening die head mounted in a fixed position on the bed in the machine. With prior machines of this type, the operator must place the nipple in the chuck jaws by placing one hand between the rotating die head and the jaws (a dangerous position), and manipulate a handwheel to open and close the jaws manually with the other hand. He must then move said other hand from the jaw controlling hand wheel to a lever disposed on the carriage of the machine that permits him to advance the carriage and start the threading operation. The dies are generally self-threading, and during the threading operation the operator must retract the carriage and open the jaws of another unit disposed on the same bed, which is supplied with nipples threaded at one end. Thus, considerable manipulation is required between successive threading operations, and a substantial amount of time is consumed thereby limiting the production of the machine.

By contrast, with a machine made according to this invention, means are provided whereby the grippers on the carriage are automatically opened and closed in response to the position of the carriage relative to the threading die, and a feeding and discharge arrangement is provided wherein a new blank or length of pipe is positioned in the gripper and the threaded blank is discharged during the retraction of the carriage. Thus, loading of the blanks in position to be picked up during the next stroke of the carriage is effected under safe conditions during the threading operation, as opposed to the prior arrangement wherein the blank must be inserted by the operator in the grippers just before the threading operation. The relationship of the carriage-controlled grippers and the blank-supporting platform is such that the grippers are opened automatically on the retraction stroke, whereupon the blank previously placed on the feeding platform causes the threaded nipple to be discharged forwardly from the grippers while the grippers are moving with the carriage over the new blank. During the entire cycle the operator of the preferred embodiment of the machine need make but a simple motion of a single lever with one hand, and the other hand need only place a nipple on the blank-receiving platform during the threading operation, which does not delay initiation of the threading operation.

In a machine made according to the present invention, after a new blank is gripped in the grippers, the carriage is moved forwardly and the end of the blank yieldably pressed into the threading dies. In the illustrated embodiment, this is done by the operator moving the carriage forward manually. As soon as the threading dies start on a particular blank, the threading operation proceeds automatically, so that a minimum amount of time is required for starting each blank, and the operation is independent of the drive of the threading spindles. Thus the total handling time for loading each blank is reduced, the proportion of the loading time which necessarily intervenes between the end of one threading operation and the beginning of the next is reduced, and the time required for starting a threading operation after a blank has been loaded is maintained at a minimum, so that in normal use both threading dies are in threading operation ninety per cent of the time and the production is increased tremendously over the prior machines.

Since, in the present invention, the threaded nipple is automatically ejected forwardly upon retraction of the carriage, a chute may be provided to receive the ejected nipples and transfer them to the other side of the machine convenient to the operator for loading the platform.
associated with the other bank of the machine. Applicants have found that with a machine made in accordance with their invention, all the flexibility and advantages of the hand machine in the form of simplicity of parts and ease of changing the setup for various sizes and lengths of nipples are retained, and yet, the rate of production is more than doubled, without need for more skilful operators.

The other typical machine in the prior art is the fully automatic two-bank machine referred to. This machine is magazine fed, and successively threads both ends of each blank. In addition to their complexity and expense, such machines do not approach the high production of the present invention because the feeding cams for the carriage are geared in synchronism with the rotating threading dies, and in order to insure that the threading of each blank is uniformly started, and that the blank will be completely threaded before the controlling cams retracted carriage, it is necessary to time the dies to make a number of extra turns over that required to carry out a normal threading operation.

Furthermore, since the stroke of the carriage of such machines is usually constant and is long enough to handle long nipples, when short nipples are threaded unnecessary time is consumed by traversal of the carriage. With the machine of the present invention the carriage movement is independent of the die rotation, and the position of the carriage controls the opening and closing of the dies and grippers so that adjustments are readily made to reduce carriage travel to the minimum required for a nipple of given length. Another disadvantage of prior automatic machines resides in the fact that it may take many hours to change the setup and cam arrangements to convert from one size nipple to another, whereas the machine of the invention is converted as readily as is a hand machine.

With the novel combination of elements referred to in the foregoing brief description of applicants' machine, it has been found that with one double-bank machine controlled by a single operator, a production schedule can be maintained which equals that provided by one operator tending two of the complex and costly double-bank automatic machines. Yet, the machine of this invention retains all the flexibility, simplicity and ease of conversion to different nipple sizes that is characteristic of the slower type hand machines of the prior art.

It is another feature of a preferred embodiment of the invention that means for controlling the opening and closing of the grippers in accordance with carriage position are interconnected with the self-opening die head mechanism so that the grippers are opened as soon as the nipple end is clear out of the die and remain open during the back stroke of the carriage. On the other hand, the grippers are closed at the end of the back stroke and remain closed during the forward stroke so that there is no danger of the nipple changing its position with the grippers. This facilitates the rearward loading and self-electing operation previously referred to, in addition to providing for positive carrying of the nipples.

Other improvements and advantages incident to the invention will appear in the following detailed description of a preferred embodiment thereof.

In the drawings, the machine elements that are conventional or well known to those skilled in the art are not illustrated in detail, it being understood that such elements as the self-opening die head are standard articles of commerce in the art.

Fig. 1 is a rear end view of the machine made in accordance with the invention with parts broken away; Fig. 2 is a partial side view of one bank of the preferred embodiment of the invention; Fig. 3 is a view similar to Fig. 2 with parts broken away and in section; Fig. 4 is a fragmentary plan view of the machine; Fig. 5 is an enlarged view of the carriage and grippers; Figs. 6 to 9, inclusive, are schematic diagrams showing four steps in the operation of the machine; and, Fig. 10 is a fragmentary side view showing a modified form.

Referring to Figs. 1 to 5 wherein a preferred embodiment of the invention is illustrated, it should be understood that details of the means for driving the die heads, die head construction and machine design elements known to this art are not illustrated in detail.

We have found that one operator can operate the double or two-bank machine at the maximum production of each bank, and although the invention is not limited to the use of a two-bank machine, such is the preferred form. Each bank of the machine includes several basic elements, all cooperating to attain the advantages previously referred to. These elements include the frame or bed structure 10 upon which are mounted the two banks A and B. For example, bank A includes a rotatable self-feeding and self-opening die head assembly D turned to the desired threading speed by motor and gearing not shown; a manually reciprocable carriage C that is moved to and from the die head under control of the operator; blank grippers G for carrying the blank to and from the die head; and fluid motor means M for automatically opening and closing the grippers. The corresponding elements in bank B are lettered similarly with a subscript "1" appended.

**Die head mechanism**

The die head D is of the type that is self-feeding once the blank is started therein by the operator's control of the carriage. As is well known in the art, the die head may be of the type that is self-opening after the proper length of blank has been threaded. One means of accomplishing this is by providing a shoulder or an abutment means in the die head that is engaged by the blank when the threading operation is completed or substantially so. This trip mechanism in the die head and causes it to open so that the threaded blank can be retracted from the die head by operation of the carriage.

Manual means are generally provided to open and close the die head. For example, D takes the form of a lever 11 pivoted to a collar 12 that operates the die trip mechanism, and pivoted to the machine frame as at 12. In the preferred form of the invention, lever 11 has an extension 13 disposed in a mid-section of the machine for facilitating automatic closing of the dies when the carriage is retracted. Linkage for effecting this includes a link 14 extending from the extension 13 of the die head operating lever. As best seen in Fig. 3, link 14 connects to a double crank arm 16 pivot-
ally mounted at 17 on a support line 18, the latter being pivotally fixed to the frame as at 19. This arrangement accommodates for the slightly vertical oscillation of the lower end of lever 11.

In order to provide for automatic closing of the die when the carriage is retracted, we prefer to provide a shift rod 22 pivoted to the crank 16 as at 21, and provide it with forward and rearward adjustable collars 23 and 24 respectively. The carriage is such that when the carriage is retracted after the die has been opened, the abutment means 37 on the carriage is pulled against collar 24 which causes the die operating means to operate the linkage just described, and close the die's jaws, these jaws being shown in their closed position in Figs. 2 and 3.

In the broader aspects of our invention, instead of relying upon abutment means integral with the die head for opening of the die in response to engagement of the blank being threaded, we could employ any other means or means adjustable so that the opening and closing of the die head is automatically determined by the position of the carriage relative to the frame and die head.

Carriage

Continuing with the detailed explanation of a preferred embodiment, the carriage assembly C includes a base section 30 and guides 31 for sliding on ways provided in the bed of the machine in accordance with conventional machine design practice. To cause manual reciprocation of the carriage, a rack shaft 32 is mounted in the carriage and keyed to a forked arm 33 which reacts against a pin 34 fixed to the carriage in response to manual motion of the carriage-operating lever 36.

Grippers

As best seen in Fig. 5, the gripper assembly G mounted on the carriage includes adjustable-mounted, fixed jaw 40 and a movable jaw 40a slidably mounted in suitable guides 41, there being adjusting means 42 and 43 for positioning the fixed jaw 40 so that it is centered with respect to the blank. Replaceable jaw members 44 are fastened by suitable means 45 and formed to grip the blank when the movable jaw is forced toward the fixed one. In order to cause reciprocation of the movable jaw 40a for gripping the blank, the fluid motor assembly M is provided. This includes a cylinder 51 mounted on the carriage by any suitable means 52, the cylinder being fitted with double acting piston 53. A piston rod 54 is attached to the move by jaw member 40a by means of suitable bolt means 55.

Gripper control mechanism

A carriage-mounted control assembly is provided for causing actuation of the motor means M to open and close the movable jaw or gripper 40a. Where a fluid motor, such as an air or hydraulic piston and cylinder assembly is employed, this may take the form of a valve member 60 connected to a source 61 of fluid under pressure and connected to distribute fluid to cylinder by means of lines 62 and 63, the flow through the valve being under control of a mechanical plunger 64. In the form illustrated, when the plunger 64 is in its lowest position, fluid is admitted through line 61 to close the gripper in order to engage the blank. When the plunger 64 is lifted, connections in the valve are reversed and fluid under pressure is admitted in front of the piston to cause the gripper to open and release the blank.

As seen in Fig. 2, there is a cam follower device associated with the valve and going to complete the carriage-mounted control assembly for the motor M. This may take the form of a depending block 55 attached to support means 32, slotted as at 66, for reception of a cam follower bell-crank lever 67. This lever includes a cam follower roller 68 and an arm 69 for lifting the valve plunger 64. As best seen in Fig. 2, a carriage-mounted operator for the fluid motor control device is provided. In the preferred form, an angle 71 may be fastened to the frame provided with a rail 72. An adjustable mount member includes a base 73 and a wear plate 74, integral therewith that forms a cam surface for operating the bell-crank lever 67 under certain conditions, to be herein described. Suitable stop means 81 on block 80 may be provided for limiting the motion of the cam in one direction. Shaft 77 is turned when double crank arm 16 (shown in Figs. 2 and 3) is moved by shifting of the die operating lever 11. This causes rotation of the crank 78, and the position of the cam is changed. When the lever 11 is moved to close the threading jaws of the die, the cam 73 is lowered as shown in Fig. 2, and the bell-crank lever 67 is disposed so that plunger 64 is in its lowest position. The connections to the fluid motor are now such that the grippers or jaws are closed. If the threading jaws of the die are opened, lever 11 is moved so as to raise the cam. With the cam in its raised position, as the carriage is retracted roller 58 rides upon the cam and plunger 64 is lifted which adjusts the connections to the fluid motor and causes the gripper to open and release the blank, after the carriage has retracted a sufficient distance to withdraw the blank from the die head.

Loading and ejecting device

A semi-automatic loading and blank ejecting means are provided and disposed rearwardly of the carriage. In the preferred form, a V-shaped trough 82 is supported on the carriage by any convenient bracket means 83 and the terminal portion of the trough is cut away (as seen in Figs. 3 and 5) to clear the grippers in both the open and closed position thereof. An adjustable stop or ejector means is supported on the frame by bracket 85, and may comprise a rod 86 slidably mounted in the bracket so that it is adjustable along the trough 82. A spring finger 87 may be mounted on the carriage by any suitable means such as 88 and serves the purpose of preventing the blank from being accidentally displaced when disposed between the grippers before the movable gripper has been closed to engage the blank.

We may provide a trough or chute 89 within the machine that receives the blanks ejected from between the grippers and conveys them transversely of the machine to the other side of the machine wherein they may fall in a receptacle or drop on to a conveyor to be hereinafter more fully described. Suitable chute means 91 may
also be provided to direct the completely threaded nipples from bank B to any convenient receptacle.

**Operation**

The operation of the preferred embodiment just described will now be explained. Assume that the machine is being first put into operation and is unloaded, but adjusted for the length of nipple to be produced. This adjustment entails selecting the proper speed of rotation for the die head, adjustment of the stop bar 55 for the length of nipple, and adjustment of collars 23 and 24 to cause proper opening and closing of the die head. Also, suitable receptacles containing unthreaded blanks and blanks threaded at one end are disposed adjacent machine banks A and B respectively. The operator standing behind the machine places his right hand on lever 34 of bank A and moves the carriage forward. With his left hand he picks up an unthreaded nipple and lays it in trough 52 against the stop 55. Lever 44 is pushed forward and the die head is opened, which lifts cam 14 and causes the movable gripper 40b to open. The carriage and die head operating lever are set in the same manner for the other bank B, and the machine is ready for operation.

The nipple N is then laid in trough 52 against stop 55 and the carriage retracted. As this occurs, the grippers encompass the nipple and when the carriage reaches its rearward position, abutment means on the carriage 37 strikes collar 24 to close the die head. Closing of the die head operates the various linkages and causes the cam 74 to drop, whereupon plunger 54 controlling the valve 58 drops and the movable gripper 40b grips the blank.

With the machine set up for operation as described, the principles of the cycle may be readily understood by referring to Figs. 6 to 9. As seen in Fig. 6, with the nipple N gripped by the gripper assembly C, the operator advances the carriage with one hand by means of lever 36 and urges the nipple into proper engagement with the threading or chasing dies 7, and with the carriage advanced lays a blank N on trough 52 with the other threading dies picking up the blank and, being self-feeding, thread it automatically.

During the threading operation, the operator transfers his attention to bank B and repeats the operations just described. The completion of the threading operation in the first bank is illustrated diagrammatically in Fig. 7 wherein the nipple N has engaged an abutment means 8 within the die and causes the die jaws to open. This also lifts cam 74 into the path of the cam follower, but has no effect on the grippers because the cam follower is forward of the cam.

When the operator perceives the opening of the die head in the first bank, he merely grasps with one hand the lever 35 for that bank and with one continuous motion retracts the carriage. As seen in Fig. 8, early in the retract stroke cam follower 61 rides up on the previously raised cam and causes gripper 40c to open. At retraction continues, the grippers encompass the unthreaded blank N which ejects the threaded blank N, as seen in Fig. 9. At the end of the retract stroke, the new blank N is in place between the grippers and the arm V moves the cam collar to close the dies. This lowers the cam causing the grippers to close. Without removing his hand from the lever 36 and without need for hesitation, the operator rapidly advances the carriage (as seen in Fig. 6) toward the now closed die head and loads the trough behind the carriage with a third nipple.

These operations are then repeated on the second bank while the nipple N is being threaded in the first bank.

The total loading time is reduced to a minimum, since it is only necessary to retract and advance the carriage and lay a new blank on the trough 52, which may be done while the carriage is being advanced. The portion of the loading time which necessarily intervenes between successive threading operations is only that time necessary to retract and advance the carriage and yieldably press the blank gripped into the carriage into the threading dies. Since this operation is independent of the timing of the threading dies, the time required is reduced to the minimum so that both threading dies are actually threading about ninety per cent of the time. Since the total loading time is reduced, a further increase in production is obtained on many sizes and types of nipples, particularly the smaller sizes, by increasing the rate of threading the dies. In prior machines working on such sizes and types of nipples, it was useless to increase the threading speed to the maximum speed at which threading can be accomplished, since the production was limited by the handling and loading time, and any such increase merely increased the time during which the machine was waiting for the operator.

For example, a particular prior art double-bank machine operating at one hundred per cent operating efficiency on one-half inch space nipples, at the cutting speed recommended by the manufacturer, thirty-three feet per minute, is capable of producing but three hundred finished nipples per hour. A machine of the same size embodying the present invention, operating at the same threading speed on the same nipples is capable of producing eight hundred sixty-eight and eight-tenths finished nipples per hour, an increase in production of about two hundred ninety per cent. The same machine is actually operated on the same nipples at a cutting speed of forty-one and three-tenths feet per minute, and at one hundred per cent operating efficiency is capable of producing one thousand eighty-six finished nipples per hour, an increase of three hundred sixty-two per cent, without any increase in operator skill or fatigue. Even greater increases are obtained in the smaller sized nipples.

It will also be apparent that in the illustrated embodiment the loading operation involves a mere dropping of a blank on the loading trough 53 behind the carriage so that there is no danger of the operator injuring his hands as exists in a machine wherein the blank must be inserted between the grippers from the front which is adjacent to the rapidly rotating die head.

Also, due to the fact that the movement of the carriage is independent of the rotation of the dies or other strokes of the machine, the stroke of carriage travel may be made just long enough to accommodate the length of nipple being machined, which increases operating speed as nipple length decreases.

Since the operation of the die head and grippers is controlled by the position of the carriage, and if an elongated nipple is required, no delay is required such as is required in prior automatic machinery and the output of a single dual hand machine like that just described equals the output of two of the prior automatic machines.
Modified form

Fig. 10 shows a modified form which embodies certain elements of the invention, but forms a simplified construction. The arrangement of the carriage, jaw-operating means, and work-supporting and ejection means is like that previously described in the modified form, and details thereof will be omitted.

Frame 110 mounts a pair of carriage, one of which, C2, is shown in the view. Each carriage has a jaw-operating motor means, one motor M1 being visible, and a pair of die heads are provided, one of them D2 appearing in the drawing. Manual lever 111 may be provided for manipulating the die head which may be of a self-closing type as described previously. The die head is also made self-opening, either with the linkage and lever means previously described, or by means of a rod 122 (shown in the drawing) that operates the die opening lever 114 and causes the die to close as the carriage reaches the rearward portion of its back stroke. A hand control lever 135 is provided for each carriage and a work-supporting platform 182 and stop rod 186 are likewise provided. The jaws are controlled by relative motion of the carriage and a fixed cam 172. The control valve 169 for the motor has an operating pin 164 which may be lifted by the bell-crank lever 167 as it rides up on the cam 172.

From the standpoint of operation, the form shown in Fig. 10 is no different from that previously described. The only major structural difference between the forms is that in the form shown in Fig. 10, the chuck jaws do not close as soon as the carriage has completed its back stroke, but remain open until the carriage is advanced to a position wherein the cam follower leaves the cam. Thus, with this form reliance is had upon the pressure of spring such as 87, seen in Fig. 5, for retaining the blank in the jaws during the portion of the forward stroke in which the jaws are open. However, the form shown in Fig. 10 has all the advantages of ease and speed of operation together with safety of the previously described embodiment.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology in the description is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

What is claimed is:

1. A threading machine comprising in combination a frame, a rotatable die head mounted on said frame, a carriage reciprocably mounted on said frame, a control for moving said carriage toward and away from said die head, non-rotatable blank gripping means carried by said carriage, die head operating means including means arranged to open the head when engaged by means moving with the carriage at completion of threading and means to close the die head, when engaged by the carriage adjacent its rearward position, means for opening and closing said blank gripping means, means for moving said carriage toward and away from said die head, blank gripping means carried by said carriage, die head operating means including means arranged to open the head when engaged by a blank being threaded in the head after threading and means to close the die head when engaged by said carriage means with the carriage adjacent its rearward position, fluid motor means connected for opening and closing said blank gripping means, a carriage-mounted control valve for said fluid motor, a cam adjustably mounted on said frame and arranged to assume two positions, a cam follower movable with said carriage for operating said valve to open the grippers when said cam is in one position and to close the grippers when said cam is in the other position, and a connection between said cam and said die head operating means, said die head operating means and connection being arranged so that when the die head is open said cam is in said one position and when the die head is closed said cam is in said other position.

2. A threading machine comprising in combination a frame, a rotatable die head mounted on said frame, a carriage reciprocably mounted on said frame and including abutment means, a control for moving said carriage toward and away from said die head, blank gripping means carried by said carriage, die head operating means including means arranged to open the head when engaged by a blank being threaded in the head after threading and means to close the die head when engaged by said carriage means with the carriage adjacent its rearward position, fluid motor means connected for opening and closing said blank gripping means, a carriage-mounted control valve for said fluid motor, a cam adjustably mounted on said frame and arranged to assume two positions, a cam follower movable with said carriage for operating said valve to open the grippers when said cam is in one position and to close the grippers when said cam is in the other position, and a connection between said cam and said die head operating means, said die head operating means and connection being arranged so that when the die head is open said cam is in said one position and when the die head is closed said cam is in said other position.

3. A threading machine comprising in combination a frame, a rotatable die head mounted on said frame, a carriage reciprocably mounted on said frame and including abutment means, means associated with said carriage for moving it toward and away from said die head, blank gripping means carried by said carriage, die head operating means including means arranged to open the head when engaged by means moving with the carriage after threading and means to close the die head when engaged by said carriage means with the carriage adjacent its rearward position, fluid motor means connected for opening and closing said blank gripping means, a carriage-mounted control valve for said motor means, a cam adjustably mounted on said frame and arranged to assume two positions, a cam follower movable with said carriage for operating said valve to open the grippers when said cam is in one position and to close the grippers when said cam is in the other position, and a connection between said cam and said die head operating means, said die head operating means and connection being arranged so that when the die head is open said cam is in said one position and when the die head is closed said cam is in said other position.

4. A threading machine comprising in combination a frame, a rotatable die head mounted on said frame, a carriage reciprocably mounted on said frame, a manually operable control for moving said carriage toward and away from said die head, blank gripping means carried by
said carriage, die head operating means including means arranged to open the head when engaged by means moving with the carriage after threading and means to close the die head when engaged by means moving with the carriage adjacent its rearward position, means moving in synchronism with said carriage for causing said die head operating means to close when the carriage is adjacent its rearward position, fluid motor means connected for opening and closing said blank gripping means, a carriage-mounted control valve for said motor means, a cam adjustable mounted on said frame and arranged to assume two positions, a cam follower movable with said carriage for operating said valve to open the grippers when said cam is in one position and to close the die head when engaged by means moving with the carriage adjacent its rearward position, fluid motor means connected for opening and closing said blank gripping means, a carriage-mounted control valve for said motor means, a follower movable with said carriage for operating said valve, a cam mounted on said frame, said cam being disposed in the path of said follower for causing said control valve to actuate the motor means in order to open the blank gripping means as the carriage is retracted from the die head, means moving in synchronism with said carriage for causing said die head operating means to close when the carriage is adjacent its rearward position, blank support and fixed stop means disposed rearwardly of said carriage, die head operating means including means arranged to open the head when engaged by means moving with the carriage after threading and means to close the die head when engaged by means moving with the carriage adjacent its rearward position, means moving in synchronism with said carriage for causing said die head operating means to close when the carriage is adjacent its rearward position, fluid motor means connected for opening and closing said blank gripping means, a carriage-mounted control valve for said motor means, a cam adjustable mounted on said frame and arranged to assume two positions, a cam follower movable with said carriage for operating said valve to open the grippers when said cam is in one position and to close the grippers when said cam is in the other position, and a connection between said cam and said die head operating means, said die head operating means and connection being arranged so that when the die head is open said cam is in said one position and when the die head is closed said cam is in said other position.

A threading machine comprising in combination a frame, a rotatable die head mounted on said frame, a carriage reciprocably mounted on said frame, manually operable control for moving said carriage toward and away from said die head, blank gripping means carried by said carriage, a blank support and fixed stop means disposed rearwardly of said carriage, die head operating means including means arranged to open the head when engaged by means moving with the carriage after threading and means to close the die head when engaged by means moving with the carriage adjacent its rearward position, fluid motor means connected for opening and closing said blank gripping means, a carriage-mounted control valve for said motor means, a cam adjustable mounted on said frame and arranged to assume two positions, a cam follower movable with said carriage for operating said valve to open the grippers when said cam is in one position and to close the grippers when said cam is in the other position, and a connection between said cam and said die head operating means, said die head operating means and connection being arranged so that when the die head is open said cam is in said one position and when the die head is closed said cam is in said other position.

A threading machine comprising in combination a frame, a rotatable die head mounted on said frame, a carriage reciprocably mounted on said frame, manually operable control for moving said carriage toward and away from said die head, blank gripping means carried by said carriage, a blank support and fixed stop means disposed rearwardly of said carriage, die head operating means and connection being arranged so that when the die head is open said cam is in said one position and when the die head is closed said cam is in said other position.

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