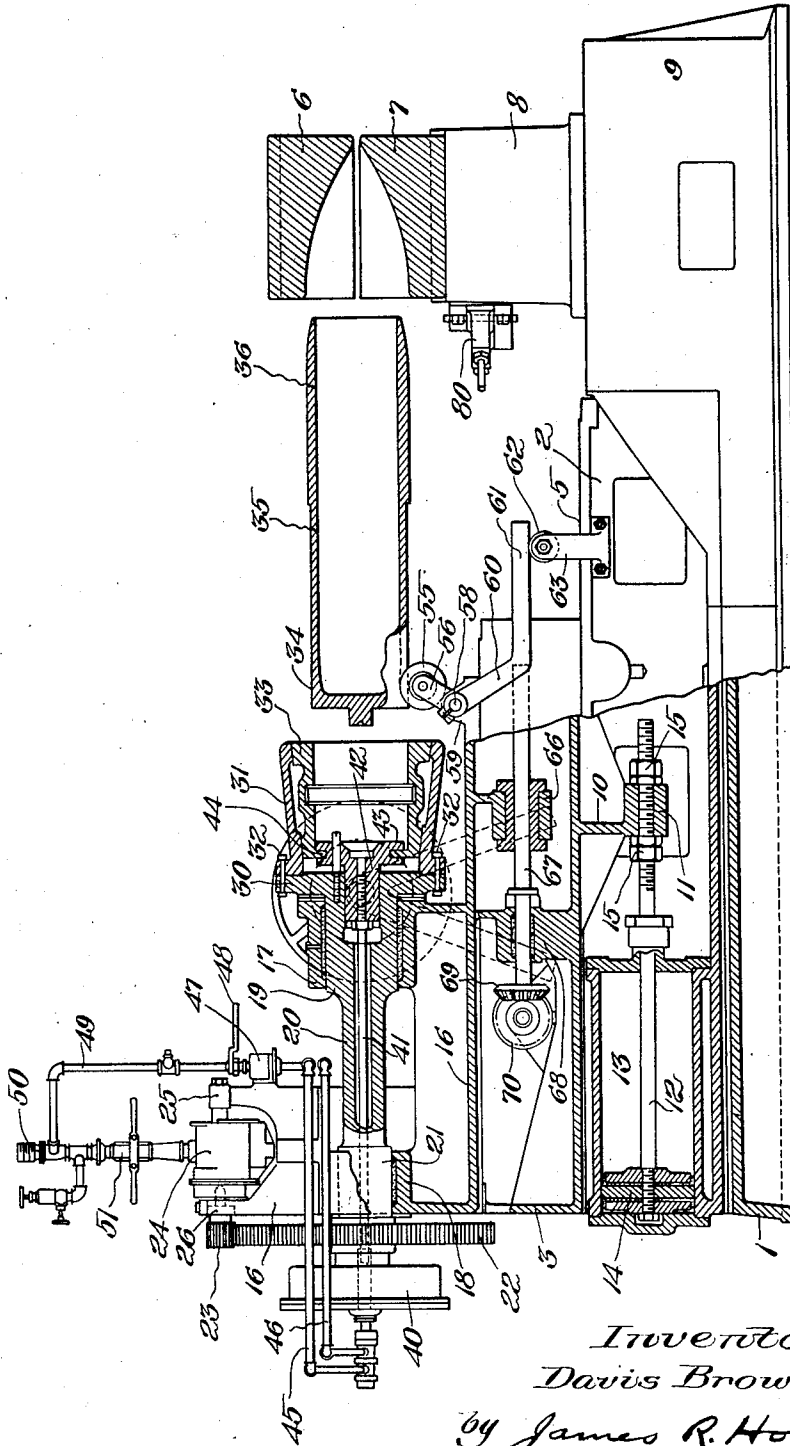


D. BROWN.
MACHINE FOR AUTOMATICALLY NOSING IN SHELLS.
APPLICATION FILED MAY 18, 1918.

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3 SHEETS—SHEET 1.

fig. 1.



Inventor:
Davis Brown,
by James R. Hodder
Attorney.

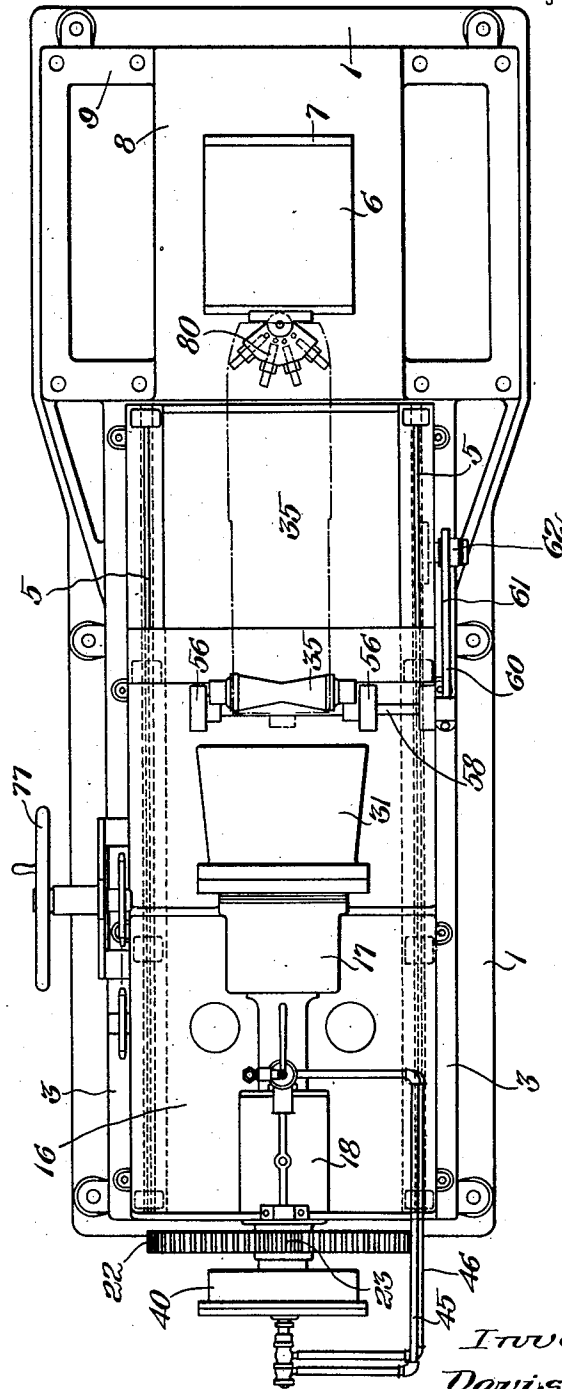
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Fig. 2.



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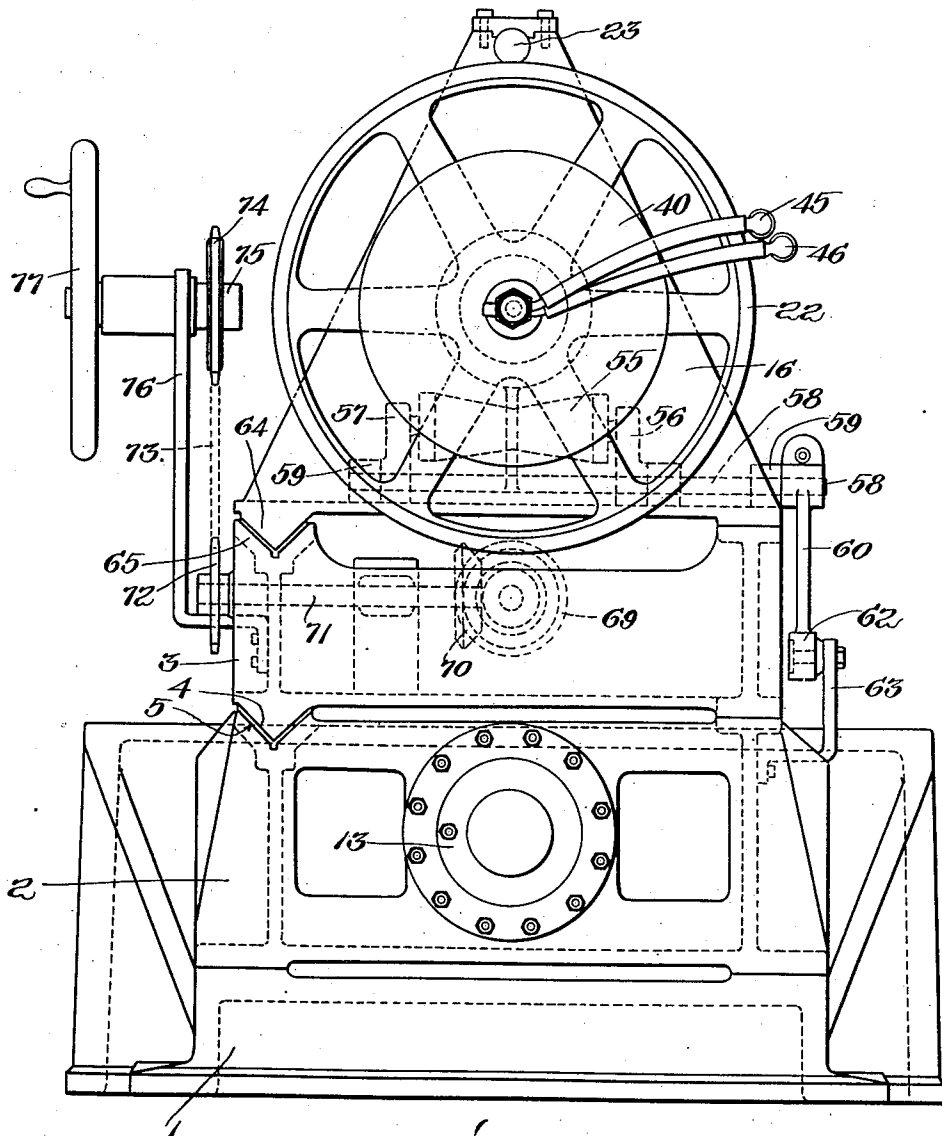


Fig. 3.

Inventor:
Davis Brown,
by James R. Hodder:
Attorney.

UNITED STATES PATENT OFFICE.

DAVIS BROWN, OF BUCYRUS, OHIO, ASSIGNOR TO THE AMERICAN EQUIPMENT COMPANY, A CORPORATION OF OHIO.

MACHINE FOR AUTOMATICALLY NOSING IN SHELLS.

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Specification of Letters Patent.

Patented Mar. 2, 1920.

Application filed May 18, 1918. Serial No. 235,244.

To all whom it may concern:

Be it known that I, DAVIS BROWN, a citizen of the United States, and resident of Bucyrus, in the county of Crawford and State of Ohio, have invented an Improvement in Machines for Automatically Nosing in Shells, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My present invention is an improved machine for handling cylindrical castings, or forgings, particularly the shell blanks of large size and weight which are subjected to a hammering or "nosing in" process to close the open end of the forging at a suitable bevel or point. My machine is particularly directed to provide improved and automatic means which will enable a large heavy shell forging, with the portion to be subjected to the nosing or hammering dies or press, while heated to the proper temperature for this process, to be gripped firmly, rotated evenly, and fed forwardly into the press at a proper speed consistent with the hammering and nosing in action of the press, and with an elasticity of feeding drive which will permit the momentary stoppage of the forward feeding action at the instant of the closing of the dies. Preferably, also, the feeding means is sufficiently elastic to permit this momentary interruption and then to continue the feeding movement without undue strain, damage or injury.

During this feeding and nosing in action, I also prefer to have the shell continuously rotated, excepting for the momentary interruption upon closing of the dies so that the beating and nosing in will be uniform throughout the circumference of the shell, the dies employed in the nosing in press being of substantially correct contour for the finished portion. A considerable range in the size of shells is thus automatically taken care of by the same dies, the constant rotation of the shell enabling the dies to beat in the open end of such shells to a uniform contour although I prefer to have dies of correct contour for the finished shell of each different diameter. Automatic means are also provided which will support the shell in position guiding and holding it until it is clasped by the chuck or other device employed, and furthermore aiding in sup-

porting the shell when it is released by the crane or hoist handling it and continuing this supporting position until the forward part is actually resting in the lower nosing in die, whereupon the support is automatically removed to be again replaced in shell supporting position when the completed nosed in shell is withdrawn from the dies.

By means of air pressure and suitable valves, the operation of my improved machine is readily controlled from a single point by one attendant, the operator actuating the chuck to engage, grip and hold the shell forging when it is lowered in position, securing the same rigidly at the opposite end of the cylindrical casting to that which is heated, and ready for the nosing in press, then rotating the chuck thus holding the shell and feeding the entire chuck and shell holding carriage forwardly to the dies in the nosing in press, continuing this feeding action until the completion of the operation and then by a further control reversing the movement of the carriage and withdrawing the completed shell from the dies, permitting the crane or hoisting device to engage the shell for its removal and releasing the chuck therefrom, all automatically.

Referring to the drawings illustrating preferred embodiments of the invention,

Figure 1 is a side view, partly in cross section, illustrating my improved machine;

Fig. 2 is a plan view; and

Fig. 3 is an end view.

Referring to the drawings, I provide a firm and solid base 1, for the machine, extending entirely under the apparatus and holding the movable part of the machine firmly to the dies to take up the thrust of the dies in operating and also to properly time the mechanism therewith and hold the same in coöperating position. On the forward part of the base 1 is a frame 2, supporting the movable carrier 3, the latter sliding on the frame 2 by suitable guideways, such as the ribs 4 and grooves 5, this carrier moving toward and from the dies 6 and 7 supported on a standard 8 at the other end of the base on a raised portion 9. The lower die 7 is rigidly secured on the standard 8 while the upper die 6 is reciprocated toward and from the lower die, being actuated in any usual manner, as by a crank and pitman motion, raising and lowering

the upper die, which runs in guideways. This die operating mechanism is not shown, being of wellknown or any suitable type.

The carrier 3 has a depending web 10 extending downwardly and centrally into the frame 2, said web having a hub 11 through which the stem 12 passes, this stem extending into an air cylinder 13 and being connected with the piston 14, located in the front of the frame 2. Check nuts 15, 15, hold the hub 11 in any desired longitudinally adjusted position on the stem 12 which has its outer portions threaded for the purpose. This construction enables the carrier 3 to be secured in any position toward or from the dies 6 and 7, allowing for different lengths of shells to be handled by the machine, the travel of the carrier 3 toward and from the dies being controlled by the air cylinder 13, and the feeding and retracting movement thereby of the piston 14 therein.

On the carrier 3 is secured the shell holding chuck devices and the means to grip and hold the shell, means to support the same, and means to rotate the shell during the forward feeding movement of the carrier. Mounted on the carrier 3 is a carriage 16, provided with a framework having bearings 17 and 18 for a hollow rotatable sleeve 20, which is preferably enlarged at the bearing 17 into a hub 19 and at the bearing 18 into the hub 21. At the outer end of this sleeve 20 is secured a gear wheel 22 adapted to mesh with a pinion 23 which is rotated by a motor 24 on the shaft of the pinion 23 mounted in bearings 25 and 26 at the top of the upwardly projecting arms of the framework 16. This motor is preferably air driven to provide an elastic drive, so that when the shell which is being carried and rotated through the actuation of the pinion 23 and gear 22 is gripped by the dies momentarily in their beating and hammering action, there will be sufficient resiliency in the drive to permit this temporary stoppage of rotation without injury. At the other end of the sleeve 20 is a flange 30, carrying a flared member 31 secured to said flange by bolts 32, 32. In this flared member 31 is secured a split chuck 33, also having its outer surfaces beveled to bear and slide upon the inner portion of the flared member 31. This chuck is moved outwardly relatively with the member 31, thereby permitting it to expand and engage the rear portions 34 of a shell 35 to be handled by the machine, said shell having its forward portion 36 heated to a sufficiently high degree to enable the dies 6 and 7 to beat, hammer or nose in said forward portion, thus pointing the shell. The operation of the chuck 33 is controlled by a double acting air cylinder 40, mounted outside the gear 22 on the sleeve 20 and acting on the chuck 33 to move the same forwardly and backwardly within the

flared member 31 by the rod 41 passing through the sleeve 20 from the cylinder 40 to the slide 42, which has its head 43 secured to the chuck members 33 by a flange and dovetailed connection as shown at 44, 70 thus permitting the chuck members 33 to expand or contract as the chuck is moved outwardly to grasp a shell and then retract it to contract about the rear portion of the shell and hold it, simultaneously rotating said shell with the rotation of the sleeve 20. Air pipes 45 and 46 from a valve 47 lead to the double acting air cylinder 40 and control the forward and backward movement of the stem 41 and chuck 43. The operator's valve 48 therefor is arranged in convenient position and a suitable supply of air pressure is led thereto through a pipe 49 to a main pipe 50, which latter also supplies air through the valve 51 to the motor 24.

In the operation of this machine it is desirable to lower the shell 35 with its highly heated end 36 to be hammered in, into position, where the chuck 33 may conveniently and quickly engage and hold the same, and for this purpose I have provided novel means to support the shell and aid in guiding it to the clutch 33 and thereafter to aid in holding it as the carrier 3 moves forwardly, until the forward portion of the shell engages and rests upon the lower die 7. Thereupon this support is automatically removed from engagement with the shell, so that the shell is freely supported between the chuck and die, while taking up the rotation of the chuck. To this end I provide a roller 55 mounted between rocker arms 56 and 57 secured to a shaft 58 extending through suitable bearings 59 at the forward portion of the carrier 3. The shaft 58 runs outwardly at one end where it is clamped by a controlling arm 60, said arm extending downwardly with a portion 61 of sufficient length to rest upon and engage a roller 62 mounted in a support 63 on the frame 2 during the forward travel of the carrier, until the shell 35, after it is gripped by the chuck 33, has its forward or nose portion resting safely and firmly on the lower die. Thereupon the carrier will force the portion 61 of this controller off the roller 62, allowing the roller 55 to drop away from the shell and leave it unsupported, excepting between the chuck and the dies. It will be appreciated, on reference to Fig. 1, that when the shell 35 is engaged by the chuck 33 and drawn backwardly, from the position as shown in Fig. 1, that the roller 55 will constitute a support for the shell sufficiently forward of the chuck 33 to hold the shell in alinement with the dies and to relieve the chuck from the strain otherwise produced by the extreme weight of the shell outside the chuck. The roller 55 is therefore positioned at a point

sufficiently in advance of the chuck 33 to provide an appropriate fulcrum for the support of the shell after it is being held and rotated by the chuck while the carriage 3 is moving forwardly. To operate the chuck, moving it forwardly to engage the shell 35, I prefer to mount the carriage framework 16 carrying the chuck and operating mechanism as above described, as a slideway, upon the carrier 3, a rib and groove arrangement 64 and 65, similar to the ribs 4 and 5 of the carrier 3 and frame 2 is provided, this upper carriage 16 having a depending hub 66, engaged by a shaft 67 running through a bearing 68 in the carrier 3 with a beveled gear 69 at one end in mesh with a corresponding horizontally mounted gear 70 on the shaft 71 leading outside the carriage 3 and as herein shown is operated by a sprocket wheel 72, sprocket chain 73 and upper sprocket wheel 74 on a shaft 75 carried by brackets 76 and engaged with a wheel 77. This arrangement for feeding the chuck forwardly and backwardly by means of the hand wheel 77, as just described, can be also operated by pneumatic power, particularly in machines for handling large shells, thus facilitating speed of operation. This additional feeding arrangement is also useful in permitting the final feeding action of the shell into the dies. By moving the entire carrier 3 quickly forward through actuation of the air cylinder 13 as heretofore described, until the carrier strikes against the stop 80, which can be effected quickly, and then feeding the chuck forwardly by rotation of the wheel 77, either by hand or power, thus feeding forwardly the shell during the final hammering and nosing in action of the dies, while the shell is held firmly in the chuck 33 and constantly rotated. As soon as the nosing in process is completed the carrier 3 may be rapidly withdrawn through actuation of the air cylinder 13 moving the piston 14 in the opposite direction from that of the feeding movement, such retraction of the carrier 3 swinging the supporting wheel 55 again into shell supporting position when the controller 60 runs upwardly on the roller 62 during the backward movement of the carrier 3, thus supporting the shell when it is removed from the dies 6 and 7, and holding the same until the crane or other lifting devices engages the shell 35 and the chuck 33 releases the shell, permitting it to be removed and another heated shell to be fitted for the nosing in operation. My improved machine enables a considerable range of shells of different diameters and lengths to be quickly, accurately and easily handled, rapidly positioning the same, gripping and holding the shell, automatically, rotating it, supporting it while feeding forwardly, continuing the feeding into the nosing dies, either by the

yielding actuation of a compressed air drive or by the hand wheel, as herein illustrated, either permitting the shell to be momentarily gripped by the dies 6 and 7 and the feeding and rotating temporarily stopped, and then an immediate continuation of the feeding to be taken up, while the temporary supporting device cooperating with the chuck is automatically withdrawn from the shell until the nosing in operation is completed, and is thereafter automatically brought into shell supporting position while it is withdrawn from the dies, thus producing an extremely simple yet efficient and quickly operating nosing in apparatus.

My invention is further described and defined in the form of claims as follows:

1. A machine of the kind described, comprising pressing dies, a shell holding chuck, a carriage to hold said chuck movable toward and from said dies, a carrier having the carriage slidably mounted thereon and elastic fluid means to move the same, a work holding support mounted on the carrier and movable therewith, supporting the work during a portion of the travel of the carrier and automatically withdrawing from work supporting position at a predetermined time.

2. A machine of the kind described, comprising pressing dies, a shell holding chuck, a carriage to hold said chuck movable toward and from said dies, a carrier having the carriage slidably mounted thereon and elastic fluid means to move the same, a work holding support mounted on the carrier and movable therewith, supporting the work during a portion of the travel of the carrier and automatically withdrawing from work supporting position at a predetermined time, and automatically being restored to work engaging position during retraction of the carrier from said press.

3. A nosing in press of the kind described, comprising a pair of dies, a carrier movable toward and from said dies, a carriage mounted on the carrier, a chuck secured to said carriage and having an expansible and contractible shell holding chuck thereon, means to rotate said chuck, a work support on the carriage mounted in advance of said chuck, cooperating with the chuck to hold work in alinement with said dies, and automatic means to remove the work holder when the work is fed into the dies, said work holder permitting longitudinal and rotary movement of the work while in contact therewith.

4. A nosing in press of the kind described, comprising a pair of dies, a carrier movable toward and from said dies, a carriage mounted on the carrier, a chuck secured to said carriage and having an expansible and contractible shell holding chuck thereon, means to rotate said chuck, a work support

on the carriage mounted in advance of said
chuck, cooperating with the chuck to hold
work in alinement with said dies, and au-
tomatic means to remove the work holder
5 when the work is fed into the dies, an arm
controlling the position of said work sup-
port, and means cooperating with said arm
to remove the work support from work en-
gaging position during the forward feeding
10 movement of the work, and to restore said

work holder to work engaging position dur-
ing the retracting movement of the machine.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

DAVIS BROWN.

Witnesses:

LAURA M. ASH,
BLANCHE SHEALY.