Nov. 22, 1927. 1,650,583

S. T. NELSON

FORGING MACHINE

Original Filed Jan. 23, 1922 2 Sheets-Sheet 1

Fig. 1.

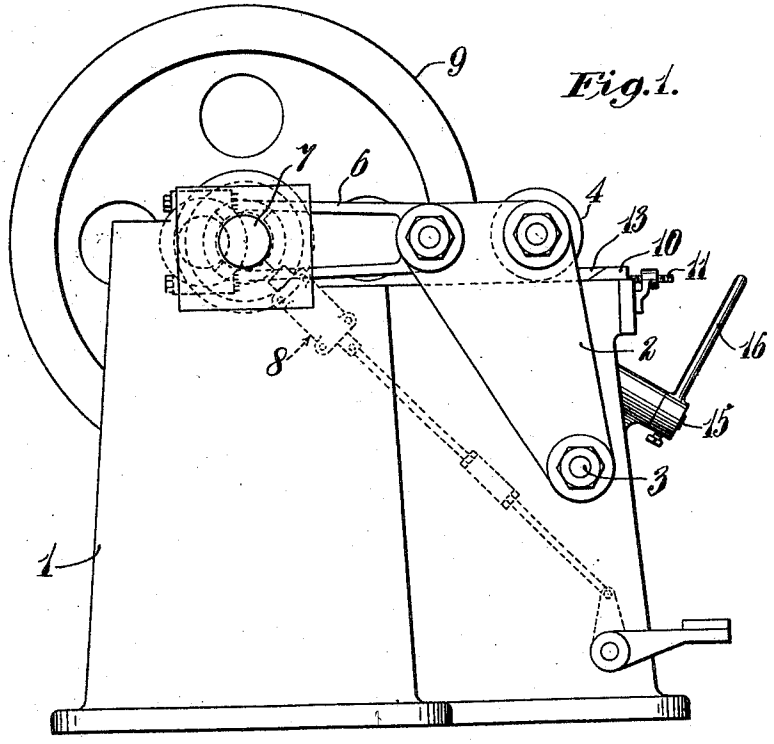
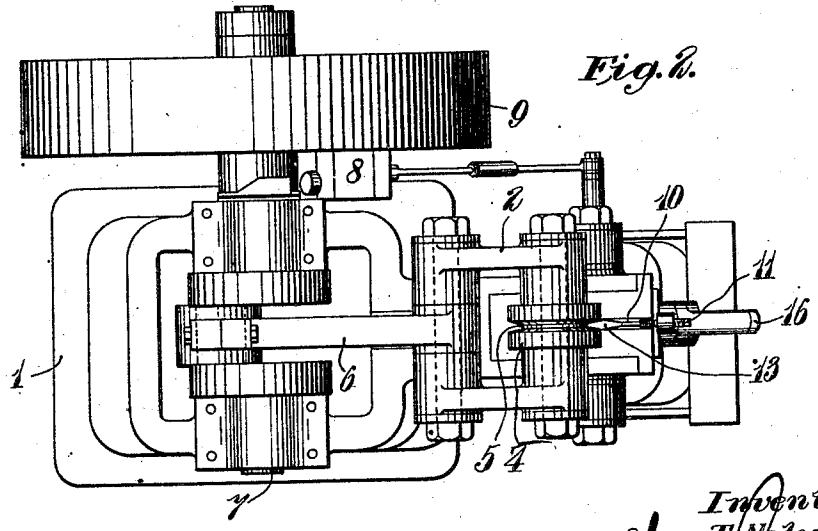


Fig. 2.



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Fig. 3.

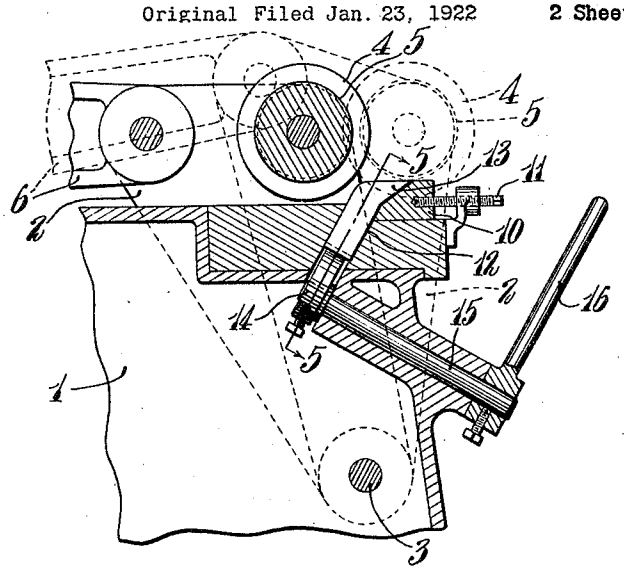
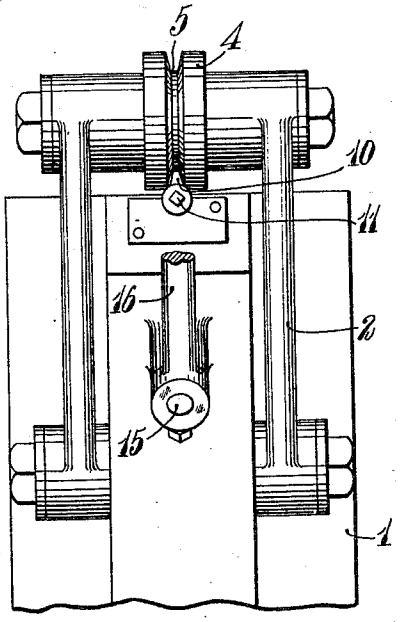


Fig. 4.



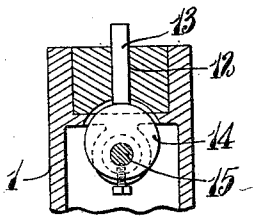


Fig. 5.

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UNITED STATES PATENT OFFICE.

SVEN T. NELSON, OF MICHIGAN CITY, INDIANA, ASSIGNOR TO SULLIVAN MACHINERY COMPANY, A CORPORATION OF MASSACHUSETTS.

FORGING MACHINE.

Application filed January 23, 1922, Serial No. 531,209. Renewed July 18, 1927.

My invention relates to forging machines.

An object of my invention is to provide an improved forging machine. Another object of my invention is to provide an improved forging machine having improved means for adjusting a blank which is operated on thereby. A further object of my invention is to provide an improved forging machine which by the cooperation of a single pair of dies and suitable blank adjusting means can completely forge a blank into its finished form. Other objects and advantages of my invention will hereinafter more fully appear.

In the accompanying drawings I have shown for purposes of illustration, one form which my invention may assume in practice.

In these drawings,—

Fig. 1 is a side elevation of a forging machine constituting the illustrative embodiment of my invention.

Fig. 2 is a plan view thereof.

Fig. 3 is a detail central vertical section through the dies and blank adjusting means, certain parts being shown in dotted lines in a different position.

Fig. 4 is a detail end elevation on an enlarged scale with parts broken away.

Fig. 5 is a fragmentary section on the line 5—5 of Fig. 3.

In the embodiment of my invention which I have elected to disclose for purposes of illustration, the same is mounted on a heavy base frame 1. Upon this base frame there is pivoted a yoke 2 pivoted upon a transverse axis as illustrated at 3 and carrying at its upper end a rotatably mounted die 4, cooperating with a stationary die on the base 1, hereinafter described, and provided with a peripheral groove 5 whose cross section corresponds to the desired shape of a finished blank. The yoke 2 is connected by a connecting rod 6 to a crank shaft 7 and under the control of foot operated clutch mechanism generally indicated at 8 is driven by a heavy fly wheel or driving pulley 9.

Disposed between the sides of the yoke 2 and carried by the frame 1 is a stationary die 10 adapted to cooperate with the die 4 and adjustable by a screw 11 to take up wear, etc. Adjacent this die and in alinement therewith is a socket 12 adapted to receive a blank 13 and to support it in contiguity to the die 10 during the forging operation. It will be noted that the yoke is so disposed upon the frame that the die 4 is oscillatable over a blank supported in the groove 12 and adjacent the die 10 and, observing Fig. 4, that the die 10 is a snug fit for the peripheral groove 5 in the die 4. Arranged transversely at the bottom of the socket 12 is a cam or eccentric member 14 mounted upon a shaft 15 supported in the frame 1 and adjustable as the shaft 15 is rotated by means of its operating handle 16 to vary the portion of the blank 13 above the top of its socket and also to support the blank as the latter is struck and formed by the die 4.

The mode of operation of my improved mechanism will be readily apparent. The operating lever 16 will be moved to a position to bring the eccentric 14 into a position such that its radius of eccentricity is disposed at a considerable angle to the plane of the socket 12. A heated blank 13 will be slipped into the socket 12 and will slip down if it is a new blank to rest upon the periphery of the cam of eccentric 14, or until it catches on the die 10 if an old drill bit. The foot actuated clutch mechanism will be operated to cause the yoke 2 to oscillate and the die 4 to be moved relative to the die 10. The hand lever 16 will then be turned to cause the cam to gradually protrude the blank in such manner as to cause it to be struck by the moving die 4 and formed between the stationary die and the grooved periphery of the moving die to the desired shape. When the blank has been finished, it may be removed by a pair of tongs or in any other suitable manner. Should wear of the die 10 occur, it can be adjusted by its screw 11.

While I have in this application specifi-

cally described one form which my invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a forging machine, a die, means for causing it to traverse a predetermined path, a stationary die arranged to cooperate with said first mentioned die, a socket adjacent said second mentioned die adapted to receive the shank end of a blank, and means including a shaft whose axis is parallel to the plane of movement of said first mentioned die and perpendicular to the socket for feeding a blank received in said socket.

2. In a forging machine, a die, means for causing it to traverse a predetermined path, a stationary die arranged to cooperate with said first mentioned die, a socket adjacent said second mentioned die adapted to receive the shank end of a blank, and means including a shaft and a pivoted cam carried thereby for adjusting a blank received in said socket.

3. In a forging machine, a frame, a die carrying member pivoted thereon, a die carried by said member, means for oscillating said member about its pivot, a stationary die with which said first mentioned die cooperates, a socket adjacent said stationary die to receive a blank, a cam extending transversely of said socket and adapted to be engaged by the rear end of a blank, and means for adjusting said cam.

4. In a forging machine, a frame, a die carrying member pivoted thereon, a die carried by said member, means for oscillating said member about its pivot, a stationary die with which said first mentioned die cooperates, means for adjusting said stationary die, a socket adjacent said stationary die to receive a blank, a cam extending transversely of said socket and adapted to be engaged by the rear end of a blank, and means for adjusting said cam including a handle movable in a plane transverse to the plane of movement of said first mentioned die.

5. In a forging machine, a frame, a stationary die supported thereon, an oscillating yoke supported on the opposite sides of said frame, a movable die carried by said yoke, means for oscillating said yoke to cause said movable die to cooperate with said stationary die, a blank receiving socket adjacent said stationary die, and means slidably engaging a blank for adjusting the same in said socket and disposed between the sides of said yoke.

6. In a forging machine, a frame, a stationary die supported thereon, an oscillating yoke supported on opposite sides of said frame, a movable die carried by said yoke, means for oscillating said yoke to cause said movable die to cooperate with said stationary die, a blank receiving socket adjacent said stationary die, and means for adjusting a blank in said socket disposed between the sides of said yoke, and including a shaft lying in the same vertical plane as said socket.

7. In a forging machine, a die movable in a path in a vertical plane, a stationary die with which said moving die cooperates, a blank receiving socket adjacent said stationary die, and means movable in a plane transverse to the plane of movement of said moving die adapted to slidably engage and feed a blank received in said socket.

8. A forging machine comprising a frame, a blank holder carried thereby, an arm pivoted to said frame, a forging die carried by said arm, means for oscillating said arm and die including a continuously rotating member and a crank shaft carried by said frame, a connecting rod to connect said crank and arm, clutch mechanism disposed between said rotating member and shaft, and means for controlling said clutch at the will of the operator.

9. A forging machine comprising die members, one of said members disposed outside the other, power actuated means including continuously operable means for causing said outer die member to have oscillatable movement relative to the other die member, blank adjusting means, and control means for said power and blank adjusting means, said control means including hand and foot operated members.

10. A forging machine comprising a frame, a blank holder carried thereby, an arm pivoted thereto, a forging die carried by said arm, means for oscillating said arm and die including a continuously rotating member and crank shaft carried by said frame, a connecting rod to connect said crank and arm, clutch mechanism disposed between said rotating member and shaft, and means for controlling said clutch at the will of the operator, said oscillating means being disposed to the rear of said blank holder so as to allow clear access to a blank carried by said holder.

11. A forging machine comprising cooperating dies and means for causing relative movement between the same including a die supporting member pivotable about a single axis, means for rotatably supporting a die on said member in spaced relation to said pivotal axis, and an actuating element for said member pivotally connected to the latter.

12. A forging machine comprising a blank

support, a plurality of cooperating pivotally connected members, and a forging die connected to and movable with one of said members and relative to said blank support, said latter member including a stationary offset pivoting point.

13. A forging machine comprising a blank support, and means including a member slidably engagable with a blank for adjusting the same, said means including manually operable means rigidly connected thereto.

14. A forging machine comprising a blank support, a rotatable blank engaging member for feeding a blank, and manually operable means therefor connected rigidly therewith.

15. A forging machine comprising a blank support, a member slidably engaging a blank to feed the same and normally bearing a fixed relation to said blank support, and manually operable adjusting means therefor, said member and means forming a unitary structure.

16. A forging machine comprising a blank holder having a raised die against which the cutting face of a cutter bit is formed, a roller die having a groove into which said raised die extends and which is operative to form the lateral surfaces of the cutting portion of a bit, means for supporting said roller die comprising an arm movable about a fixed point, and means to move said arm about said point to effect forging operation.

17. A forging machine comprising a raised blank supporting die, roller die means having a groove into which said raised die extends and which is operative to form the lateral surfaces of the cutting portion of a bit, and means for imparting oscillating movement to said roller die means to effect forging.

18. A forging machine comprising a die against which the front face of a blank is formed, die means adapted for an interfitting connection therewith, and means for imparting oscillating movement to said die means.

19. A forging machine comprising a base, a forging die between which and a work piece relative movement takes place during the forging action by the die, and supporting means therefor comprising a plurality of oscillatory members, the ends of which are pivoted together at a point offset from said die.

20. A forging machine comprising a base, a forging die, means for supporting the same including a member adapted to have a fixed pivoting point and a plurality of other pivotal connecting points, means for associating said die with one of said other points, and actuating means connected to the other point.

21. A forging machine comprising blank receiving means and a rotatable cam cooperating therewith and positioned upon an axis having a fixed relation to said blank receiving means for slidably engaging a blank carried by the receiving means.

22. A forging machine comprising blank receiving means and forging die means, means for effecting relative movement therebetween, and blank adjusting means positioned upon an axis having a fixed relation to said blank receiving means for slidably engaging the blank and movable in a direction transverse to the direction of said relative movement.

23. In a forging machine, a blank support, a plurality of cooperating pivotally connected members, and a roller die connected to and movable with one of said members, said latter member having a stationary pivoting point offset from the die axis.

24. In a forging machine, a grooved roller die, a projecting stationary die formed to extend in the groove in said roller die, and oscillatory means for effecting a relation of said dies, in which said stationary die extends into the groove in said roller die.

25. In a forging machine, a roller die, a stationary die, means for causing relative movement between said dies, said means, including a plurality of relatively movable cooperating pivotally mounted members pivotally connected together, and means whereby said roller die is connected to one of said members so as to have movement about a single pivoting point offset from the die axis.

26. In a forging machine, a grooved die, a complemental stationary projecting die formed to extend in the groove in said other die, and oscillatory means for effecting the relation of said dies in which said complemental die extends in the groove in said other die.

27. In a forging machine, a grooved roller die, a complemental stationary die means formed to extend in the groove in said roller die, and oscillatory means for effecting the relation of said die and die means in which said complemental die means extends in the groove of said other die.

28. In a forging machine, a grooved die, a complemental stationary die formed to extend in the groove in said other die, and oscillatory means including a pivotally mounted member carrying the said grooved die for effecting a relation of said dies in which said complemental die extends in the groove in said other die.

29. In a forging machine, a grooved roller die, a stationary projecting die formed to extend into the groove in said other die, and oscillatory means including a pivotally mounted member carrying said roller die for effecting a relation of said dies in which said stationary die extends into the groove in said roller die.

30. In a forging machine, a grooved roller die, a complemental die formed to extend

into the groove in said other die, and oscillatory means including a plurality of pivotally mounted members pivotally connected together at one end thereof for effecting a relation of said dies in which said complemental die extends into the groove in said roller die, one of said members carrying said roller die.

31. In a forging machine, a grooved roller die, a stationary die formed to extend into the groove in said other die, and means including an oscillatory yoke carrying said roller die for effecting a relation of said dies in which said stationary die extends into the groove in said roller die.

In testimony whereof I affix my signature.

SVEN T. NELSON.