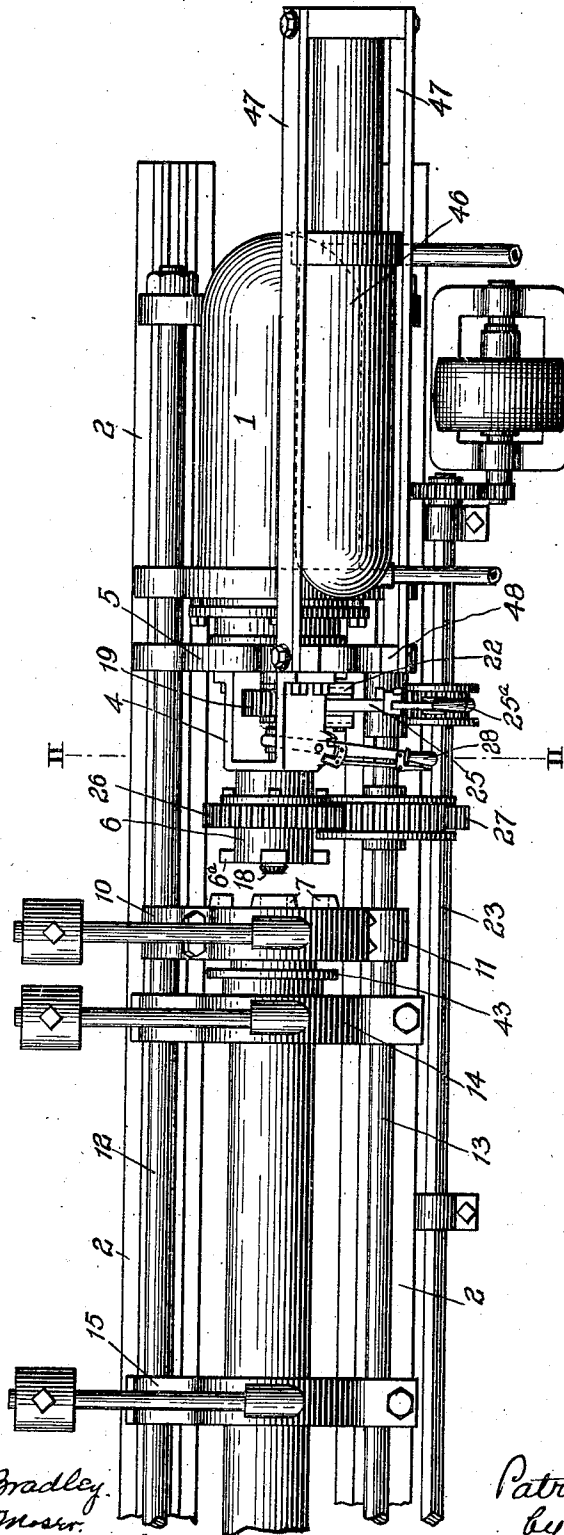


P. J. HAVEY.
METAL WORKING MACHINE.
APPLICATION FILED JAN. 4, 1909.

933,981.

Patented Sept. 14, 1909.
4 SHEETS—SHEET 1.

FIG. 1.



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4 SHEETS—SHEET 2.

FIG. 2.

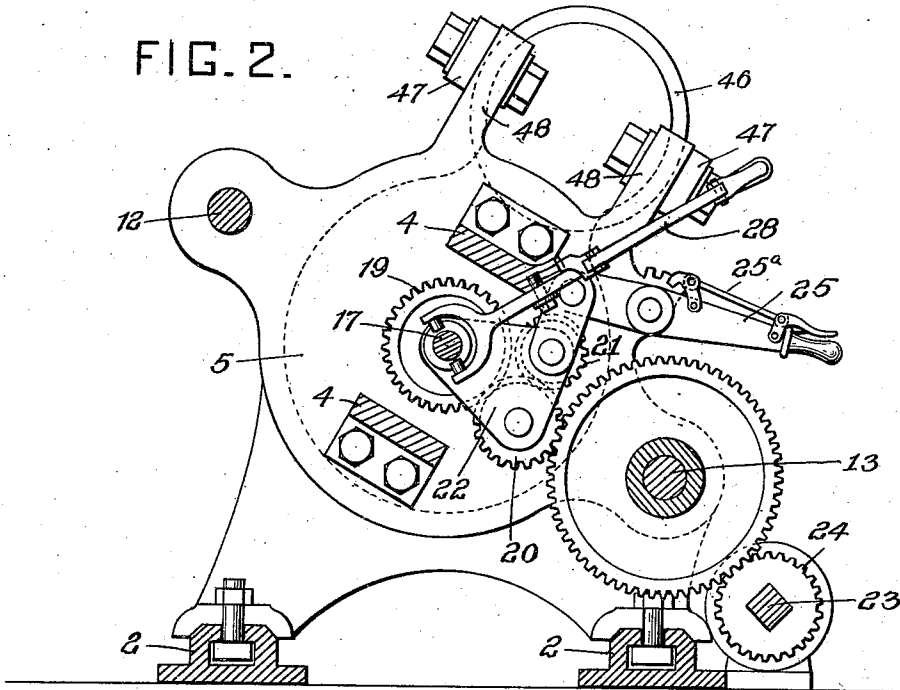
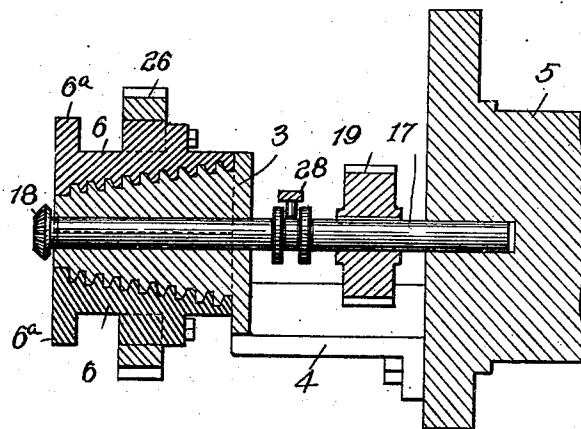


FIG. 5.



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4 SHEETS—SHEET 3.

FIG. 3.

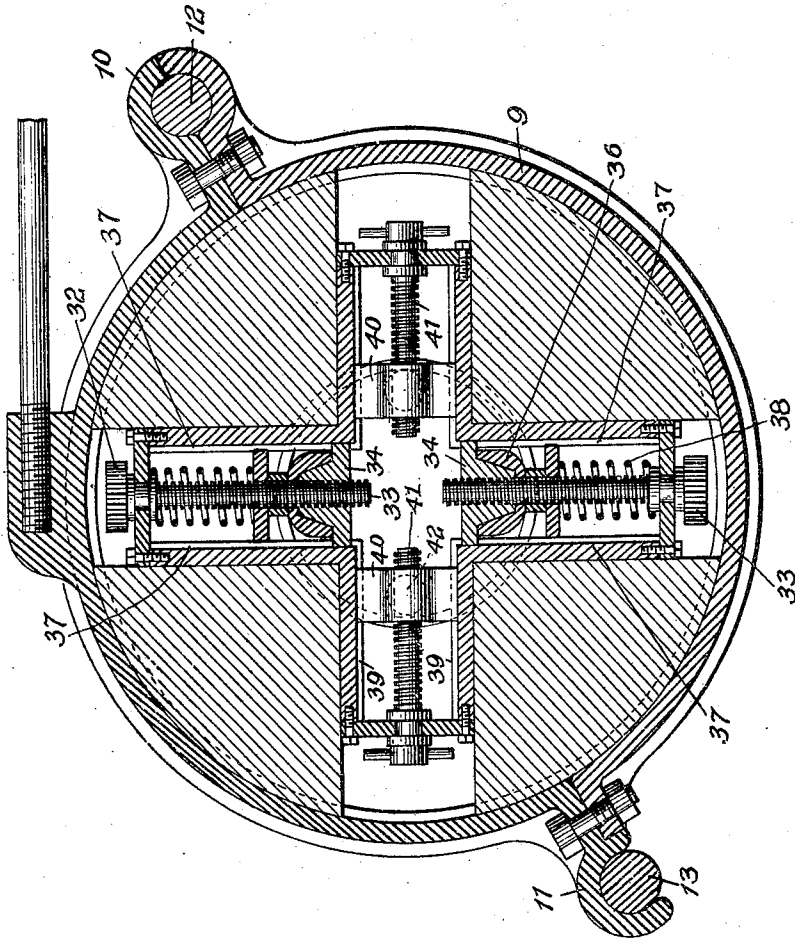
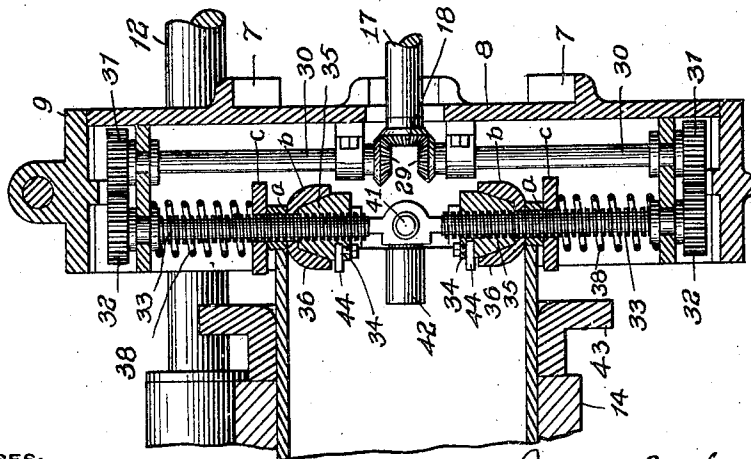


FIG. 4.



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4 SHEETS—SHEET 4.

FIG. 6.

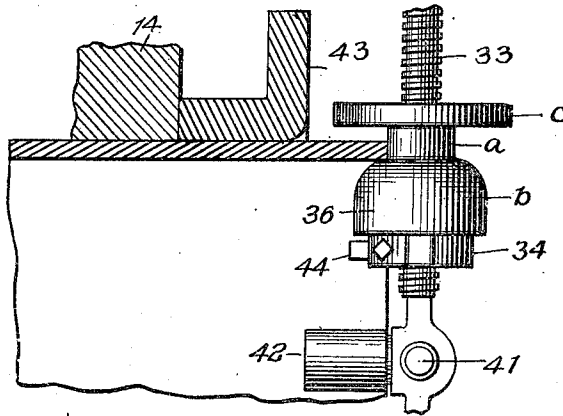


FIG. 7.

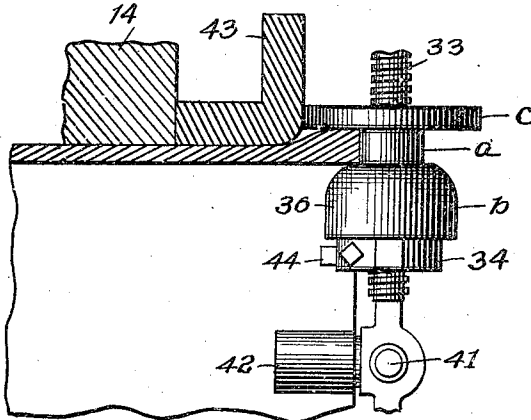
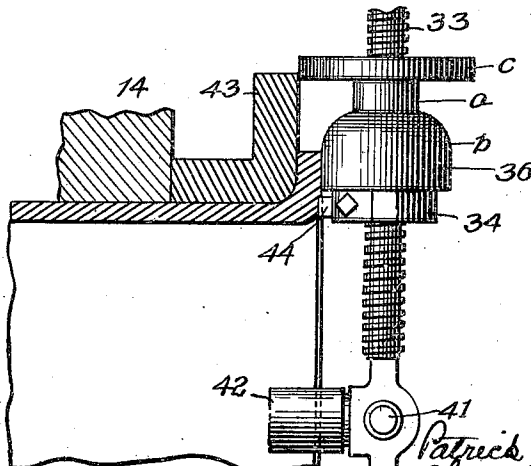


FIG. 8.



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UNITED STATES PATENT OFFICE.

PATRICK J. HAVEY, OF SWISSVALE, PENNSYLVANIA.

METAL-WORKING MACHINE.

933,981.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed January 4, 1909. Serial No. 470,670.

To all whom it may concern:

Be it known that I, PATRICK J. HAVEY, residing at Swissvale, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Metal-Working Machines, of which improvements the following is a specification.

10 The invention described herein relates to certain improvements in apparatus for upsetting a portion of the end of a pipe, spreading such upset portion to a plane at right angles or approximately at right angles with
15 the axis of the pipe, thereby forming a flange and then facing such flange portion, said several steps forming parts of a continuous operation.

20 The invention is hereinafter more fully described and claimed.

In the accompanying drawing forming a part of this specification Figure 1 is a top plan view of my improved apparatus; Fig. 2 is a sectional elevation on a plane indicated by the line II—II Fig. 1; Figs. 3 and 4 are sectional views illustrating the construction of the chuck carrying the parts directly operative on the pipe to effect the upsetting, flanging and facing operations;
30 Fig. 5 is a sectional detail view showing the thrust bearing carrying the upsetting, flanging and facing head, and other parts adjacent thereto; Figs. 6, 7 and 8 are detailed views illustrating the several steps effected
35 in the operation of my improved machine.

In the practice of my invention, suitable means such as a fluid pressure cylinder 1 is secured to or in proper relation to guide-ways 2. A thrust block 3 is secured by a
40 bracket 4 to the end of the ram 5 of the fluid pressure cylinder and around this thrust block is arranged a sleeve 6 engaging the thrust block as against any longitudinal movement relative thereto but free to rotate
45 freely on the thrust block as hereinafter described. The sleeve 6 is provided with lugs 6^a adapted to engage lugs 7 on the face plate 8 of a chuck carrying the tools operative on the pipe. This chuck as clearly
50 shown in Fig. 3 is mounted in the sleeve 9 provided with diametrically arranged lugs 10 and 11. One of these lugs is provided with an eye for the reception of a guide rod 12 while the opposite lug 11 is provided with
55 a hook adapted to engage the opposite guide rod 13. This construction permits of the

turning of the chuck to one side for the insertion and removal of pipe. The pipe to be operated on is held by clamping jaws 14 and 15 mounted on the rods 12 and 13, the
60 upper section of the clamping jaws being weighted so that the upper section will readily swing up out of the way when it is desired to insert or remove the tube to be operated on. A shaft 17 is so mounted in the
65 ram 5 and thrust block 3 as to be capable of rotation and longitudinal movement therein. This shaft is provided at one end with a beveled pinion 18 adapted to engage correspondingly shaped pinions in the chuck as
70 hereinafter described. This shaft has a pinion 19 mounted thereon, said pinion adapted to intermesh with a pinion 20, the latter also intermeshing with a pinion 21, both pinions being carried by a swinging frame 75
22 loosely mounted on the shaft 17.

On a driven shaft 23 is mounted a gear wheel 24 which may be constantly or intermittently driven and which will also intermesh with either one or the other of the
80 pinions 20 or 21. By swinging the frame so pinion 20 will engage with gear wheel 24, the shaft 17 will be rotated in one direction. When the frame 22 is swung so as to cause the pinion 21 to engage the gear wheel 24 a
85 reverse rotation will be given to the shaft 17 as the motion imparted to the pinion 21 is transmitted to the shaft through the pinions 20 and 19. The shifting of the frame 22 can be effected in any suitable manner as
90 for example by a lever 25 provided with a suitable latch lever 25^a, whereby it may be locked in either of its positions. The thrust sleeve 6 is provided with a toothed rim 26 engaging the gear wheel 27 on the shaft 23.
95

When it is desired to operate on the pipe which has been previously clamped in the jaws 14 and 15, the ram 5 of the cylinder 1 is caused to move forward thereby pushing the end of the thrust sleeve 5 against
100 the face plate 8 of the chuck and thrusting such chuck into operative relation, as hereinafter described, with the end of the pipe. The bevel pinion 18 on shaft 17 engages when the shaft is shifted as herein-
105 after stated with the beveled pinions 29 on the ends of shafts 30 in the chuck. These shafts are provided at their outer ends with pinions 31 intermeshing with pinions 32 on the threaded shafts 33. On these shafts are
110 mounted nuts 34 preferably having conical bosses or projections 35 forming bearings for

the rollers 36 which operate to upset and spread the end of the pipe. The nuts 34 are provided with lugs which engage with and are held from turning by guides 37 in the chuck. These several parts are so constructed and arranged that when the shaft 17 is rotated in one direction the nuts will be moved inwardly and when in the opposite direction will be moved outwardly in a radial direction carrying with them the metal working rollers 36 which are preferably made in sections as shown. While not necessary it is preferred that the rollers which are loosely mounted on the screw shafts 33 should be held against the nuts by springs 38 so that they will follow the nuts and be in proper position when the latter are adjusted, and the sections held in operative relation to each other. In ways 39 arranged at right angles with the ways 37 are mounted blocks 40 adapted to be shifted by the screws 41 to the desired position as hereinafter stated, and carrying rollers 42 loosely mounted on pins projecting from the blocks 40.

The end of a pipe having been properly heated, the pipe is placed in position between the jaws 14 and 15 with a desired length projecting from the jaws 14. An anvil ring 43 is then slipped over the projecting end of the pipe, and the nuts 34 and rollers 36 having been so adjusted relative to each other and the diameter of the pipe, that the neck or upsetting portion *a* of the rollers will bear upon the end of the pipe, the chuck is forced toward the pipe by the outward movement of the ram 5. The thrust sleeve is then rotated and with it the chuck so as to carry the rollers around the end of the pipe. The chuck is moved forward to upset the portion of the pipe between the anvil ring which bears against the clamping jaws 14 and the rollers 36 by the ram of the cylinder 1. At the same time that the rollers are adjusted as above stated, the blocks 40 are also adjusted so that the rollers 42 will bear against the inner periphery of the pipe during the upsetting operation, so that all the enlargement of the pipe during such upsetting will occur outwardly. After the desired upsetting or thickening of the metal has been effected, the shaft 17 is shifted longitudinally so that the pinions 18 will engage the pinions 29 and the frame 22 is swung so as to bring the pinion 20 into engagement with the gear wheel 24. By the rotation of the shaft 17, the nuts 34 and rollers 36 will be gradually moved outward, forcing the conical portions *b* of the rollers to operate on the previously thickened portion of the pipe, and spread the thickened metal out radially to form a flange, the inward movement of the chuck against the pipe being continued. By these conjoint movements the thickened portion of the pipe

will be bent into the form of a flange as shown in Fig. 8. In order to face the flange thus formed cutting tools 44 are secured to the nuts 34 in such position that when the nuts are moved outwardly as heretofore described these tools will be caused to traverse the outer face of the flange formed on the end of the pipe.

After the completion of the pipe, the shaft 17 is withdrawn and the ram 5 with the parts carried thereby retracted by any suitable means for example an auxiliary fluid pressure cylinder 46 having its ram connected by rods 47 to lugs 48 on the head of the ram 5.

By making the rollers 36 in sections necks *a* of different lengths to suit the thickness to be produced in upsetting can be readily placed in position, and the entire roller need not be replaced. The disk portion *c* of the rollers will serve as a stop by bearing against the anvil 43.

I claim herein as my invention:

1. In a tool for flanging pipe, a chuck provided with rollers, in combination with means for rotating the chuck, means for moving the chuck in the direction of the length of the pipe and thereby effecting an upsetting of the wall of the pipe adjacent to its ends by the action of the rollers thereon and means for moving the rollers radially of the chuck, thereby bending the previously thickened portion outwardly.

2. In a tool for flanging pipe, a chuck provided with conically shaped rollers arranged with their apices outward and with means operative during the rotation of the chuck for moving the rollers outwardly, in combination with means for rotating the chuck and means for holding the pipe in position.

3. In a tool for flanging pipe, a chuck provided with rollers adapted to bear against the end of a pipe, means for adjusting the rollers toward and from each other, and with adjustable rollers adapted to bear against the inner periphery of the pipe in combination with means for moving the chuck in the direction of the length of the pipe, means for rotating the chuck and means for moving the interiorly operating rollers to form the flange.

4. In a tool for flanging pipe, a chuck provided with rollers adapted to bend the end wall outwardly to form a flange, cutters for facing the flange and with means for moving the rollers and cutters outwardly during the rotation of the chuck in combination with means for rotating the chuck.

5. In a tool for flanging pipe a chuck provided with rollers adapted to bear against the end of the pipe and upset the same and means for bending the previously thickened portions outwardly to form a flange in combination with means for rotating the chuck.

6. In a tool for flanging pipe the combina-

tion of means for upsetting or thickening the end of the pipe and means for bending the previously thickened portion outwardly to form a flange.

5 7. In a tool for flanging pipe the combination of a rotatable chuck, a roller arranged to bear against the end of the pipe, a roller mounted to move radially on the chuck, and means for moving the said roller outwardly
10 during the rotation of the chuck and means for moving the chuck in the direction of the length of the pipe.

8. In a tool for flanging pipe the combination of a rotatable chuck, rollers adapted to
15 extend into the pipe to preserve the normal

internal diameter thereof, rollers adapted to bear upon the end of the pipe to upset the end portion thereof, means for controlling the extent of the upsetting action, rollers for bending the upset or thickened portion outwardly to form a flange, said parts being carried by the rotatable chuck and means for moving the chuck in the direction of the length of the pipe.

In testimony whereof, I have hereunto set my hand.

PATRICK J. HAVEY.

Witnesses:

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CHARLES BARNETT.