

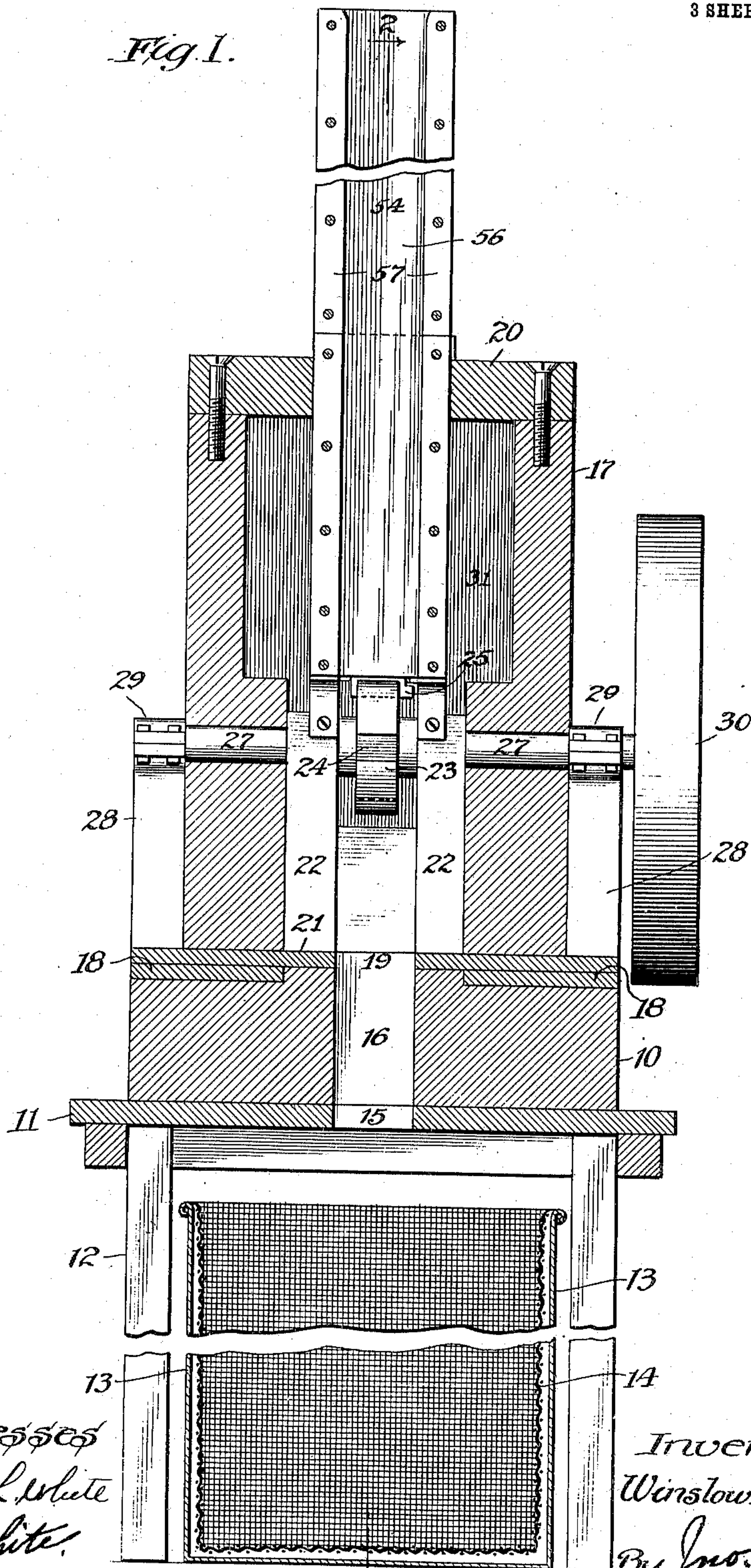
W. R. PARSONS.  
ANNEALING AND TEMPERING APPARATUS.  
APPLICATION FILED JUNE 14, 1907.

957,998.

Patented May 17, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses  
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Ray White.

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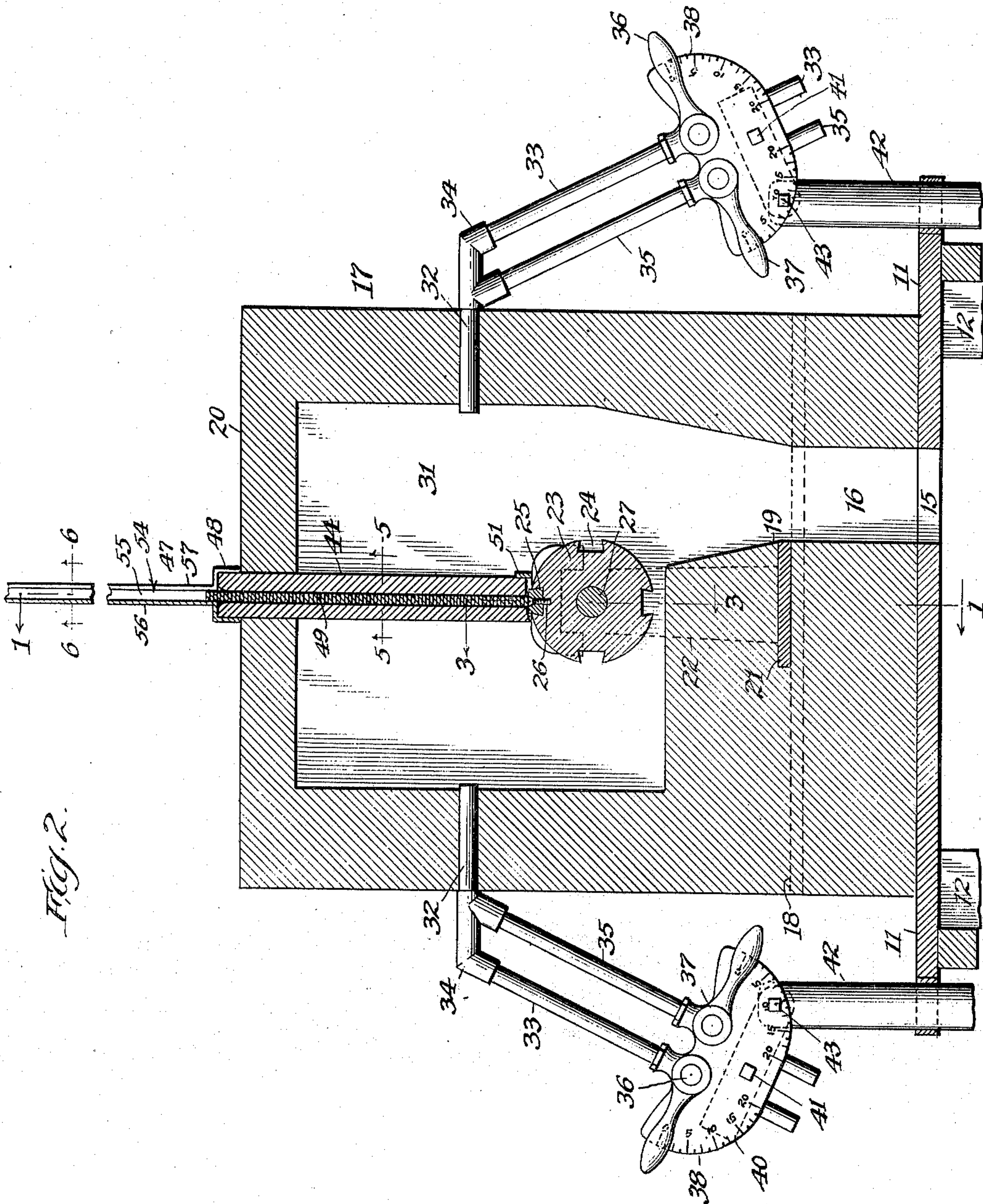


Fig. 2.

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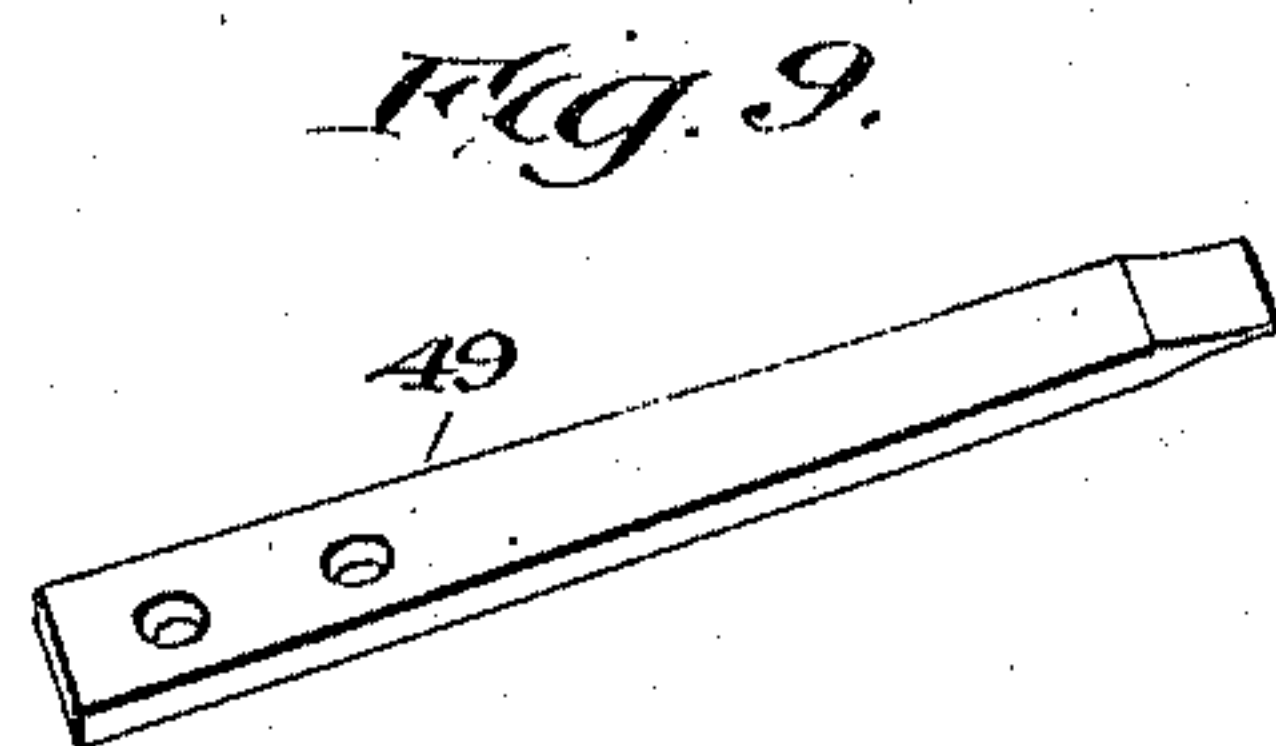
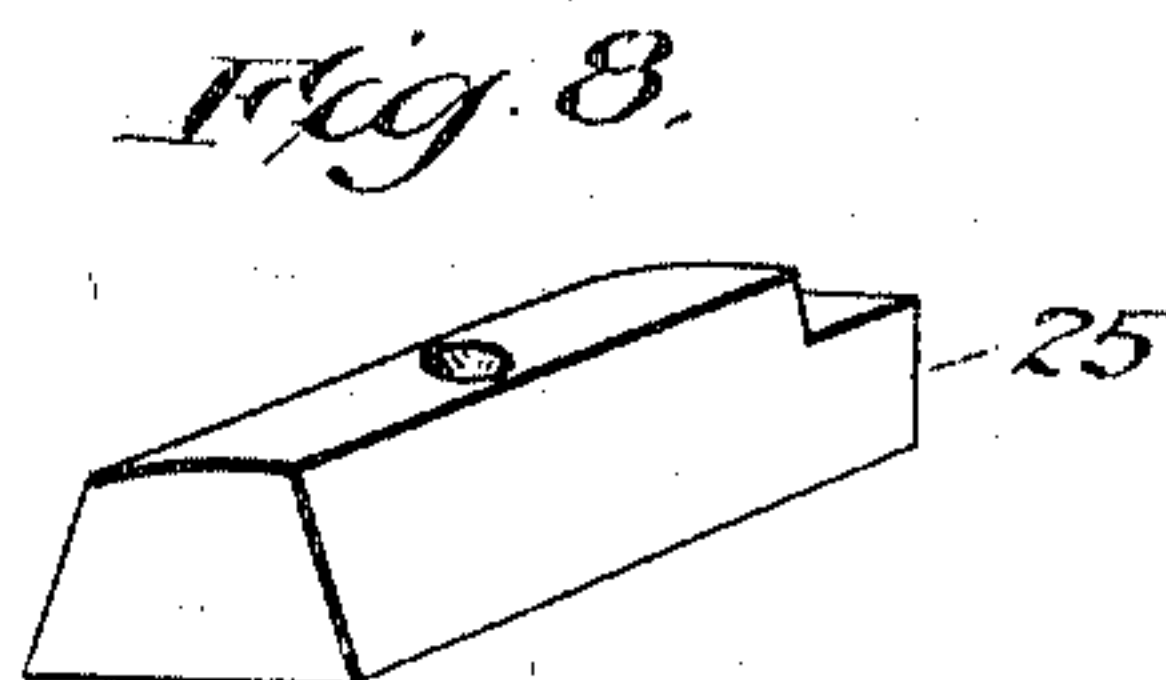
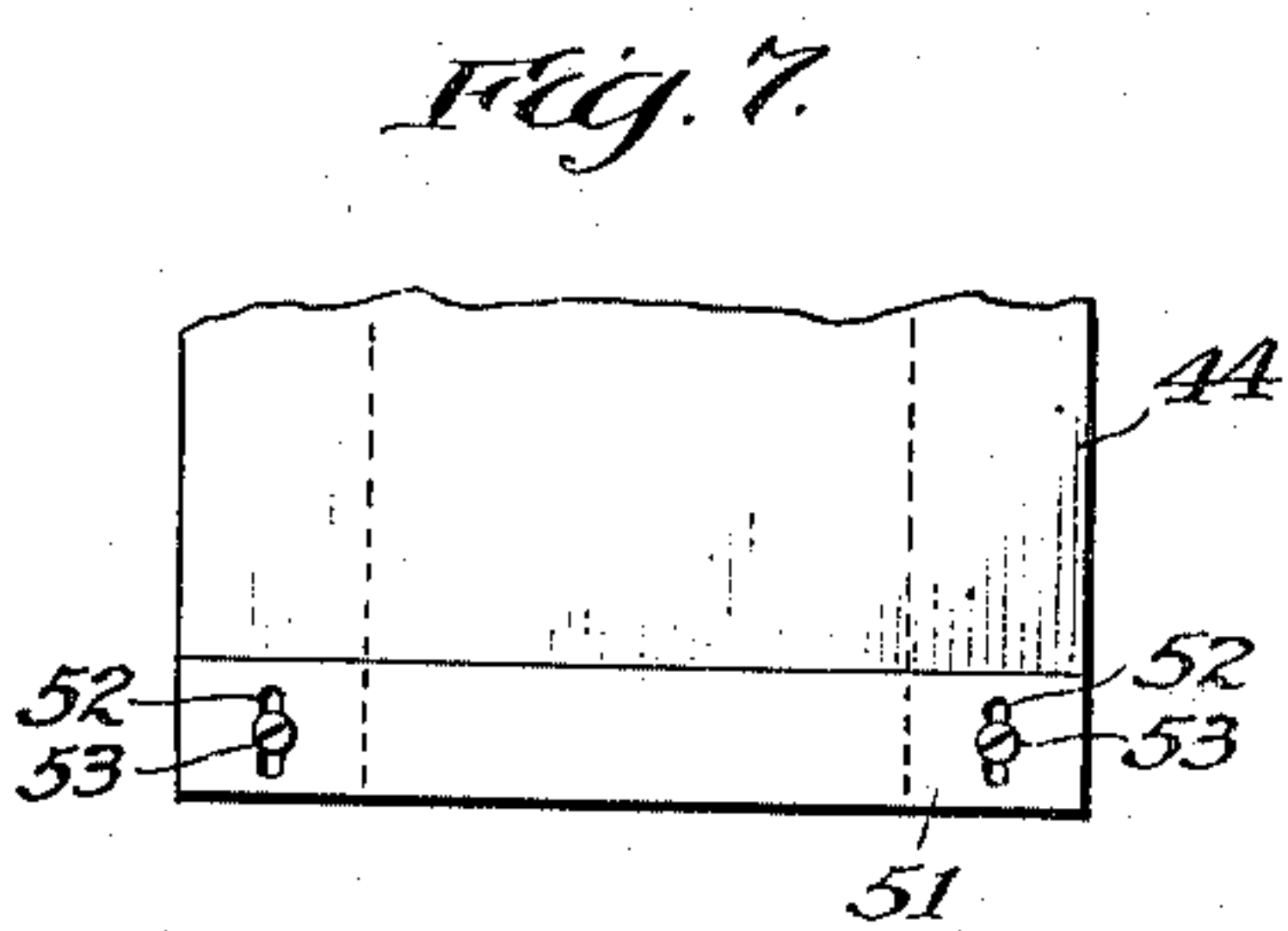
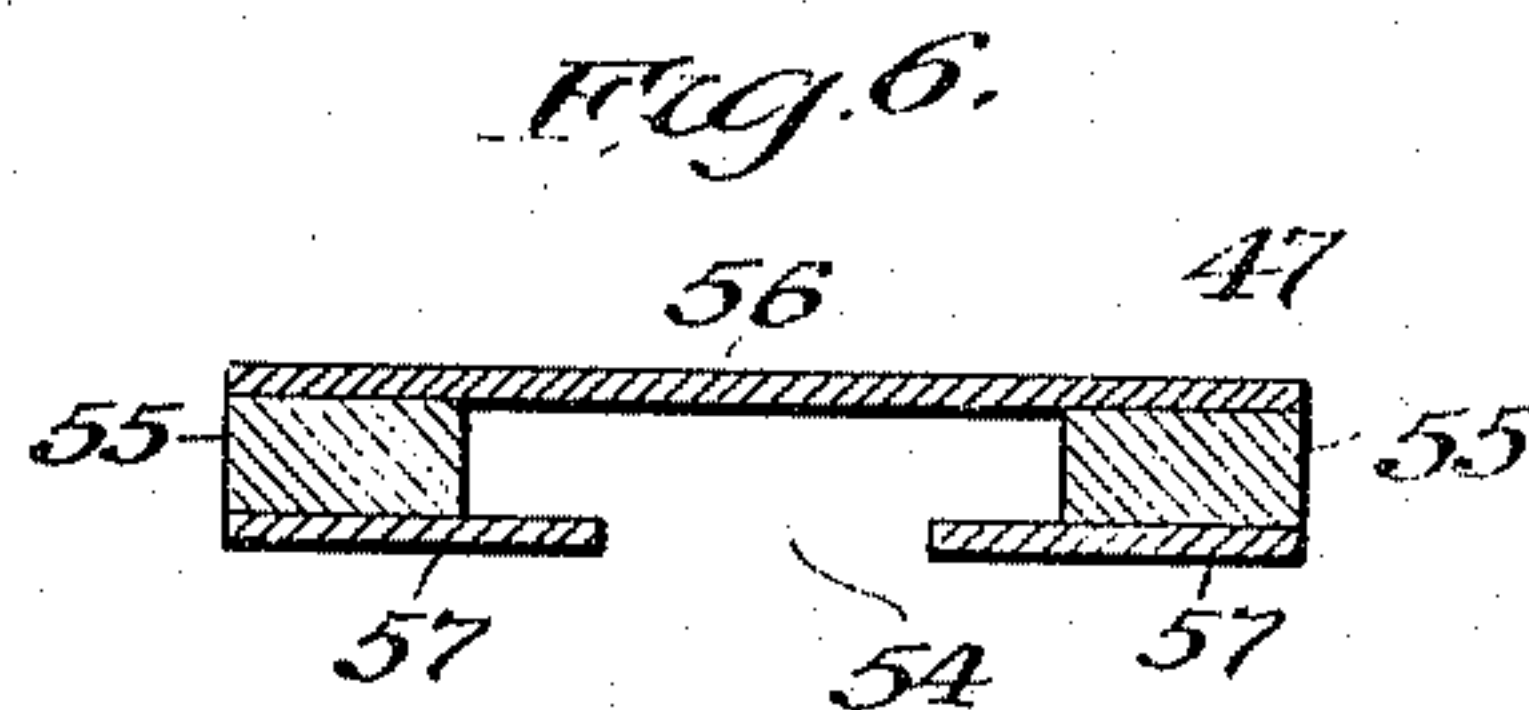
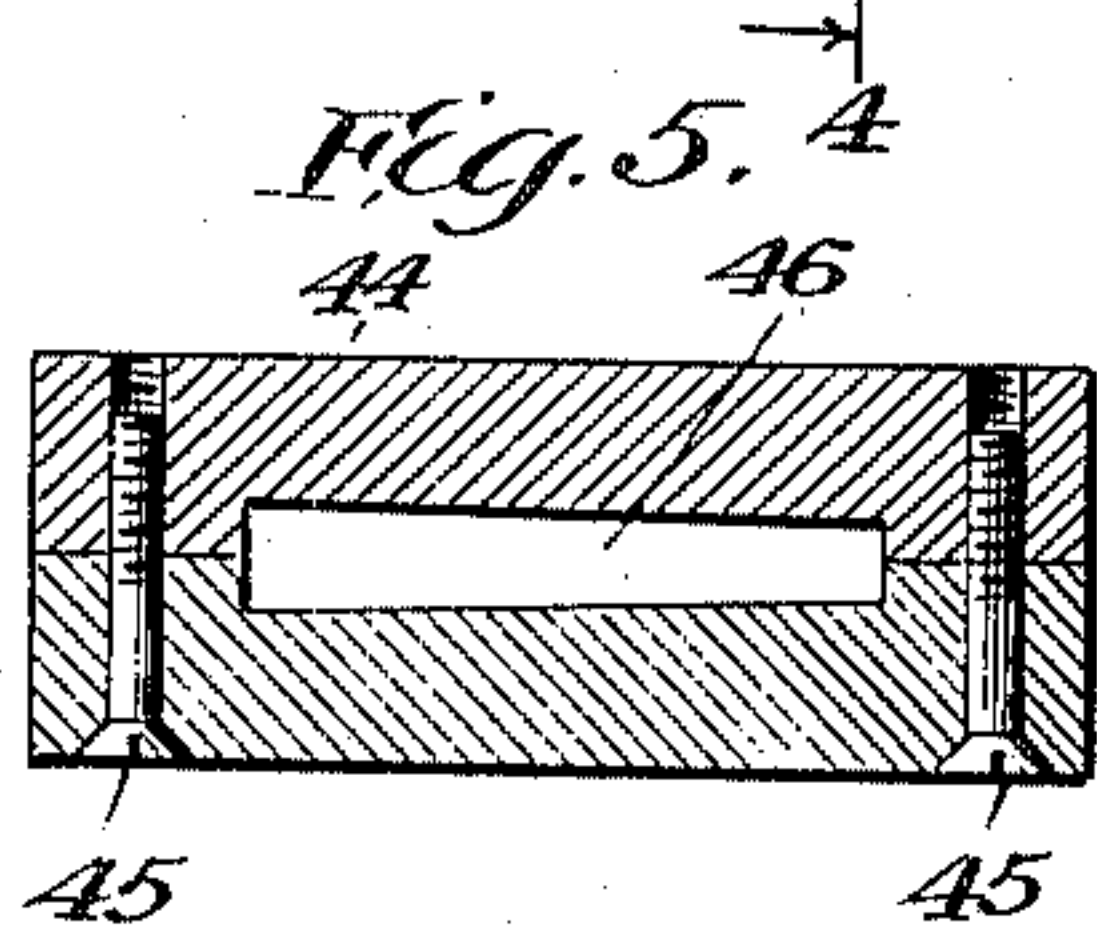
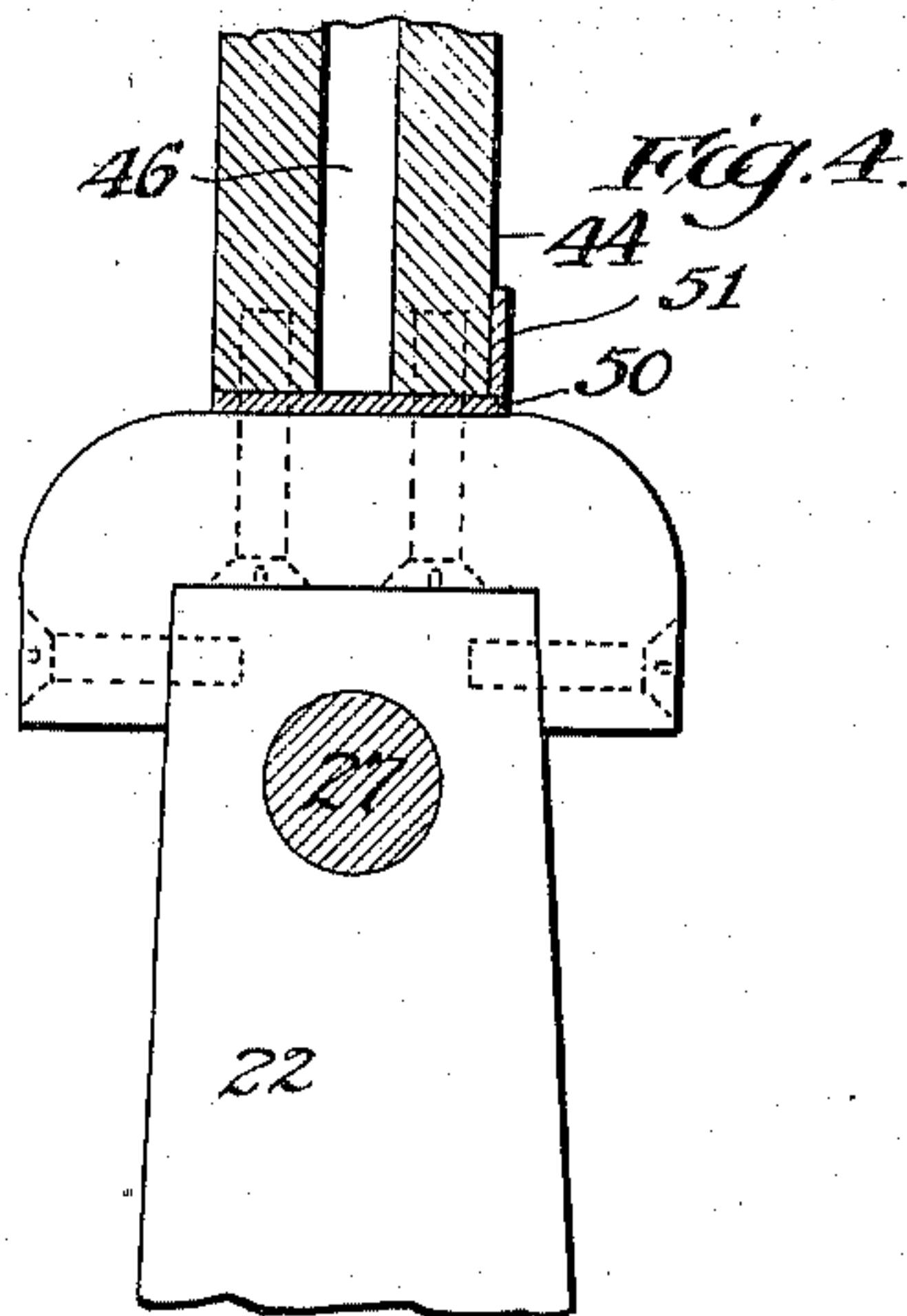
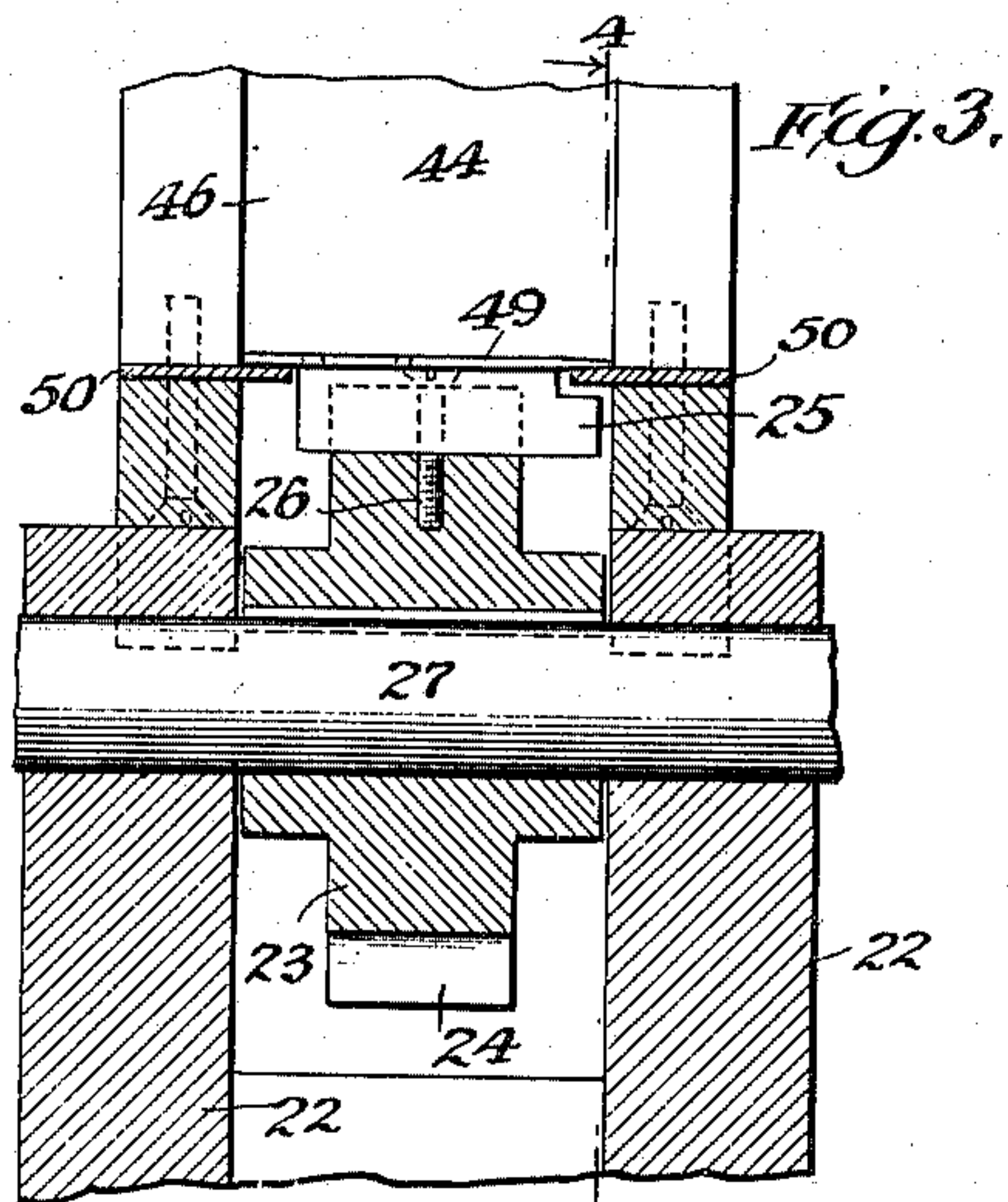


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3 SHEETS—SHEET 3.



Witnesses  
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# UNITED STATES PATENT OFFICE.

WINSLOW R. PARSONS, OF CHICAGO, ILLINOIS.

## ANNEALING AND TEMPERING APPARATUS.

957,998.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed June 14, 1907. Serial No. 378,938.

*To all whom it may concern:*

Be it known that I, WINSLOW R. PARSONS, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Annealing and Tempering Apparatus, of which the following is a full, clear, and exact specification.

My invention relates to improvements in annealing and tempering apparatus in which the articles to be tempered are moved onwardly through the heated annealing chamber and while in a heated condition are subjected to a cooling and tempering liquid.

The objects of my invention are to promote the rapidity of the annealing and tempering operation by very simple means; to insure a uniform tempering of an unlimited number of articles to any predetermined degree of hardness or softness; and to induce to a minimum oxidation during both the annealing and tempering, and resultant scaling, and particularly of small or comparatively thin articles which when finished should be uniform in size and of very high temper.

With these ends in view, my invention consists in certain features of novelty in the construction, combination and arrangement of parts, by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings: Figure 1 represents a vertical section of an annealing and tempering apparatus embodying my invention on a line parallel with the power shaft therefor, on the line 1—1 of Fig. 2 and with the tempering chamber with the shaft, the plate wheel therefor, the feed rolls and the standard support for the shaft shown in full lines. Fig. 2 is an enlarged vertical section on the line 2—2 of Fig. 1 with the tempering chamber and its receptacle removed. Fig. 3 is an enlarged detail vertical section on the line 3—3 of Fig. 2 more particularly showing the feed roller, the means by which stacked articles are intermittently discharged from the annealing chamber into the tempering chamber. Fig. 4 a side elevation of Fig. 3 from the left hand side thereof. Fig. 5 a detailed sectional view of the tempering chamber on the line 5—5 of Fig. 2. Fig. 6 is a transverse section through the hopper conducting the

articles to be tempered to the tempering chamber taken on the line 6—6 of Fig. 2. Fig. 7 an enlarged side elevation of the tempering chamber showing the means by which the discharge opening therefor is adjusted to the thickness of the devices tempered therein. Fig. 8 a perspective view of one of the discharging blocks or teeth forming a part of the discharging roller, and Fig. 9 a perspective view of an article to be tempered which, as illustrated, is the blade of a screw driver.

Similar characters of reference indicate the same parts in the several figures of the drawings.

10 indicates a bed-plate which may be supported upon the top of a bench 11 provided with legs 12, but which may be entirely inclosed except at one side for the introduction of a vessel 13 into which, as hereinafter described, the annealed articles are directly discharged from the heating chamber for tempering purposes.

The tempering vessel is provided with a wall or other perforate cage 14 for the convenience in removing the tempered articles without disturbing the liquids and contents of the vessel, which are discharged from the heating chamber into the tempering vessel or chamber through an opening 15 in the table registering with a corresponding opening 16 in the bed-plate 10 in the path of the line of discharge of the article from the annealing chamber.

Supported by the bed-plate is a box like casing 17 provided with a flange bottom 18 which is provided with an opening 19 registering with the perforations 15 and 16 respectively in the bench and bed-plate, the casing being provided with a cover 20 which may be removable for convenience of access thereto.

Supported on the bottom of the casing by their flanges 21 are bracket arms 22 between which is a discharger 23, which, as shown, is in the form of a roller provided with several dove-tail grooves 24 into one or more of which may be secured discharger blocks 25 held against accidental detachment by a set-screw 26, the said roller being secured upon a shaft 27 which passes through the brackets 22 and is journaled at each side of the casing by standards 28—28 supported on the flanges 18 thereof in suitable boxes 29—29, one end of which shaft



projects beyond a bracket 28, and has thereon a plate wheel 30 connected with any suitable force of power for rotating the feed roller.

5 The casing above the feed roller forms a heating chamber 31, the heating being supplied thereto by the combustion of air and gas through discharge pipes 32—32 at opposite sides of said chamber, the air being  
10 supplied through pipes 33—33 connected with the outer ends of the pipes 32 by couplings 34—34 and the gas by pipes 35—35 bisecting the discharge pipes 32 at a point between their outer and inner ends,  
15 that is to say the path traversed by the air with the result that the gas is broken up by the force of the air prior to the discharge of either into the heating chamber 31. Pipes 33 and 35 are respectively provided  
20 with cocks 36 and 37 for regulating their supply and which may be determined by the position of their handles relative to gage plates 38—38 secured to the pipes 33 and 35 for that purpose. To each of these gage  
25 plates is bolted a plate 40 by bolts 41 which plates are respectively bolted at inwardly projected ends to standards 42—42 by pivot bolts 43—43 which when tightened serve as a support for the plates and a portion of  
30 the weight of the pipes 33 and 35 and relieving their joints to that extent, and also by means of which the pipes may be alined with their couplings 34, and the distance of their projection in the heating chamber may  
35 be increased or diminished for moving the discharge pipes inwardly as their ends may be burned off.

Projecting downwardly through the cover  
20 to register with the box 25 of the discharger roller is a heating chamber 44 composed of two opposing channel irons which are of cast iron to withstand the intense heat they are necessarily subjected to without liability to warp, the said channel irons  
45 being secured together (see Fig. 5) by screw bolts 45—45 so as to form the passage 46 constituting the annealing chamber and which in cross section should conform to the articles to be conducted therethrough  
50 as hereinafter described, as for example by shape shown when the article conducted is a screw-driver blade such as is shown in Fig. 9, the form, however, being varied to conform to that of any other articles to  
55 which my invention may be applied.

Tightly fitting the upper end of the annealing chamber plates or walls is a chute 47 by means of flanges 48, as shown in Fig. 2, but may be by any other suitable means  
60 through which chute the articles to be tempered are guided and supplied to the annealing chamber. The dimensions of the passages forming the annealing chamber and chute are such that the articles to be  
65 tempered may be placed therein one upon

the top of the other and when so placed the bottom article 49 rests at its ends, or sides as may be, upon opposing lugs or plates 50 shown as projecting through the side walls of the heating chamber in such a  
70 plane relative to the discharging block 25 that it will contact with and push one plate at a time from the lugs 50 and thereby discharge it through the passages 15, 16 and 19 into the tempering solution in the vessel 13.  
75

The wall of the discharging side of the heating chamber is foreshortened, as shown in Fig. 2, to leave a space between the annealing chamber and the roller for the discharge of the articles during the rotation of  
80 the roller, the thickness of the discharge passage being regulated by a plate 51 (see Figs. 2 and 7) provided with elongated slots 52 through which screws 53 pass and secure the plate to the wall of the annealing  
85 chamber.

For convenience of inspection a chute 47 is provided on one side (see Fig. 6) with a vertical slot 54 and may be formed by two upright bars 55—55, a plate 56 at one side  
90 thereof and two short plates 57—57 at the opposite side, but said chute might be made of sheet metal bent to form.

In operation gas and air in proper proportions and under a pressure to secure the  
95 desired degree of heat is turned on and ignited at the burner ends of the pipe 32 and the walls of the annealing chamber are heated sufficiently to obtain the degree of annealing desired, the annealing chamber  
100 and may be the chute are then filled with the articles to be annealed and tempered by stacking them one upon the other therein, as indicated at the lower portion of the annealing chamber in Fig. 2, the power shaft 27 is  
105 then revolved through the medium of its plate wheel and its connection with the result that the articles, as for example, the screw-driver blade shown in Fig. 9 are discharged one at a time at each revolution of the discharge roller whence they drop into the tempering solution in the vessel below through the discharges before described. The number of articles thus first annealed and then  
110 tempered depends upon the degree of heat in the annealing chamber and the rapidity of the discharge both of which may be regulated through the speed of the plate and the burner stop cocks, but obviously with a predetermined degree of heat, the degree of annealing may be increased or diminished by  
120 increasing or diminishing the velocity of the roller in rotating. On the other hand the rapidity of the discharge may be increased without increasing the velocity of the discharger by employing several discharger blocks 25 instead of one, and for which purposes I have shown a number of vacant grooved seats therefor in the discharger roller, although the practical operation of  
130



the machine demonstrates that with the single discharger block many thousand plates or pieces similar to those shown in Fig. 9 may be annealed or tempered in a single day, and this to any desired degree and uniformity by heating the walls of the annealing chamber to proper temperature and revolving the discharger accordingly.

In the practical operation of the apparatus embodying my invention the walls of the annealing chamber are uniformly heated throughout their length projecting into the combustion chamber 31 and by the employment of several discharger blocks, as before stated, the capacity of this apparatus may be said to be limited only by the degree of heat employed and the rapidity of the discharge of the annealed articles from the annealing chamber, which is of such length that the articles will be uniformly heated throughout their body through the desired degree at the bottom of their discharge therefrom. In this connection it should be noted that air has no possible access to the annealing chamber and that very little has access to the annealed articles from the instant of their discharge until they are submerged in the tempering liquid, the result being that the articles are tempered with practical and entire absence of oxidation and scaling thereby promoting their uniformity in dimensions and making a scale removing manipulation and process unnecessary.

The apparatus embodied in my invention is also adapted for great uniformity and rapidity in annealing to the exclusion of tempering in which case, however, the receptacle instead of a liquid may be filled with the usual materials upon which it is customary to have annealed articles deposited and prevented from substantial hardening from their cooling process.

That feature of my invention by which the articles are entirely excluded from contact with the flame is of substantial importance for the reason that it is such contact that produces an objectionable degree of scaling, and for the further reason that such exclusion is rendered possible while at the same time the heat due to the flame is imparted to the articles as fully as may be without actual contact therewith.

Although a revolving discharger is desirable because of affording a very simple and effecting means for rapidity and uniformity of discharge and for regulating the integral between the discharge of the articles from the annealing chamber, my invention includes any other device for this purpose without regard to the path of its movement.

Having described my invention what I desire to secure by Letters Patent is,

1. In a device for the purposes described an annealing chamber so arranged that ar-

ticles to be annealed are conducted there-through by gravity alone, means for automatically discharging said articles from said chamber, and means maintaining the walls of said chamber uniformly heated, substantially as described.

2. In a device for the purposes described an annealing chamber provided with a free and substantially close passage through which the articles to be annealed are conducted by gravity alone, means for uniformly heating the walls of said chamber to any desired degree of heat, and mechanical means closing the discharge end of said chamber and adapted to automatically discharge the annealed articles intermittently therefrom, substantially as described.

3. In a device for the purposes described an annealing chamber provided with a passage closed toward one extremity by the articles to be annealed and adapted to conduct the articles therethrough by gravity alone, and a rotary discharger adapted to close its lower extremity, substantially as described.

4. In a device for the purposes described an annealing chamber conforming in cross area to that of the articles to be annealed, means for conducting said articles there-through by gravity alone, a surrounding combustion chamber, means for supplying a regulated degree of heat thereto and to the walls of the annealing chamber, and a rotary discharger operating intermittently to discharge the articles from the annealing chamber, substantially as described.

5. In a device for the purposes described an annealing chamber provided with a passage therethrough conforming to the cross area of the articles to be annealed and stacked therein, a surrounding heating chamber therefor, means for supplying heat thereto, means for supporting a column of stacked articles in the annealing chamber and mechanical means for intermittently discharging said articles one at a time therefrom, substantially as described.

6. In a device for the purposes described a suitable casing, a combustion chamber therein, means for supplying combustible materials thereto, an annealing chamber the walls of which project through said combustion chamber, a discharger for the articles annealed therein, and means for adjusting the discharge opening to differing thicknesses of articles, substantially as described.

7. In a device for the purposes described an annealing chamber substantially conforming in cross section to the area of the individual articles to be annealed conducted therethrough and closed by said articles, means for heating said chamber, means for automatically discharging the annealed articles intermittently therefrom, a tempering



chamber, and means for automatically conducting the annealed articles to the tempering chamber, substantially as described.

8. In a device for the purposes described  
5 an annealing chamber, the cross section of which conforms to the area of the articles annealed therein, means whereby said articles are conducted through said chamber by gravity alone, means supporting a plurality of said articles stacked one upon the  
10 other in the annealing chamber, a rotary discharger intermittently discharging said articles from said support, a tempering chamber in a plane below the annealing chamber,  
15 and a closed passage directly connecting the annealing chamber with the tempering chamber whereby said articles are prevented from oxidation during the annealing and tempering process thereof, substantially as  
20 described.

9. In a device for the purposes described, the combination of an annealing chamber

through which the articles to be annealed are conducted by gravity alone, and jets whereby a blast heat is directed against the walls of said chamber for heating the same to the desired temperature, substantially as described. 25

10. In a device for the purposes described the combination of an annealing chamber through which the articles to be annealed close the passage therein and are conducted by gravity alone therethrough, jets for directing and means for regulating blast heat directed against the walls of said chamber, substantially as described. 35

In witness whereof, I have hereunto set my hand and affixed my seal, this 11th day of June A. D. 1907.

WINSLOW R. PARSONS. [L. s.]

Witnesses:

JOHN WM. HUMMEL,  
JAY JENKINS.