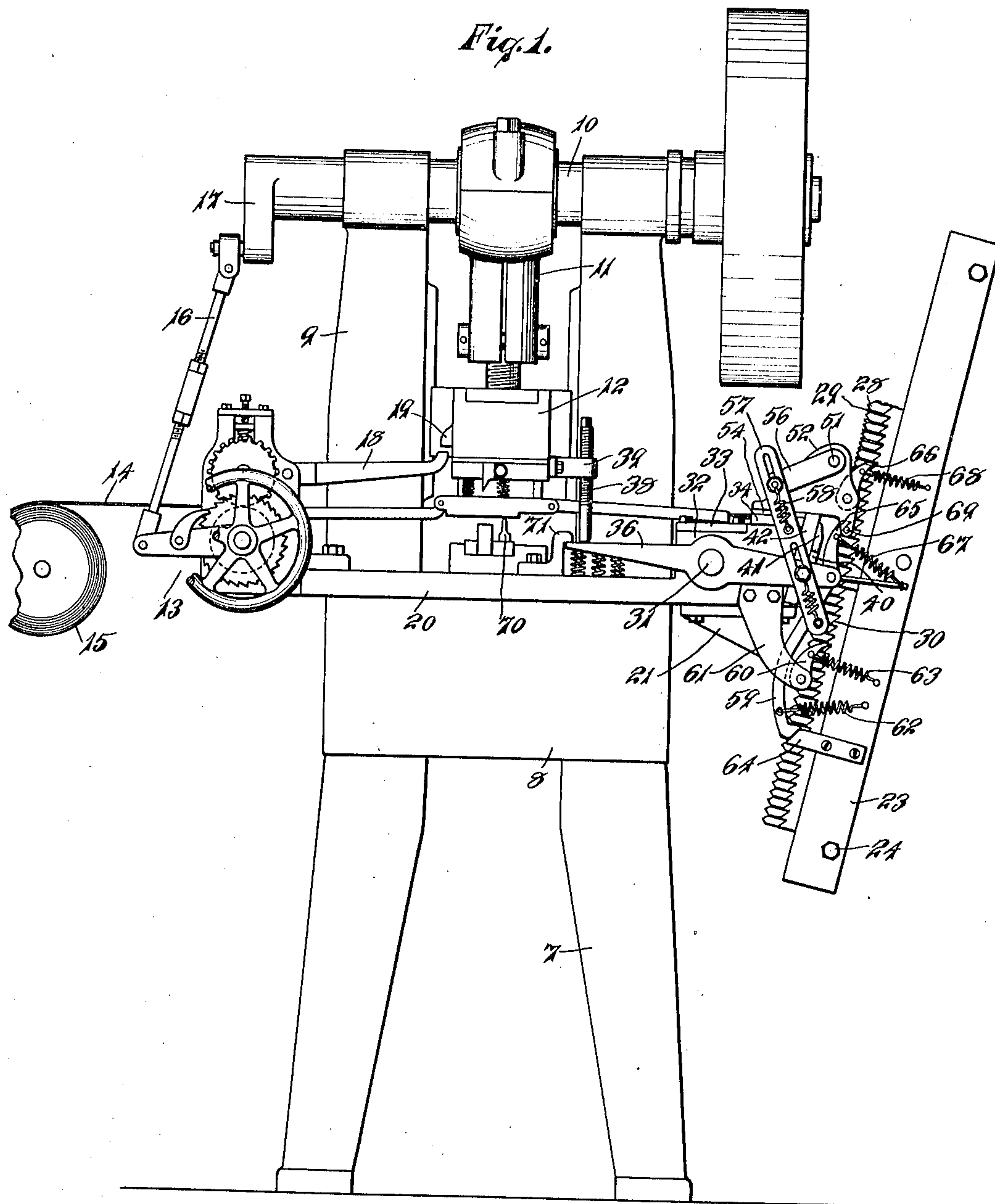


1,298,172.

P. M. BUSH.
JIG FILLING MECHANISM.
APPLICATION FILED AUG. 16, 1917.

Patented Mar. 25, 1919.
2 SHEETS—SHEET 1.



WITNESSES:

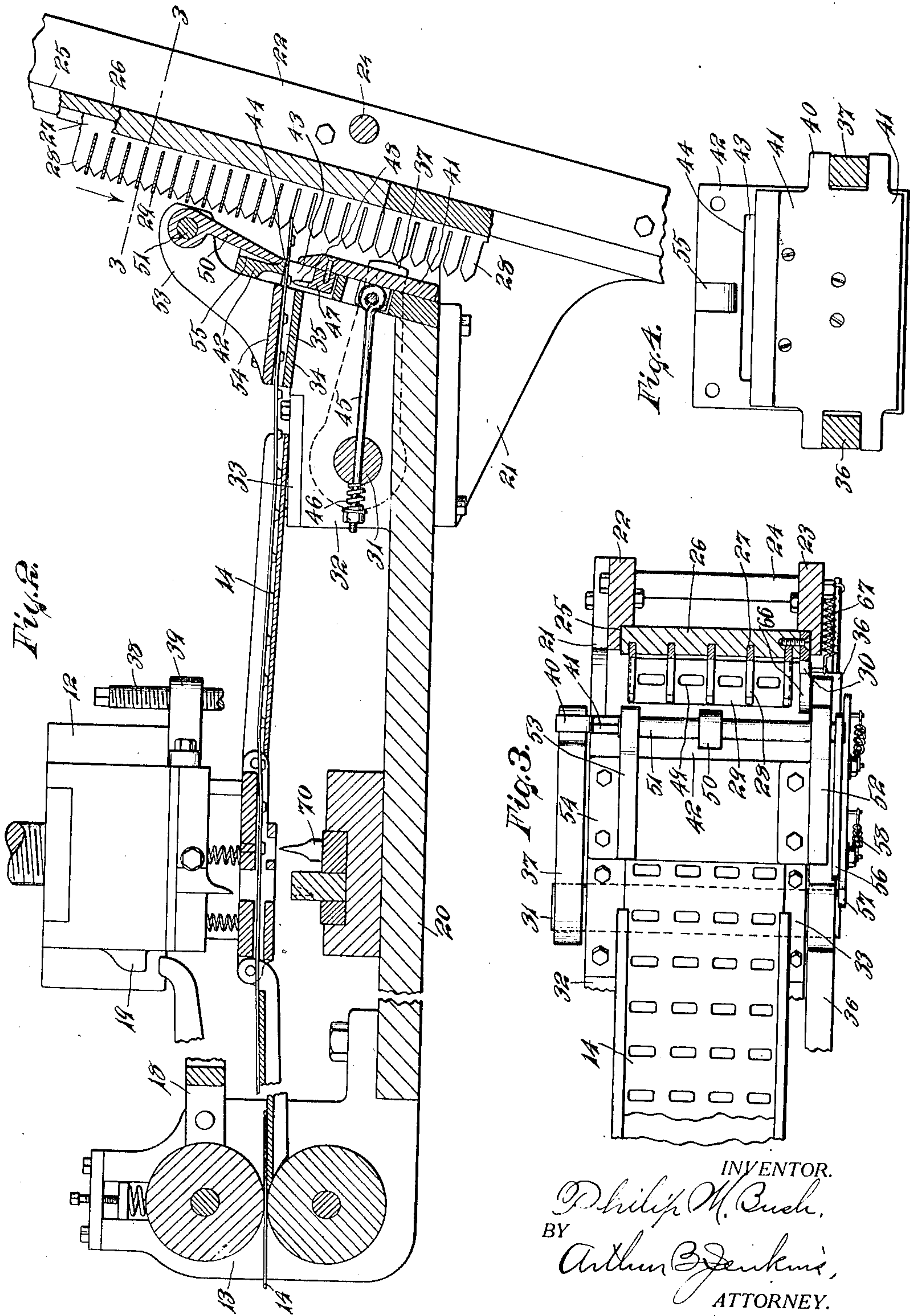
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2 SHEETS—SHEET 2.

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INVENTOR.

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UNITED STATES PATENT OFFICE.

PHILIP M. BUSH, OF HARTFORD, CONNECTICUT.

JIG-FILLING MECHANISM.

1,298,172.

Specification of Letters Patent.

Patented Mar. 25, 1919.

Application filed August 16, 1917. Serial No. 186,600.

To all whom it may concern:

Be it known that I, PHILIP M. BUSH, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and improved Jig-Filling Mechanism, of which the following is a specification.

My invention relates more especially to mechanism for filling jigs with parts that are commonly subjected to special operations while retained in the jig, or in the same relative positions which they occupy while in the jigs, and an object of my invention, among others, is to provide a jig filling mechanism that shall be extremely simple in construction and efficient and rapid in operation.

One form of jig filling mechanism embodying my invention, and in the construction and use of which the objects herein set out, as well as others, may be attained, is illustrated in the accompanying drawings, in which—

Figure 1 is a view of a punch press showing my improved jig filling mechanism attached thereto.

Fig. 2 is a detail view in vertical section of a portion of said press and of my improved jig filling mechanism, especially illustrating the construction of the latter, the scale being enlarged over that shown in Fig. 1.

Fig. 3 is a detail view, scale enlarged, in horizontal section through the filling mechanism on plane denoted by dotted line 3—3 of Fig. 2 and looking in the direction indicated by the arrow.

Fig. 4 is a detail face view of the shears looking from a point at right angles to the plane of the shears, the scale being enlarged.

Mechanism embodying my invention is shown herein as applied to a punch press for making small pieces included in radiator construction for supporting the tubes that conduct a fluid for the purpose of cooling gas engines, and especially those used in automobile construction. It will, however, be understood that my invention is not limited to use in connection with such a press, or for making the pieces herein specifically shown, as it will be found that it may be adapted to a wide variety of uses.

In the accompanying drawings the numeral 7 indicates the legs, 8 the base, 9 the shaft supports rising from the base, 10 the crank shaft, 11 the pitman and 12 the plun-

ger of a punch press, all of which may be of common and well known construction and that may be operated in any well known manner. The numeral 13 indicates generally feed mechanism for feeding the strip 14 of metal, as copper, from a roll 15, this feed mechanism being operated as by means of a connecting rod 16 attached to a crank 17 on the shaft 10, said feed mechanism also being operated by means of a lever 18 pivotally supported and operated as by means of a lug 19 on the side of the plunger 12. This feed mechanism may be of any ordinary and well known construction and further and detailed description is, therefore, omitted herein, it being stated, however, that this mechanism is such as to impart a step-by-step feeding movement to the strip of metal to pass it underneath the punch.

A base plate 20, comprising the immediate support for the lower dies of the punch press extends on opposite sides thereof, the feed mechanism being supported on one projecting end of said base plate and my improved jig filling mechanism being supported on the opposite projecting end of said base plate. A bracket 21 is secured to the under side of the projecting end of the base plate, preferably at or near its back edge, and one of the side parts 22 of a jig guide and support is rigidly secured to this bracket, the other side part 23 of said guide and support being rigidly secured to rods 24 firmly attached to and projecting from the side part 22. These side parts each has its edge formed as a track 25 to receive and guide for movement therealong jigs each comprising a base 26 and clips 27 that are set into grooves extending lengthwise along the base, said clips having fingers 28 formed to receive pieces 29 between them, which pieces are separated from the strip 14 after having been acted upon by the dies of the punch press to produce openings located at regular intervals lengthwise along said pieces. A rack 30 is secured to one edge of each jig, the teeth of the rack being formed to receive holding and feeding pawls to be hereinafter described.

An actuating shaft 31 is mounted for oscillating movement in supporting side parts 32 secured to and rising from the base plate 20, a strip supporting plate 33 and a strip guide plate 34 extending from one to the other of the side parts and being rigidly

secured to the upper edges of said side parts. The strip guide plate has a guide groove forming a portion of a guide opening 35 through which the strip 14 extends and by which it is guided to cutting devices to be hereinafter described.

An actuating lever 36 is secured to one end of the shaft 31, and another actuating lever 37 is secured to the opposite end of said shaft 31. One end of the lever 36 underlies an actuating pin 38 that is adjustably mounted, as by means of interengaging screw threads in a lug 39 projecting from the side of the plunger 12 so that an oscillating movement is imparted to said lever at each reciprocating movement of said plunger. The lever 36 on the side of the shaft 31 opposite the pin 38 and the corresponding part of the lever 37 project into openings formed by ears 40 on opposite sides of a cutter or shear die 41 that is mounted for sliding movement against the face of a cutter supporting plate 42 that rests at its lower edge upon the bracket 21 and that is secured against the ends of the side parts 32 in any suitable manner. This supporting plate has an opening 43, the upper edge of which constitutes a shear die 44 that cooperates with the cutter 41 in severing the pieces from the strip 14 that is passed through the opening 43. The cutter 41 is yieldingly held against the face of the cutter supporting plate 42 as by means of a cutter supporting rod 45 that is pivotally attached to a lug or lugs on the back of the cutter. The opposite end of this rod passes through a hole in the shaft 31, a supporting spring 46 being located on the rod and thrusting against a nut secured upon the end of said rod. A justifier 47 is secured to the back or inner face of the cutter 41, this justifier consisting of a bar that is located in the opening 43 and that has fingers 48 located in position to pass into openings 49 formed by the punch in the strip 14; these fingers engaging the openings in the strip and thus properly positioning it so that all of the pieces 29 will be of equal width after having been separated by the action of the shears.

A pusher 50 is secured to a pusher shaft 51 mounted in the upper ends of brackets 52—53 secured to and rising from a bracket supporting plate 54 extending across the upper edges of the side parts 32, this supporting plate having a groove in its under surface registering with the groove in the plate 34 and completing the guide openings 35. The free end of the pusher normally rests in a recess 55 in the cutter supporting plate 42, and it is moved out of said recess intermittently against the ends of the pieces 29 to push said pieces into the spaces between the fingers 28, the cutter 41, as it severs the pieces, moving them upwardly into the path of movement of the lower end

of said pusher. A pusher operating arm 56 is secured to the shaft 51 and is connected by a pusher operating bar 57 with the actuating lever 36, studs upon said arm and lever passing through slots in said bar, and springs 58 connecting said studs with the bar, whereby a yielding connection between the lever 36 and arm 56 is obtained, so that should any of the parts become jammed the lever 36 may continue to operate without injury to the other parts.

In order to enable a substantially continual movement of one jig after another upwardly along the track 25 I provide two sets of feeding devices, to wit: an initial and a final feeding set. The initial set of said feeding devices comprises an initial feeding pawl 59 and an initial holding pawl 60, the former being pivotally attached to the end of the lever 36 and the latter being pivotally attached to an arm 61 secured to and depending from the front edge of the base plate 20, as shown in Fig. 1 of the drawings. Springs 62 and 63 are connected with said pawls to move them into engagement with the teeth of the rack 30. A feeding pawl disengaging cam 64 projects from the side part 23 in the path of movement of the pawl 59 as it is moved downwardly by the lever 36, the cam thus disengaging said feeding pawl from the teeth of the rack, the latter being held at this time by the holding pawl 60.

The final set of feeding devices comprises a final feeding pawl 65 and a final holding pawl 66, the former being pivotally attached to the end of the lever 36 and the latter being pivotally mounted on the bracket 52. Springs 67 and 68 are employed to move said pawls toward the teeth of the rack 30, as shown in Fig. 1 of the drawings. A camming pin 69 projects from the side of the bracket 52, to support the pawl 65 that rests against said pin. As the lever 36 is operated to move the pawl upwardly, the curved edge of the pawl resting against said pin, and the location of the latter, allows the spring 67 to pull the pawl 65 into engagement with the teeth of the rack 30 and move the jig upwardly. In the downward movement of said pawl the rack is held against downward movement by the holding pawl 66. The operation of the device as to the feeding of the strip 14, the punching operations thereon, the intermittent movement of said strip underneath said punch and between the shear dies, and the intermittent movement of the latter to sever pieces from the end of the strip will be readily understood from the foregoing description taken in connection with the drawings illustrating my invention herein. The upward feed of the jigs will take place intermittently by the action of the holding and feed pawls hereinbefore described. When the

lower end of a jig approaches a point opposite the end of the base plate 20, the pawls 59 and 60 will have ceased their action on said jig. At this time a new jig may be inserted in the track 25, its upper end being pushed into contact with, or nearly so, the lower edge of the preceding jig, and in this position the pawls 59 and 60 will immediately take up their operation to move the jig upwardly with a step-by-step movement, and as soon as the rack on said jig arrives in position for action of the pawls 65 and 66, the action of the two sets of feeding pawls will be in unison and upon the same jig.

A justifier 70 is positioned underneath the plunger 12 to enter the holes which have been formed by the action of the plunger and thus correctly position the strip for the action of the plunger. By the use of the justifiers 47 and 70 the sets of holes are formed at the same distance from each other, and in the severing of each piece from the end of the strip the holes are all located in the same position in each piece so severed. A stop 71 is secured to the base plate 20 to limit the movement of the lever 36 in the downward or positioning movement of the pawls on said lever.

In accordance with the provisions of the patent statutes, I have described the principles of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown is only illustrative, and that the invention can be carried out by other means within the scope of the appended claims.

I claim:

1. In combination with a support for a piece of material from which parts are to be severed and with means for feeding said piece with respect to said support, a jig guide arranged to receive jigs provided with means to receive said severed parts, and means for moving the jigs along said guide.

2. In combination with a support for a piece of material from which parts are to be severed and with means for feeding said piece with respect to said support, a jig guide arranged to receive jigs provided with means to receive said severed parts, and means for simultaneously moving a plural number of jigs along said guide.

3. In combination with a support for a piece of material from which parts are to be severed and with means for feeding said piece with respect to said support, a jig guide arranged to receive jigs provided with means to receive said severed parts, and means for simultaneously moving a plural number of jigs in tandem formation along said guide.

4. In combination with a machine ele-

ment arranged to operate upon a strip of material from which parts are to be severed at the end thereof and with means for feeding said strip, a jig guide positioned in the path of movement of said strip and arranged to receive jigs provided with means to receive said severed ends, and means for moving the jigs along said guide.

5. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed from the end thereof and with means for feeding said strip, a jig guide positioned in the path of movement of said strip and arranged to receive jigs provided with means to receive said severed ends, and means for simultaneously moving a plural number of jigs along said guide.

6. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed from the end thereof and with means for feeding said strip, a jig guide positioned in the path of movement of said strip and arranged to receive jigs in tandem formation, which jigs are provided with means to receive said severed ends, and means for simultaneously moving a plural number of jigs along said guide.

7. In combination with a support for a piece of material from which parts are to be severed and with means for feeding said piece with respect to said support, a jig guide arranged to receive jigs provided with means to receive said severed parts, and means operating solely upon each of a plural number of jigs to move them along said guide.

8. In combination with a support for a piece of material from which parts are to be severed and with means for feeding said piece with respect to said support, a jig guide arranged to receive jigs in tandem formation, said jigs being provided with means to receive said severed parts, and means operating solely upon each of a plural number of said jigs to move them in tandem formation along said guide.

9. In combination with a support for a piece of material from which parts are to be severed and with means for feeding said piece with respect to said support, a jig guide arranged to receive jigs in tandem formation, said jigs being provided with means to receive said severed parts, initial feeding means for moving a jig along said guide, and final feeding means for moving said jig along said guide.

10. In combination with a machine arranged to intermittently operate upon a strip of material from which parts are to be severed from the end thereof and with means for feeding said strip, a jig guide positioned in the path of movement of said strip and arranged to receive jigs provided

with means to receive said severed ends, and feeding means operated to intermittently move the jigs along said guide.

11. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed from the end thereof and with means for feeding said strip, a jig guide positioned in the path of movement of said strip and arranged to receive jigs provided with means to receive said severed ends, and a plural number of feed devices acting in unison with each other to intermittently move jigs along said guide.

12. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed from the end thereof and with means for feeding said strip, means for intermittently moving said strip of material, a jig guide positioned in the path of movement of said strip and arranged to receive jigs provided with means to receive said severed ends, and means for imparting intermittent movement to jigs along said guide during the periods of rest of said strip.

13. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed from the end thereof and with means for feeding said strip, means for imparting intermittent movement to said strip, a jig guide positioned in the path of movement of said strip and arranged to receive jigs provided with means to receive said severed ends, and means acting independently but in unison to impart movement simultaneously to a plural number of jigs during the periods of rest of said strip.

14. In combination with a support for a strip of material from which parts are to be severed, a jig guide positioned in the path of movement of said piece of material and arranged to receive jigs provided with means to receive said severed parts, means for moving the jigs along said support, and means for forcing the severed parts into the grasp of said jigs.

15. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed from the end thereof, a jig guide positioned in the path of movement of said strip and arranged to receive jigs provided with means to receive said severed ends, means for forcing said severed parts into the grasp of said jigs, and means for moving the jigs along said guide.

16. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed from the end thereof, a jig guide positioned in the path of movement of said strip and arranged to receive jigs provided with means to receive said severed ends, means for sev-

ering the ends from the strip, means for forcing said severed ends into the grasp of said jigs, and means for moving the jigs along said guide.

17. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed from the end thereof, a jig guide positioned in the path of movement of said strip and arranged to receive jigs provided with means to receive said severed ends, means for severing said ends from the strip of material, a pusher acting in unison with the severing means to force the severed ends into the grasp of said jigs, and means for moving the jigs along said guide.

18. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed from the end thereof, a jig guide positioned in the path of movement of said strip and arranged to receive jigs provided with means to receive said severed ends, means for severing said ends, a pusher acting in unison with the severing means to force said severed ends into the grasp of said jigs, and means for imparting intermittent movement to the jigs along the guide and in unison with said cutting means.

19. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed from the end thereof, means for intermittently moving said strip for action of said machine element, a jig guide positioned in the path of movement of said strip and arranged to receive jigs provided with means to receive said severed ends, means for severing the ends from said strip during its periods of rest, and means for intermittently moving the jigs along said guide during the periods of rest of said strip.

20. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed from the end thereof, means for intermittently moving a strip for action of said machine element, a jig guide positioned in the path of movement of said strip, means arranged to receive jigs provided with means to receive said severed ends, means for severing said ends during the periods of rest of said strip, means for forcing the severed ends into the grasp of said jigs during the periods of dwell of said strips, and means for imparting intermittent movement to said jigs along said guide during the periods of rest of said strip.

21. In combination with a support for a piece of material from which parts are to be severed and with means for feeding said piece with respect to said support, a jig guide arranged to receive jigs provided with means to receive said severed parts, a plural number of feed members positioned to act

upon different jigs, and a member to operate said feed members.

22. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed from the end thereof, a jig guide positioned in the path of movement of said strip and arranged to receive jigs provided with means to receive said severed ends, a plural number of feed members positioned to act upon different jigs, a lever to operate said feed members, and a connection between said lever and the machine element for operation of said lever.

23. In combination with a reciprocating punch arranged to act upon a strip of material from which parts are to be severed from the end thereof, means for feeding said strip to the punch, a jig guide located in the path of movement of said strip and arranged to receive said severed ends, means for severing the ends of the strip, a plurality of feeding members positioned to act upon different jigs in said guide, and a lever positioned to be operated by said punch and connected to simultaneously operate all of said feed members.

24. In combination with a machine and with means for feeding a strip of material, a jig guide supported on said machine in the path of movement of a strip that is acted upon by said machine, means to feed along said guide jigs arranged to receive ends severed from said strip, and means for severing the ends of the strip.

25. In combination with the table of a machine to operate upon a piece of material, a jig guide supported by the table at the end thereof in the path of movement of said piece of material, feed members positioned to feed along said guide a jig having means to receive parts severed from said piece, a pusher supported by the table to push the severed parts into the grasp of said jig, and means for moving the pusher against said parts.

26. In combination with the table of a punch press to operate upon a strip of material, a jig guide supported by the table at the end thereof in the path of movement of said strip, a feed member positioned to feed along said guide a jig having means to receive the severed ends of said strip, and a lever supported by said table and operatively connected with said feed members and also with the reciprocating punch of said machine.

27. In combination with the table of a punch press to operate upon a strip of material, a jig guide supported by the table at the end thereof in the path of movement of said strip, a feed member positioned to feed along said guide a jig having means to receive the ends severed from said strip, a lever supported by said table and opera-

tively connected with said feed member and also with the reciprocating punch of said machine, and a pusher connected with said lever to be operated thereby.

28. In combination with the table of a punch press to operate upon a strip of material, a jig guide supported by the table at the end thereof in the path of movement of said strip, a feed member positioned to feed along said guide a jig having means to receive ends severed from said strip, and a lever supported by said table and operatively connected with said feed member and also with the reciprocating punch of said machine, said lever supporting said feed member.

29. In combination with the table of a punch press to operate upon a strip of material, a jig guide supported by the table at the end thereof in the path of movement of said strip, a plurality of sets of feed members positioned to feed along said guide jigs having means to receive ends severed from said strip, a lever supported by said table and operatively connected with each set of feed members, means for operating the lever, and a pusher operatively connected with said lever.

30. In combination with the table of a machine to operate upon a piece of material, a jig guide consisting of side parts constituting an open frame supported by said table at the end thereof and with the opening of said frame facing the end of the table with a space between the table and frame, feed members supported by the table to feed jigs along the frame, and means for operating the feed members.

31. In combination with a support for a piece of material from which parts are to be severed and with means for feeding said piece of material, a jig guide located in the path of movement of said piece of material and arranged to receive jigs provided with means to receive said severed parts, a plurality of feed members for simultaneously moving a plurality of jigs along said support, a lever supporting all of said feed members, and means for operating the lever.

32. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed and including a support for said strip and with means for feeding said strip of material with respect to said support, a jig guide arranged to receive jigs provided with means to receive said severed parts, said guide being located in the path of movement of said strip of material, means for feeding the strip of material along said support, a plurality of feed members to simultaneously feed a plurality of jigs along said guide, a lever supporting all of said feed members, and means for operating the lever.

33. In combination with a punch press in-

cluding a support for a strip of material from the end of which parts are to be severed, means for feeding said strip with respect to said support, a jig guide arranged to receive jigs provided with means to receive said severed parts, a lever pivotally mounted on said support and operatively connected with the punch of said press, and a plurality of feed members supported by said lever and positioned to simultaneously feed a plurality of said jigs along said support.

34. In combination with a support for a piece of material from which parts are to be severed, means for moving the strip along said support, a jig guide arranged to receive jigs provided with means to receive said severed parts when the strip is moved along, a plurality of sets of holding pawls mounted on said support, a lever mounted on said support, a plurality of pawls supported by said lever to operate simultaneously upon a plurality of said jigs, and means for operating the lever.

35. In combination with a support for a piece of material from which parts are to be severed and with means for feeding said piece of material, a jig guide arranged to receive jigs provided with means to receive said severed parts, a strip guide to receive said strip and guide it to said jig, means appurtenant to said strip guide to sever the ends of the strip, a lever pivotally mounted upon the support, means for operating the lever, and a plurality of pawls supported by the lever and arranged to simultaneously feed a plurality of said jigs.

36. In combination with a support for a piece of material from which parts are to be severed and with means for feeding said piece of material, a jig guide arranged to receive jigs provided with means to receive said severed parts, a strip guide located on said support and having an opening to receive said strip, a pair of shear dies located adjacent to said opening to sever the end of the strip projecting therefrom, a plurality of feed members to feed a plurality of jigs simultaneously along said guide, and means for operating said feed members.

37. In combination with a table for a piece of material from which parts are to be severed and with means for feeding said piece of material, a jig guide supported by said table opposite its ends and in the path of movement of said piece of material, said guide being arranged to receive jigs provided with means to receive parts severed from said piece of material, side parts located on said table, shear dies secured at the ends of said side parts, means for operating said dies, a guide located on said side parts for said piece of material, a plurality of feed members for simultaneously feeding

a plurality of jig guides along said support, and means for operating feed members.

38. In combination with a table to support a piece of material from which parts are to be severed, a jig guide supported by said table to receive jigs provided with means to receive said severed parts, a rock shaft for a pusher to insert said severed parts in the jig, a lever supported by said table, means for operating the lever, a plurality of feed members mounted on said lever, and a connection between said lever and said rock shaft to operate the pusher.

39. In combination with a support for a piece of material from which parts are to be severed, a jig guide arranged to receive jigs provided with means to receive said severed parts, a plurality of shear dies, one of which has a recess for a pusher located near the cutting edge of the die, means for operating the shear dies to sever the end of said piece and to move the edge of said severed end into the path of movement of the pusher, means for operating the pusher, and means for feeding the jig.

40. In combination with a support for a piece of material from which parts are to be severed, a jig guide arranged to receive jigs provided with means to receive said severed parts, a feed member to feed a jig along said guide, means for operating the feed member, a pair of shear dies for separating parts from said piece of material, one of said dies having a recess for a pusher, means for operating the shears whereby the edge of a severed part is located in the path of movement of said pusher, and means for operating the pusher.

41. In combination with a support arranged to receive jigs provided with means to receive parts severed from a piece of material, means for feeding a piece of material with respect to said support, and means for moving jigs along said support.

42. In combination with a support arranged to receive jigs provided with means to receive parts severed from a piece of material, of a plurality of feeding means arranged to operate simultaneously upon each jig placed upon said support.

43. In combination with a machine element arranged to operate upon a strip of material from which parts are to be severed from the end thereof, a jig guide positioned in the path of movement of said strip and arranged to receive jigs provided with means to receive said severed parts, means for imparting intermittent movement to said strip, means for imparting intermittent movement to said jigs, each of said moving means being arranged to impart movement to its part while the other part is at rest.

44. In combination with a machine element arranged to operate upon a strip of

material while at rest and from which parts
are to be severed from the end thereof,
means for feeding the strip to said element,
a jig guide arranged to receive jigs adapted
5 to receive pieces severed from strip, means
for severing pieces from the end of the
strip, and means operatively connected with
said element, for operation thereby, during
periods of rest of said strip, to feed jigs
10 along said guide during such periods of rest.

45. In combination with a support for a
piece of material from which parts are to
be severed, a jig guide located in the path of
movement of said piece of material and
arranged to receive jigs provided with 15
means to receive said severed parts, means
for feeding the end of said piece into the
jig, and means for severing said end after
it is located in said jig.

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