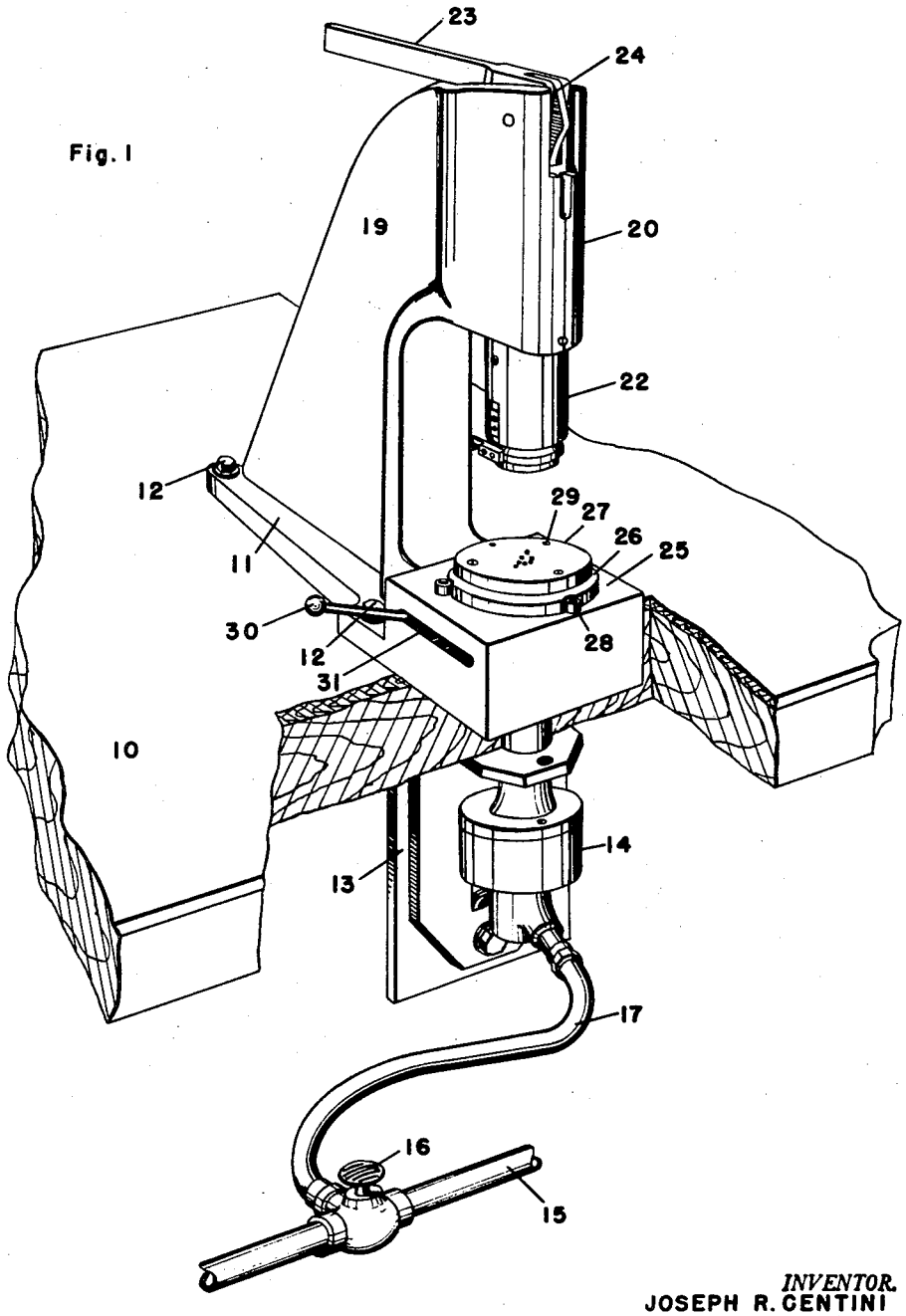
July 15, 1952 J. R. CENTINI ET AL 2,602,986

JEWEL SETTING PRESS

Filed June 19, 1948 3 Sheets-Sheet 1

Fig. 1



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Fig. 2

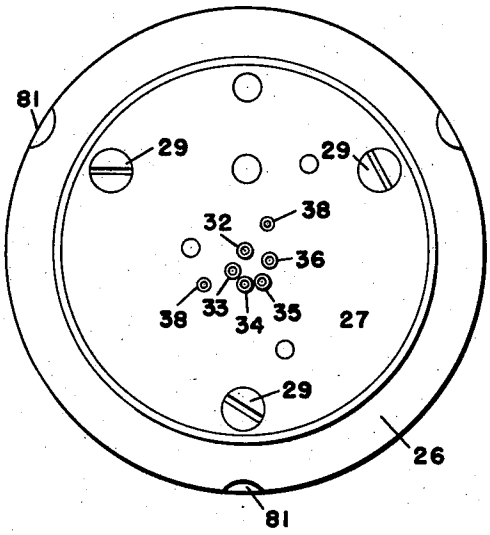


Fig. 3

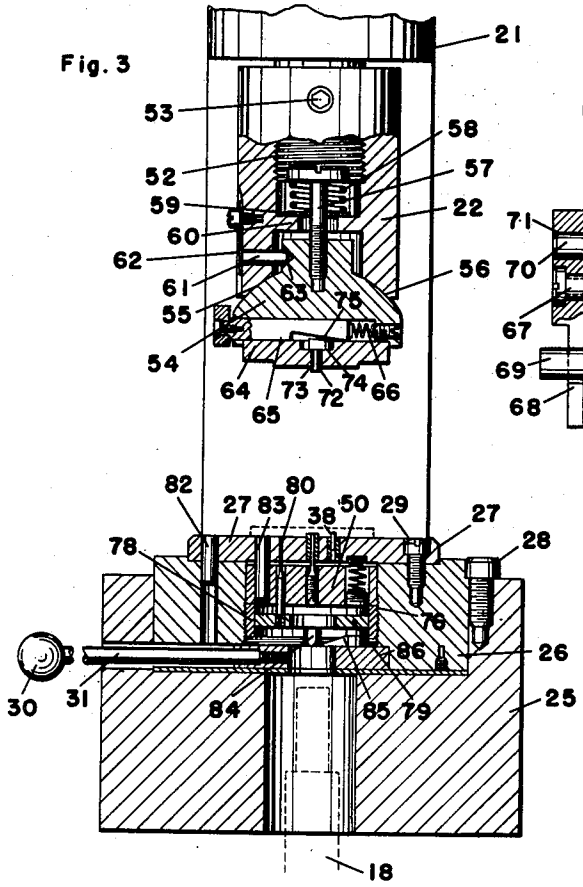
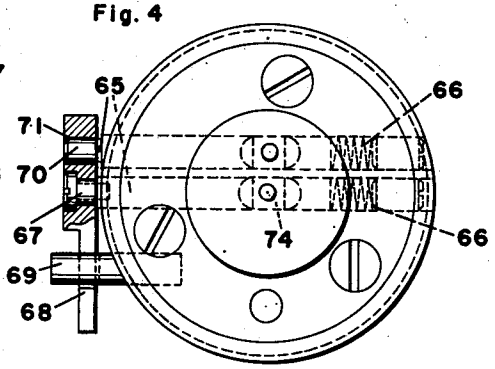


Fig. 4



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Fig. 5

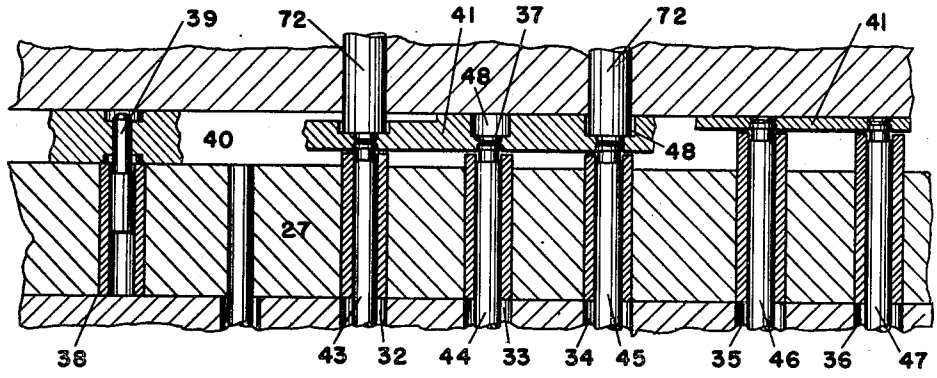


Fig. 6

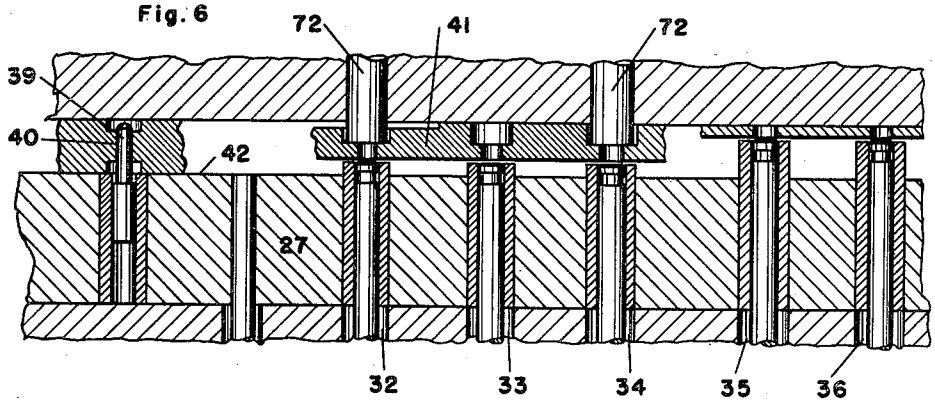
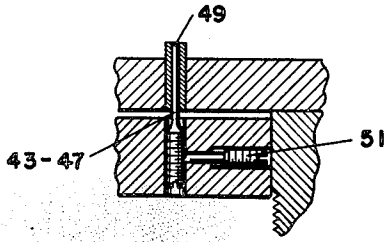


Fig. 7



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Patented July 15, 1952

2,602,986

UNITED STATES PATENT OFFICE

2,602,986

JEWEL SETTING PRESS

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Application June 19, 1948, Serial No. 33,967

4 Claims. (Cl. 29—10)

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This invention relates to a multiple jewel press for fitting watch jewels in pillar plates and bridges.

The object of the present invention is to provide a machine in which a multiplicity of jewels are frictionally set in a pillar plate at one and the same operation.

A further object of the present invention is to provide a press having means for inserting a multiplicity of jewel bearings to different depths in a pillar plate but to a definite predetermined position within that pillar plate at one and the same operation.

A further object of the present invention is to provide a universally mounted head serving to engage the pillar plate and to hold said plate in perfect alignment with the bed of the machine during the jeweling operation to insure the alignment of the jewel surface with the surface of the pillar plate.

A still further object is to provide a multiple press having a universal head for backing and supporting the plate to be jeweled and means carried by said head for reinforcing certain webs individually in the plate in which jewels are mounted, during the jeweling operation to prevent springing of the plate during the jeweling operation.

A still further object of the present invention is to provide a multiplicity of independently set plungers to precisely determine the final position of said jewels in the plate.

A further object of the present invention is to provide an ejector mechanism for releasing the plate from the machine after the jeweling operation.

With the foregoing and other objects in view, the invention resides in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein described may be made within the scope of what is claimed without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawings in which:

Figure 1 is a perspective view of the entire machine, a portion of the table on which the machine is mounted being cut away to show the lower part of the mechanism.

Figure 2 is a top plan view of the bed of the machine.

Figure 3 is a cross section of a detail of the

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machine showing the universally mounted head, the bed and the ejector mechanism.

Figure 4 is a detail showing the mechanism used for backing the webs of the plate during the jeweling operation.

Figure 5 is a sectional view taken through the various setters of the jewel bearings and showing the bearings in final position.

Figure 6 is a view similar to Figure 5 with the bearings in a position to be inserted.

Figure 7 is a detail view showing the means for locking any one of the plungers in predetermined desired position.

Referring particularly to Figure 1, the invention which is a comparatively small machine is mounted on a table 10, the supporting base 11 being held to said table by bolts 12. Depending from the base is a back plate 13 to which is bolted a cylinder 14 operated by air pressure from the line 15 and controlled by the foot valve 16. A hose connection 17 connects the air valve 16 with the cylinder 14 to operating piston 18 (shown in dotted lines in Figure 3). The details of the air operated piston 18 and the cylinder 14 are not shown as they form no part of the invention, being purchased on the open market and being added to the tool.

Supported by the base 11 a vertical standard 19 has integrally formed therewith a cylinder 20 which has slidably mounted therein a piston 21 (see Figure 3) carrying a head 22. This piston is manually operated through a lever 23 and link 24 and by means of said lever can be locked firmly in its lowermost position.

The base 11 has integrally formed therewith a platform 25 upon which is mounted the bed 26, which in turn supports a bed plate 27. Bolts 28 securely hold the bed 26 to the platform 25, while other bolts 29 secure the bed plate 27 to the bed 26. An ejector mechanism operating arm 30 extends through a slot 31 in the platform to within an easily manipulating position.

Referring to Figures 2, 5 and 6 (Figures 5 and 6 being sections on a line taken through the center of the jewel bearings), tubes 32, 33, 34, 35 and 36 extend through the bed plate to receive the jewel bearings 37. Also extending through the plate 27 are tubes 38 in which are positioned locator pins 39 receivable in holes 40 in the pillar plate 41 to properly position the pillar plate for the jeweling operation.

Referring particularly to Figure 6, the tubes 32, 33 and 34 extend approximately the same distance above the bed plate 27, whereas tubes 35 and 36 project farther from the surface 42 of the

bed plate hereinafter called the parting line. The jewels **37** are frictionally pressed into the pillar plate **41** by means of plungers **43, 44, 45, 46** and **47**, the operation shaving a small amount of metal from the inside of the holes of the pillar plate to form a slight burr, as shown just above the jewels at **48**. It is extremely necessary that these jewels be positioned within the pillar plate at an exact distance from the parting line. With hand jeweling it was absolutely impossible to accurately position all five jewels in a pillar plate consistently. The present invention overcomes that by projecting tubes to a point almost touching the surface of the pillar plate, yet not touching allowing for a slight tolerance in machining and mounting a slidable plunger in each tube to securely press all five jewels simultaneously into the pillar plate. As the jewels are loosely seated in the tubes **32, 33, 34, 35** and **36**, the accuracy which determines whether the jewel hole opening is normal to the surface of the pillar plate depends on the flatness of the upper head of the plunger. This head **49** is ground perfectly flat and consequently the jewel is firmly seated in the pillar plate in its correct position. As a means for determining the exact distance the jewels are located from the parting line, the plungers **43—47** are threaded into a movable piston **50** (Figure 3) and securely locked in desired position by set screws **51**.

Referring to Figures 3 and 4, the piston **21** slidably mounted in the cylinder **20** carries a removable head **22** which is threaded at **52** to the piston **21** and securely locked by the set screw **53**. This head **22** is bored to receive a swivel piece **54**, the spherical ends **55** of the head fitting the spherical surface **56** of the swivel piece to provide within the desired limits a universal action of said swivel piece. To hold the swivel piece in position is a bolt **57** threaded into the upper end of said swivel piece and holding said piece securely against the spherical surface **55** through the action of a coil spring **58** bearing against the underhead of the bolt and a washer **59** securely seated on web **60**. A pin **61** is securely pressed by a spring **62** into a conical depression **63** in the upperhead of the swivel piece.

The lower surface of the swivel piece **54** is milled to provide a pair of grooves to receive sliding bolts **65** which are urged in one direction longitudinally of the grooves by springs **66**. A cover plate **64** is fastened over the milled grooves by screws threaded into the swivel piece **54**. Pivoted at **67** to one of the pins **65** is an unlocking lever **68** which is moved into and out of locking position with the latch **69** by pivoting about the pin **67**, being limited in its motion by the end **70** of the other of the pins passing through an arcuate slot **71** in the unlocking lever **68**. Release of said unlocking lever allows the bolts **65** to move outward under the influence of the springs **66**. At right angles to the milled grooves are a pair of holes **72** in which are mounted pins **73** for vertical movement. These pins are provided with square heads **74** adapted to be engaged by cam surfaces **75** on the underside of the pins **65**. Outward movement of the bolts **65** will bring the cam surface **75** into engagement with the heads of these pins and because of the angle at which the contact is made, the pins are securely held against the vertical motion.

The platform **25** is formed with a circular bore enlarged at its upper end to receive the bed **26** and slotted transversely for the movement of the ejector arm **30**.

The bed **26** is formed with a central partially threaded opening **76** having a piston **50** slidably mounted in its upper part and a sleeve **78** serving as a stop for said piston threaded into the lower portion of the bore. An ejector pin carrying disc **79** is slidably mounted within the sleeve and carries ejector pins **80** which pass through the piston **50** and the bed plate **27** to engage the surface of the pillar plate at the parting line. The bed is firmly held into the platform by the bolts **28**, threaded into said platform and engaging the niches **81** in the edge of said bed plate and is bored to receive a locator pin **82** for properly positioning the bed plate as well as the bolts **29** which secure the bed plate to the bed.

The piston **50** is bored and threaded to receive the five plungers **43—47** as well as the set screws **51**, as well as the guide pin **83**; also return springs and clearance for ejectors.

The ejector disc **79** which carries the ejector pin **80** is formed with feet **84** adapted to be engaged by the cam surface **85** of the cam **86**. Both the cam and the ejector disc are formed with central openings to permit passage of the air operated piston **18**.

In the operation of the machine the operator drops jewels of the proper sizes into the tubes **32, 33, 34, 35** and **36**, slips the pillar plate into the proper position on the bed, clamps the head in position and operates the foot valve **16**, the entire operation taking less than thirty seconds. Heretofore, it was impossible to insert a single jewel in this period of time.

The operator seated before the machine has at hand boxes containing the different size jewel bearings and with tweezers places the bearings in their respective tubes. It is clearly shown in Figures 5 and 6 that the bearings are of slightly less diameter than the opening in the tubes and consequently seat themselves on the very flat end surface of the plungers **43, 44, 45, 46** and **47**. These plungers as well as the tubes are located at varying heights above the bed because of the milled character of the pillar plate and the different distances which the jewels must be set from the parting line. With the jewels located on the plungers and in the tube, the pillar plate is placed on the locator pins **39**, the piston **21** forcing the head **22** and its swivel piece **54** down against the pillar plate to thoroughly hold the pillar plate in jewel receiving position. Operation of the air piston **18** through the valve **16** forces the movable piston **50** and its set plungers upward using the under surface of part **27** as a fixed stop, the plungers forcing the jewels into desired position in the pillar plate.

An ejector disc **79** carrying an ejector pin **80** which projects through the piston **50** and the bed plate **27** is operated by the engagement of the foot **84** carried on the ejector disc with the cam surface **85**, said cam surface being rotated to raise the ejector disc through the use of the hand lever **30**.

It is essential that the jewels be set perfectly true in the holes so that there is no canting of the jewel and thus a bending of the pivot points for which the jewels are bearings. It has been found that with even the utmost care the surfaces of the pillar plate are sometimes not exactly parallel. To correct this the head **22** is provided with a swivel piece **54** which when brought into engagement with the pillar plate automatically and firmly seats itself on the top surface of the pillar plate while insur-

ing an even contact of that surface of the pillar plate which contacts the bed plate, referred to as the parting line. The pins 72 carried in the swivel head are adapted to engage webs, clearly shown in Figures 5 and 6, to support the webs during the jeweling operation. Upon contact of the swivel piece with the pillar plate, the lever 68 is released from the latch 69, the springs 66 forcing the pins 65 separately outward and bringing the cam surface 75 with the head 74 forcing the pins downward into engagement with the web into which the jewel bearing is to be forced. The angle between the surfaces 74 and 75 is such that any upward pressure directed against the pins will not move the pin 65 against the spring 66. It is thus seen that all portions of the pillar plate are firmly supported against distortion due to the jeweling operation.

What is claimed is:

1. A multiple jewel bearing setting press for frictionally fitting jewel bearings in pillar plates comprising a base, an upright support on said base, a cylinder carried by said upright support, a piston slidable in said cylinder, a head carried by the piston to engage the pillar plate, a manually operated lever engaging said piston for locking said head in said pillar plate engaging position, a platform having a central bore carried by said base, a bed formed with a central bore seated in an enlarged section of the bore of said platform, a bed plate secured to and supported by said bed, jewel bearing receiving tubes mounted in and extending a specified distance above said bed plate, locator pins carried by said bed plate for receiving said pillar plate and maintaining it in jewel bearing receiving position, a pin carried by said bed plate and extending downward into the bore of said bed, a piston slidably mounted on said pin, adjustable plungers carried in said piston and extending upward through said jewel receiving tubes, an air operated piston adapted to engage said plunger carrying piston and move said plungers upward in the tubes to force the bearings supported therein into the pillar plate, an ejector disc carried below said plunger carrying piston, ejector pins mounted in said disc and extending through said plunger carrying piston and said bed plate to engage the pillar plate and a cam for engaging said ejector disc to move said ejector pins to raise the pillar plate from the bed plate after completion of the jeweling operation.

2. A multiple jewel bearing setting press for frictionally fitting jewel bearings in pillar plates comprising a base, an upright secured to said base, a vertically movable hand operated piston supported by said upright, a removable plate mounted on said base, a multiplicity of tubes carried in predetermined relationship in said plate and adapted to house the jewel bearings, pistons adjustably carried in said tubes, a swivel head carried on the lower end of said first mentioned piston to be brought into contact with the upper surface of a pillar plate adapted to be placed on the tube carrying plate, spring means urging said swivel head firmly against a spherical shaped depression in said movable piston and means for simultaneously operating the pistons contacting the jewel bearings to force said jewel bearings into said pillar plate.

3. A multiple jewel bearing setting press for frictionally fitting jewel bearings in pillar plates according to claim 2 and including means for ejecting said pillar plate from said base carried plate after the completion of the jeweling operation.

4. A multiple jewel bearing setting press for frictionally fitting jewel bearings in pillar plates according to claim 2 and including means within said swivel head for reinforcing webs in said pillar plate designed to receive the jewel bearings during the bearing setting operation.

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