March 22, 1932. A. R. HAVENER 1,850,671

DUPLEX RIVETING MACHINE WITH ANVIL TURNTABLE

Filed April 6, 1931 5 Sheets-Sheet 1

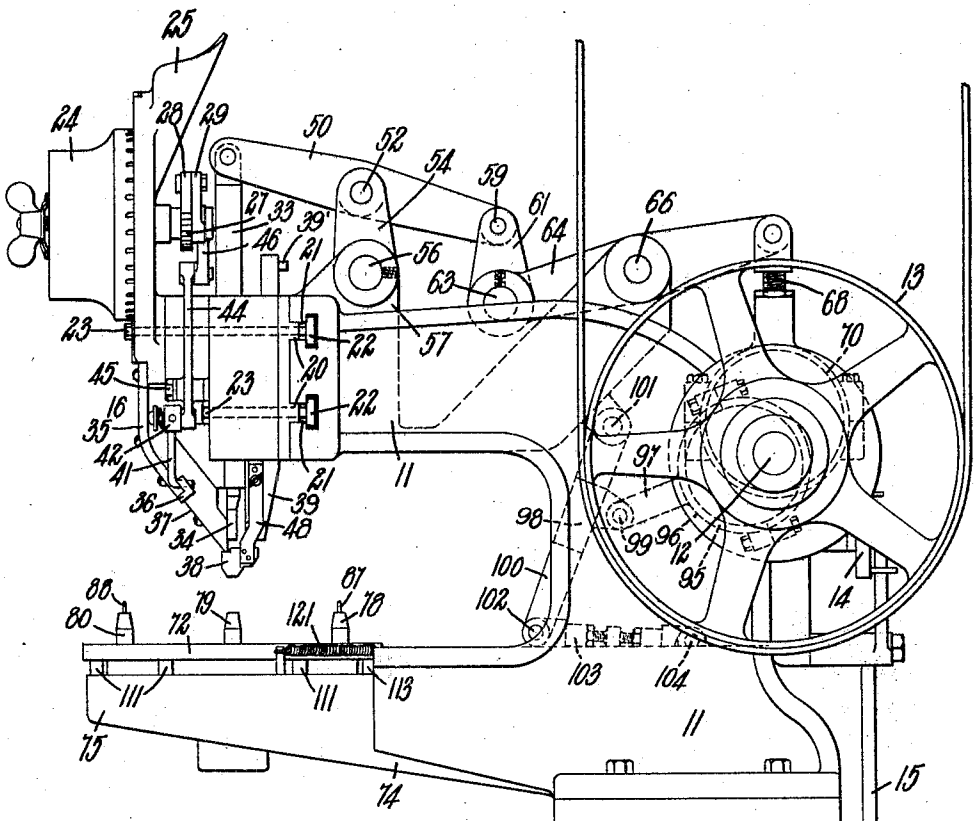


Fig. 1.

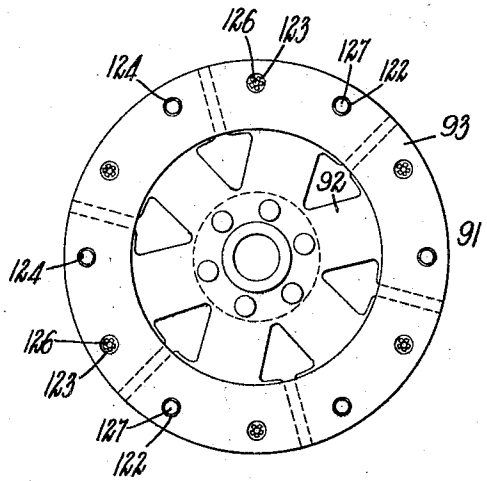


Fig. 9.

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DUPLEX RIVETING MACHINE WITH ANVIL TURNTABLE

Filed April 6, 1931 5 Sheets-Sheet 2

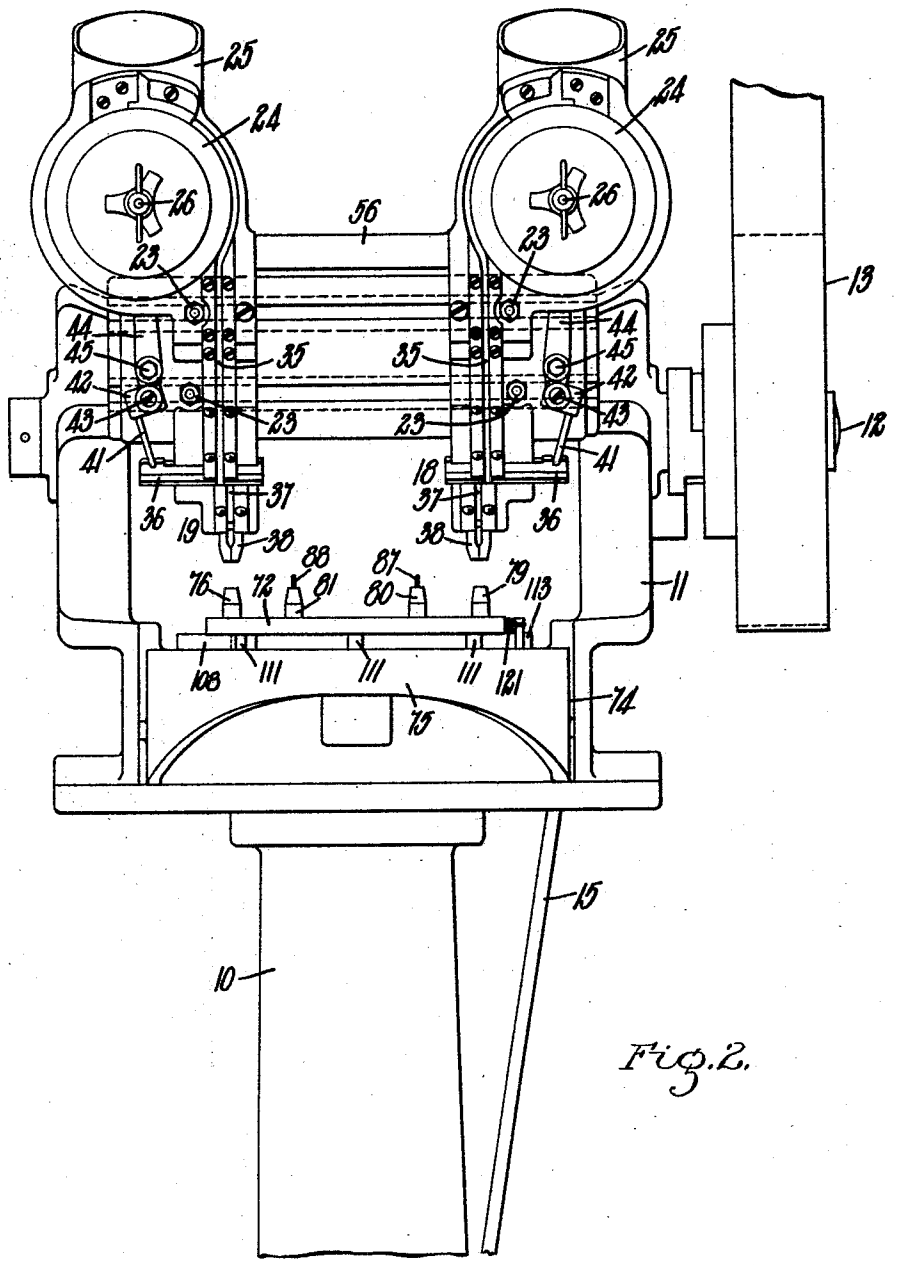


Fig. 2.

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DUPLEX RIVETING MACHINE WITH ANVIL TURNTABLE

Filed April 6, 1931 5 Sheets-Sheet 3

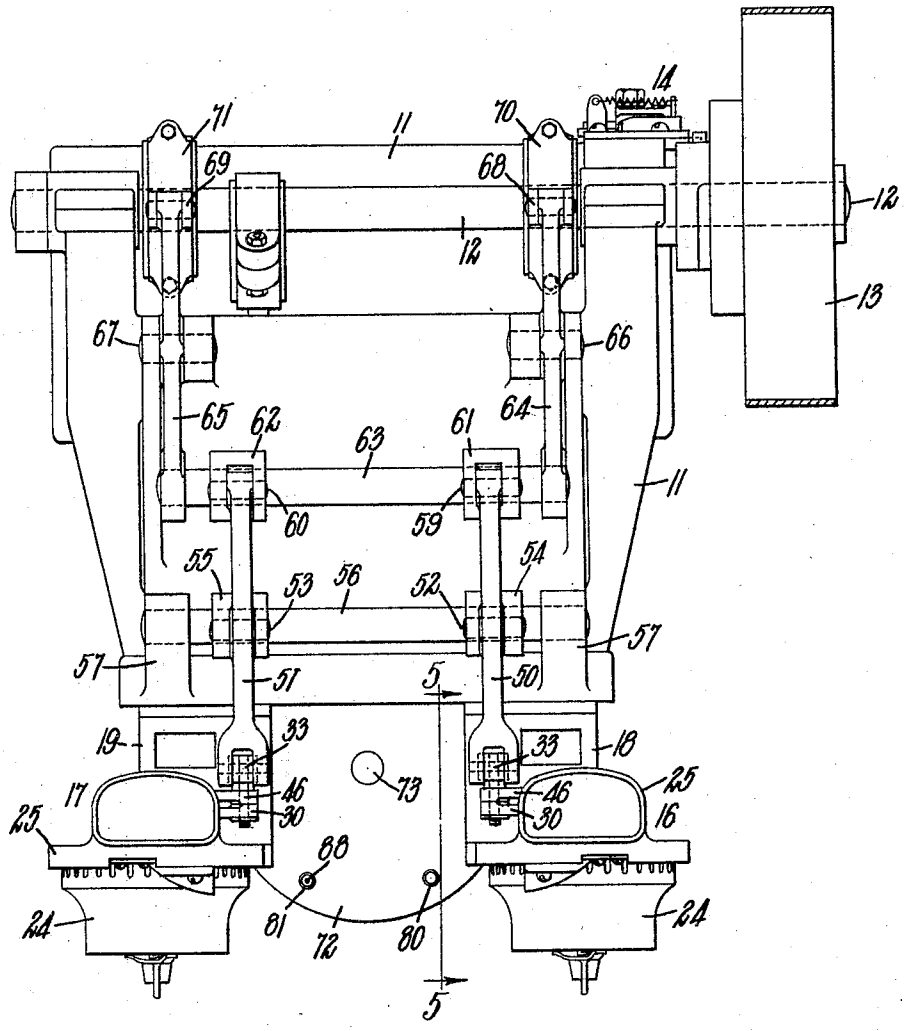


Fig. 3.

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DUPLEX RIVETING MACHINE WITH ANVIL TURNTABLE

Filed April 6, 1931 5 Sheets-Sheet 4

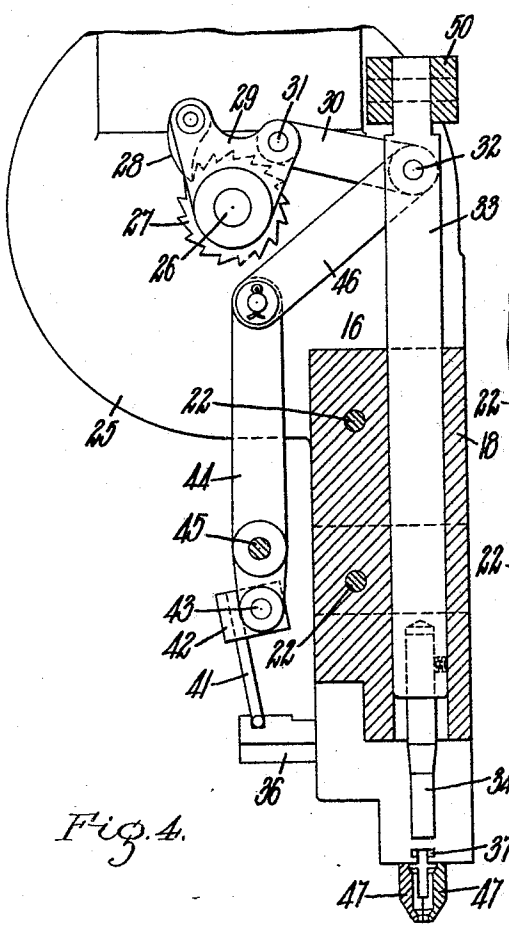


Fig. 4.

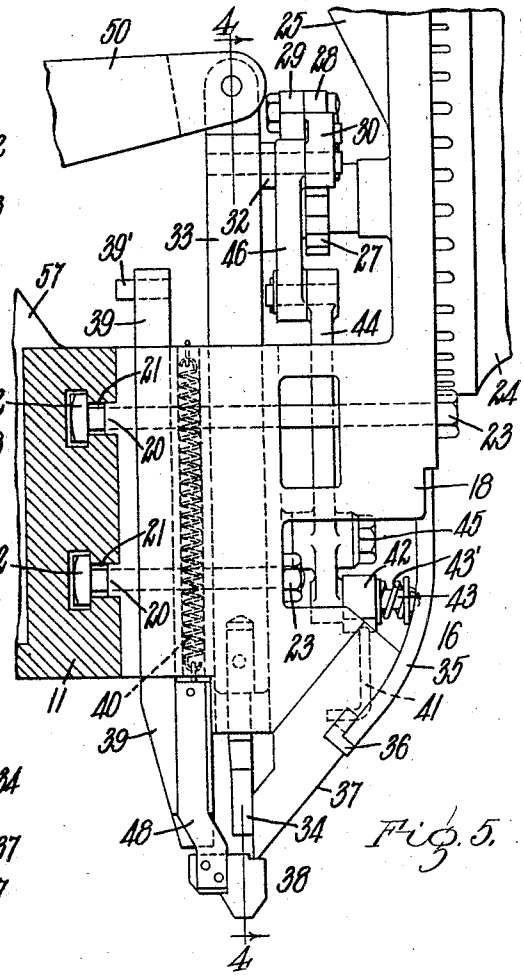


Fig. 5.

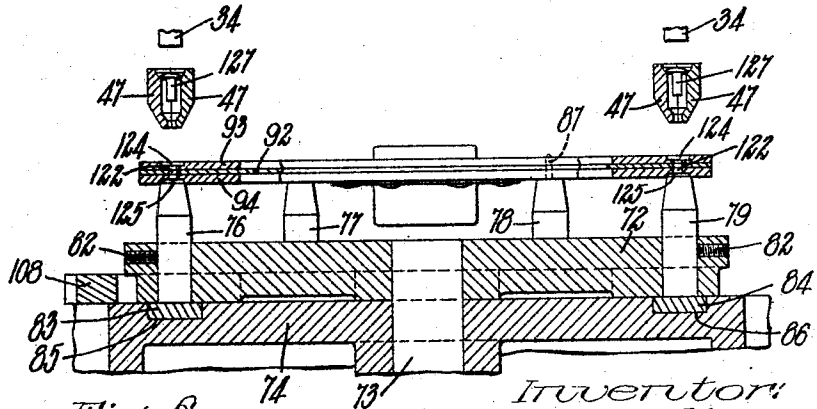


Fig. 6.

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DUPLEX RIVETING MACHINE WITH ANVIL TURNTABLE

Filed April 6, 1931 5 Sheets-Sheet 5

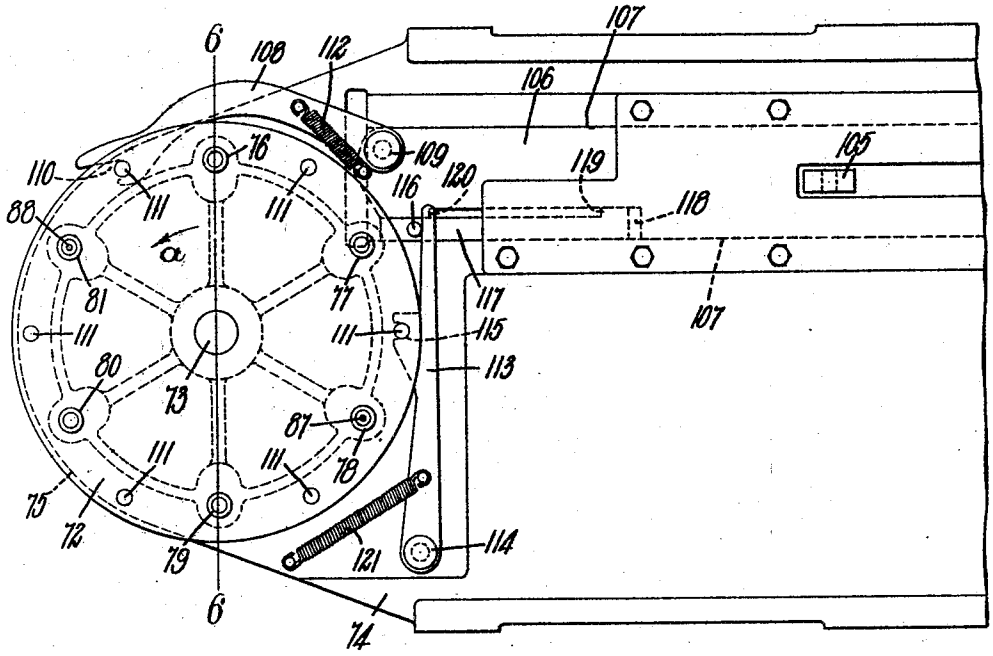


Fig. 7.

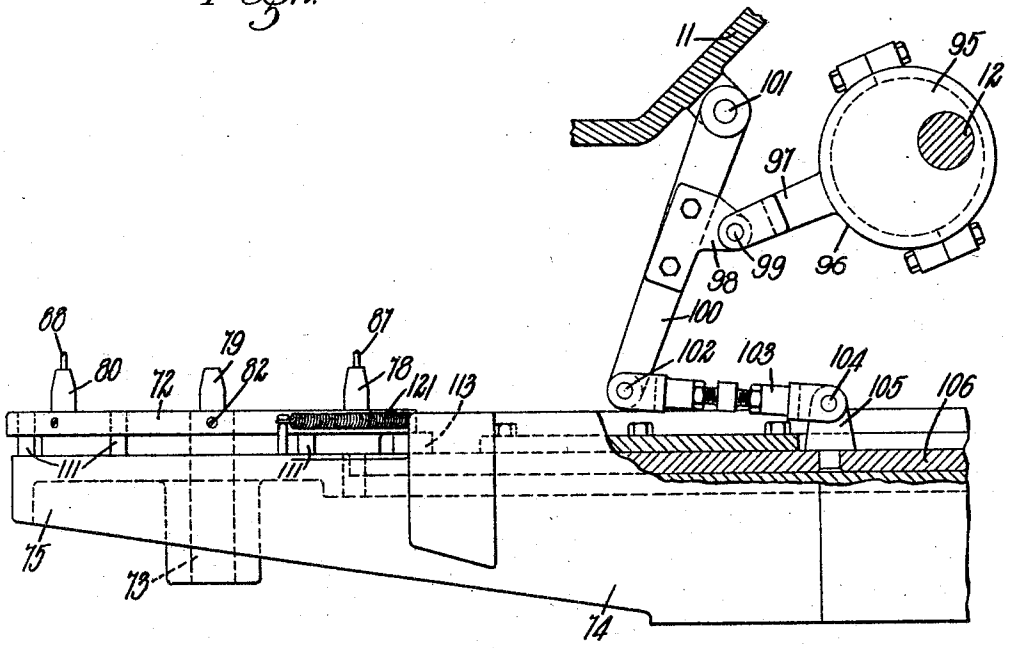


Fig. 8.

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Patented Mar. 22, 1932 1,850,671

UNITED STATES PATENT OFFICE

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DUPLEX RIVETING MACHINE WITH ANVIL TURNTABLE

Application filed April 6, 1931. Serial No. 528,019.

This invention relates to an improved rivet feeding and setting machine, the object of the invention being to provide a rivet feeding and setting machine which can feed and set two rivets at a time and which is so constructed that the distance between the rivets which are so set may be varied as desired, so that the machine can be utilized to feed and drive simultaneously a pair of rivets at any desired distance apart, and this object is attained by embodying in the machine a pair of rivet feeding and setting mechanism frames and a turntable, upon which are mounted a plurality of anvils. The rivet feeding and setting mechanism frames are adjustable upon a main frame toward and away from each other and upon said main frame is provided mechanism for actuating the rivet feeding and setting mechanisms in any of the relative positions to which they may be adjusted, and the turntable is rotatable and has mechanism for imparting an intermittent rotary movement thereto, and upon the turntable, as stated, there are a plurality of anvils mounted preferably in pairs, equidistant from each other and concentric with the perimeter of the turntable upon which they are mounted.

The machine is particularly adapted to rivet three circular pieces of material together by rivets such, for example, as the pieces of material which constitute a clutch disc for a Ford automobile.

The object of the invention further is to provide a machine of the character set forth in which the rivet setting mechanisms may be adjusted relatively to each other, and in which turntables of different sizes may be used, upon which anvils may be positioned at different distances apart, or at different distances from the center, such changes being readily made and involving comparatively small expense to adapt the machine for different articles to be riveted.

The machine of this invention embodies means for locking the turntable in different positions for the purpose of aligning different pairs of anvils with the rivet driver slides or rivet drivers.

The invention further embodies means for positioning the articles to be riveted on the turntable with respect to the anvils thereon.

The invention consists in the combination and arrangement of parts disclosed in the following specification and particularly pointed out in the claims.

Referring to the drawings:—

Fig. 1 is a right hand side elevation of a duplex riveting machine with anvil turntable embodying my invention, the column of the machine and the clutch rod being broken away.

Fig. 2 is a front elevation of the same.

Fig. 3 is a plan of the said machine.

Fig. 4 is a sectional elevation taken on line 4—4 of Fig. 5 viewed in the direction of the arrows on said line.

Fig. 5 is a sectional elevation taken on line 5—5, Fig. 3, viewed in the direction of the arrows on said line 5—5.

Fig. 6 is a sectional elevation through the turntable taken on line 6—6, Fig. 7, and illustrating in connection therewith a portion of each of the rivet carriers and holders and a portion of the rivet drivers broken away.

Fig. 7 is a plan view of the turntable and a portion of the frame upon which it is rotatably supported.

Fig. 8 is a side elevation partly in section viewed from the right of the machine and illustrating the turntable and the mechanism by which an intermittent rotary motion is imparted thereto.

Fig. 9 is a plan view of a clutch disc illustrating one article, the parts of which are adapted to be riveted together on a machine of this invention.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 10 is the column of the machine, 11 the main frame and 12 the main driving shaft, which is rotated by a pulley 13, the pulley being clutched to the shaft 12 at the will of the operator by means of a clutch 14 operated by a clutch rod 15 leading to a clutch treadle not illustrated in the drawings. 16 and 17 are two rivet feeding and setting mechanisms mounted on frames 18 and 19. The frames 18 and 19 have guides 20 extending transversely across their rear faces and projecting into guideways 21 provided in the

main frame 11, the frames 18 and 19 being clamped in adjusted position by clamp bolts 22 and nuts 23.

The rivets are placed in mass in hopper casings 24 rotatably mounted on hopper frames 25 fast to the adjustable frames 18 and 19. The hopper casings 24 are fastened to shafts 26 and the said shafts are each rotated by a ratchet 27 which is given an intermittent step by step rotation by a pawl 28 pivotally mounted on a pawl carrier 29 which, in turn, is pivoted upon the shaft 26. The pawl carrier 29 has a rocking motion imparted thereto by a link 30 which is pivotally connected at 31 to the pawl carrier 29 and at 32 to a rivet driver slide 33. The rivet driver slide has a rivet driver 34 fastened to its lower end and is slidably mounted in one of the rivet driving mechanism frames 18 or 19 as the case may be.

The rivet driving and feeding mechanisms, which are mounted upon the frames 18 and 19 respectively, are substantially alike, therefore the description of one of said mechanisms will apply to both.

The rivets are fed from the rotary hopper casing 24 to a vertical raceway 35 and pass down said raceway to the bottom thereof where they are fed by a slide 36 from the lower end of the raceway 35 to the upper end of another raceway 37, by which they are fed downwardly into a rivet carrier 38 which is mounted upon a rivet carrier slide 39 held upwardly by a spring 40 and moved downwardly by the driver 34, all in a manner well known to those skilled in this art.

The rivet slide 36 has an intermittent sliding movement imparted thereto by a spring 41 which is fastened to a block 42 pivotally mounted upon a stud 43 on the lower end of a lever 44 which is pivotally mounted upon a stud 45 fast to the frame 18. A spring 43′ encircles the stud 43 and presses the block 42 against the lower end of the lever 44, whereby said block is caused to have a frictional engagement with the lower end of the lever 44. The lever 44 is connected by a link 46 to the pin 32 which is fastened to the rivet driver slide 33.

The rivet carrier 38 consists of two oppositely disposed plates 47 which are fastened to flat spring arms 48 which, in turn, are fastened to the vertical rivet carrier slide 39.

A reciprocatory movement is imparted to the rivet driver slides 33 by secondary rocker arms 50 and 51, said rocker arms being pivotally mounted at 52 and 53 to secondary links 54 and 55. The links 54 and 55 are pivoted upon a stationary shaft 56 which extends across the machine and is fastened to ears 57 on the main frame. At their rear ends the rocker arms 50 and 51 are pivotally connected at 59 and 60 to primary links 61 and 62 which are pivoted to rock upon a pivotal shaft 63, the opposite ends of which are fastened to the forward ends of a pair of primary rocker arms 64 and 65. The primary rocker arms 64 and 65 are pivoted upon studs 66 and 67 which are fastened to the main frame 11. The rear ends of the primary rocker arms 64 and 65 are connected by eccentric rods 68 and 69 to eccentrics 70 and 71, the eccentrics being fastened to the main shaft 12.

An anvil turntable 72 is fast to a shaft 73 which is rotatably mounted in an arm 74 on the frame 11. The turntable rests upon the arm 74 which has a semi-circular front portion 75. The turntable 72 is provided in the present embodiment of my invention with six anvils 76, 77, 78, 79, 80 and 81. The anvils extend through the turntable and are held in position by set screws 82. Discs 83 and 84 are located in recesses 85 and 86 provided in the upper face of the arm 74. These discs are diagonally opposite each other and are located beneath the anvils upon which the work is being performed such, for example, as the anvils 76 and 79 in Fig. 7. The anvils 78 and 81 are provided with positioning pins 87 and 88 which are supported in their respective anvils by springs not shown in the drawings but well known to those skilled in the art.

In Fig. 9 a clutch disc 91 is illustrated as an example of one species of work on which the machine of this invention is adapted to operate. This disc clutch consists of a circular metal intermediate portion 92 and a pair of fiber rings 93 and 94, the object being to attach the rings 93 and 94 to the intermediate member 92 by rivets, a portion of which are driven into the ring 93 and clinched in the ring 94 and another portion of which are driven into the ring 94 and clinched in the ring 93.

An intermittent rotary motion is imparted to the turntable 72 by mechanism particularly illustrated in Figs. 1, 7 and 8 and consisting of an eccentric 95 which is fastened to the main driving shaft 12 and an eccentric strap 96 mounted on the eccentric 95 and connected by an eccentric rod 97 to a bracket 98 by a pin 99. The bracket 98 is fastened to an arm 100 pivoted at 101 to the frame 11. The lower end of the arm 100 is connected by a pin 102 to a link 103 which is pivotally connected at 104 to a bracket 105 fast to a slide 106 slidably mounted in ways 107 on the arm 74 which forms in effect a portion of the frame 11.

At the front end of the slide 106 a pawl 108 is pivotally mounted thereon at 109, the front end of which is provided with a notch 110 adapted to engage successively with pins 111 fast to the turntable 72, there being six of the pins 111 corresponding to the six anvils 76 to 81 inclusive. The circle of pins 111 is concentrically located with respect to the turntable 72 and the pins are located between adjacent anvils 76 to 81 inclusive. A spring

112 is fastened at one end to the pawl 108 and at the other end to the slide 106, whereby the pawl is held normally in the relative position to the slide illustrated in Fig. 7.

The turntable 72 is locked in position by a locking pawl 113 which is pivoted at 114 to the arm 74 and is provided with a notch 115 adapted to engage successively the pins 111, thus locking the turntable in position. The pawl 113 is extended beyond the notch 115 into the path of a pin 116 which is fast to an auxiliary slide 117 slidably mounted on the arm 74 in a slot 118 provided in the slide 106. The auxiliary slide 117 has a shoulder 119 thereon which projects into the path of a similar shoulder 120 on the slide 106, so that as the slide 106 is moved rearwardly by the eccentric 95, arm 100 and link 103, from the position illustrated in Fig. 7, the pawl 108 will move rearwardly with it and thus become detached from the pin 111 with which it is shown in engagement in Fig. 7.

During the first part of the rearward movement of the slide 106, the locking pawl 113 will remain in the position illustrated in Fig. 7 and the turntable 72 will be held thereby in the position shown, but if the slide 106 is moved rearwardly a certain distance, the shoulder 120 thereon will engage the shoulder 119 on the auxiliary slide 117 and will move the pin 116 and said auxiliary slide rearwardly, thus rocking the locking pawl 113 sufficiently to disengage the pin 111 with which it has been in engagement. Meantime, the pawl 108 has been moved rearwardly by the slide 106 until the notched end thereof has engaged the pin 111 between the anvils 76 and 77, and upon a reversal of movement of the slide 106 by the eccentric 95 the same will cause the turntable 72 to be rotated in the direction of the arrow *a*, Fig. 7, until the anvil 77 is brought to the position formerly occupied by the anvil 76, whereupon the locking pawl 113 will be moved by a spring 121 into the locking position illustrated in Fig. 7, the notch 115 engaging at this time the pin 111 which was formerly located between the anvils 78 and 79.

The clutch disc 91 is provided with a series of holes 122 and 123 extending through the intermediate member 92 and the rings 93 and 94. These holes are counterbored at 124 in the ring 93 and at 125 in the ring 94.

In the drawings, Fig. 9, rivets 126 are shown as having been inserted and clinched in the clutch disc 91 in the holes 123, and the rivets 127 have been inserted and clinched in the holes 122.

The general operation of the mechanism hereinbefore specifically described is as follows:—The clutch disc 91 is positioned upon the anvils on the turntable 72 as illustrated in Fig. 6 with the positioning pins 87 and 88 projecting into two diametrically opposite holes 122. This positions two of the holes 122 in alignment with the anvils 76 and 79. At this time the turntable 72 is located in position by the locking pawl 113 and the pawl 108 is about to be moved rearwardly by the slide 106.

Rivets are placed in mass in the hopper casings 24 and pass from the hopper casings down the raceways 35 from the lower ends of which they are carried by the slides 36 to the upper ends of the raceways 37. The rivets 127 pass down the raceways 37 and into their respective rivet carriers 38 and then stand in the positions illustrated by the rivets 127 in Fig. 6. The rivet driver slides 33 are moved down simultaneously by the secondary rocker arms 50 and 51, primary rocker arms 64 and 65, primary links 61 and 62, eccentric rods 68 and 69, eccentrics 70 and 71, and main driving shaft 12. The drivers 34 descending push the rivet carriers, together with the rivets, downwardly until the lower edges of the plates 47 are in contact with the upper surface of the ring 93 of the clutch disc 91, the parts of which, namely, the intermediate member 92 and the upper and lower rings 93 and 94, are to be riveted together, whereupon a stop pin 39′ on each of the rivet carrier slides 39 engages the upper surface of the frames 18 and 19 and stop further downward movement of the carrier slides, whereupon the rivets 127 are forced downwardly through the three pieces of material forming the clutch disc 91, and are clinched against the anvils 76 and 79. Two of the rivets have now been set in the clutch disc, the rivet carriers, the rivet driver slides and rivet drivers now move upwardly away from the clutch disc, and an intermittent rotary movement is given to the turntable 72 in the direction *a*. This brings the anvil 77 into the position formerly occupied by the anvil 76 and the anvil 80 into the position formerly occupied by the anvil 79.

During the rotation of the turntable the friction disc is carried along with it and held in proper position by the positioning pins 87 and 88.

Two more rivets are now driven into the clutch disc and clinched on the anvils 77 and 80 and the sequence of operations hereinbefore described is repeated. Finally, the anvil 78 arrives in the position formerly occupied by the anvil 76, and the anvil 81 arrives in the position formerly occupied by the anvil 79. The driving of the rivets is now repeated, as hereinbefore described, but in this case the rivets when they are forced downwardly through the material of the clutch disc engage the guide pins 87 and 88, these rivets being tubular the guide pins 87 and 88 enter the rivets 127 and guide them through the material of the clutch disc during the clinching operation, and the guide pins being spring supported move down-

wardly into their respective anvils during this clinching operation.

The operation of riveting the parts of the clutch disc together is now completed insofar as inserting and clinching the rivets in the series of holes 122 is concerned.

The rivets have already been driven in a similar manner and clinched in the holes 123 but in a reverse direction, that is, the rivets are first driven into the holes 123 and clinched and then the clutch disc is reversed and the rivets are driven into the clutch disc and clinched therein through the holes 122, so that the heads of the rivets are alternately positioned in the holes 123 and 122, the heads of the rivets which are in the holes 123 being inserted in the counterbored portions 125 in the ring 94, while the rivets that are driven into the holes 122 have their heads positioned in the counterbored portions 124 in the ring 93.

The different parts of the clutch disc now having been riveted together, as hereinbefore described, the operator actuates the clutch to disengage the pulley 13 from clutch engagement with the shaft 12 and removes the clutch disc from the anvils and places three other pieces of material upon the anvils to be riveted together as hereinbefore described, and when so riveted to form a clutch disc. The operations hereinbefore described are then repeated.

When it is desired to insert rivets in a clutch disc, the holes in which are at different distances apart from those shown in the clutch disc 91 in the drawings, Fig. 6, the turntable 72 is removed and a new turntable positioned in the machine with the anvils thereon at the same distances apart as the holes in the new clutch disc which is about to be riveted. The frames 18 and 19 are then moved toward and away from each other, as may be desired, by loosening the nuts 23 and pushing the frames 18 and 19 along the main frame until they are moved to the desired distance apart, that is, with the drivers in alignment with two of the anvils in the new turntable, and the frames 18 and 19 are then clamped to the main frame 11 by the nuts 23 and bolts 22, so that the rivet drivers are then positioned in alignment with their respective anvils. The new clutch disc is now positioned upon the anvils upon the new turntable and the machine is then in readiness to rivet together the three parts forming the new clutch disc in the same manner as hereinbefore described. During this adjusting of the rivet mechanism frames, the secondary rocker arms 50 and 51, together with the secondary links 54 and 55 are moved toward and away from each other as the case may be, the links 54 and 55 sliding along on the shaft 56, at the same time the primary links 61 and 62 slide along the shaft 63. The primary rocker arms 64 remain in the same position relatively to the main frame.

As the rivet driver slide 33 is moved down, the pawl carrier 29 will be rocked toward the right, Fig. 4, by the link 30, the pawl retreating over the ratchet 27 during this movement and the lever 44 will be rocked by the link 46 to move the block 42 and spring arm 41 toward the right, Fig. 4, thus moving the slide 36 to feed a rivet from the lower end of the raceway 35 to the upper end of the raceway 37 and the rivet then descends the raceway 37 to enter the rivet carrier 38 in readiness to be fed down to the work by the driver 34.

I claim:

1. A duplex riveting machine having, in combination, two rivet setting mechanism frames, a rivet setting mechanism on each of said frames, said rivet setting mechanisms each embodying therein a rivet driver, a main frame upon which said rivet setting mechanism frames may be adjusted toward and away from each other, a rotary turntable, and a pair of anvils on said turntable adapted to be positioned in alignment with said drivers.

2. A duplex riveting machine having, in combination, two rivet setting mechanism frames, a rivet setting mechanism on each of said frames, said rivet setting mechanisms each embodying therein a rivet driver, a main frame upon which said rivet setting mechanism frames may be adjusted toward and away from each other, a rotary turntable, and a pair of anvils diagonally opposite each other on said turntable adapted to be positioned in alignment with said drivers.

3. A duplex riveting machine having, in combination, two rivet setting mechanism frames, a rivet setting mechanism on each of said frames, said rivet setting mechanisms each embodying therein a rivet driver, a main frame upon which said rivet setting mechanism frames may be adjusted toward and away from each other, a rotary turntable, and a plurality of anvils on said turntable adapted to be positioned in pairs in alignment with said drivers.

4. A duplex riveting machine having, in combination, two rivet setting mechanism frames, a rivet setting mechanism on each of said frames, said rivet setting mechanisms each embodying therein a rivet driver, a main frame upon which said rivet setting mechanism frames may be adjusted toward and away from each other, a rotary turntable, and a plurality of anvils on said turntable positioned in a circle concentric with the perimeter thereof and adapted to be positioned in pairs in alignment with said drivers.

5. A duplex riveting machine having, in combination, two rivet setting mechanism frames, a rivet setting mechanism on each of said frames, said rivet setting mechanisms each embodying therein a rivet driver, a main frame upon which said rivet setting mechanism frames may be adjusted toward and away from each other, a rotary turn-

table, a plurality of anvils on said turntable adapted to be positioned in pairs in alignment with said drivers, and mechanism to impart an intermittent rotary motion to said turntable.

6. A duplex riveting machine having, in combination, two rivet setting mechanism frames, a rivet setting mechanism on each of said frames, said rivet setting mechanisms each embodying therein a rivet driver, a main frame upon which said rivet setting mechanism frames may be adjusted toward and away from each other, a rotary turntable, a plurality of anvils on said turntable, mechanism to impart an intermittent rotary motion to said turntable, and means to position said turntable with said anvils positioned in pairs in alignment with said drivers.

7. A duplex riveting machine having, in combination, two rivet setting mechanism frames, a rivet setting mechanism on each of said frames, said rivet setting mechanisms each embodying therein a rivet driver, a main frame upon which said rivet setting mechanism frames may be adjusted toward and away from each other, a rotary turntable, a plurality of anvils on said turntable, mechanism to impart an intermittent rotary motion to said turntable, means to position said turntable with said anvils positioned in pairs in alignment with said drivers, and means to position pieces of material with holes therein on said turntable with said holes in alignment with said anvils, whereby said pieces of material may be riveted together.

8. A duplex riveting machine having, in combination, two rivet setting mechanism frames, a rivet setting mechanism on each of said frames, said rivet setting mechanisms each embodying therein a rivet driver, a main frame upon which said rivet setting mechanism frames may be adjusted toward and away from each other, mechanism on said main frame to actuate said rivet setting mechanisms, a rotary turntable, and a pair of anvils on said turntable adapted to be positioned in alignment with said drivers.

9. A duplex riveting machine having, in combination, two rivet setting mechanism frames, a rivet setting mechanism on each of said frames, said rivet setting mechanism each embodying therein a rivet driver, a main frame upon which said rivet setting mechanism frames may be adjusted toward and away from each other, a rotary turntable, a plurality of anvils on said turntable, mechanism to impart an intermittent rotary motion to said turntable, means to position said turntable with said anvils positioned in pairs in alignment with said drivers, and a spring-actuated positioning pin concentrically and slidably mounted in each of two of said anvils respectively and adapted to project through holes in pieces of material on said turntable, whereby said pieces of material may be positioned to be riveted together.

10. A duplex riveting machine having, in combination, two rivet setting mechanism frames, a rivet setting mechanism on each of said frames, said rivet setting mechanisms each embodying a rivet driver slide, a main frame on which said rivet setting mechanism frames may be adjusted toward and away from each other, a secondary rocker arm connected to each of said rivet driver slides respectively, said rocker arms being mounted on said main frame and adjustable toward and away from each other, a primary rocker arm connected to each of said secondary rocker arms respectively and mounted on said main frame, mechanism mounted on the main frame to impart a rocking motion to said rocker arms, a rotary turntable, and a plurality of anvils on said turntable adapted to be positioned in pairs in alignment with said driver slides.

11. A duplex riveting machine having, in combination, two rivet setting mechanism frames, a rivet setting mechanism on each of said frames, said rivet setting mechanisms each embodying a rivet driver slide, a main frame on which said rivet setting mechanism frames may be adjusted toward and away from each other, a secondary rocker arm connected to each of said rivet driver slides respectively, said rocker arms being mounted on said main frame and adjustable toward and away from each other, a primary rocker arm connected to each of said secondary rocker arms respectively and mounted on said main frame, a main driving shaft rotatably mounted on said main frame, a pair of eccentrics fast to said main driving shaft, a pair of eccentric rods connecting said eccentrics to said primary rocker arms, a rotary turntable, and a plurality of anvils on said turntable adapted to be positioned in pairs in alignment with said driver slides.

12. A duplex riveting machine having, in combination, two rivet setting mechanism frames, a rivet setting mechanism on each of said frames, said rivet setting mechanisms each embodying a rivet driver slide, a secondary pivotal shaft extending transversely of said main frame, a pair of secondary links on said secondary pivotal shaft and adjustable thereon relatively to each other, a secondary rocker arm pivotally mounted on each of said links respectively, each of said secondary rocker arms being connected to one of said rivet driver slides, a primary pivotal shaft extending transversely of said main frame, a pair of primary links pivotally mounted on said primary pivotal shaft connected to said secondary rocker arms and adjustable toward and away from each other, a pair of primary rocker arms pivotally mounted on said main frame, said primary

pivotal shaft being supported upon said primary rocker arms, mechanism mounted on the main frame to impart a rocking motion to said primary rocker arms and through them to said secondary rocker arms, a rotary turntable, and a plurality of anvils on said turntable adapted to be positioned in pairs in alignment with said driver slides.

13. A duplex riveting machine having, in combination, two rivet setting mechanism frames, a rivet setting mechanism on each of said frames, said rivet setting mechanisms each embodying a rivet driver slide, a secondary pivotal shaft extending transversely of said main frame, a pair of secondary links on said secondary pivotal shaft and adjustable thereon relatively to each other, a secondary rocker arm pivotally mounted on each of said links respectively, each of said secondary rocker arms being connected to one of said rivet driver slides, a primary pivotal shaft extending transversely of said main frame, a pair of primary links pivotally mounted on said primary pivotal shaft, connected to said secondary rocker arms and adjustable toward and away from each other, a pair of primary rocker arms pivotally mounted on said main frame, said primary pivotal shaft being supported upon said primary rocker arms, a main driving shaft rotatably mounted on said main frame, a pair of eccentrics fast to said main driving shaft, a pair of eccentric rods connecting said eccentrics to said primary rocker arms, a rotary turntable, and a plurality of anvils on said turntable adapted to be positioned in pairs in alignment with said driver slides.

14. A rivet feeding and setting machine having, in combination, a rivet driver slide, a rivet hopper casing, a rotary shaft fast to said hopper casing, a vertical raceway for rivets, said raceway being in two parts out of vertical alignment with each other, one of said parts leading out of said hopper casing, a horizontal rivet slide adapted to feed a rivet from the lower end of one of said raceways to the upper end of the other raceway, mechanism actuated by said rivet driver slide to impart an intermittent rotary motion to said hopper shaft and casing, a turntable, mechanism to impart an intermittent rotary motion to said turntable, and a plurality of anvils on said turntable whereby said anvils may be positioned consecutively in alignment with said rivet driver slide.

15. A rivet feeding and setting machine having, in combination, a rivet driver slide, a rivet hopper casing, a rotary shaft fast to said hopper casing, a vertical raceway for rivets, said raceway being in two parts out of vertical alignment with each other, one of said parts leading out of said hopper casing, a horizontal rivet slide adapted to feed a rivet from the lower end of one of said raceways to the upper end of the other raceway, mechanism actuated by said rivet driver slide to impart a reciprocatory motion to said rivet slide, a turntable, a plurality of anvils on said turntable and mechanism to impart an intermittent rotary motion to said turntable whereby said anvils may be positioned consecutively in alignment with said rivet driver slide.

16. A rivet feeding and setting machine having, in combination, a rivet driver slide, a rivet hopper casing, a rotary shaft fast to said hopper casing, a vertical raceway for rivets, said raceway being in two parts out of vertical alignment with each other, one of said parts leading out of said hopper casing, a horizontal rivet slide adapted to feed a rivet from the lower end of one of said raceways to the upper end of the other raceway, mechanism actuated by said rivet driver slide to impart an intermittent rotary motion to said hopper casing and shaft and a reciprocatory motion to said rivet slide, a turntable, a plurality of anvils on said turntable and mechanism to impart an intermittent rotary motion to said turntable whereby said anvils may be positioned consecutively in alignment with said rivet driver slide.

In testimony whereof I have hereunto set my hand.

ARTHUR R. HAVENER.