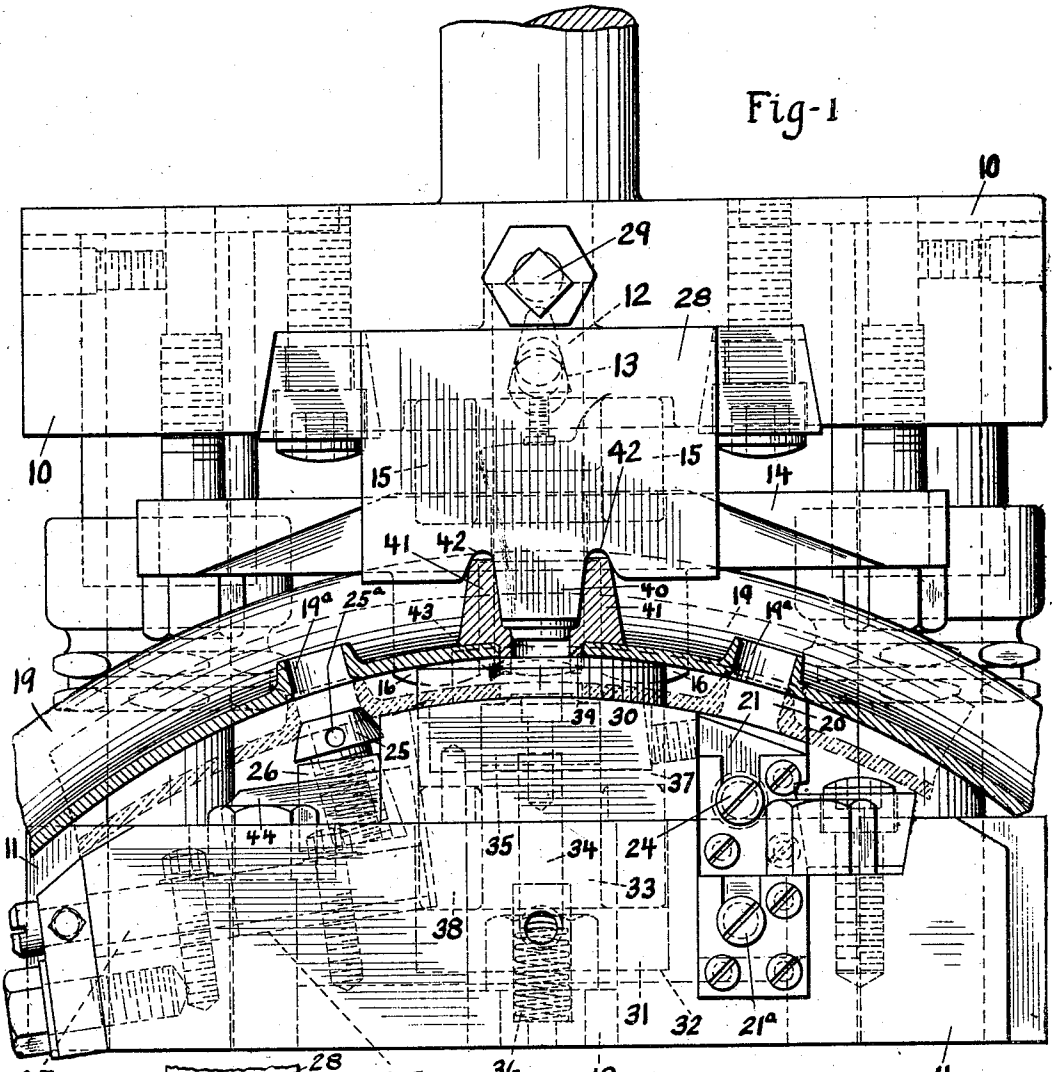
July 1, 1930. M. O. KUHN 1,769,697

PUNCHING AND RIVETING PRESS

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Fig-1



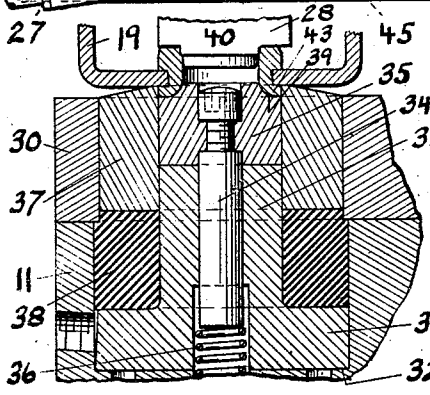


Fig-4

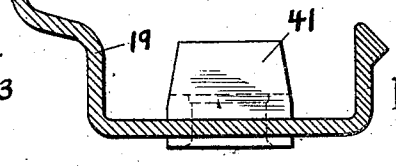


Fig-5

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PUNCHING AND RIVETING PRESS

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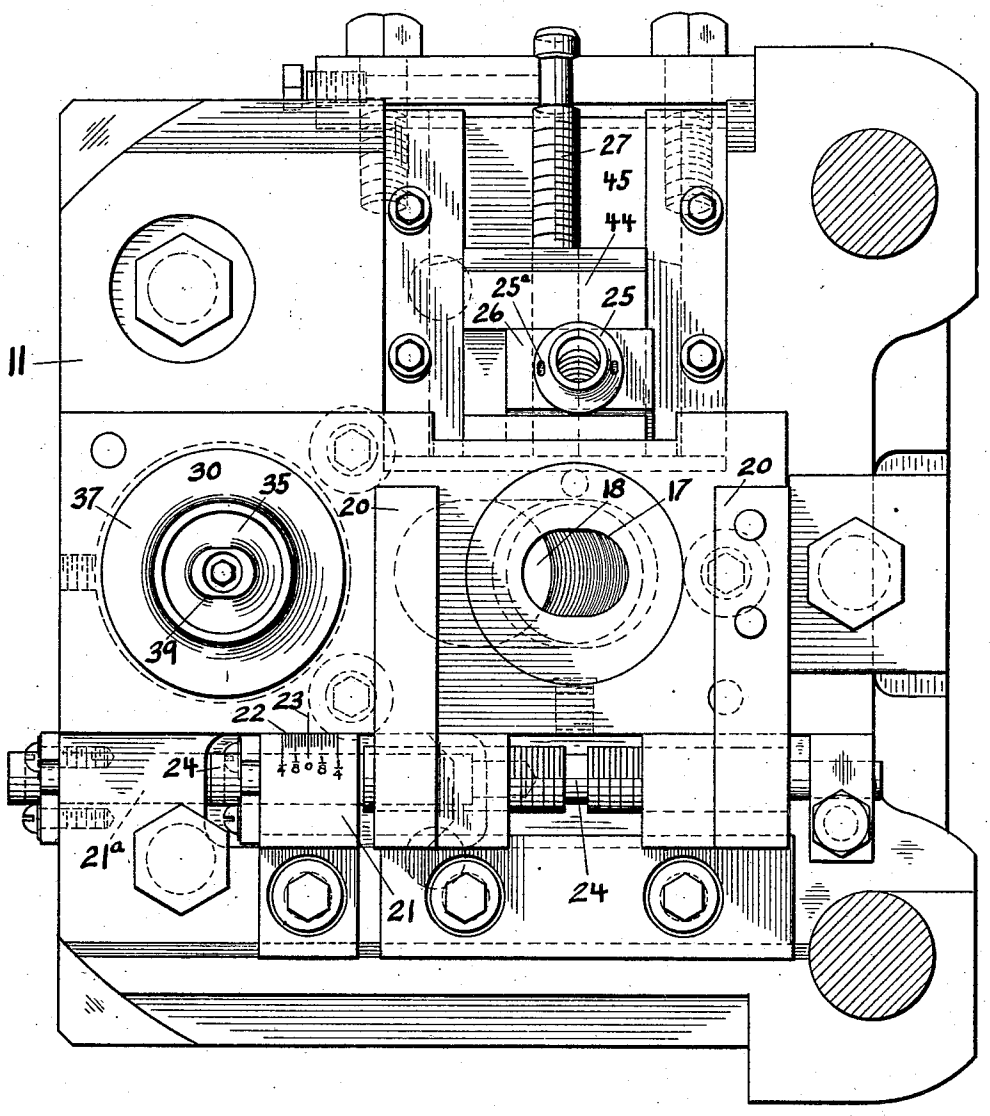


Fig-2

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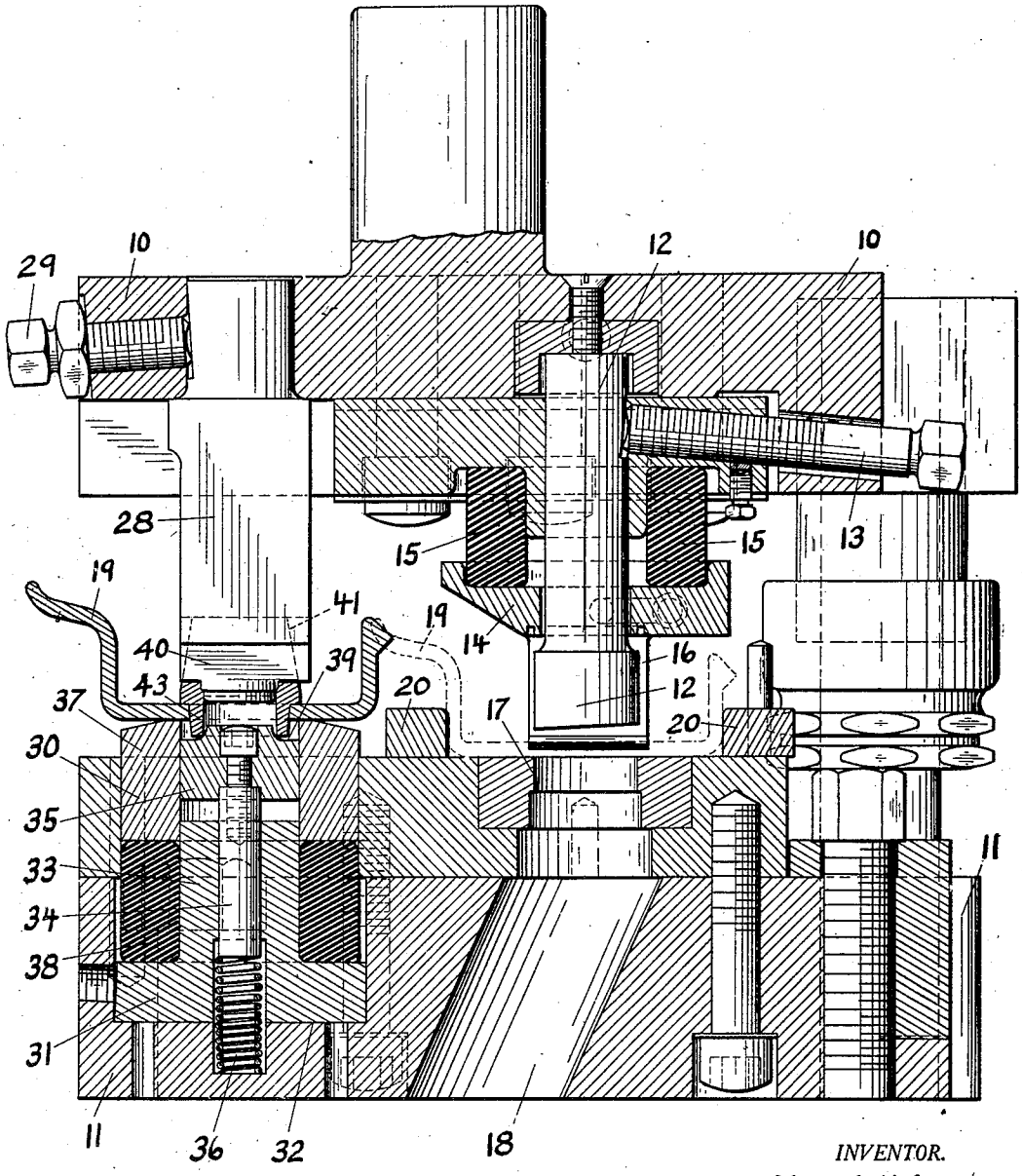


Fig-3

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UNITED STATES PATENT OFFICE

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PUNCHING AND RIVETING PRESS

Application filed April 13, 1925. Serial No. 22,557.

This invention relates to punching and riveting presses and particularly to a press designed to first punch a hole in a metal object and to subsequently insert another object in said hole and upsetting or riveting it over to secure the second object to the first.

The machine, as shown and described, is adapted for the operations of punching a valve hole in a felly or rim for wheels and securing a driving lug or sleeve on the felly or rim by riveting it thereto through said hole. It will be understood that the invention is capable of being adapted for many uses other than the specific ones described above.

The chief object of the invention is to provide a punching and riveting press capable of quickly acting in succession on the work to first punch an aperture therein and to subsequently rivet a second object to the first through the aperture.

Another object is to provide in a riveting or upsetting press an improved riveting or upsetting die construction.

Another object is to provide in a riveting or upsetting die construction a die capable of correctly positioning the work for the upsetting operation.

The foregoing and ancillary objects are obtained by the construction illustrated in the accompanying drawings and described in detail below. It will be understood that the invention is not limited to the specific construction illustrated and described.

Of the accompanying drawings:

Figure 1 is a front elevation of a press embodying the invention;

Figure 2 is a plan thereof;

Figure 3 is a section on line 3—3 of Figure 2;

Figure 4 is a detail section illustrating the action of the riveting press and die construction; and

Figure 5 is a transverse section of a felly having a driving lug secured through its valve aperture by a machine of the invention.

In the drawings, 10 is the upper platen and 11 the lower platen of a suitable press. The platen 10 has a punch 12 secured therein as by a set screw 13 operable through the platen 10, and slidable on the punch 12 is a stripper plate 14. Arranged between plate 14 and the platen 10 is a sleeve 15 of highly resilient rubber normally urging plate 14 downwardly. The plate 14 has pressure pins 16, 16 projecting downwardly therefrom on either side of punch 12 and normally below the lower end of said punch.

Punch 12 is arranged to cooperate with a die 17 supported in alignment with said punch on platen 11, the die aperture being in communication with an aperture 18 through platen 11 for conducting slugs away from the die 17. In order to position a felly indicated in dotted lines at 19 over the die 17 so that the valve aperture will be formed at the proper point on the felly, two positioning devices are employed.

To determine the position of the aperture transversely of the felly, a pair of gage bars 20, 20 are arranged on platen 11 respectively in front of and to the rear of die 17. The bars 20 are mounted on a screw 24, which is journaled in a slide 21 adjustable forwardly and rearwardly over platen 11 by means of a screw 21^a threaded through said slide and journaled on the platen 11 whereby the bars 20 may be shifted as a unit to center or off-set the aperture transversely of the felly. In order that the centering or amount of off-set may be readily determined, slide 21 has a scale at 22 thereon ruled into divisions of an inch oppositely from a zero or central position, the scale cooperating with a mark on platen 11 as indicated at 23. Bars 20 are also movable toward and from each other on platen 11 to vary their spacing so as to position fellies of different widths in the press. For this purpose, right and left hand screw 24 has its respective right and left hand portions respectively threaded through bars 20.

In wheel fellies it is customary to punch the valve aperture intermediate of the spokes. The fellies come to the machine formed with the spoke cups indicated at 19^a, 19^a. Accordingly, the circumferential positioning of felly 19 on the punch press over the die 17 is effected by a tapered pin 25 inclined substantially radially of a felly and threadedly received in a slide 26 adjustable manually for-

wardly or rearwardly in another slide 44 which is adjustable to the right or left on platen 11 by a screw 27, the slide 26 being carried on an inclined guiding surface 45 on platen 11 so that adjustment of pin 25 can be made circumferentially of a felly substantially along an arc. Pin 25 has an aperture 25ª therein whereby a tool may be inserted to adjust it perpendicularly to slide 26. Slide 26 is comparatively loose in slide 44 and if guides 20 have been changed from their previous position, it is only necessary, after the proper adjustment of slide 44, to insert pin 25 in spoke cups 19ª and slide rim 19 forwardly or rearwardly until the rim drops between guides 20.

In front of the punch and die respectively on platens 10 and 11 there is arranged an upsetting plunger 28 secured by a set screw 29 in platen 10, and an upsetting die construction indicated generally by the numeral 30. The die 30 includes a supporting member 31 seated in a socket 32 in platen 11 and formed with an upstanding sleeve 33 through which extends a rod 34 having an upsetting die 35 secured on its upper end, the rod 34 being mounted on a compression spring 36 normally urging die 35 upwardly. Surrounding die 35 and sleeve 33 is a sleeve 37 normally urged upwardly by being seated on a sleeve 38 of rubber also surrounding sleeve 33 and seated on member 31. Die 35 is formed with an annular upsetting surface as shown at 39. Plunger 28 is formed as best shown in Figure 1 with a portion 40 adapted to be projected between spaced lugs 41, 41 of the driving lug and portions 42, 42 adapted to engage over the upper ends of the lugs. The driving lug is formed with an annular sleeve portion 43 adapted to pass through the valve aperture in felly 19 and the lower end of which is adapted to be upset by die 35 in the manner illustrated in Figure 5.

The operation of the device which will be clear from the foregoing description may be briefly described as follows:

The bars 20 and pin 25 being properly adjusted as will be understood, the felly 19 to be punched is placed between bars 20 with one spoke cup 19ª on pin 25. Upper platen 10 is then depressed in any suitable manner, pressure pins 16 first engaging the felly, sleeve 15 being compressed and punch 12 then passing through the felly. The platen 10 is then elevated, punch 12 being first retracted, pins 16 stripping the felly therefrom, and finally, when compression in sleeve 15 is relieved, pins 15 are retracted.

The felly 19 is now lifted from over die 17 onto sleeve 37 and the driving lug is mounted on the felly, sleeve 43 thereof being passed through the valve hole. As shown in Figure 3, sleeve 43 will engage surfaces 39 of die 35 which is held elevated by spring 36 to properly center the lug with respect to die 35. Platen 10 is again depressed, carrying plunger 28 into engagement with lugs 41 and as its motion is continued downwardly, sleeve 37 is effective first to snugly urge the felly and driving lug together. Sleeve 37 will then be depressed against the action of sleeve 38 of rubber which will flow laterally in the space shown in socket 32 (see Figure 4) and die 35 will be forced down upon sleeve 33 and will be then effective to upset the metal of the sleeve 43 of the driving lug (Figure 4) to secure the same to the felly. Upon elevation of platen 10, the parts will return to the position shown in Figure 3.

It will be seen from the foregoing that the operations of punching of valve holes and the securing of driving lugs therein are easily and rapidly performed in sequence in a single press unit. The same or similar operations could, of course, be formed in like manner on other articles. Accordingly, it is apparent that modifications of the invention may be resorted to without departing from the spirit thereof or the scope of the appended claim.

What is claimed is:

An upsetting press for uniting two members by an upsetting operation, including a plunger and a die construction relatively movable with respect to each other, a member of the die normally supporting the work out of upsetting relation with respect thereto, an upsetting member of the die movable against the work, yielding means urging the first member beyond the end of the die, yielding means urging the upsetting member against the work, and positive means limiting the movement of the upsetting member after the plunger and die construction have been urged together while permitting the first member to continue to yield to allow the work to be forced into upsetting relation in the die.

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