Sept. 25, 1928. 1,685,504

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AUTOMATIC SPOT SETTING MACHINE

Filed April 28, 1926 3 Sheets-Sheet 1

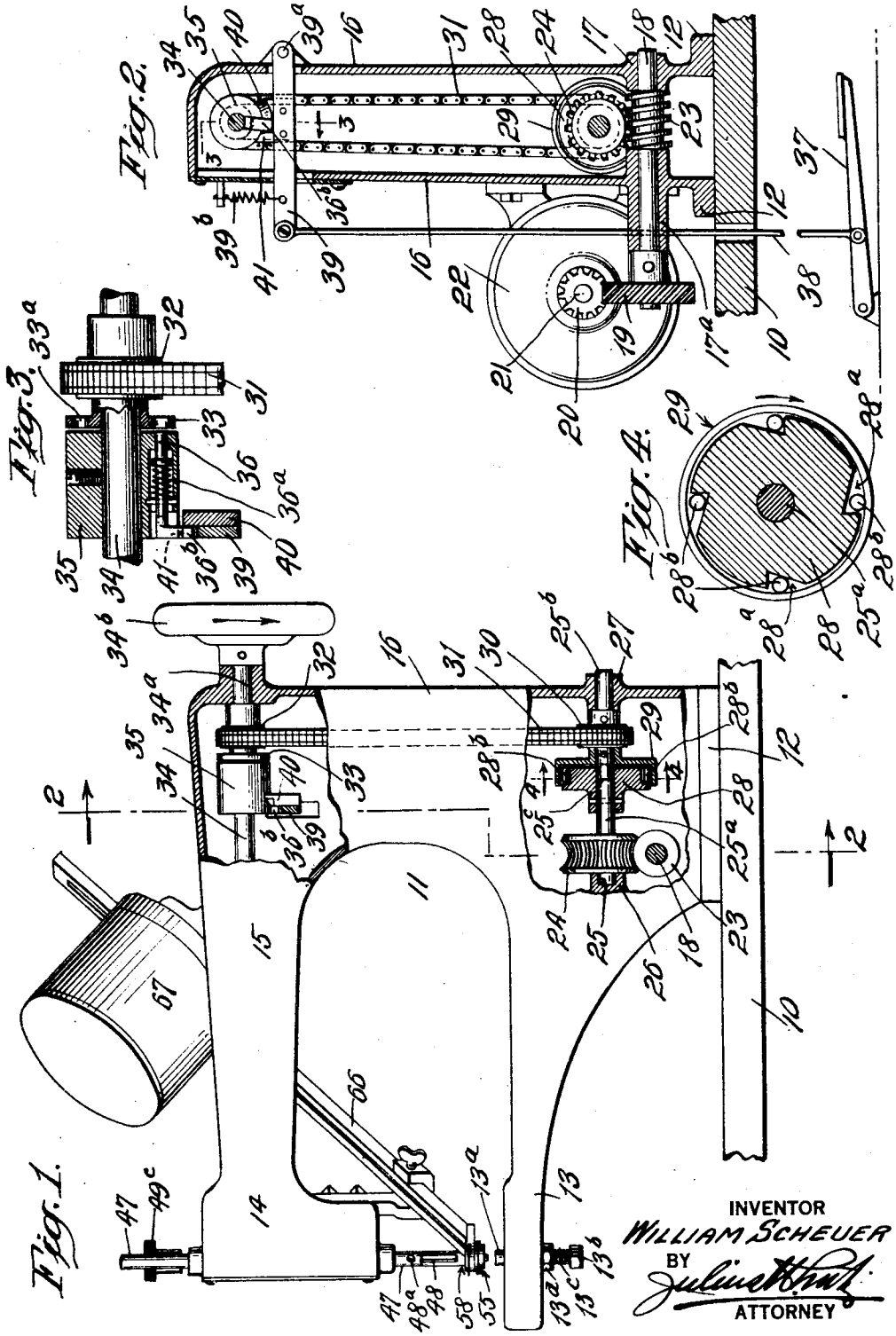


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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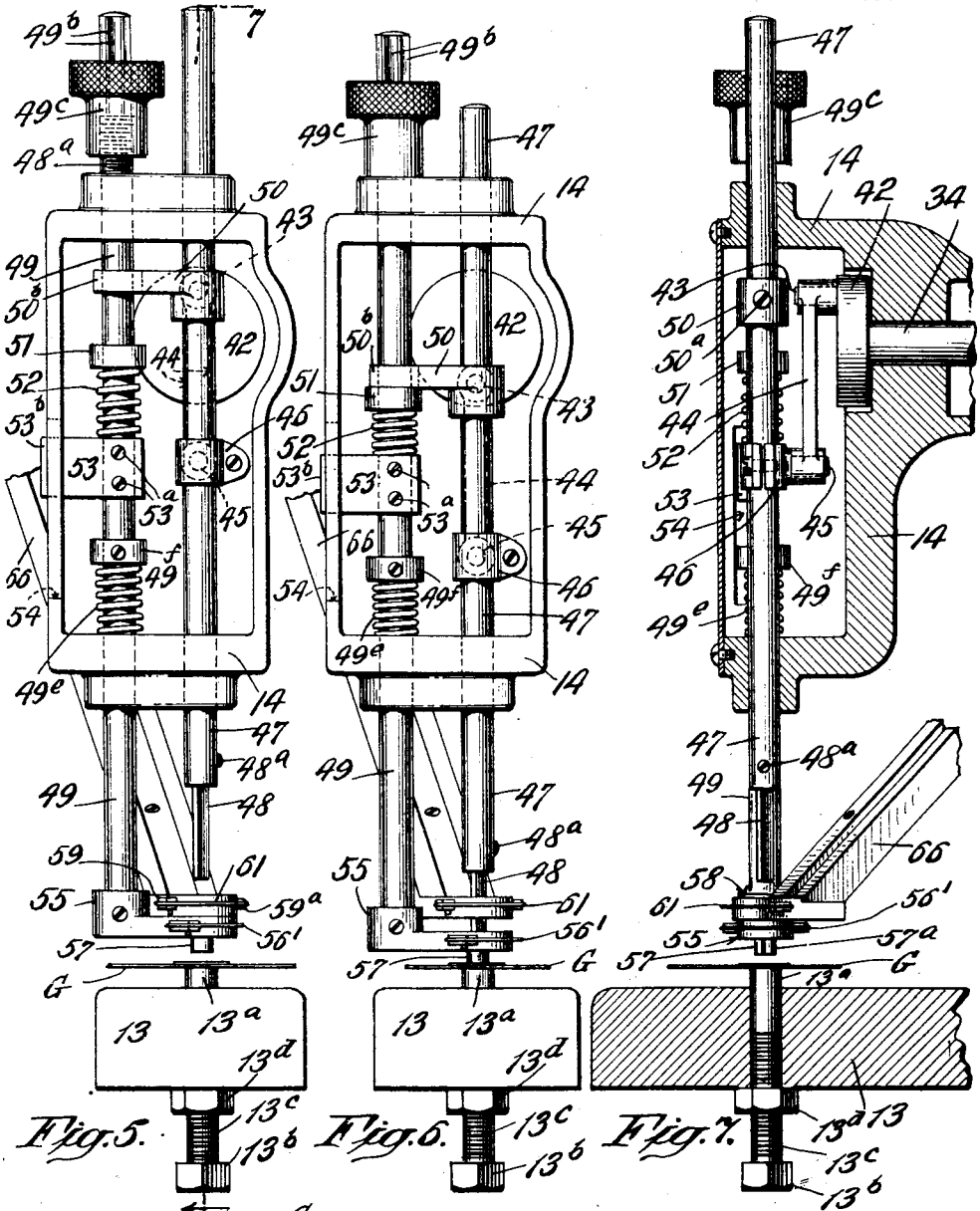


Fig. 5.

Fig. 6.

Fig. 7.

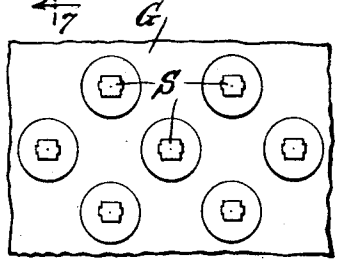


Fig. 17.

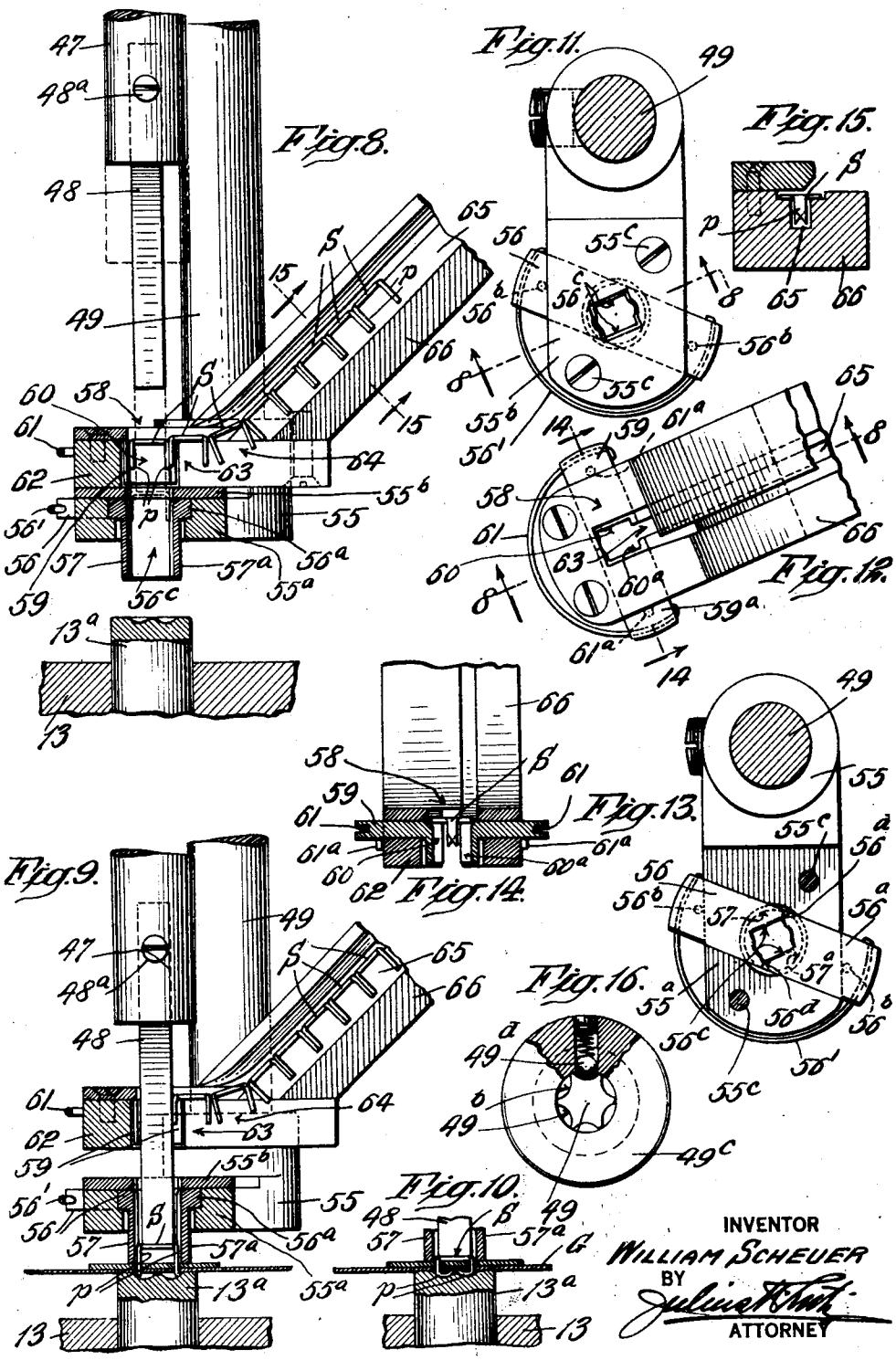
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UNITED STATES PATENT OFFICE.

WILLIAM SCHEUER, OF NEW YORK, N. Y.

AUTOMATIC SPOT-SETTING MACHINE.

Application filed April 28, 1926. Serial No. 105,096.

This invention relates to improvements in automatic spot-setting machines.

One of the objects of this invention is to produce a power-driven treadle-controlled spot-setting machine and thus to increase the efficiency of the machine and the number of spots which may be set within a given period of time.

Another feature of my invention is to enable the power-driven mechanism to be cut out and the machine to be driven by hand when it is desired to make adjustments for varying thicknesses of goods or material to which the spots are applied, or otherwise.

Another object of the invention is to provide guiding means for the vertical movement of the spots which will minimize the chances of tilting the same during such movement, thus increasing the accuracy with which spots may be placed and adding to the efficiency of the machine; to enable the use of a stationary spot-setting anvil and a plunger having a relatively long stroke, and with these ends in view, I produce an automatic spot-setting machine in which the spot is moved simultaneously with the movement of the plunger and preferably carried by the plunger during its downward stroke toward and into a position relatively close to the goods and is then driven through the carrying device into set position.

Another object of the invention is to provide, in an automatic spot-setting machine, a stationary spot guide having a vertical slot through which the plunger operates in combination with a movable spot-carrying guide-member movable with the plunger away from said stationary guide and toward the clinching anvil and goods.

Still another object of the invention is to provide a spot-carrying guide-member which also has the function of a presser-foot arranged to press on the goods with a resilient pressure during the fastening or clinching of the spots.

Still another object of the invention is to produce a machine of the type specified in which the resilient pressure of the presser-foot on the goods may be adjusted to compensate for varying thicknesses of the goods and also to prevent a marring of the goods by the presser-foot adjacent to the spot.

With these and other objects in view, the invention comprises the combination of members and arrangement of parts so combined as to co-act and cooperate with each other in the performance of the functions and the accomplishment of the results hereinafter contemplated, and comprises in one of its adaptations the species or preferred form illustrated in the accompanying drawings, in which:—

Fig. 1 is a side elevation of a machine embodying my invention, a part of the side being broken away to show the power-driving mechanism;

Fig. 2 is a section on the line 2—2 of Fig. 1, looking in the direction of the arrows;

Fig. 3 is a section on the line 3—3 of Fig. 2, looking in the direction of the arrows;

Fig. 4 is a section on the line 4—4 of Fig. 1, looking in the direction of the arrows;

Fig. 5 is a front view of the plunger mechanism with the front or face plate removed;

Fig. 6 is a similar view showing the presser-foot and plunger in depressed position;

Fig. 7 is a section on the line 7—7 of Fig. 5, looking in the direction of the arrows;

Fig. 8 is a section on either of the lines 8—8 in Figs. 11 and 12, showing the plunger in elevated position;

Fig. 9 is a similar view showing the presser-foot in depressed condition and the plunger partly depressed and driving the prongs of the spot through the goods;

Fig. 10 is a view of the lower portion of the plunger, presser-foot and anvil showing the cycle depression of the plunger to clinch the prongs of the spot beneath the goods;

Fig. 11 is a plan view of the lower presser-foot showing the carrying rod therefor, in section;

Fig. 12 is a similar plan view of the stationary guiding channel and portion of the chute communicating therewith;

Fig. 13 is a view similar to Fig. 11 with the upper plate removed;

Fig. 14 is a section on the line 14—14 of Fig. 12, looking in the direction of the arrows;

Fig. 15 is a section on the line 15—15 of Fig. 8 looking in the direction of the arrows;

Fig. 16 is a plan view of the reciprocating carrier-rod and adjusting mechanism for the presser-foot, a portion of the adjusting nut being broken away; and

Fig. 17 is a plan view of a fragment of the goods on which spots are mounted in accordance with my invention.

Referring now to these drawings, which illustrate a preferred embodiment of my invention, 10 indicates a table or suitable mounting for a spot-setting machine embodying a frame 11 which, as illustrated, is composed of a casting having a base portion provided with feet 12 and an elevated anvil portion 13 spaced from a plunger head 14 extending outwardly on an arm 15 from a hollow body portion 16 in which the driving mechanism is preferably enclosed.

My spot-setting machine is preferably power driven. As illustrated, the body 16 is provided near its lower end with shaft-bearings 17, 17ª in which is mounted a transversely-disposed driving-shaft 18 driven from any suitable source of power and, as shown, the outer end of said shaft 18 is provided with a worm wheel 19 meshing with a worm 20 on a shaft 21 of a motor 22 mounted on the side of the body member 16 to produce a self-contained power construction.

Power is transmitted from the drive-shaft 18 through suitable transmission mechanism to a treadle-controlled plunger-operating shaft, means being provided, however, for coupling and uncoupling the power from said treadle-controlled plunger operating shaft so as to enable manual operation, when necessary or desirable. This is accomplished by providing a clutch-controlled split shaft, one end of which has a connection with the power and the other has a connection with said plunger-operating shaft and plunger. In the embodiment shown, the shaft 18 is provided within the hollow body 16 with a worm 23 which meshes with a worm-gear 24 mounted on a split shaft 25 bearing at opposite ends in bearings 26 and 27 in the body portion of the casting 16. As illustrated, the shaft 25 is split at 25ᶜ into what I shall call "power-connected" and "plunger-connected" portions 25ª and 25ᵇ respectively, and one of these parts bears in the other contiguous to the split 25ᶜ. The adjacent ends of the split portion are coupled and uncoupled by a clutch device adapted to automatically couple with the end of the shaft 25 when motion is applied through the clutch member on said power-connection portion and to uncouple therefrom when motion is applied through the clutch member on the plunger-connected portion. Thus, the front portion 25ª has fixed thereto contiguous to the split 25ᶜ a clutch-disc 28 having angular pockets 28ª having rollers 28ᵇ mounted therein and enclosed by a cylindrical casing member 29 which, in the embodiment shown, is fast on the plunger-connected shaft-portion 25ᵇ. This rear shaft portion 25ᵇ is connected by transmission mechanism with the said shaft 34 and is provided, as illustrated, with a sprocket 30 which rotates through a sprocket chain 31 a sprocket 32 loose on the shaft 34. In the embodiment shown, the sprocket 32 has integrally formed therewith a clutch disc 33 provided with a series of holes 33ª and the said shaft 34 has fast thereon a clutch housing 35 provided with a clutch pin 36 adapted to be normally moved to clutching position by means of a spring 36ª. The clutch pin is provided at its outer end with a downwardly-extending latch 36ᵇ controlled by a manually-operated treadle mechanism comprising, as shown, a treadle 37 connected to a treadle rod 38 arranged to depress a lever 39 pivoted at 39ª on the casting 16, said lever 39 being normally held in elevated position by means of a spring 39ᵇ and carrying intermediate its ends a throw-out cam 40 and a stop 41, said two members, as shown, being made in two pieces suitably connected together.

As shown, the shaft 34 is provided at its front end with a driving disc 42 having eccentrically mounted thereon a pivot 43 on which is pivoted a crank arm 44 having at its lower end a connection with a projecting pin 45 fastened adjustably by means of a clamp 46 with a vertically reciprocating rod 47 having at its lower end a plunger 48 connected thereto in any conventional manner by means of a screw 48ª.

The opposite end of the operating shaft 34 is provided with a hand-wheel 34ᵇ which in combination with said split shaft and the coupling mechanism arranged on the power and plunger portions thereof constitutes manual means independent of the power for reciprocating the plunger viz, means by which the plunger may be reciprocated manually while the power is cut off.

Mounted in the head 14 to reciprocate in parallel relationship with the plunger rod 47 is a spot-carrying presser-foot rod 49 arranged to have a limited and adjustable movement and also, as illustrated, arranged to be moved by and with the plunger-reciprocating rod. As illustrated, the plunger-reciprocating rod 47 is provided with an arm 50 adjustable vertically on said plunger rod by means of a screw 50ª and having at its opposite end a fork portion 50ᵇ engaging the rod 49 at opposite sides and slidable in relation thereto during a portion of the reciprocating movement of the plunger. As illustrated, the arm 50 is so positioned in relation to the presser-foot rod 49 as to permit an independent movement of the plunger rod and also during its downward movement to engage a spring-supported washer 51 loose on the said rod 49 and abutting against a spring 52 which abuts at its opposite end against a guide arm 53 fastened by screws 53ª to the presser-foot rod

49 and having an outwardly-extending portion 53^b extending within a slot 54 in the side of the head 14 so as to act as a guide against rotating movement of the said rod and the spot-carrying presser-foot 55 which is fastened to said rod 49 at its lower end.

The spot carrying presser-foot member 55 is provided with a pair of jaws 56, 56^a having extension portions 57, 57^a, said jaws and extensions having a guide channel 56^c adapted to receive a spot S, and said jaws splitting the said channel 56^c, as shown at the corners 56^d thereof. As illustrated, said jaws 56, 56^a are resiliently pressed into abutment at the channel corners by a spring 56′ fastened at its opposite end to the ends of said jaws. The movement of said jaws toward each other is preferably limited by pins 56^b, 56^b and the jaws are retained in the presser-foot body 55^a by a top plate 55^b fastened by screws 55^c, 55^c (See Figs. 11 and 13).

The bottom portion of the spot-carrying presser-foot comprising the extensions 57, 57^a is spaced from the clincher bed or die 13^a which, as shown, extends above the anvil base 13.

This clincher die 13^a is adjustably mounted in the base 13 and comprises a bolt body 13^a having a head 13^b and screw threads 13^c, a lock-nut 13^d being mounted on the threads and abutting against the under surface of the anvil 13. The die portion, as aforesaid, preferably extends above the base and the goods G is adapted to be inserted between this die portion and the extension 57, 57^a of the presser-foot.

The presser-foot is movable by the plunger shaft through the washer 51 and spring 52 to bear resiliently on the goods G. It is desirable to have this spring restrained movement limited so as not to mar the goods G and for this purpose the movement of the rod 49 is preferably limited by screw threading a portion adjacent to the upper end as at 49^a, providing a series of vertical grooves or channels 49^b, and mounting at said upper end a lock nut 49^c having interior threads engaging the threads 49^a on the rod and also being provided with a spring-pressed ball clutch 49^d adapted to engage one of the vertical grooves or channels 49^b. This spot-carrying presser-foot is returned to its initial position by a spring 49^e which abuts at one end against a washer 49^f fixed on said shaft and at the other end by the frame member 14.

Spots S may be fed to the carrier presser-foot in any suitable manner and, in the preferred embodiment illustrated, I provide above the presser-foot a stationary spot guide 58 having spot-engaging jaws 59, 59^a provided with vertical channel portions 60, 60^a through which the spots S are adapted to be moved by means of the plunger. These jaws are pressed toward each other and into contact with the spot by means of a spring 61, the inward movement of these jaws being limited and centered by means of stop pins 61^a, 61^a which abut, as shown, against the mounting portion 62 of the guide 58. The gripping jaws 59, 59^a have an entrance channel 63 which registers with a channel 64 in the body portion 62 which in turn communicates with a channel 65 formed in a chute 66 communicating at its upper end with a hopper 67 of conventional construction so as to feed spots S through said channels to the jaws 59, 59^a.

The treadle-controlled plunger-operating shaft 34 is provided with a rearward extension 34^a having fast thereon a hand-wheel 34^b which enables hand operation of the device when desired, as for example, during the adjustment of the parts for varying types of spots.

It will be seen that operation of the hand wheel, due to the form of clutch mechanism on the drive shaft 25, will be released from the driving part 25^a of the split shaft 25 because the rollers 28^b will, during rotation by the said hand-wheel, be disconnected in view of the fact that said clutch disc is arranged for connection by movement in one direction only.

In operation, spots S are inserted in the hopper 67 and are fed by gravity through the channels and the chute 66 to the stationary guide member 58, the forward spot being, by gravity, moved into position beneath the plunger and between the resiliently mounted jaws 59, 59^a. When the plunger is in its reciprocating movement by the arm 44, disc 42 and treadle-controlled shaft 34 moved downwardly either by rotation of this shaft 34 by the hand-wheel 34^b or through the power-actuated mechanism, said plunger will, in its downward movement contact with a spot in the jaws 59, 59^a and force it through the vertical channel in said jaws and into engagement with the jaws 57, 57^a in the spot-carrying presser-foot 55. Simultaneously with the movement by the plunger of the spot into engagement with the jaws 57, 57^a, the arm 50 on the plunger rod will engage the loose spring-restrained washer 51 on the rod 49 and will begin to resiliently lower the presser-foot 55 into engagement with the goods G. Further movement of the plunger will force the spot downwardly through the channel 56^c in the spot-carrying presser-foot members 57, 57^a and into contact with the goods G so that the prongs p of the spots S will be clinched by the oppositely-disposed depressions in the clincher die beneath the goods G with the upper ornamental portion of the spot resting on the upper surface of the goods G and securely fastened thereto by the prongs p as aforesaid.

Having described my invention, I claim:—

1. An automatic spot setting machine embodying, in combination, a reciprocating plunger mechanism, a stationary spot-clinching die arranged to cooperate therewith, means for feeding spots beneath the plunger, a reciprocating member having spot-engaging means and movable between the said feeding means and die, said reciprocating spot-engaging member being movable simultaneously with the movement of the plunger, means for causing a resilient contact of said reciprocating member with the goods to hold the same in place during the setting of the spot, and means for adjusting the extent of movement of said spot-engaging reciprocating member to vary the degree of resilient pressure on the goods and to compensate for varying thicknesses of goods.

2. An automatic spot setting machine embodying, in combination, a reciprocating plunger mechanism, a stationary spot-clinching die arranged to cooperate therewith, means for feeding spots beneath the plunger, a parallel reciprocating member having fixedly connected thereto a spot-carrying member movable between said feeding means and die, and provided with spot-engaging means movable relatively to said spot-carrying member, said spot-carrying member being movable by the plunger during a portion of the effective downward stroke thereof, and means for causing a resilient contact of said spot-carrying member with the goods to hold the same in place during the setting of the spot including a spring interposed between a part of the plunger-reciprocating mechanism and said parallel reciprocating member.

3. An automatic spot setting machine embodying, in combination, a reciprocating plunger mechanism, a stationary spot-clinching die arranged to cooperate therewith, means for feeding spots beneath the plunger, a parallel reciprocating member having fixedly connected thereto a spot-carrying member movable between said feeding means and die and provided with spot-engaging means movable relatively to said spot-carrying member, and a stationary member having movable spot-seating means connected with said spot-feeding means to permit an initial seating of a spot beneath and in registration with the plunger.

4. An automatic spot setting machine embodying, in combination, a reciprocating plunger mechanism, a stationary spot-clinching die arranged to cooperate therewith, means for feeding spots beneath the plunger, a parallel reciprocating member having fixedly connected thereto a spot-carrying member movable between said feeding means and die and provided with spot-engaging means movable relatively to said spot-carrying member, and a stationary member having movable spot-seating means connected with said spot-feeding means to permit an initial seating of a spot beneath and in registration with the plunger, said stationary spot-seating member having a vertically-disposed spot-guiding channel provided with resilient walls arranged to yieldingly engage a spot during its movement by the plunger into contact with said reciprocating spot-carrying member.

5. An automatic spot setting machine, embodying, in combination, a plunger-rod mounted for reciprocating movement, means for reciprocating said plunger, another reciprocating rod similarly mounted to reciprocate in parallel relationship to said plunger-rod and having fixedly connected at its lower end a spot-carrying member extending beneath the plunger and provided with a spot-guiding channel and spot-engaging means movable relatively to said spot-carrying member, an arm reciprocating with the plunger, and a resilient, shock-absorbing connection including a spring between said arm and said reciprocating rod.

In witness whereof, I have signed my name to the foregoing specification.

WILLIAM SCHEUER.