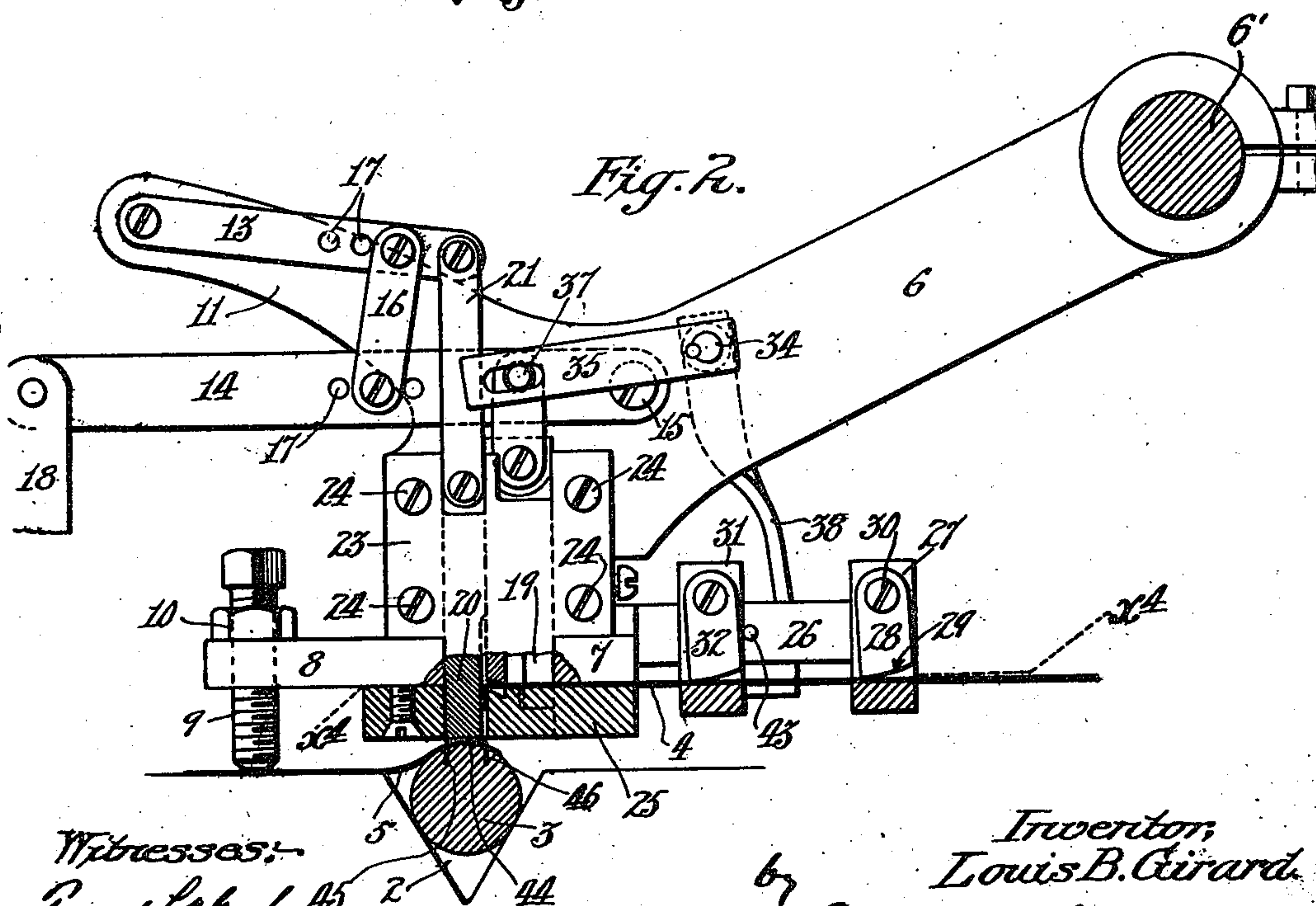


953,416.

2 SHEETS--SHEET 1.



Witnesses:
Frank L. Mahan
Frederic W. Gray.

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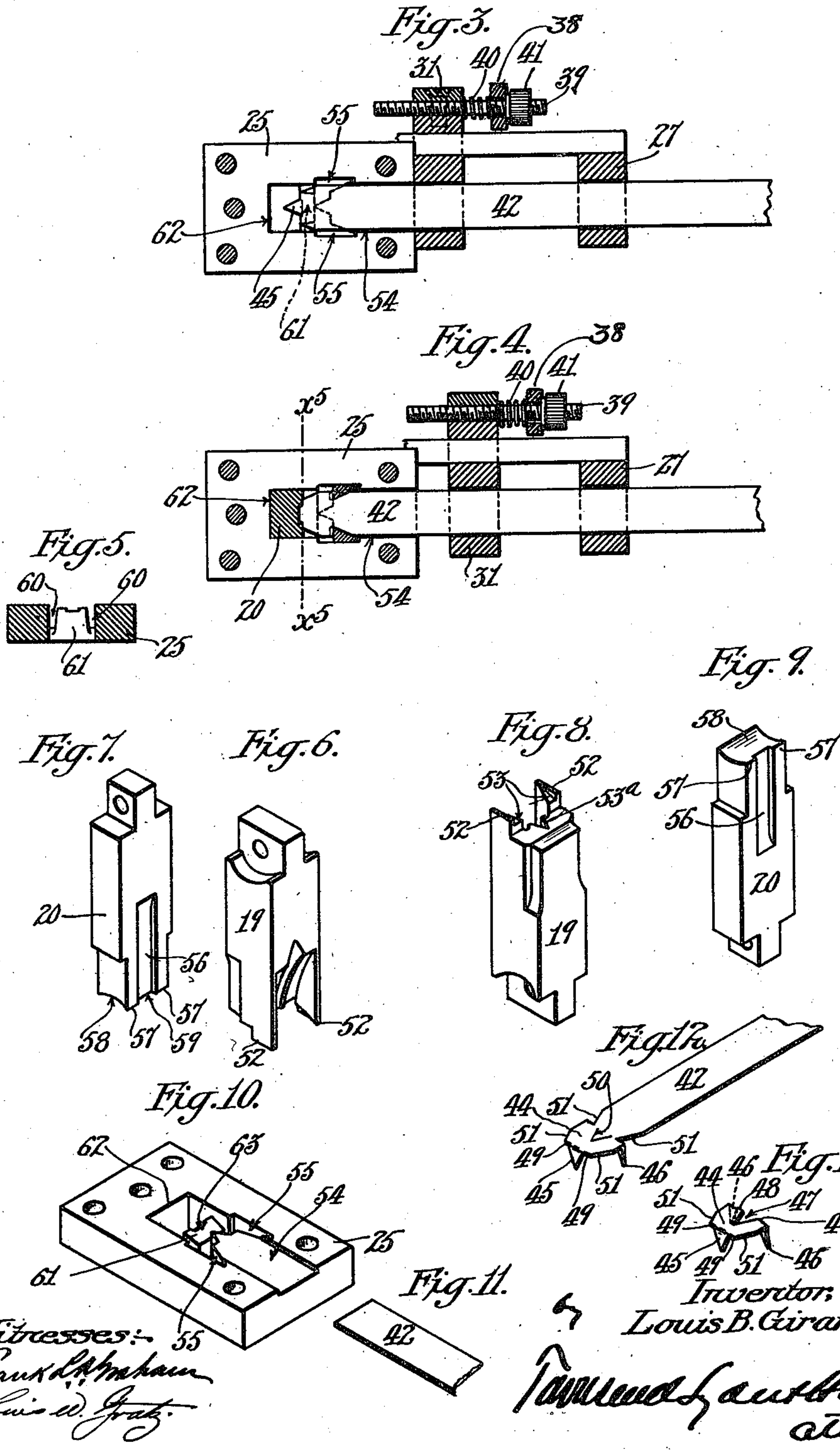
Louis B. Girard.

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TACK FORMING AND DRIVING DIES.
APPLICATION FILED OCT. 17, 1908.

Patented Mar. 29, 1910.

2 SHEETS—SHEET 2.

953,416.



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UNITED STATES PATENT OFFICE.

LOUIS B. GIRARD, OF LOS ANGELES, CALIFORNIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE GIRARD MANUFACTURING COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

TACK FORMING AND DRIVING DIE.

953,416.

Specification of Letters Patent.

Patented Mar. 29, 1910.

Application filed October 17, 1908. Serial No. 458,284.

To all whom it may concern:

Be it known that I, LOUIS B. GIRARD, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Tack Forming and Driving Dies, of which the following is a specification.

This invention relates to dies which are adapted to form a tack or staple from a strip of sheet metal and drive the same. The dies are especially designed for forming tacks for fastening window shade rollers, the dies acting to drive the tack as soon as it is formed to fasten the window shade to the roller, but while especially adapted for this purpose they may also be used for forming and driving tacks used for other purposes. The dies are also adapted to be used merely in forming the tack should the tack driving function not be required.

Other objects and advantages of the invention will appear in the following description.

Referring to the drawings:—Figure 1 is a side elevation of the device with the dies partly in section. The parts are shown in the position they have when just about to shear the tack from the strip and drive it through the window shade into the roller. Fig. 2 is a view similar to Fig. 1 showing the parts in the position they have at the time the tack is driven. Fig. 3 is a section on line x^3-x^3 Fig. 1, showing the contour of the female die and showing the contour and relative location of the first male die in dotted lines. Fig. 4 is a section on line x^4-x^4 Fig. 2, and shows that portion of the first male die in section which has formed the back prongs of the tack. The second die is also shown in section and its longitudinal groove is seen. Fig. 5 is a section on line x^5-x^5 Fig. 4. Fig. 6 is a perspective view of the first die. Fig. 7 is a perspective view of the second die. Fig. 8 is a perspective view of the first die inverted to show the construction of its lower end. Fig. 9 is a perspective view of the second die inverted to show the construction of its lower end. Fig. 10 is a perspective view of the female die. Fig. 11 is a perspective view of the part of the blank strip of metal from which the tacks are formed. Fig. 12 is a perspective view of a blank strip of metal with a tack formed thereon but not yet severed

therefrom. Fig. 13 is a perspective view of the finished tack.

1 designates a table having a groove 2 in which is laid the shade roller 3, the shade 5 which is to be attached to the roller having been placed in position over the top of the roller, as indicated.

The mechanism which performs the forming and tacking operation is carried by an arm 6 which is journaled on shaft 6' so that the device may be swung up out of the way to enable the shade roller to be easily placed in position or removed from the groove 2. Cast on the lower end of the arm 6 are two vertical guides 7 and a foot 8. A supporting screw 9 passes through the foot 8 to act as a leg for supporting the device the proper distance above the shade holder. This screw may be operated to raise or lower the device to the desired height and is prevented from accidentally turning by means of a lock nut 10. An arm 11 is also cast integrally with the arm 6, and pivoted thereto by a screw 12 is an upper rock arm 13. An operating arm 14 is pivoted at 15 to the arm 6 and operates the upper arm 13 by a link 16, arms 13 and 14 having several perforations 17 to enable adjustment of link 16 to produce the desired ratio of stroke between the arm 14 and arm 13. The arm 14 may be operated from any suitable source of power, not shown, through the medium of a connecting rod 18. Slidable between the two guides 7 is a first die 19 and a second die 20. The second die 20 is operated from the upper arm 13 by a link 21, while the first die 19 is actuated from the operating arm 14 by a link 22.

A side plate 23 is fastened by screws 24 to the guides 7 and serves to confine and guide the dies 19 and 20. A female die 25 is secured below the guides 7. The specific construction of the dies is shown in detail in Figs. 3 to 10 and will be described later.

A stationary guide 26 extends rearwardly, and secured to the rear end thereof is a stationary bracket 27 to which is pivoted a dog 28 having a face 29 eccentric to its pivot 30. Slidable on the guide 26 is a bracket 31 to which is pivoted a dog 32 similar to the dog 28.

A sleeve 33 is mounted on the arm 6, and journaled in sleeve 33 is a shaft 34 to one end of which is keyed an arm 35 having a

slot 36 into which projects a pin 37 which pin also pivotally connects the upper end of link 22 to arm 14. On the opposite side of arm 6 an arm 38 is keyed to the shaft 34 and the lower end of arm 38 is forked to straddle a screw 39 which projects from the slidable bracket 31, there being a compression spring 40 between arm 38 and bracket 31 and a nut 41 on the screw on the opposite side of the arm.

42 designates the blank strip of sheet metal from which the tacks are formed, which strip, as clearly shown in Fig. 2, passes through the brackets 27 and 31 under the dogs 28 and 32. As the arm 14 is actuated it operates the dies 19 and 20, as will be described, and also actuates rock arm 35 which in turn swings arm 38 to the right as the arm 14 moves down, thereby sliding the bracket 31 to the right, the dog 32 freely sliding over the blank strip of metal 42 which is prevented from moving rearwardly by the dog 29. Upon the return stroke of operating arm 14 the bracket 31 slides to the left and the dog 32 grips the blank strip 42 and shifts the latter to the left, thus feeding the strip under the dies. When the end of the strip strikes the die and arrives at the position shown in Fig. 1, it is positively stopped, and any excessive movement of the arm 38 to the left will simply compress spring 40 so that no damage is caused any of the parts. This enables the stroke of the arm 38 to be made a trifle greater than necessary to insure that the strip 42 will be moved sufficiently to the left even though the dog 32 might occasionally slip a trifle or fail to catch at the exact moment. A pin 43 on the guide 26 limits the movement of the bracket 31 to the right.

The completed tack, as shown in Fig. 13, consists of a flat body portion 44 with a single down-turned front spur 45 and two rear down-turned spurs 46 there being a V-shaped notch 47 between the rear spurs 46 and a shoulder 48 between each spur 46 and the notch 47. At the front there are two shoulders 49 on each side of the spur 45. The first operation is performed by the first die, the downward stroke of the die stamping and bending down the rear spurs 46 and producing the V-shaped cut at 50 for the spur 45, but not, however, cutting the blank at the shoulders 48 so that, although the tack is partially separated from the blank 42 by the cut 50, it is still connected with the blank by the small amount of uncut metal at the shoulders 48. The formation of the rear spurs 46 leaves the beveled edges 51. To produce this first operation the first die 19 has two wings 52 with shoulders 53 which latter shear the blank 42 at 51 and as the die 19 moves down the shoulders 53 bend down the rear spurs 46. The end of the blank being operated on lies in a groove

54 in the female die 25 and the spurs 46 are bent down through openings 55. The levers and links which operate the two dies 19 and 20 are so proportioned that the second die 20 has a longer stroke and moves faster than the first die 19 and they are so adjusted that during the downward stroke of the operating arm 14 both dies 19 and 20 strike the metal at substantially the same time, and during the time that the first die 19 is stamping and forming the spurs 46 and making the cut 50, the second die 20 is bending down the front spur 45 and at the same time shearing the previously made tack at shoulders 48. The second die 20 has a longitudinal groove 56 and cutting edges 57, also a concave bottom 58 so that as the second die 20 descends the bottom edge 59 of groove 56 bends over the front spur 45 and the groove 56 then slides down over the spur 45, the cutting edges 57 meanwhile severing the previously formed tack at the shoulders 48. During the down stroke the dog 32 has been retracted so that during the up stroke of the dies the strip 42 is fed forward in the manner previously described. The female die 25 has two notches 60, as shown in Fig. 5, on each side of the bridge 61, through which notches 60 the down turned spurs 46 pass as the strip is advanced so that the forward feeding of the strip is not interfered with. During the up stroke of the dies the strip is advanced until the down turned spur 45 strikes the edge 62 of the female die where it is arrested. Any further movement of the arm acts merely to compress spring 40. Upon the down stroke of the dies the first die acts on the strip in the manner previously described, while the second die 20 bends down the prong 45 over a slightly rounded edge 63 formed on the bridge 61 and severs the tack at shoulders 48 by means of the cutting edges 57, and the continued downward stroke of the second die 20 pushes the completed tack down through the female die and forces it through the shade 5 into the shade roller 3, the concave bottom 58 of the die substantially conforming to the curvature of the shade roller so that the tack is curved to fit the roller and presents a very smooth surface.

A very important advantage of this device is that the shade roller does not require a groove to enable the tack to be properly driven for the reason that the prongs of the tack are confined by the female die 25 and the prongs are thus prevented from spreading at the surface of the roller before they enter the wood, and as they are compelled to enter the wood immediately after emerging from the lower face of the female die they have no chance to spread. Ordinarily when a tack of this type, such, for example, as shown in United States Letters Patent No. 735,540 or 553,407, is driven, it is neces-

sary to groove the roller so that the prongs of the tack will not slip.

What I claim is:—

1. In a device of the character described
5 a first die provided with two parallel wings
52, the inner walls of which are in diverging
vertical planes, each wing 52 having a shoulder
53 which slopes upwardly and rear-
wardly at an angle to the edge of the wing,
10 the upper portion of the shoulder being
wider than the lower portion, said die hav-
ing a wide shoulder at the rear of said wings,
the wide shoulder lying in a plane above
the shoulders on said wings, said die having
15 a V-shaped cutting edge 53^a located between
said wings and above the first two shoulders,
a second die and means for producing co-
operation of said dies.

2. In a device of the character described
20 a second die having a concave end 58 which
is transverse of the die and formed with a
longitudinal groove 56 which terminates at

one side of the concave end, thereby forming
a pair of opposite cutting edges 57, said die
also having cut-away portions on opposite 25
sides thereof at each end of the concave por-
tion another die, and means for producing
coöperation of said dies.

3. In a device of the character described
a female die having a groove 54 for guiding 30
the metal strip, openings 55 to permit down-
ward bending of the rear prongs, a bridge
61 with rounded edge 63 over which the
front prong is bent and having slots 60
through which the prongs 46 may slide as 35
the strip is advanced.

In testimony whereof, I have hereunto set
my hand at Los Angeles, California, this
10th day of October 1908.

LOUIS B. GIRARD.

In presence of—

G. T. HACKLEY,

FRANK L. A. GRAHAM.