

May 22, 1956

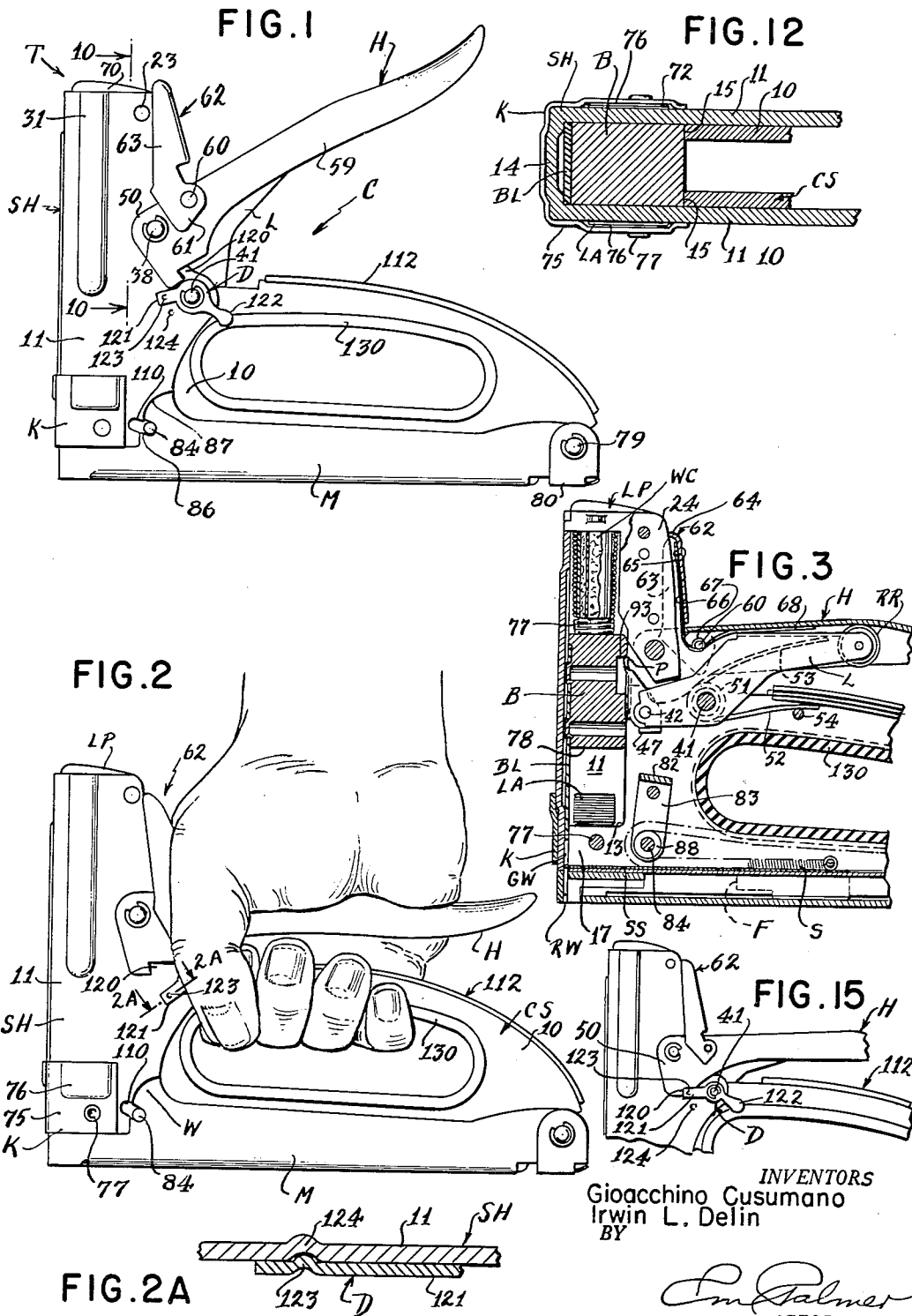
G. CUSUMANO ET AL

2,746,044

TACKERS

Filed Jan. 8, 1954

4 Sheets-Sheet 1



May 22, 1956

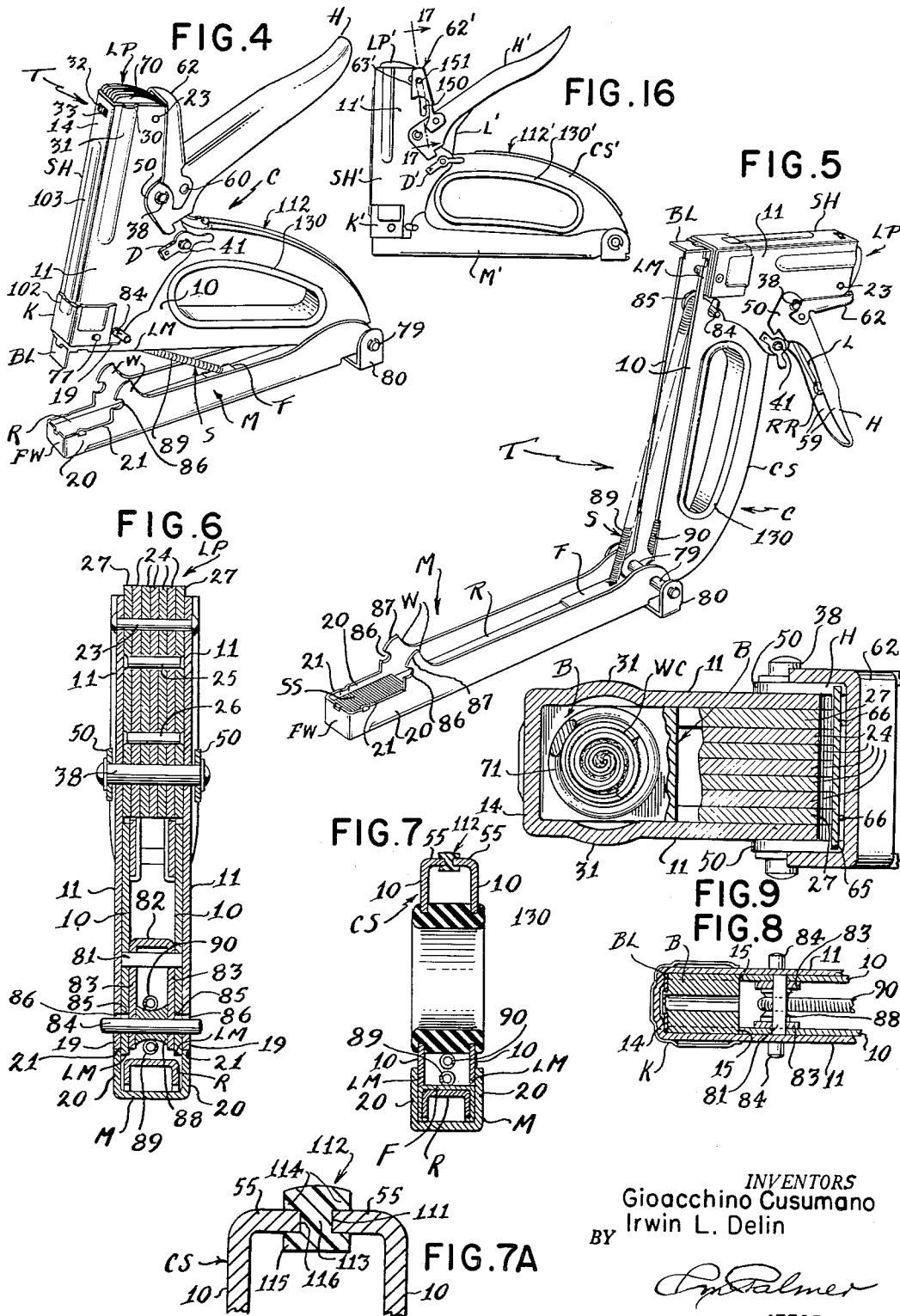
G. CUSUMANO ET AL

2,746,044

TACKERS

Filed Jan. 8, 1954

4 Sheets-Sheet 2



May 22, 1956

G. CUSUMANO ET AL

2,746,044

TACKERS

Filed Jan. 8, 1954

4 Sheets-Sheet 3

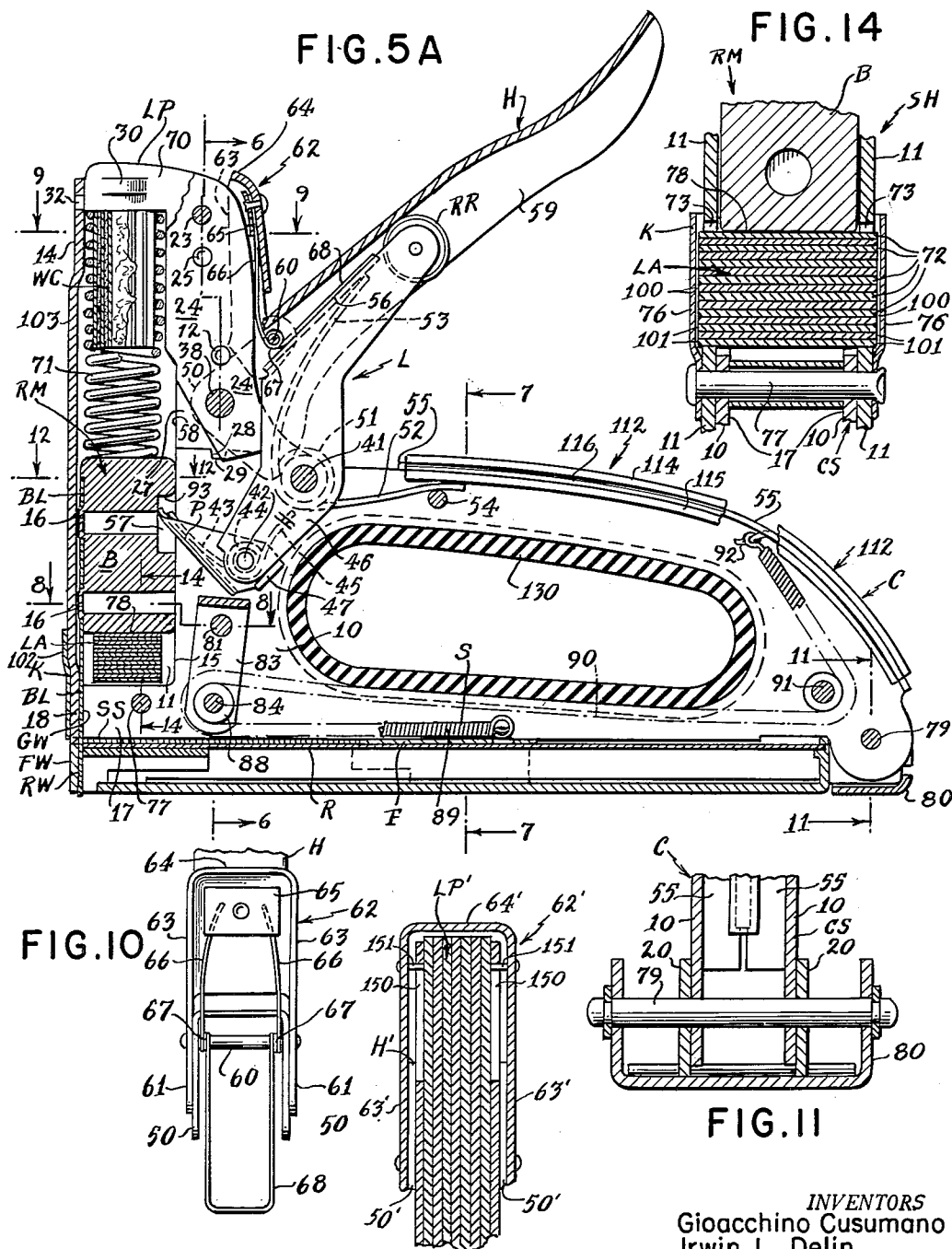


FIG.10

FIG.17

FIG. 11

INVENTORS
Gioacchino Cusumano
Irwin L. Delin
BY

Em Palmer
ATTORNEY

May 22, 1956

G. CUSUMANO ET AL

2,746,044

TACKERS

Filed Jan. 8, 1954

4 Sheets-Sheet 4

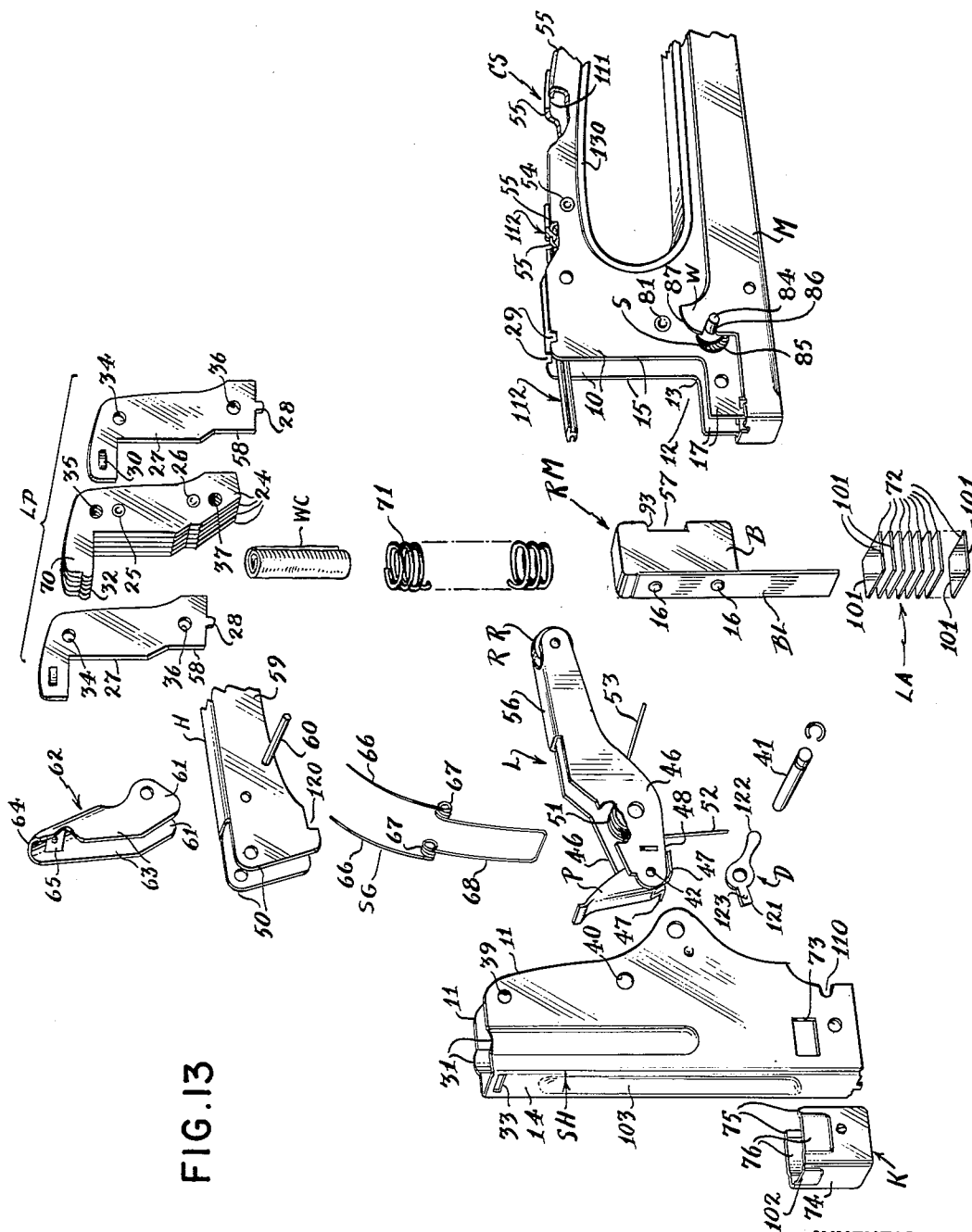


FIG. 13

INVENTORS
Giacchino Cusumano
Irwin L. Delin
BY

Irwin L. Delin
ATTORNEY

2,746,044

TACKERS

Gioacchino Cusumano, Glendale, and Irwin L. Delin, Brooklyn, N. Y., assignors to Swingline, Inc., Long Island City, N. Y., a corporation of New York

Application January 8, 1954, Serial No. 462,970

26 Claims. (Cl. 1—49)

This invention is an improved tacker of the type utilizing staple driving means including a slidably guided spring controlled blade carrying block adapted to strike an impact receiving member carried by the cover for the staple receiving magazine of the tacker. Normally an appropriately retained coiled spring holds the block of the driving means effectively against the impact receiving member whereby the staple driving blade of the driving means is removably arranged within the staple raceway in the magazine. In tackers of the type alluded to, a fixed relatively thick sheet metal member has been resorted to per se or in association with a rubber block to absorb the kinetic energy of the block on its driving downstroke. In other instances a rubber bumper has been employed in the slidably guided driving means. Tackers of this type generally are adequate for low operating speeds, namely, for less than approximately 100 complete operating cycles per minute. Where tackers are used for industrial purposes, higher speeds are generally required. If, therefore, the tacker embodies shock absorbing means in the form of a fixed impact receiving member, it is not uncommon in actual practice for the sheath of the cover which carries the impact receiving member or even the impact receiving member to break. Also in the case of high speeds where rubber blocks are resorted to in association with a fixed impact receiving member or where rubber bumpers are carried in the driving block, these bumpers or blocks at high speeds generally become heated and start to flow, ultimately becoming permanently set, eventually in part powdering concomitantly losing their effectiveness and required strength. One object of the invention is realized in provision of novel and simplified shock absorbing means comprising a relatively high stack of closely superimposed, relatively thin sheet metal, flexible and resilient diaphragms or plates slightly loosely confined by a keeper fastened to the sheath of the tacker for receiving the impact of the slidably guided block of the driving means on each downward operating stroke of the latter and for buffering the driving block during such downstroke, namely, in effectively causing the latter to come to a gradual and ultimate stop. Another object is to provide a relatively flexible and resilient shock absorbing laminated stack or pack of diaphragms wherein the impact thereon by the driving block on each downstroke of the driving means causes the stack to be instantly stressed, flexed and deflected, thus permitting the driving block to come to a cushioned stop, thereby permitting the tacker to operate at relatively high speed as required for industrial purposes. Another object comprehends the utilization in a tacker of a laminated stack of flexible and resilient diaphragms adapted to normally trap a film of oil therebetween and consequently, when impacted by the driving block, the film and even the air between adjacent diaphragms is displaced, further causing cushioning of the driving block, that is, gradually slowing down the driving block as desired at a time when the diaphragms are under appreciable stress and deflection. Another object is concerned with the provision of

a laminated shock absorbing stack wherein even if one of the diaphragms thereof should fail or become ineffective, the remainder of the laminated stack is adequate to absorb the sudden impact of the slidably guided block in the matter of effectively deflecting the closely superimposed diaphragms of the stack for gradually slowing down the slidably guided driving block instantly after the foremost staple has been driven into the material to be tacked. Another object is to provide an improved slidably guided guard effective on displacement of the operating handle of the tacker to closely but movably hug the sheath of the cover of the tacker to preclude pinching of the gripping hand of the operator. Another important object is further realized in the provision of an improved pinch resisting guard having a dual purpose: namely, having as its primary function to positively prevent pinching of the gripping hand of the operator during operation of the tacker and having as its secondary function to permit positioning of the gripping hand of the operator in such a manner as to increase the effectiveness of the staple driving means, that is to say, in the provision of a slidably guided guard nesting the region of the tacker in part enclosing the driving means and adapted to permit convenient gripping thereof by the mass of the gripping hand of the operator to supplement the mass of the tacker to reduce the recoil of the tacker pursuant to each staple driving operation, and by permitting added mass to the region or head of the tacker containing the driving means the effectiveness of the driving means is thus appreciably enhanced, consequently requiring an improved shock absorbing means, for example of the type herein alluded to.

Another object is to provide an improved strip for conveniently interlocking with spaced flanges constituting the top wall of the case or rear part of the cover of the tacker and for closing the top wall to enhance the appearance thereof.

Other important advantages and objects and functional and structural features of the invention will appear in the following detailed specification taken with the accompanying drawings wherein:

Fig. 1 is a side elevational view of the tacker according to our invention, illustrating the handle raised and the slidable pinch resisting guard elevated.

Fig. 2 is a view similar to Fig. 1 but showing both the pivoted handle and slidable projective guard depressed but with the guard still closely hugging and straddling the posterior part of the head of the tacker.

Fig. 2A is an enlarged sectional view on the line 2A—2A of Fig. 2 illustrating the pivoted latch or dog interlocked with the sheath.

Fig. 3 is a fragmentary vertical sectional view of Fig. 2 showing the staple driving means elevated and just about to slip off the pivoted pawl to begin its downward stroke for expelling the foremost staple of the staple strip and for impacting the laminated stack of flexible and resilient and slightly floating sheet metal and relatively thin diaphragms.

Fig. 4 is a perspective view of the tacker showing its cover slightly raised from the magazine thereof.

Fig. 5 is another perspective view of the tacker showing the cover swung fully away from the staple receiving magazine.

Fig. 5A is an enlarged vertical sectional view of Fig. 1 illustrating the handle raised and the spring controlled driving means depressed and abutting the laminated shock absorbing means.

Fig. 6 is a transverse sectional view substantially on the bent line 6—6 of Fig. 5A.

Fig. 7 is a transverse sectional view taken on the line 7—7 of Fig. 5A.

Fig. 7A is a fragmentary enlarged view of Fig. 7.

Fig. 8 is a horizontal sectional view on the bent line 8—8 of Fig. 5A but on a smaller scale.

Fig. 9 is an enlarged horizontal sectional view on the line 9—9 of Fig. 5A.

Fig. 10 is an inside view of the slidable guard shown removed from the sheath.

Fig. 11 is an enlarged rear sectional view taken on the line 11—11 of Fig. 5A.

Fig. 12 is a horizontal sectional view on the line 12—12 of Fig. 5A.

Fig. 13 is an exploded and perspective view illustrating several dominating parts of the swingable cover and showing a few of the diaphragms or relatively thin plates only of the laminated and slightly floating stack for receiving the impact of the driving means and for cushioning the driving means on each down stroke thereof.

Fig. 14 is an enlarged transverse sectional view on the line 14—14 of Fig. 5A, illustrating the superimposed and floating and closely superimposed diaphragms of the shock absorbing laminated stack.

Fig. 15 is a fragmentary view of Fig. 1 however illustrating the handle of the tacker held depressed by the rotatable latch.

Fig. 16 is a view similar to Fig. 1, on a smaller scale, but illustrating the sheath and guard slightly modified, to also permit the guard to closely and slidably hug and receive the upper posterior part of the head of the tacker in part containing the driving means, and

Fig. 17 is an enlarged transverse sectional view taken on the line 17—17 of Fig. 16.

Illustrative of the embodiments disclosed the tacker generally designated T, embodies cover C swingable relative to the open top magazine M which includes a fixed rail R adapted to slidably support a conventional staple strip SS (Figs. 5 and 5A). Appropriately slidably retained on rail R is follower F urged yieldingly by spring S to shift stack SS forwardly against blade BL having its upper end effectively anchored to the slidably guided block B of the ram or driving means generally denoted RM.

Cover C comprises the U-shaped sheath or casing SH and case CS, the latter having spaced sides 10 closely straddled by spaced sides 11 of sheath SH. Spaced sides 10 are provided with transversely aligned recesses 12 (Fig. 13) characterizing rounded corner fillets 13. More specifically, slidably guided within sheath SH (Fig. 12) and particularly by the front wall 14 and between spaced sides 11 thereof and also by the front faces 15 of spaced sides 10 of case CS is the ram block B having spaced projections 16 (Figs. 5A and 13) for positioning the upper end of driving blade BL. Projections 16 are suitably drawn from block B and subsequently are adequately upset to anchor blade BL which is slidable in guideway GW (Fig. 5A) defined by spaced extensions 17 (also note Fig. 13) of case CS and lower part 18 of the front wall 14 of sheath SH. Blade BL is also guided in staple raceway RW which is in alinement with guideway GW when cover C fully closes magazine M. Raceway RW is defined by front wall FW of the magazine M and the spaced rail R.

Lower margins LM (Figs. 4 and 16) of spaced sides 10 of case CS extend below lower margins 19 of spaced sides 11 of sheath or casing SH. With cover C closing magazine, margins LM removably and closely fit between spaced sides 20 (Fig. 6) of the open top magazine M to preclude upward displacement of the staple stack SS as is well understood at which time lower margins 19 of sheath SH are against upper stop faces 21 of the magazine sides 20 (Fig. 6).

Desirably secured by rivet 23 between the upper parts of sides 11 of sheath SH is reinforcing and stabilizing pack of relatively thick laminations or plates LP which includes the intermediate stack of plates 24 secured together by rivets 25 and 26 (Figs. 6 and 11). Apart from providing added strength to the head of the tacker, these plates 24 add more mass, aiding to reduce recoil of the

tacker pursuant to each downstroke of the driving means. Outside plates 27 of the pack or stack LP embody a depending lug 28 (Fig. 13) fitting into a positioning notch as 29 in spaced sides 10 of case CS (Fig. 5A). Outside plates 27 each embody a laterally overhanging lug 30 (Figs. 4 and 5A) adapted to fit into a positioning as rib 31 in the spaced sides 11 of sheath SH. Intermediate plates 24 embody aligned projections 32 for reception in opening 33 at the upper end of wall 14 of the sheath. Plates 24 and 27 include upper and aligned perforations 34 and 35 (Fig. 13) for reception of the rivet 23, and lower and aligned perforations 36 and 37 are for reception of fulcrum pin and rivet 38. Rivet 23 also passes through aligned openings 39 (Fig. 13) interrupting sides 11 and rivet 38 also transverses aligned openings 40 also in the spaced sides 11. By the arrangement disclosed, laminated pack LP is appropriately anchored to sheath SH which is also secured to case CS by a rivet or fulcrum pin 41 on which lever L is pivoted intermediate sides 10. This lever, carries at its lower end, pin 42 on which pawl P is effectively pivoted although normally urged outwardly by terminal or leg 43 of the coiled spring 44 encircling pin 42. The rear leg 45 of spring 44 is anchored to a side wall 46 of lever L in any well known manner. Outward displacement of pawl P relative to lever L is limited by lugs 47 (Fig. 13) extending laterally of pawl P and cooperating with lower faces 48 of the spaced sides 46.

Lever L carries at its upper end roller RR confined within and cooperating with handle H having its lobes 50 straddling spaced sides 11 of sheath SH. Handle H is held normally raised by spring 51 coiled about fulcrum pin 41 and specifically by legs 52 and 53, leg 52 effectively abutting rivet 54 interconnecting spaced sides 10 of case CS while leg 53 acts against bridge 56 of lever L, thus holding roller RR elevated and it follows that handle H likewise is held normally raised in which case pivoted pawl P is at its lowest position as shown in Fig. 5A and in part projecting into recess 57 of the driving block B also slidably guided between outside laminated plates 27 and front wall 14 of sheath SH, since faces 58 (Fig. 5A) of plates 27 line up with guide faces 15 of sides 10 of the case.

Fastened to spaced sides 59 of handle H is fulcrum pin 60 on which spaced perforated lobes 61 of guard 62 are pivoted. Lobes 61 constitute the posterior lower portions of spaced sides 63 merged with rounded bridge 64 of guard 62 within which is a fixed plate 65 for anchoring spaced legs 66 of spring generally indicated SG provided with spaced coiled portions 67 encircling fulcrum pin 60 and the loop 68 abutting bridge 56 (Fig. 5A) of lever L, the arrangement being such that due to action of spring SG, guard 62 is normally held closed, namely, nesting or receiving and straddling the rear part of sheath SH, that is the posterior part of the head of the tacker.

Interposed between the overhanging limbs 70 of the laminated stack LP and the upper face of the driving block B is a relatively strong helicoidal spring 71 which normally is expanded and urges block B downwardly and against the laminated shock absorbing pack LA comprising a plurality of diaphragms or rectangularly shaped thin flexible and resilient sheet metal plates 72 closely superimposed and defining a relatively high stack insertible into aligned rectangular shaped openings 73 (Figs. 13 and 14) interrupting spaced side walls 11 of sheath SH.

Diaphragms of stack LA are slightly wider than and extend across the width of sheath SH and are retained slightly loosely in place by the U-shaped one piece keeper K (Fig. 13) comprising front wall 74 and the spaced side wall 75 appropriately embossed or offset to form shallow ribs 76 to receive and position the side of the diaphragm stack (Fig. 14). Rivet 77 is utilized to secure the lower portion side walls 11 of sheath SH to the spaced extensions 17 of case CS. Rivet 77 also secures sides 75 of the keeper K to the spaced sides 11 of sheath

5

SH. By this arrangement restricted and slight vertical displacement of the diaphragms 72 is possible, in that the height of openings 73 is slightly greater than the height of stack LA (Fig. 14). In the normally raised position of handle LA (Fig. 5A), the bottom face 78 of block B is against the laminated stop or stack LA holding the latter against vertical play in spaced openings 73 of the sheath. It should be noted however that once handle H is depressed, lever L operates to raise pawl P and hence driver block B is elevated, consequently permitting vertical play of the thin diaphragms 72. Also lateral or side play of these diaphragms is possible to the extent of clearances 100 (Fig. 14) between ribs or pockets 76 of keeper K and corresponding side faces 101 of the diaphragms. In other words, laminated stack LA may be said to float in keeper K relatively to sheath SH although received, positioned, and retained by spaced ribs 76 of the keeper.

Struck out of front wall 75 of keeper K is rib 102 for receiving and positioning the lower portion of rib 103 projecting from front wall 14 of sheath SH. Rib 103 provides means offset relative to front wall 14 for reception of upset heads or projections 16 struck out of driving block B.

Positioned within power spring 71 is spirally wound grease saturated cartridge WC also containing grease between the convolutions thereof. This cartridge during operation of the tacker travels up and down within spring 71, spraying out grease for lubricating spring 71, driver block B and staple driving blade BL. Thus surfaces guiding both block B and blade BL are also lubricated. The grease also draws into gaps or clearances 100 to enter between diaphragms 72 of laminated stack LA.

Case CS of cover C is pivoted on the slidable fulcrum pin 79, carried by rear ends of spaced sides 20 of magazine M (Fig. 5). Slidable pin 79 fixedly carries bracket 80 which serves to stabilize the tacker when used near vertical walls or corners.

Fastened to the spaced sides 10 of case CS (Figs. 6 and 13) is rivet 81 swingably sustaining yoke 82 having spaced sides 83 fixedly carrying at their lower ends locking pin 84 having its ends passing through relatively large clearing openings 85 (Fig. 13) in the spaced sides 10 of case CS and adapted to interlock with aligned notches 86 below cam portions 87 of spaced wings W extending upwardly from the spaced sides 20 of magazine M.

Roller 88 is mounted on pin 84. Spring S is trained over roller 88 whereby leg 89 is appropriately connected to the slidably retained follower F and its upper leg 90 is trained about fixed rivet 91 and slidably retained on hook 92 struck out of case CS.

By the arrangement disclosed, spring S serves to shift the slidable follower rearwardly when cover C is swung rearwardly away from the magazine M (Fig. 5). When the cover is swung downwardly to close the open top channel of the magazine the ends of floating pin 84 strike cams 87, thus stressing spring S until the ends of pin 84 snap into notches 86 to interlock with wings W to hold the magazine closed. When the magazine is closed, follower F, due to action of spring S, urges the staple stack SS forwardly and yieldingly against blade BL (Fig. 5A) in the normal raised position of handle H. However, when the handle is depressed, pawl P cooperates with shoulder 93 of the driving block B, hence raising the latter against the compression of spring 71 and consequently blade BL is also raised above the elevation of the staple stack SS. Instantly thereafter, spring S causes the staple stack or strip to advance, presenting the foremost staple thereof into raceway RW and under blade BL. Eventually the upper terminal of the spring controlled pivoted pawl P slips off shoulders 93. At this time spring 71 expands to automatically drive block B downwardly whereby blade BL ejects the foremost staple out of raceway RW at which time bottom face 78 of block B has struck the floating laminated stack of diaphragms LA

6

flexing and deflecting the latter, thus absorbing the shock transmitted by block B on its downward driving stroke. By such action the driving means is cushioned and gradually slowed down as desired as the shock imparted to the diaphragms is taken up through their deflection. By this action, the tacker may be effectively operated at relatively high speed for industrial purposes, for example, in excess of one hundred cycles per minute.

Referring back to the slidably guided guard 62, the latter as previously stated closely hugs the upper end and even receives the rear part of the sheath SH or in other words, the posterior part of the head of the tacker. With handle H fully raised (Fig. 11), the upper part of guard 62 even extends above the upper part of the sheath. If the operator grips the handle (Fig. 2) and shifts the same downwardly, guard 62 moves downwardly but still yieldingly hugs and straddles the sheath SH due to the action of spaced legs 66 of spring SG which in fact always urge guard 62 forwardly until limited by plate 65 striking the rear parts of plates 24 of the laminated pack LP. Because of the continuous nesting or telescoping relationship, the gripping hand of the operator may be positioned close to the region or head of the tacker containing the driving ram. Thus the mass of the operating hand supplements the mass of the tacker near the head of the tacker, consequently reducing the recoil of the tacker pursuant to each driving stroke of the driving means. Such more effective and improved shock absorbing means is satisfied by the herein disclosed laminated stack LA which as previously pointed out is also adapted to be lubricated by drainage of grease through the clearing gaps 100 (Fig. 14).

In Fig. 1, the tacker is shown closed, that is, the cover C is interlocked with magazine M since the ends of pin 84 are within the notches 87 of wings W. To unlock the cover the operator merely moves the ends of pin 84 out of notches 86 and into aligned relief notches 110 interrupting sides 11 of sheath SH. This action unlocks cover C from the magazine. It follows that the cover may be swung rearwardly away from magazine to expose the open top channel of the magazine to permit convenient loading of a fresh strip of staples therein.

The arcuate and downwardly and rearwardly sloping top wall of case CS is formed by spaced flanges 55 (Figs. 5A, 7, 11 and 13) constituting gap 111 (Figs. 7A and 13) closed by the ornamental plastic "I-shaped" strip 112 having its web 113 slidably and frictionally interposed between flanges 55 while the upper and lower lugs 114 and 115 thereof closely and frictionally straddle the upper and lower margins of flanges 55 which may be said to be frictionally received by walls of recesses 116 constituted by web 113 and lugs 114 and 115.

Where it is desired to hold handle H depressed (Fig. 15), latch or dog D is employed. This latch is appropriately rotatably retained on fulcrum pin 41. It will be noted that one of the lobes 50 of handle H is provided with recess 120 adapted to removably receive and interlock with limb 121 of latch D, thus preventing counterclockwise movement of handle H. To unlock latch or dog D, limb 122 is moved counterclockwise, thus removing limb 121 from recess 120 and consequently spring arm 55 automatically raises handle H to its normal but unlocked position, in which case the rotatable latch D may be manually shifted to permit detent 123 of limb 121 (Fig. 2A) to snap into and interlock with indent 124 interrupting adjacent wall 11 of sheath SH. Generally, when the tacker is in use, latch or dog D is held in an idle position, namely, removably locked to sheath SH as illustrated in Fig. 2.

A substantially elliptical protective rubber band 130 is arranged within the central aligned openings defined by spaced side walls 10 of case CS (Fig. 7). This band is appropriately and removably interlocked with the spaced side walls 10 and serves as a soft bearing against

which the operator's fingers are pressed when operating the tacker (Fig. 2).

Attention is directed to Fig. 5A wherein the grease containing cartridge WC is shown within and at the top of the power helicoidal spring 71. Such showing is purely for purposes of illustration as following the driving stroke of block B, the cartridges would glide downwardly to rest on block B, although at times it may cling at the top of the spring 71 until the next impact of block B against the resilient and flexible floating stack LA.

In Figs. 16 and 17, a slightly modified protective guard 62' is shown, permitting also the gripping hand of the operator to be clasped near the head of the tacker and parts corresponding to the form shown in Figs. 1-15 have primed. It will be observed that in Figs. 16 and 17, spaced sides of sheath SH' are provided with aligned cam slots 150 receiving and guiding pins 151' suitably secured to the spaced side walls 63' of guard 62' thus slidably guiding the latter relative to sheath SH' when handle H' is displaced. In fact, pins 151 in slots 150 closely maintain the upper rear part of the sheath nested within guard 62' without the aid of any spring action as in the case of the form shown in Figs. 1-15. In other aspects, the embodiment according to Figs. 1-15 is along the lines of the modification illustrated in Figs. 16 and 17 although in both of the forms disclosed cover C may be considered as a casing or frame comprising a sheath as SH straddling and secured to a hollow case as CS and in all the forms the protective guard is slidable relative to the head of the tacker.

Various changes may be made in details of construction and arrangement of parts without departing from the spirit of the invention or sacrificing any of the advantages thereof inherent therein.

We claim:

1. In a tacker, a magazine for receiving a strip of staples and having a raceway, reciprocable staple driving means comprising a blade having a lower portion removably shiftable into said raceway for driving the foremost staple of said strip out of said magazine and comprising a block for anchoring the upper part of said blade, means for slidably guiding said driving means including a casing having spaced sides provided with transversely aligned openings disposed appreciably below said block, shock absorbing means for receiving the impact of said driving means on the downward stroke thereof and embodying a laminated stack within said openings and bridging said sides and comprising a series of relatively thin, flexible and resilient, closely superimposed sheet metal diaphragms; helicoidal spring means within said casing for normally holding said block against said stack, means for initially raising said block away from said stack against the resistance of said spring means and for subsequently releasing said driving means to permit downward displacement of said block due to expansion of said spring means whereby said block impacts said laminated stack to flex and deflect said diaphragms for gradually slowing down said driving means pursuant to ejection by said blade of the foremost staple of said strip out of said raceway.

2. In a tacker, a magazine for receiving a strip of staples and having a raceway, reciprocable staple driving means comprising a blade having a lower portion removably shiftable into said raceway for driving the foremost staple of said strip out of said magazine and comprising a block, for anchoring the upper part of said blade, means for slidably guiding said driving means including a casing having spaced sides provided with transversely aligned openings disposed appreciably below said block, shock absorbing means for receiving the impact of said driving means on the downward stroke thereof and embodying a laminated stack loosely disposed within said openings and bridging said sides and comprising a series of relatively thin flexible and resilient, closely superimposed sheet metal diaphragms; helicoidal spring means within said casing for normally holding said block against said stack,

means for initially raising said block away from said stack against the resistance of said spring means and for subsequently releasing said driving means to permit downward displacement of said block due to expansion of said spring means whereby said block impacts said laminated stack to flex and deflect said diaphragms for gradually slowing down said driving means pursuant to ejection by said blade of the foremost staple of said strip out of said raceway.

3. The tacker according to claim 2 wherein a keeper is secured to said casing and cooperates with the sides of said diaphragms to retain the latter across said casing and under said block.

4. The tacker according to claim 3 characterized further in that said keeper is a U-shaped member having spaced sides including spaced ribs for receiving and positioning said spaced sides of said diaphragms.

5. The tacker according to claim 4 characterized further in that said sides of said diaphragms are spaced from spaced inside faces of said ribs to provide for displacement of said diaphragms relative to said casing.

6. The tacker according to claim 5 wherein the height of said stack of diaphragms is less than the height of said spaced openings in said casing to permit play between said diaphragms and between said diaphragms and casing.

7. In a tacker wherein helicoidal spring means is adapted to be actuated by a movable block carrying a staple driving blade and is interposed between said block and a fixed stop; a grease containing cartridge actuated by said block and movably disposed within said spring means for issuing lubricant on said block to drain to said blade.

8. In a tacker wherein helicoidal spring means is adapted to be actuated by a movable block carrying a staple driving blade and is interposed between said block and a fixed stop; a spirally wound grease containing cartridge actuated by said block and movably disposed within but of a height less than said spring means for issuing lubricant to drain on to said block.

9. In a tacker, a sheath having a front wall and spaced sides, staple driving means within said sheath and comprising a block having a blade fixed thereto, shock absorbing means bridging said sides, stabilizing means interposed between said sides, spring means within said sheath and interposed between said stabilizing means and said block for normally holding the latter against said shock absorbing means, actuating means pivoted relative to said sheath for elevating said block against the resistance of said spring means and for subsequently releasing said block, a handle pivoted to said sides for operating said actuating means; a pinch resisting guard bodily carried by said handle and movable along said sides, and means to maintain said guard adjacent said sides during displacement of said handle and during displacement of said guard relative to said sheath.

10. In a tacker, a sheath having a front wall and spaced sides, staple driving means within said sheath and comprising a block having a blade fixed thereto, shock absorbing means bridging said sides, stabilizing means interposed between said sides, spring means within said sheath and interposed between said stabilizing means and said block for normally holding the latter against said shock absorbing means, actuating means pivoted relative to said sheath for elevating said block against the resistance of said spring means and for subsequently releasing said block, a handle pivoted to said sides for operating said actuating means; a pinch resisting guard pivotally carried by said handle and movable downwardly and upwardly along said sides and having spaced sides for straddling said spaced sides of said sheath, and means to maintain said guard in said straddling relation during displacement of said handle and during displacement of said guard relative to said sheath.

11. In a tacker, a sheath having a front wall and spaced sides, staple driving means within said sheath and comprising a block having a blade fixed thereto, shock absorbing means bridging said sides, stabilizing means in-

terposed between said sides, spring means within said sheath and interposed between said stabilizing means and said block for normally holding the latter against said shock absorbing means; actuating means pivoted relative to said sheath for elevating said block against the resistance of said spring means and for subsequently releasing said block, a handle pivoted to said sides for operating said actuating means; a pinch resisting guard pivotally carried by said handle and movable downwardly and upwardly along said sides and having spaced sides for straddling said spaced sides of said sheath, and spring means to maintain said guard in said straddling relation during displacement of said handle and during displacement of said guard relative to said sheath.

12. In a tacker, a sheath having a front wall and spaced sides including aligned cam slots adjacent posterior margins of said sides, staple driving means within said sheath and comprising a block having a blade fixed thereto, shock absorbing means bridging said sides, stabilizing means interposed between said sides, spring means within said sheath and interposed between said stabilizing means and said block for normally holding the latter against said shock absorbing means, actuating means pivoted relative to said sheath for elevating said block against the resistance of said spring means and for subsequently releasing said block, a handle pivoted to said sides for operating said actuating means; and a pinch resisting guard bodily carried by said handle and having pin means movably guided by the walls of said slots to maintain said guard adjacent said margins during displacement of said handle and during displacement of said guard relative to said sheath.

13. In a tacker, a casing having stabilizing means, staple driving means movably guided within said casing, a laminated stack comprising a multiplicity of closely superimposed, relatively thin, flexible and resilient sheet metal diaphragms disposed transversely across said casing below said driving means for absorbing the impact of the latter on the driving stroke thereof; helical spring means interposed between said stabilizing means and driving means, and a grease containing and lubricant issuing cartridge movable within and of a height appreciably less than said spring means and adapted to be displaced towards said stabilizing means by said driving means.

14. In a tacker, a casing having stabilizing means, staple driving means movably guided within said casing, a laminated stack comprising a multiplicity of closely superimposed, relatively thin, flexible and resilient sheet metal diaphragms disposed transversely across said casing below said driving means for absorbing the impact of the latter on the driving stroke thereof; and keeper means cooperating with the sides of said stack to hold the latter across said casing.

15. In a tacker, a casing having spaced sides including aligned openings, stabilizing means secured to said sides, staple driving means movably guided within said casing between said sides, a laminated stack comprising a multiplicity of closely superimposed, relatively thin, flexible and resilient sheet metal diaphragms disposed transversely across said casing below said driving means for absorbing the impact of the latter on the driving stroke thereof; and a keeper means secured to said casing and having sides straddling said casing and at least in part spaced from spaced sides of said stack to provide for slight lateral play between said diaphragms and keeper, the height of said openings being greater than the height of said stack to provide for vertical play of said diaphragms relative to keeper.

16. In a tacker, a casing having spaced sides, stabilizing means at the upper part of said casing and secured to said sides, staple driving means movably guided within said casing and in part by said stabilizing means, a laminated stack comprising a multiplicity of closely superimposed, relatively thin, flexible and resilient sheet metal diaphragms disposed transversely across said casing below

said driving means for absorbing the impact of the latter on the driving stroke thereof; helicoidal spring means interposed between said stabilizing means and driving means to normally hold said driving means against said stack, actuating means coacting to elevate said driving means away from said stack against the resistance of said spring means and for releasing said driving means to impact said stack under the influence of said spring means, a handle pivoted to said casing for operating said actuating means, a guard pivoted to said handle, and means to maintain said guard adjacent said sides during displacement of said handle or said driving means, said guard characterizing means to allow positioning of the gripping hand of the operator adjacent said stabilizing means for reducing the recoil of said tacker pursuant to each complete down stroke of said driving means.

17. In a stapling machine, a case having a downwardly and rearwardly sloping arcuate and longitudinally top wall comprising spaced flanges having spaced substantially parallel sides defining a relatively narrow gap along the length of said top wall, a plastic insert having a web portion having substantially parallel sides frictionally cooperating with the sides of said gap and disposed along the length of said top wall for closing said gap and having upper and lower laterally extending flanges frictionally cooperating with spaced upper and lower margins of said walls adjacent said gap.

18. In a tacker, a casing having spaced sides, driving means slidably guided within said casing, actuating means for operating said driving means, a normally raised handle pivoted to said sides for operating said actuating means, a pinch resisting guard pivotally carried by said handle and movable downwardly and upwardly along said sides and having spaced sides for straddling said first mentioned sides, and means to maintain said guard continuously in said straddling relation during displacement of said handle and during displacement of said guard relative to said casing.

19. In a tacker, a casing, a handle pivoted to said casing, a guard pivoted on said handle and slidably nesting a rear portion of said casing, and means maintaining said guard to continuously nest said rear portion during displacement of said handle relative to said casing.

20. In a tacker, a casing having stop means at the upper part thereof, staple driving means movably guided within said casing, a laminated stack comprising a multiplicity of closely superimposed, relatively thin flexible and resilient loosely disposed sheet metal diaphragms disposed transversely across and within said casing but spaced below said driving means for absorbing the impact of the latter on the driving stroke thereof; helicoidal spring means interposed between said stop and driving means, and a normally open grease containing lubricant issuing cartridge movable within and of a height less than said spring means and adapted to be displaced towards said stop means by said driving means.

21. In a tacker or stapling machine, a casing having spaced sides, staple driving means movably guided within said casing, actuating means coacting to elevate said driving means, a handle pivoted to said casing for operating said actuating means, a guard having its lower end pivoted to said handle, and spring means to maintain said guard adjacent said sides during displacement of said handle, said guard characterizing means to allow positioning of the gripping handle of the operator adjacent said casing for reducing the recoil pursuant to each complete downstroke of said driving means.

22. In a tacker or stapling machine, a casing having spaced sides, staple driving means movably guided within said casing, actuating means coacting to elevate said driving means, a handle pivoted to said sides for operating said actuating means, a pinch resisting guard having its lower end pivotally carried by said handle and movable downwardly and upwardly along said sides and having

11

spaced sides for straddling said spaced sides of said casing, and spring means to maintain yieldably said guard in said straddling relation during displacement of said handle and during displacement of said guard relative to said casing.

23. In a tacker, a casing, a handle pivoted to said casing, a guard having its lower end pivoted on said handle and having means slidably nesting a rear portion of said casing, and spring means maintaining said guard continuously nesting said rear portion during displacement of said handle relative to said casing.

24. A stapling machine comprising a casing, driving means therein, a handle pivoted to said casing, and a movable guard nesting a portion of said casing, and means to maintain the nesting relationship of said guard and casing during pivotal displacement of said handle.

25. In a tacker, a casing having spaced sides including cam means, a handle pivoted to said casing, a guard, means pivotally connecting the lower part of said guard to said handle, and means carried by said guard and guided by said cam means for nesting said guard in part over corresponding portions of said sides during manipulation of said handle.

12

26. In a tacker, a casing having stop means at the upper part thereof, staple driving means movably guided within said casing, a laminated stack comprising a multiplicity of closely superimposed, relatively thin flexible and resilient loosely disposed sheet metal diaphragms disposed transversely across and within said casing but spaced below said driving means for absorbing the impact of the latter on the driving stroke thereof; helicoidal spring means interposed between said stop and driving means, and a normally open spirally wound grease containing lubricant issuing substantially cylindrical cartridge within and of a height less than said spring means and adapted to be displaced towards said stop means by said driving means and subsequently automatically movable by gravity towards said stack and adapted to drain lubricant to reach said diaphragms to hold the latter separated by relatively thin films of lubricant.

References Cited in the file of this patent

UNITED STATES PATENTS

2,593,231 Wandel ----- Apr. 15, 1952