Feb. 28, 1967 W. C. SPATARI 3,306,278

ELASTIC BAND U-SHAPED PROJECTILE LAUNCHING DEVICE

Filed Dec. 2, 1963 3 Sheets-Sheet 1

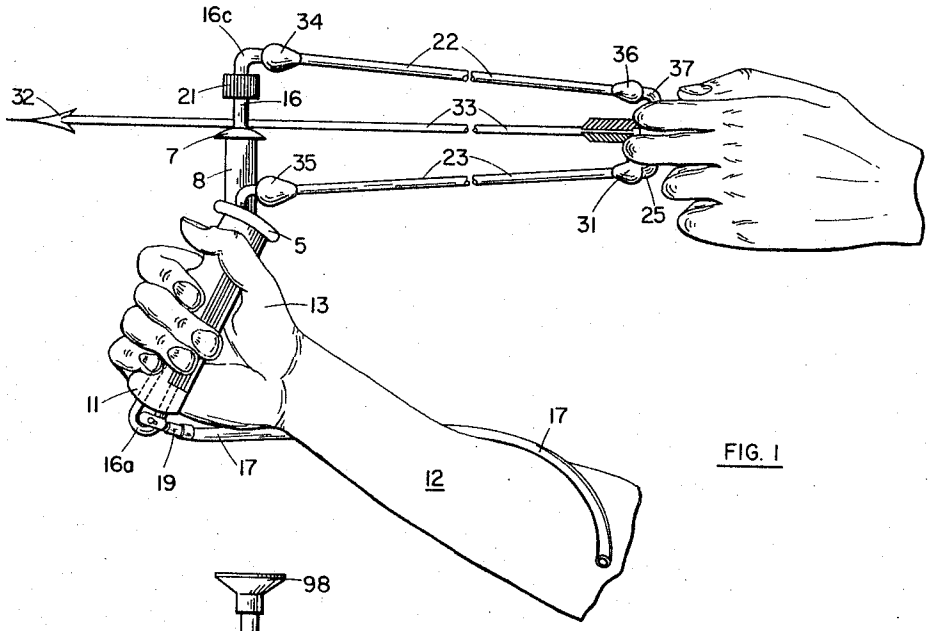


FIG. 1

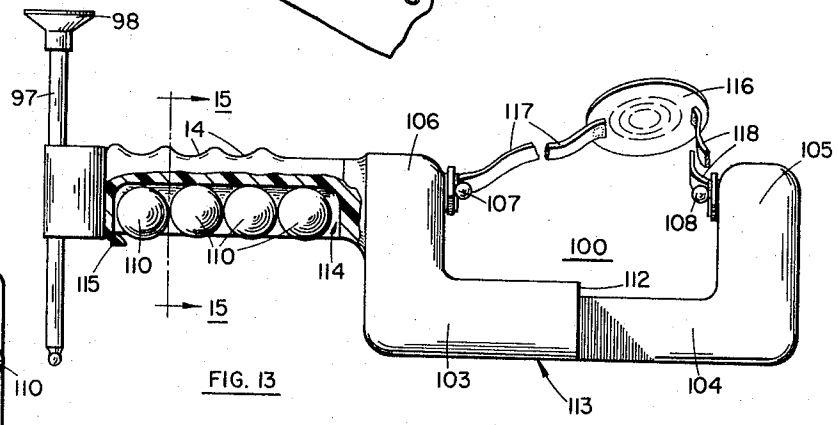


FIG. 13

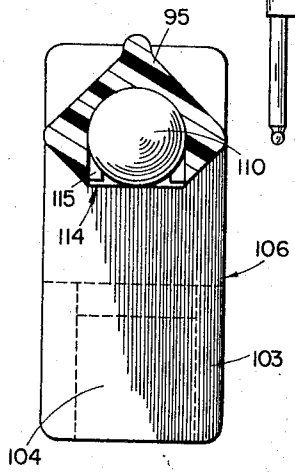


FIG. 15

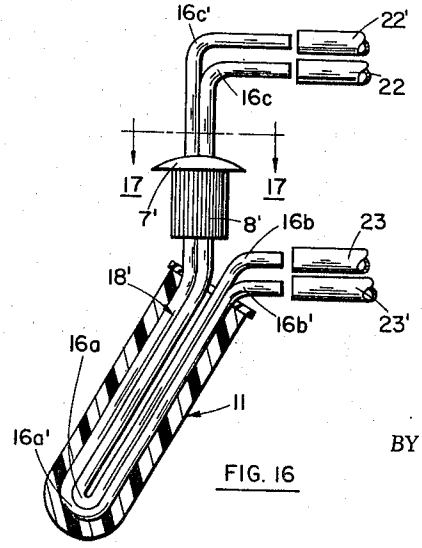


FIG. 16

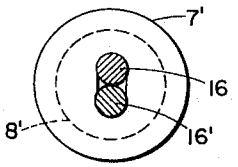


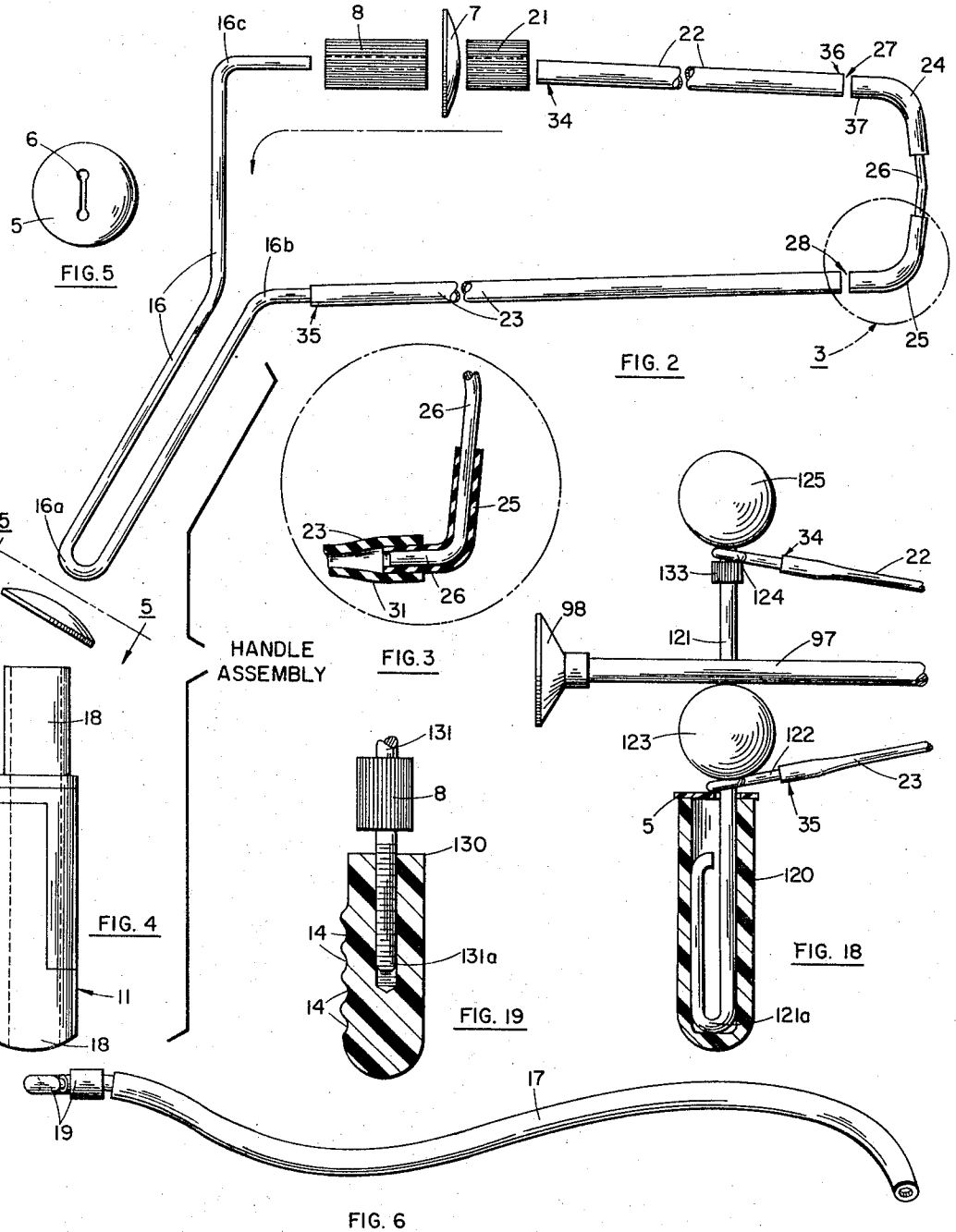
FIG. 17

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ELASTIC BAND U-SHAPED PROJECTILE LAUNCHING DEVICE

Filed Dec. 2, 1963 3 Sheets-Sheet 2



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ELASTIC BAND U-SHAPED PROJECTILE LAUNCHING DEVICE

Filed Dec. 2, 1963 3 Sheets-Sheet 3

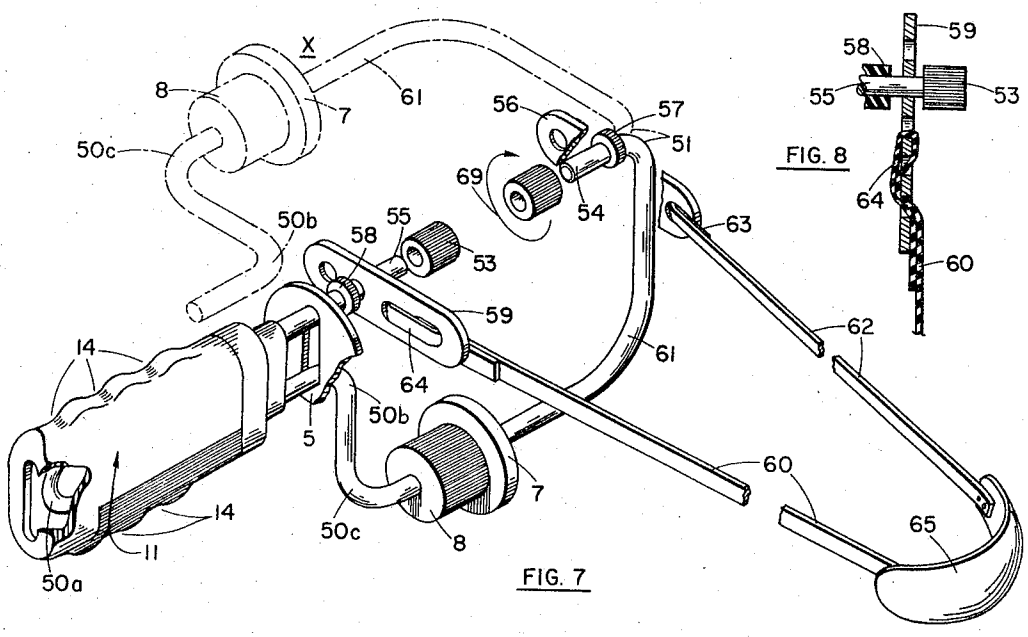


FIG. 7

FIG. 8

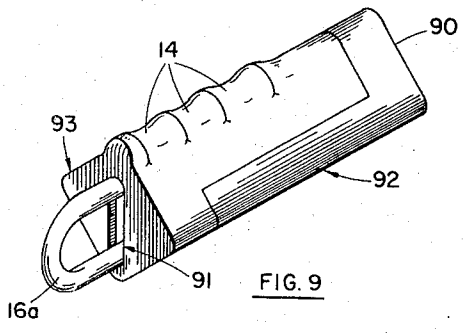


FIG. 9

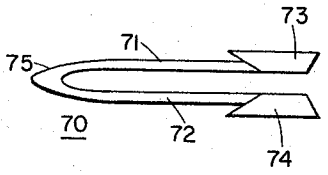


FIG. 10

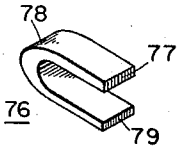


FIG. 11

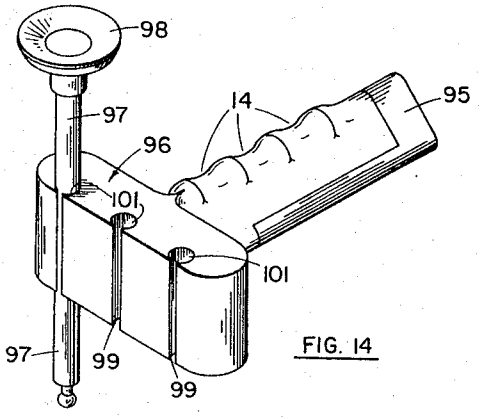


FIG. 14

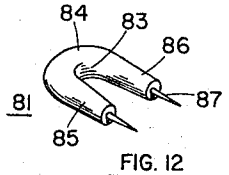


FIG. 12

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3,306,278

ELASTIC BAND U-SHAPED PROJECTILE LAUNCHING DEVICE

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Filed Dec. 2, 1963, Ser. No. 327,321
2 Claims. (Cl. 124—22)

This invention relates to devices for the launching of arrows and other projectiles and more particularly to novel arrow launching and sling shot projectile launching devices for sporting, hunting or guerrilla warfare applications.

The sling shot and the bow and arrow are among the oldest of man's weapons. Although there have been many varieties of arrow launch weapons from the primitive bow and arrow to the medieval cross-bow, the sling shot has remained more or less like its primitive original even to this day.

There has not been any thought given, throughout the centuries of use of these two primitive weapons, to their joint or combined features being incorporated in a single weapon in which the fire power of the bow and arrow may be joined with the compactness and simplicity of the sling shot type of weapon.

In guerrilla warfare there is a need for a compact silent easily-carried close weapon which permits stealth of approach and effectiveness as a weapon for silent removal of enemy sentries and similar operations, in locations where individuals must operate more or less singlehandedly against such enemy personnel.

This invention contemplates just such weapons as above suggested which combines the effectiveness of the bow and arrow and simplicity and compactness of the sling shot and which additionally may be used either in an arrow launching mode or sling shot mode.

As contemplated in this invention the weapon consists of a frame support for resilient tubes or bands of materials such as surgical rubber which are held to the support by the oriental finger grip technique, pulling or launching grip and a means for supporting arrows, if arrows are to be used as missiles to be launched with the invention, or, alternatively the frame may be rotated to permit its use in a sling shot mode for the projection of pellets, armed or barbed staples or other similar devices.

As contemplated in this invention various embodiments thereof are conceived in which either a military guerrilla warefare weapon may be derived therefrom or a hunting weapon, or simply a sporting weapon for target practice. Other embodiments are conceived as toys for the projecting of rubber or plastic balls or rubber suction tipped arrows.

The novel features of the invention involve a frame support structure for the resilient launching means which has a novel arm brace in one form thereof and which can be operated in an upright form as a U of the sling shot support type, as a side apertured C frame in which arrows may be launched and which has arrow supporting guide means, or as either in the one device.

In the toy form as contemplated herein means are provided for storage of the suction cup arrows and soft rubber or plastic ball "ammunition" in the handle of the toy.

Accordingly it is an object of this invention to provide a novel combined arrow and missile launching weapon or sporting device.

It is another object of this invention to provide a novel projectile ejecting device having strong resilient means for the ejection thereof.

It is a further object of this invention to provide a close, silent, and effective guerrilla warfare weapon which can be used in an arrow shooting or sling shot mode.

It is yet another object of this invention to provide a missile launching means which can provide usefulness as either a sporting device for target practice or as a toy.

It is an even further object of the invention to provide in a combined arrow ejecting or sling shot toy a storage means for the toy arrows and other projectiles used therewith.

These and other objects of the invention will become more clear from the specification which follows and the appended claims taken together with the drawings in which:

FIGURE 1 shows an embodiment of this invention in the form of an arrow launcher;

FIGURE 2 is a partially exploded view of the frame assembly of the arrow launcher shown in FIGURE 2;

FIGURE 3 is a view of an enlarged portion of the frame shown in FIGURE 2;

FIGURE 4 forms a part of FIGURE 2, showing the handle thereof;

FIGURE 5 is a top view of a part of the article shown in FIGURE 1 and detailed at **5—5** in FIGURE 4;

FIGURE 6 is a detail of a portion of the article shown in FIGURE 1;

FIGURE 7 is a view of an embodiment of the invention showing its use as a sling shot and including in phantom a part thereof articulated into another position to show its use as an arrow launching frame;

FIGURE 8 shows a detail of the assembly of the launcher of FIGURE 7;

FIGURE 9 is a view of an alternative grip configuration usable with the articles of FIGURES 1 and 7;

FIGURE 10 shows a form of missile for use with the article shown in FIGURE 7;

FIGURE 11 shows another form of missile for use with the article of FIGURE 7;

FIGURE 12 shows still another form of missile which can be used with the article of FIGURE 7;

FIGURE 13 is a partially cutaway view of an embodiment of this invention usable as a toy employing ball pellets or suction cup "arrows";

FIGURE 14 is a detail of the arrow storage end of the article shown in FIGURE 13;

FIGURE 15 is a cross section through **15—15** of FIGURE 14;

FIGURE 16 is a partially cutaway view of a further embodiment of the invention showing the nesting of frames for increased power in the launchers hereof;

FIGURE 17 is a detail through **17—17** of FIGURE 16;

FIGURE 18 shows another embodiment of the invention in partially cutaway form; and

FIGURE 19 shows a detail partially in cross section of another form of grip for use with the invention.

In FIGURE 1 there is shown an embodiment of the missile launchers of this invention as used for the dispatch of arrows. Considering FIGURES 1 through 6 together the launcher **10** is held by its hand grip **11** with the arm **12** outstretched and hand **13** gripping hand grip **11** tightly. Hand grip **11** is formed with external finger grooves such as **14** so that finger **15** may have a non-slip hold upon hand grip or handle **11**. Handle **11** is provided with a central aperture **18**. A support frame **16** is formed from a single piece of round rod stock and bent into a shape similar in form to a coping saw frame. At **16***a* the handle portion of the frame is formed into a tight U which is fitted into the central aperture **18** of handle or grip **11**. An arm brace **17** is atriculatingly hung on the bend portion **16***a* of the U. Arm brace **17** may have a snap clip at **19** to permit looping there of over the bend in handle frame **16** at **16***a*, after handle **11** is fitted thereover. A leather or plastic gasket **5** fits over frame **16***a* on top of grip **11**. A thick walled resilient tubing **8** is

fitted over verticle frame portion **16** by forcing it around bend **16***c* at the top thereof to provide a lower shock absorber for an arrow such as **32–33** as it is launched from the missile launcher used as an arrow launcher as shown in FIGURE 1. An arrow rest **7** sits on top of rubber shock absorber **8** while an upper shock absorber **21** is fitted over frame **16** just below bend **16***c*. When an arrow such as **32, 33, 39** is launched the feathered end will pass between rest **7** and rubber shock absorber **21**. The shock of the launch being taken up by rubber or other resilient material forming shock absorbers **8** and **21**. Surgical rubber tubing **22, 23** or similar resilient tubing material is fitted to frame **16** at **34** and **35** being forced over the frame at **16***b* and **16***c* very tightly and holding thereto by an action similar to the oriental finger grip. Any pull in the direction of arrows shown at **41—41** in FIGURE 1 will serve only to tighten the assembly of tubing **22, 23** on frame **16** at **16***b* and **16***c*. Two pieces of metallic tubing **24** and **25** are fitted over a piano wire bent in a broad U shape as at **26** form the arrow nock of the arrow launcher. The end **36** of tubing **22** and the end **31** of tubing **23** are fitted, respectively, over the free ends of metallic tubings **24** and **25**, respectively, in the oriental finger grip fashion as shown at **36** and **31** respectively in FIGURE 1.

When used, although shown here with the right arm at **12** and the right hand at **13**, the left arm may be held in the arm brace **17** equally well, and so used the left hand will grip handle **11**. In any case the other hand **40** not in the arm brace and not holding grip **11** will be free to pull on nock **24, 25, 26** with arrow **32, 33, 39** resting on arrow rest **7** by its shaft **33** and with its feathered end **39** in nock **24, 25, 26**. So doing resilient tubings **23, 22** are stretched and when released, arrow **32, 33, 39** will be projected with great force in the direction of its tip **32**.

In FIGURE 16 a double frame **16, 16'** with ends **16***b*, **16***b'* and **16***c*, **16***c'* are shown with resilient tubings **22, 22'** and **23, 23'**. Frames **16, 16'** which may be nested together in handle **18'** as shown in FIGURE 16 and the dual resilient tubings **22, 22'** and **23, 23'** may be connected to ends **16***b*, **16***b'* and **16***c*, **16***c'* in the same manner as shown for a single assembly in FIGURE 1 to provide twice the fire power in the use of frame **16–16''** as above described as could be obtained with the single frame **16** alone.

The embodiment of this invention shown in FIGURE 7 is one in which both sling shot action may be effected and arrow launching as well. As illustrated in FIGURE 7 in solid line, the sling shot form is shown. Handle **11** has inserted therein a frame **50** similar in concept to frame **16** previously described. The folded over portion of frame **50** as shown at **50***a* is inserted into handle **11** which has finger gripping surfaces **14** as in the previously shown handle **11** in FIGURES 1 and 4. Frame **50** bends around **50***b* to form a U with frame portions **61** and **51**. Items **7** and **8** shown on frame portion **61** are an arrow rest and shock absorber like that shown in FIGURES 1 and 2, but are used only in the arrow launching mode of the article illustrated in FIGURE 7. A leather gasket **5** like that of FIGURE 1 is slipped over frame **50** at the folded over portion **50***a* in the same manner as shown in FIGURE 1. The ends of frame **50** shown at **54** and **55** support leather anchors **63, 64** in which gum rubber bands **60, 62** are laced as may be seen at **59** and in details shown in FIGURE 8. The anchor **63** has been cutaway as shown with part **56** to reveal the detailed structure, partially in exploded form, of the assembly of the anchors and washers such as **57** and **58** and rubber or plactic locking tubes by which the anchors are assembled to frame **50, 52, 61, 55, 54**. The portion **61** of frame **50** forms the bottom of the throat of the sling shot illustrated in FIGURE 7 in solid line.

If frame **50** and handle **11** as shown in FIGURE 7 are rotated about the axis formed by parts **54–55** of frame **50** in the direction indicated by arrow **69** for an angle 90° it may be seen that throat bottom **61** becomes an arrow support on which disc **7** and arrow guide and shock absorber **8** perform the same function in FIGURES 1 and 2. Anchors **63, 64** perform their same function to support elastic bands **60–63** and an arrow nock or missile pouch may be formed at **65** and attached to elastic bands **60, 62**. Alternatively instead of elastic bands such as **60, 62** an assembly of the type shown in FIGURES 1 and 2 may be used employing surgical rubber tubing such as **22, 23** and its accessories such as nock **24, 25, 26, 37,** or the rubber tubing **22, 23** with a pouch such as **65**.

In FIGURES 10, 11 and 12 several staple types of missiles are shown such as **70, 76** or **81**. These are representative of the kinds of projectiles that can be used with the article of FIGURE 7 in its sling shot mode as weapons for silent disposition of animals, when hunting, or for a wartime use against enemy personnel.

In FIGURE 9 a rectangular handle **90** is shown as one alternative form thereof to give solid gripping action particularly when using the articles in military combat situations. Handle **90** is equipped with finger grip depressions **14** as with handles previously disclosed herein. The particular shape of handle **90** has been conceived so that when used in the dark the article such as shown in FIG. 7 can be handled easily so that by the tactile sensation of the fingers in grooves **14** with respect to the generally rectangular edges **92, 93**, the user can know for which mode of use the device is being held. For example with the fingers gripped about handle **90** held in the left or right hand the grooves **14** when felt inside the second joint knuckles will suffice to indicate that the article is being held in arrow launch mode, that is when throat bar **61** of frame **50** is in position X of FIGURE 7 shown in dashed line. When the relatively sharp edge **92** is felt behind these second joint knuckles then the user will know that throat bar **61** is in the position shown in solid line in FIGURE 7. The latter is the sling-shot mode.

A toy version of the device for launching missiles is shown in a partically cutaway illustration in FIGURE 13. The U-shaped frame **100** has a handle **95** extending outwardly therefrom in the same plane as the U and normal thereto. Handle **95** continues from an upright **106** of the U **100**. The other upright of the U **100** is at **105**. The base **113** of the U **100** has portions **103** and **104**. The portion of **104** of the base **113** is somewhat smaller in dimensions than the portion **103**. The transition **112** between the portions **103** and **104** when said launcher is used for arrows acts as an arrow shaft rest.

The handle **95** has an aperture **114** in it within which is inserted a resilient contoured surface pad—or the handle itself may have resilient walls **115** in the aperture **114**. Within the aperture **114** pellets or balls **110** may be stored.

As has been previously mentioned in connection with the other embodiments of this missile launching device it may be used either to launch arrows or to launch missiles in a sling shot fashion. As an arrow launcher frame **100** would be oriented in the same plane as its resilient bands **117** and **118** which are fastened to knobs **107** and **108** respectively in the inner surfaces of the U **100**. The other ends of bands **117–118** are connected to a pouch **116**. Missiles are stored in the handle **95** of frame **100** for use in the sling shot mode in which frame **100** is used in the orientation illustrated in FIGURE 13 where the frame **100** and resilient bands **117–118** and pouch **116** are used at right angles to one another.

The pellet receptacle **114** may be seen in further cross sectional detail in FIGURE 15. In FIGURE 14 are illustrated additional details of the end extension **96** of handle **95** which has a plurality of slots **101** cut vertically in the end surface of extension **96** to hold the shafts **97** of arrows **98**. The inner areas of slots **101** are rounded to fit shafts **97** and by virtue of slots **99** therein tend to hold arrow shaft **97** tightly. The slot **99** permits holes

101 to be made smaller in diameter than shafts 97 so that the shafts 97 are resiliently held in place by the urge of the slot edges 99 to close to the normal diameter.

In FIGURES 18 and 19 there are shown some details of a sporting version of the device for launching arrows or pellets. The frame of bent wire 126, 121*a*, 121 has a straight shaft section 121 continuing out from handle 120 which fits over the bent wire 121*a*–126. A ball 123 serves the purpose of an arrow rest and is shown with an arrow 97, 98 of the type used in the toy of FIGURE 13.

Resilient tubing 22, 23 is attached to frame rod 121 in the generally similar manner to that shown in FIGURE 1. The tubing 22, 23 is connected as shown at 34 and 35 to hooks 124 and 122. The ends not shown would be connected to either the pouch of the type 65 shown in FIGURE 7 or arrow nock 24–25–26 shown in FIGURE 1. The Chinese finger pull type of holder at 34–35 for the surgical tubing 22–23 may also be used here.

The single shaft version is shown in another form in FIGURE 19. The handle 130 here is solid and threaded to receive a screw thread end 131*a* of a rod 131 acting exactly as rod 121 to hold an arrow rest 8. Not shown but obviously arrangeable in the same manner as shown in FIGURE 18 are the resilient members 22 and 23, which would have either pouch 65 or nock 24, 25, 26, The launcher of FIGURE 18 or 19 is held horizontally in use.

It may be seen that there have been described above a number of embodiments of a device for launching missiles or pellets or ammunition of the staple or slug variety. As an arrow launcher two forms are described one for standard arrows of the feathered end type and another for a toy type which has rubber suction cut tips such as shown at 98. Any of the devices described may be assembled from any combination of the elements described hereinabove which perform the respective functions. These functions are as a frame support, resilient release or launch means, shock absorbing rest or the like. The frame may be U-shaped or a straight rod. It may be a unitary wire frame item as in FIGS. 1, 7 and 13 or it may be a solid molded item as in FIGURE 13. The handle may be integral or fitted over wire frame parts. There are many combinations by which the invention may be implemented and many are shown herein. It should be clear in the light of these teachings that others skilled in this art may find additional ways and the additional ways may fall within the ambit of the appended claims.

What is claimed as new is:

1. A multiple resilient band missile launching device comprising a frame support having a generally rectangular U-shape including a pair of spaced apart parallel members, a member forming the base of the U-shaped frame support and connecting the said parallel members, a handle of predetermined shape attached to a right angle integral extension of one parallel member which extends outwardly from the U-shaped support and is co-extensive with the plane passing through the parallel members, a pair of elastic bands, said right angle extension being turned back on itself and extending the length of the handle and having an end portion which provides a connection means for one of said elastic bands, an interconnecting pounch joining the elastic bands, the free end of the remaining elastic band being connected to the end of the other of the parallel members, an S-shaped brace having one end connected to the end of the handle and positionably spiralling around the user's forearm, a shock absorbing arrow support means positioned on the member forming the base of the U-support, whereby when the frame support is positioned so that the plane of the U-support is horizontal, the arrow support means will support one end of an arrow while the feathered end of the arrow will be positioned in the pouch, said frame support being positionable so that the U-support is vertical thus forming an opening between the parallel members whereby pellets may be fired.

2. A plural purpose manually held resilient band missile launching frame comprising:

a generally U-shaped supporting frame having a pair of spaced apart parallel members, a member forming the base of the U-shaped frame and connecting the said parallel members, an integral extension normal to one of said parallel members,

a generally rectangular handle having finger contour corrugations in the surface, said handle being fixedly fastened to the normal extension to one of the said parallel members and lying in a plane co-extensive with that of the U-supporting frame,

an arm brace articulatingly coupled to the end of said handle farthest from said U-supporting frame, said brace having a generally S-shaped configuration so as to spiral about the holder's arm when holding said handle, said U-shaped supporting frame being formed from a single wire, said extension being bent outwardly in the same general direction as the line of said base and bent back upon itself to form a receiving support for said handle and said handle being slipped thereover, the bent back portion of said extension projecting beyond said handle and having said arm brace connected thereto.

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