Jan. 15, 1957 W. P. MURPHY 2,777,237

EXTRACTOR FOR REVOLVER TYPE AUTOMATIC GUN

Filed Jan. 19, 1954

Fig. 1

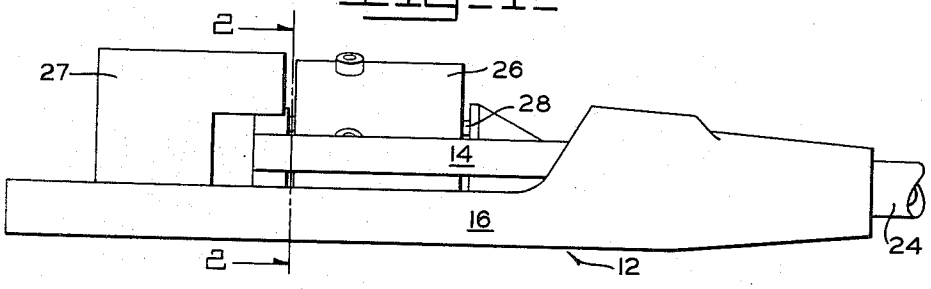



Fig. 3

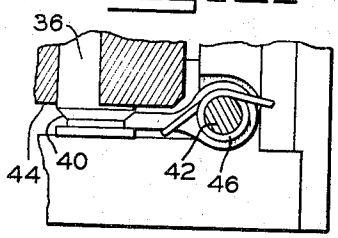



Fig. 2

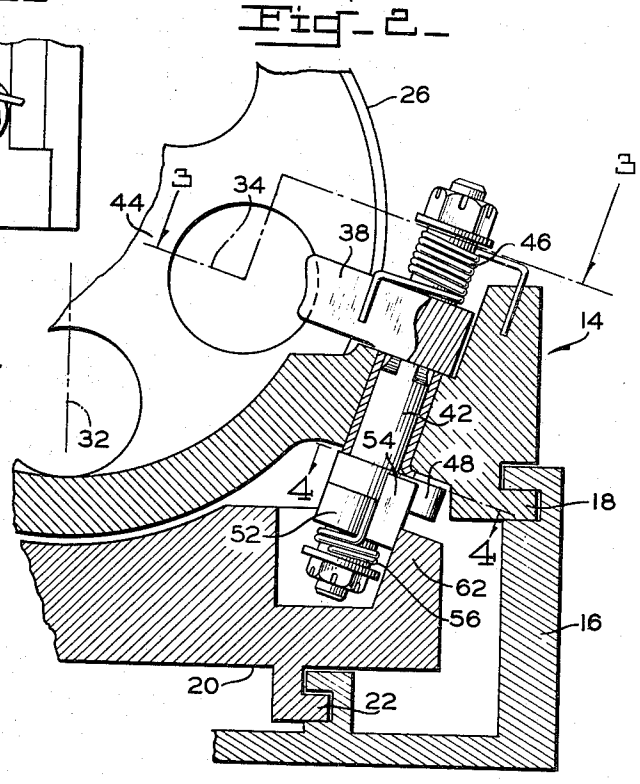



Fig. 4

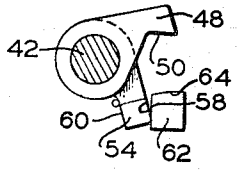



Fig. 5

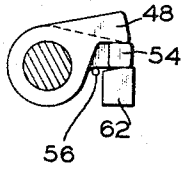
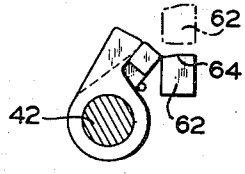



Fig. 6




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2,777,237

# EXTRACTOR FOR REVOLVER TYPE AUTOMATIC GUN

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Application January 19, 1954, Serial No. 405,053

1 Claim. (Cl. 42—68)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment of any royalty thereon.

My invention relates to an electrically fired revolver-type automatic gun and more particularly to an extractor therefor.

Such gun ordinarily comprises a recoil unit provided with a barrel and slidably disposed on a receiver and an actuator slidably disposed with respect to the recoil unit. The recoil unit also includes a rotatable drum provided with cartridge chambers. Rollers and grooves are provided on the drum and the actuator respectively for engagement during operation of the actuator to successively index the chambers to a firing station of the drum aligned with the barrel.

The cartridge drum of the gun usually includes five chambers which respectively dwell in four non-firing stations during one rotation of the drum while the cartridges in the remainder of the chambers are fired. The chambers are loaded with cartridges by a feeder before they reach the firing station and the cases of the spent cartridges are removed from the chambers in a drum extraction station immediately following the firing station.

The extractor currently used for the gun described includes a pawl for normally projecting into the extractor groove of cases chambered in the extraction station. The pawl is secured to the upper end of a shaft journaled in the recoil unit and a spring is wound around the shaft and secured to the pawl and the recoil unit to bias the pawl towards the normal position thereof engaging the rear face of the drum.

A cam on the lower end of the shaft and a striker on the actuator are provided for engagement to rotate the pawl and remove the cases from the drum during forward operation of the actuator. The cam and the striker are adapted for a decreasing radius of engagement during extraction to provide an increasing case extraction speed.

In this device, the pawl is displaced from the drum when the actuator is in battery and the spring is required to return the pawl to the drum in time for extraction. As the pawl is returned to the drum, the force of the spring causes the pawl to rebound from the drum several times before it stabilizes in engagement therewith. These rebounds were found to interfere with the rims of the cases rotated to the extraction position to put the gun out of action.

It is therefore an object of my invention to provide a quick-return flag-type extractor for the gun described.

Another object of my invention is to provide an extractor in which the pawl is released for return to its normal position before the actuator arrives at battery position.

A further object of my invention is to provide an extractor for the gun described, having a low ratio of operation periods of the pawl and the gun.



Other aims and objects of my invention will appear from the following explanation thereof.

In carrying out my invention, the shaft of a quick return extractor includes an arm, and a crank is pivotally mounted on the lower end of the shaft. The crank is provided with a lug and is spring-biased for engagement of the lug with the arm.

The crank is engageable by a striker on the actuator of the gun, and during the rearward stroke of the actuator, the striker engages the crank to rotate the lug from the arm. The actuator then continues in the remainder of the rearward stroke and the corresponding portion of the forward stroke and in the meantime the crank spring returns the lug of the crank to engagement with the arm.

In the last portion of the actuator forward stroke, the crank is engaged by the striker to rotate the extractor pawl and remove the spent cartridge case from the drum. The striker is constructed to release the crank before the actuator arrives at the battery position.

By this construction, the ratio of the operation periods of the pawl and the gun is decreased over that of the extractor described above to allow a greater proportion of the gun cycle for recovery of the pawl to normal position after displacement therefrom.

For a more complete understanding of my invention, attention is directed to the following description and the accompanying drawing in which:

Fig. 1 is a partial elevation view of an automatic weapon incorporating my invention;

Fig. 2 is a view along line 2—2 of Fig. 1;

Fig. 3 is a view along line 3—3 of Fig. 2;

Fig. 4 is a view along line 4—4 of Fig. 2;

Fig. 5 is a view similar to Fig. 4 with the striker beginning forward stroke engagement with the crank; and

Fig. 6 is a view similar to Fig. 4 with the striker still engaging the crank before arriving at battery position.

According to the drawing, an automatic gun **12** includes a recoil unit **14** slidable on a receiver **16** by means of feet **18** and an actuator **20** slidable with respect to recoil unit **14** by means of feet **22**.

A barrel **24** is secured to recoil unit **14** and a drum **26** is rotatably mounted on a shaft **28** journaled in the recoil unit. Drum **26** includes spaced cartridge chambers which are supplied with live cartridges by a feeder of the gun shown generally at **27**. Two of the cartridge chambers are respectively shown in the six o'clock firing station **32** of the drum aligned with barrel **24** and in the immediately adjacent extraction station **34**. Spent cartridge case **36** is shown in Fig. 3 in extraction station **34**.

A pawl **38** for normally projecting into extractor groove **40** of case **36** is splined to a shaft **42** journaled in recoil unit **14**. Pawl **38** in the normal position thereof, is biased against rear face **44** of drum **26** by a spring **46** wrapped around shaft **42** and secured to recoil unit **14**. Minimum clearance is provided between shaft **42** and drum **26** to limit the length required for pawl **38** and hence to limit the time required for recovery of the pawl to the normal position after rotation therefrom.

An arm **48** having a surface **50** is secured to the lower portion of shaft **42** and a crank **52** is pivoted on the shaft adjacent the arm. Crank **52** includes a lug **54** for engagement with surface **50** and a spring **56** is wrapped around shaft **42** and secured to the shaft to bias lug **54** towards surface **50**.

Crank **52** is provided with surfaces **58** and **60** for respective engagement with a striker **62** of actuator **20** in the rearward and forward strokes thereof. During the actuator rearward stroke, striker **62** engages surface **58** to pivot lug **54** away from arm **48** as shown in Fig. 4.

In the forward stroke of actuator **20**, striker surface

64 engages crank surface 60 to rotate pawl 38, as shown in Fig. 6, and remove case 36 from drum 26. Surface 64 is raked for imparting an increasing pair of extraction velocities to case 36. Striker 62 is constructed to pass crank 52 in the forward stroke of actuator 20 to allow spring 56 to return lug 54 to contact with arm 48. The dotted representation of striker 62 in Fig. 6 corresponds to battery position of actuator 20.

Upon release of crank 52, pawl spring 56 begins to return pawl 38 to normal position before actuator 20 again reaches battery position allowing a greater proportion of the gun cycle for the surge wave of the pawl spring to be dissipated over that allowed by previous extractors.

As a further advantage of my invention, the pawl is in normal position when the gun is inactive or when it is stored to free the pawl spring from extraction pressures.

While the foregoing is a description of the preferred embodiment, the following claim is intended to include those modifications and variations that are within the spirit and scope of my invention.

I claim:

In a revolver-type automatic gun including a recoil unit, a drum provided with cartridge chambers and rotatably disposed on the recoil unit, and an actuator slidable in rearward and forward strokes with respect thereto



for rotating the chambers to a drum extraction station, an extraction device comprising a shaft journaled in the recoil unit, a pawl secured to the upper end of said shaft, a spring biasing said shaft for normal position projection of said pawl into the extractor groove of cartridge cases chambered in the extraction station, an arm secured to the lower end of said shaft, a crank including a lug rotatably disposed on said shaft and biased for engagement of said lug and said arm, and an actuator striker for engaging said crank, said crank being responsive to the rearward strokes to displace said lug from said arm and responsive to the forward strokes to rotate said pawl and remove the cases from the drum, and said crank and said striker being constructed for disengagement before the ends of the forward strokes to permit said spring to control said pawl.

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