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Deaths Due to Accidental Discharge of a Dropped Handgun

Accidental deaths due to firearms are relatively uncommon. Only 2400 were recorded in the United States in 1972 [1]. Most of these deaths were due to carelessness or misuse of firearms. A very small number were due to dropping a weapon with resultant discharge. This paper will present twelve cases of this latter type of accident that occurred in Dallas from 1969 to 1973, as well as a discussion of the type of weapon in which such an accident is possible. Seven of the twelve cases will be described in detail since each involves a different type of weapon. As the weapons involved in all twelve cases were handguns, the discussion will be limited to this class of weapon.

Cases

Case 1

A 35-year-old white male was getting out of his car when a gun, still in its holster, fell from his lap, striking the ground and discharging. The bullet entered the left chest; perforated the heart, pulmonary artery, and lung; and came to rest underneath the skin of the back. The weapon was a single-action Ruger .22 caliber Magnum revolver. Dust and rock particles were on the hammer of the weapon where it had struck the ground.

Case 2

A 52-year-old black male drummer was sitting on the bandstand in a nightclub when a woman at the bar dropped her purse. A revolver in the purse discharged upon striking the floor. The bullet entered the drummer's right temple and perforated the brain. The weapon was a double-action Colt .41 caliber revolver, manufactured prior to 1900. Examination of the purse revealed powder burns of the interior.

Case 3

A 20-year-old white male gasoline station attendant was at work when a friend stopped by to show him a weapon he had just purchased. As the friend handed the weapon to the deceased, the gun slipped out of the deceased's hand, fell to the ground, and discharged. The bullet entered the right chest, perforated the right lung and liver, and lodged in the fifth thoracic vertebra. The deceased lived two days before dying of his wounds. The gun was a double-action U.S. Revolver Co. break top revolver, chambered for the .38 Smith and Wesson cartridge. At the time the weapon fell, it was in a holster

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with an oily rag wrapped around it. Powder burns were present in the interior of the holster.

Case 4

A 26-year-old black male was ascending a staircase to a rest room when a shot rang out. The victim stumbled down the stairs, collapsed, and died. A revolver was found halfway up the staircase. The deceased, who had been drinking (blood alcohol 140 mg percent), had been carrying this weapon in his belt. Examination of the body revealed a distant gunshot wound of entrance in the midline of the chest 2½ in. above the nipple line. The bullet perforated the sternum, followed a sharply upward path, and then perforated the aorta. The bullet was recovered free in the left pleural cavity. Testing of the weapon, a .22 CDM revolver, revealed that it would fire when dropped if a live round was under the hammer.

Case 5

A 15-year-old white male was sitting on a couch with a small gun in his belt. As he bent over to pick up a pack of cigarettes, the weapon fell out of his belt, striking a brick lying on the floor and discharging. The bullet entered the right lower quadrant of the abdomen, severed the iliac artery and vein, and perforated the small bowel. The weapon was a .22 caliber double-barreled derringer made in West Germany. Pieces of brick were recovered from the hammer spur.

Case 6

A 32-year-old black male was in a lounge playing pool when he was seen to drop a piece of chalk from his cue stick. As he bent over to pick up the chalk, a gun fell out of his shirt pocket, struck the floor, and discharged. The bullet entered the left chest, perforated the heart and left lung, and came to rest in the muscle of the back. The weapon involved was an RG .25 caliber automatic pistol.

Case 7

A 35-year-old white male Dallas police officer, his wife, a daughter, another officer, and the officer's wife had just returned from watching a football game. As they entered the deceased's house, the wife of the second officer handed her husband his holstered, off-duty gun that she had been carrying in her purse. As the officer attempted to attach the holstered weapon to his belt, the gun (still in the holster) fell to the sidewalk and discharged. The bullet entered the right abdomen and perforated the liver, heart, and left lung. Examination of the holster revealed the bottom to have been shot out. The weapon was a .25 caliber Astra automatic.

Discussion

Table 1 lists the type, make, and caliber of the weapons involved in the twelve fatal accidents. In all instances the weapons were dropped with resultant accidental discharge. Discharge occurred because of one or more of the following reasons: the design of the weapon, the absence of safety devices, and the poor quality of metal used in construction of these weapons.

Single-Action Revolvers

The first case involved a single-action revolver. In this type of weapon the hammer must be manually cocked before pressure on the trigger will release it. The act of

TABLE 1—*The twelve weapons.*

Weapon/Caliber	Number of Deaths
Single-action revolvers	
Ruger .22	1
Hawes .22	1
Hawes .45 Colt	1
Double-action revolvers	
Colt .41	1
CDM .22	1
U.S. Revolver Co., .38 S&W	1
Derringers	
RG .38 Special	2
Striker-operated automatics	
RG .25 automatic	1
External hammer automatics	
Astra .25 automatic	1
Star .22	2
Total	12

cocking the hammer and pressing the trigger are distinct from each other. The firing pin in these weapons may be either integral with the hammer, as in the Colt, or in the frame separate from the hammer, as in the Ruger. In either case, single-action revolvers are potentially dangerous in that when the hammer is down the firing pin projects through the breech face, resting on the primer of the cartridge aligned with the barrel (Fig. 1). If the weapon is dropped on the hammer, this force may be transmitted to the firing pin and then the primer, discharging the weapon. Because of this characteristic, all single-action revolvers should be carried with an empty chamber under the hammer.

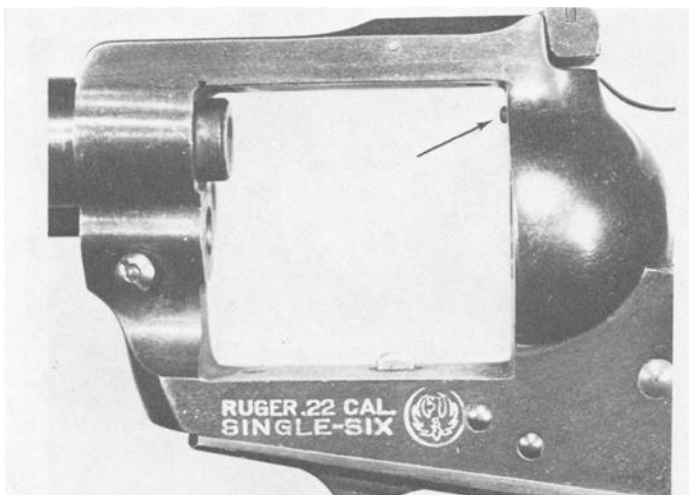


FIG. 1—Ruger single-action revolver with cylinder removed to show firing pin projecting through breech face.

This feature of single-action revolvers was well known in the 19th-century West where the "six-shooter" was usually loaded with only five rounds.

In early 1973, Ruger, a major manufacturer of single-action revolvers, introduced a positive safety mechanism in their single-action revolvers. This device, called a safety lever, permits discharge only when the trigger is pulled all the way back. The safety lever will be discussed in the next section on double-action revolvers.

Double-Action Revolvers

While single-action revolvers are still manufactured, almost all revolvers produced in the past 50 years have been double-action weapons. In these revolvers, a continuous pull on the trigger revolves the cylinder, cocks the hammer, and fires the weapon. Modern, well-made, double-action revolvers have positive safety devices which permit the hammer to contact the firing pin only when the trigger is held all the way back. Dropping such a weapon will not cause discharge of the gun, whether the hammer is at rest or cocked at the time of the fall.

All modern Smith and Wesson revolvers are equipped with two positive safety systems—the rebound slide and the hammer block. The rebound slide, introduced in 1896 and modified in 1908, prevents forward rotation of the hammer unless the trigger is held to the rear [2]. A projection from the rebound slide contacts and firmly supports a similar projection on the base of the hammer, thus preventing forward rotation of the hammer (Fig. 2). When the trigger is pulled to the rear, the rebound slide moves backward, out of the way, removing the support from the base of the hammer and permitting it to rotate forward (Fig. 3). All Smith and Wesson swing-out revolvers since 1908 have had this device. In 1915 Smith and Wesson added a second safety system to their swing-out revolvers—the hammer block [2]. The hammer block is an L-shaped metal bar whose foot is automatically interposed between the hammer and the frame, except when the trigger is held to the rear (Figs. 2 and 3). The hammer block initially worked off the hand or pawl of the revolver. Except for a slight modification in 1926,

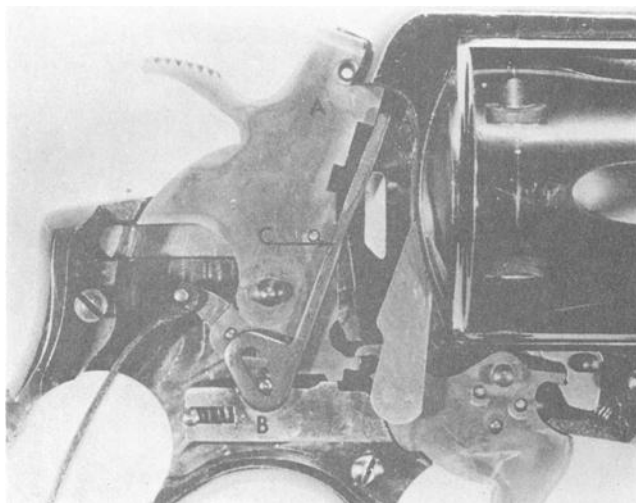


FIG. 2—Uncocked Smith and Wesson revolver: (A) hammer, (B) rebound slide, and (C) hammer block.

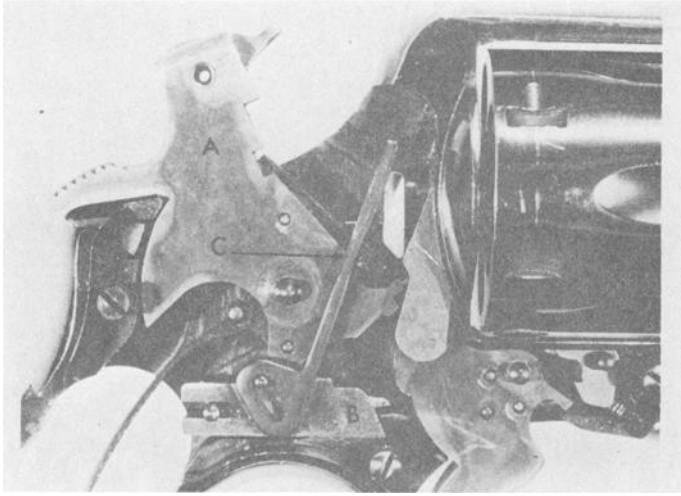


FIG. 3—Cocked Smith and Wesson revolver. The rebound slide (B) has moved backwards, permitting forward rotation of the hammer (A), while the hammer block (C) has moved downward out of the path of the hammer.

this system was used until January 1945. At that time, the hammer block was altered so as to work off a pin on the rebound slide. This is the hammer block system currently in use in all Smith and Wesson revolvers.

Colt double-action revolvers are also equipped with two safety devices. These are the rebound lever and the hammer block. The rebound lever performs the same function as the rebound slide in the Smith and Wesson. The hammer lies in a cut in the rebound lever with the full width of the lever behind the base of the hammer. This full width of metal prevents forward rotation of the hammer and, thus, contact with the firing pin. On pulling the trigger the rebound lever is elevated out of the way, permitting forward rotation of the hammer (Fig. 4). Colt introduced their hammer block system in 1905, ten years before Smith and Wesson [3]. Since 1910 all Colt double-action revolvers have been equipped with this device. The Colt hammer block works off a safety lever pinned to the trigger. Its action, however, is identical to that of the hammer block in the Smith and Wesson (Fig. 4). The Colt revolver in Case 2 was manufactured prior to 1900 and was not equipped with either the rebound lever or the hammer block.

The Ruger double-action, the Colt Mark III, and all Charter Arms revolvers are equipped with a safety device called the safety lever. This device was introduced in Iver Johnson revolvers in the 1890s. In weapons equipped with the safety lever, the hammer rests against the steel frame above the firing pin. As the trigger is pulled, the safety lever rises, interposing itself between the hammer and the firing pin. When the hammer falls, it strikes the safety lever which transmits this force to the firing pin, discharging the cartridge (Fig. 5). On releasing the trigger, the safety lever drops below the firing pin and the hammer comes to rest against the frame. At no time in the cycle does the hammer ever directly strike the firing pin.

Because of the safety systems described, all Smith and Wesson, Colt, Charter Arms, and Ruger double-action revolvers, whether cocked or uncocked, will not discharge when dropped. This is not true for cheap revolvers. The safety devices in "Saturday Night Special" revolvers vary from nonexistent to excellent in concept, but poor in practice. Weapons such as the RG-10, and a host of copies, have no positive safety devices. This

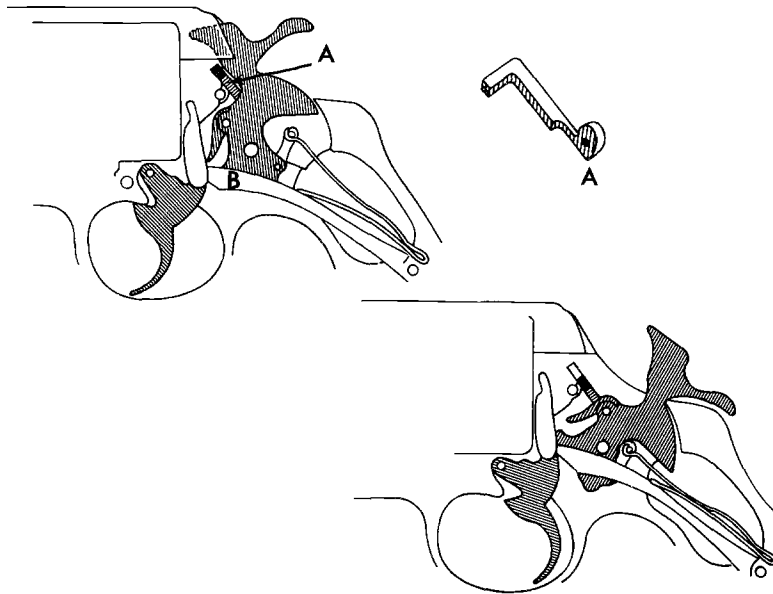


FIG. 4—Colt revolver: (A) hammer block and (B) rebound lever. On cocking, the rebound lever is elevated, which permits the forward rotation of the hammer while the hammer block has moved downward out of the path of the hammer.

was true in Cases 3 and 4. The difference between the gun in Case 3 and that in Case 4 is that the former is an old-time "Saturday Night Special" dating back to the beginning of this century, while the CDM revolver is a "modern" one. Other "Saturday Night Specials" have "safety devices" that range from a thin wire serving as a hammer block, to a crude safety lever. Not uncommonly, these devices fail to function because of breakage or wear of parts, crude workmanship, and excessive mechanical tolerances. Thus, the RG-14 has a hammer block consisting of a loop of wire which interposes itself between the hammer and frame. The metal of the hammer, however, is extremely soft. A sharp blow (or blows) to the hammer often causes the wire to indent the soft metal. At a certain point, this indentation becomes deep enough to permit the hammer to strike the firing pin discharging the weapon.

Because of the lack of safety devices, the poor materials used, the crude workmanship, and the excessive tolerances, cheaply made double-action revolvers are very susceptible to discharge when dropped.

Derringers

Case 5 involved a derringer with external hammers. In these weapons, as in single-action revolvers, the firing pin rests on the primer of the chambered round. Dropping a derringer on the hammer will cause it to discharge.

Automatic Pistols

Automatic pistols were responsible for four of the deaths. The firing mechanism in automatic pistols is of two possible designs: striker operated or hammer operated. Most of the cheaper automatic pistols are striker operated. In striker-operated pistols, a rod-type firing pin travels inside the breech block propelled by a coiled spring. When the

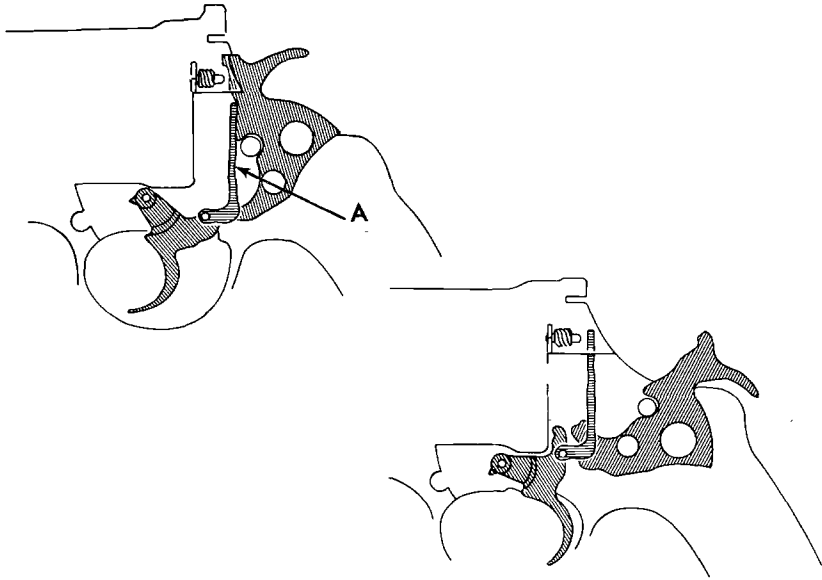


FIG. 5—Revolver equipped with safety lever (A). See text for description of operation.

pistol slide is retracted, a projection on the striker is engaged by the sear. On release, the slide is propelled forward, stripping a round from the magazine and chambering the round. The striker, however, remains in its rearward position held by the sear (Fig. 6). When the trigger is pulled, the sear disengages the striker and the spring drives the striker forward, firing the chambered round. In cheap, poorly made, striker-operated weapons, the internal tolerances of the parts may be so great that dropping the weapon will jar loose the sear from the striker firing the weapon. This was the cause of the accidental discharge in Case 6.

Wear or breakage of the sear or striker in cheap striker-operated weapons may also cause accidental discharge of a dropped weapon. This excessive wear or breakage is due to the poor quality metal. In well-made pistols, manufactured of good materials, accidental discharges due to this cause rarely occurs.

The second type of firing mechanism in automatics is hammer operated. Hammer-operated automatics have either an internal or an external hammer. In virtually all internal hammer weapons, the hammer never rests on the firing pin. Contact with the firing pin is made only at and immediately after discharge. As in striker-operated weapons, retracting the slide to chamber a round automatically cocks the weapon and engages the sear and hammer. Pressing the trigger causes disengagement of the sear, forward rotation of the hammer, and firing of the chambered round. Again, as in striker-operated weapons, internal hammer pistols will discharge on falling if there is excessive tolerance of parts permitting disengagement of the sear and hammer by the jar of falling, or if there is breakage or wear of the sear or hammer or both at their point of engagement. Since almost all internal hammer weapons are well made of good quality metal, accidental discharge of this type of weapon should be extremely uncommon.

An automatic pistol with an external hammer may be as safe as a modern double action revolver or as dangerous as an old single-action weapon. As in revolvers, this depends on the presence or absence of safety devices. Unlike revolvers, however, the position of the hammer at the time of fall may be an important factor. Weapons such

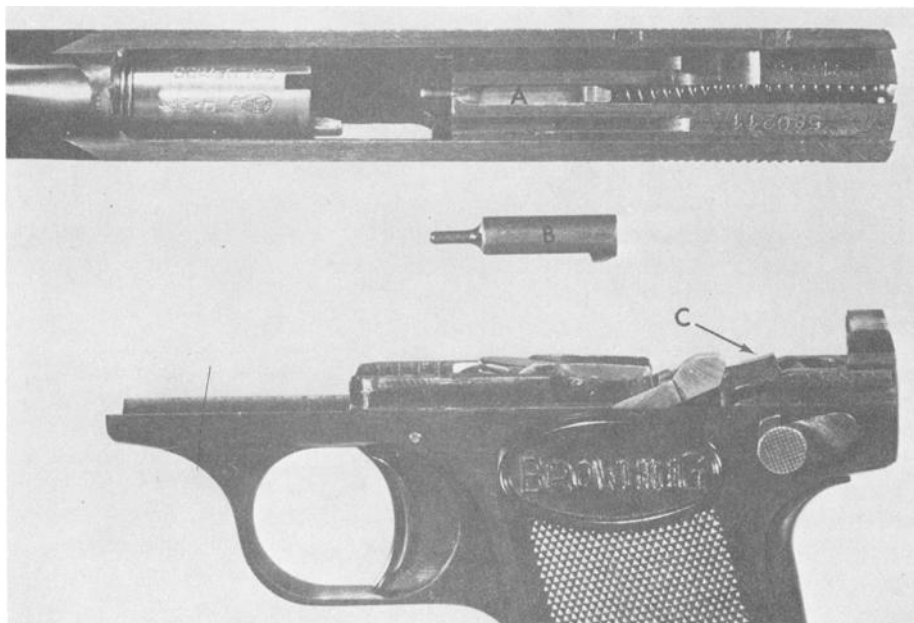


FIG. 6—Disassembled, striker-operated, automatic pistol: (A) striker, (B) striker removed from gun and viewed from the side, and (C) sear.

as the Colt Model 1911A1, the Browning Hi-Power, and the Smith and Wesson Model 39 are completely safe if dropped on their hammer when it is down. This is because they are equipped with a “flying firing pin.” This pin is shorter than the length it has to travel in the breech block. Only the inertia of a regular hammer blow will propel the pin forward far enough to strike the primer. If a weapon such as the Model 1911A1 is dropped while on half cock, however, discharge may occur. This will happen if the blow to the hammer is sufficient to break off the half-cock notch or the tip of the sear engaging this notch. This will permit forward travel of the hammer with sufficient velocity to fire the weapon. Dropping the Model 1911 and similar weapons on full cock can also theoretically cause discharge. But in such a case, the force would have to be sufficient to break both the full-cock and half-cock notches. If only the full-cock notch were broken off, the half-cock notch would catch the hammer and prevent discharge. The authors and a number of firearms examiners consulted were unaware of any Model 1911A1 having discharged when dropped on a fully cocked hammer, as long as the weapon had not been tampered with.

Double-action automatic pistols such as the Walther PP or PPK/S are generally equipped with a hammer block which performs the same function as in a double-action revolver. This block permits the hammer to strike the firing pin only when the trigger is held all the way back.

Unfortunately, not all external hammer automatics are equipped with flying firing pins or hammer blocks. The Astra automatic in Case 7, the Star .22, the postwar Colt .25, and the Titan are all examples of weapons that possess no such safety devices. These weapons should never be carried with the hammer lowered on a chambered round because the firing pin rests on the primer, as in a single-action revolver.

Altered Weapons

Mention should be made of weapons that have been repaired or have had their actions "slicked up" by amateurs. These alterations in some instances may be sufficient to neutralize a built-in safety device, converting a safe weapon into a potentially dangerous one. The author is aware of one instance in which an individual "repairing" a weapon left out the hammer block. This points out the need for examination by an experienced firearms examiner of all weapons that have "accidentally" discharged, whatever the type or make of weapon.

Summary

Twelve deaths from accidental discharge of dropped handguns are presented. Discharge occurred because of the design of the weapon, the absence of safety devices, or the poor quality of the metal. Weapons most susceptible to this type of accident are single-action revolvers, cheap double-action revolvers, derringers, cheap striker-operated automatics, and external hammer automatics without safety devices. These five types of weapons accounted for eleven of the twelve deaths that occurred. The twelfth case involved a 19th-century Colt revolver unequipped with any positive safety device. Accidental discharge following the dropping of a well-made weapon equipped with positive devices is virtually impossible. In all alleged cases of accidental discharge on dropping, the weapon should be examined by a firearms examiner to determine if such an accident is possible.

References

- [1] *The World Almanac and Book of Facts*, 106th ed., Newspaper Enterprise Association, New York, 1974, p. 1018.
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- [3] Sutherland, R. F., *The Book of Colt Firearms*, R. Q. Sutherland, Kansas City, Mo., 1971, pp. 321 and 322.

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