

## NEW ADJUSTABLE GUN STOCK.

The engraving represents an improvement in gun stocks recently patented by Messrs. A. Hape and A. S. Oliver, of Elberton, Elbert county, Ga. This stock can be adjusted to any desired inclination, and it may be lengthened or shortened as may be required. Figure 1 is a side view of a stock showing different positions in dotted lines; Figure 2 is a horizontal section showing the relation of internal parts, and Figure 3 is a vertical transverse section.

A slotted extension projects from the end of the grip, and enters the hollow stock. At the smaller end of the stock there is a joint which slides upon the extension, and is capable of being fastened at any desired point. The extension has upon one of its sides longitudinal ribs which are engaged by a ribbed sector embedded in the stock, and serve to adjust the angle of the stock by placing the ribbed extension at different points on the sector. Upon the other side of the stock there is a ribbed plate which is the counter-part of the transversely ribbed surface of the extension. This plate is clamped tightly against the extension by a screw whose head is outside of the stock. By loosening this screw the stock may be extended or moved up or down as circumstances may require, adapting the gun to the tastes or necessities of the user.

## American Dental Association.

The twenty-first annual convention of the American Dental Association began in this city July 12. The seventy-five delegates present included many of the more prominent dentists of the country. In his address Professor C. N. Pierce, of Philadelphia, discussed the professional and legal standing of the science of dentistry, its recent advances and prospects, and the need of fuller medical education on the part of dentists. He regretted that the medical profession had never appreciated the requirements of dentists, and that the medical colleges granted degrees in dentistry without insisting on a sufficient study of general medicine. The obstetrician and the surgeon were compelled to take a full course of medicine, and receive the degree of M.D., before they could be recognized in any of the specialties. He thought that the practice of dentistry required just as careful an education as the branches of medicine did, and therefore inferred that the medical profession should give the subject more attention.

## A NEW USE FOR THE INDUCTION BALANCE.

BY GEO. M. HOPKINS.

The form of induction balance devised by Professor Hughes, of London, already has several interesting and useful applications, and a new use for it is now suggested by the recent tragedy at Washington. It seems essential to locate the bullet in the body of the President.

The induction balance is a most delicate electrical instrument for detecting the presence of metals, and a modified form of it could be easily applied to this purpose with a reasonable expectation of success. This instrument consists of two short glass cylinders, around each of which are wound two parallel coils of fine insulated copper wire. One coil of each pair is included in a battery circuit in which there is a clock microphone. The other pair is placed in a closed circuit with a receiving telephone. The two glass cylinders, with their encircling coils, may be widely separated. The induction set up in the secondary or telephone circuit is balanced by the reversal of one of the secondary coils and so adjusted that the induction in one of the secondary coils exactly balances or neutralizes the induction in the other, so that when the ear is applied to the receiving telephone no sound is heard.

Now by placing ever so small a piece of metal in one of the glass cylinders the electrical balance is disturbed and the clock on the microphone is heard to tick loudly, thus indicating the presence of metal—and the same is true if the coil be placed in the vicinity of a piece of metal.

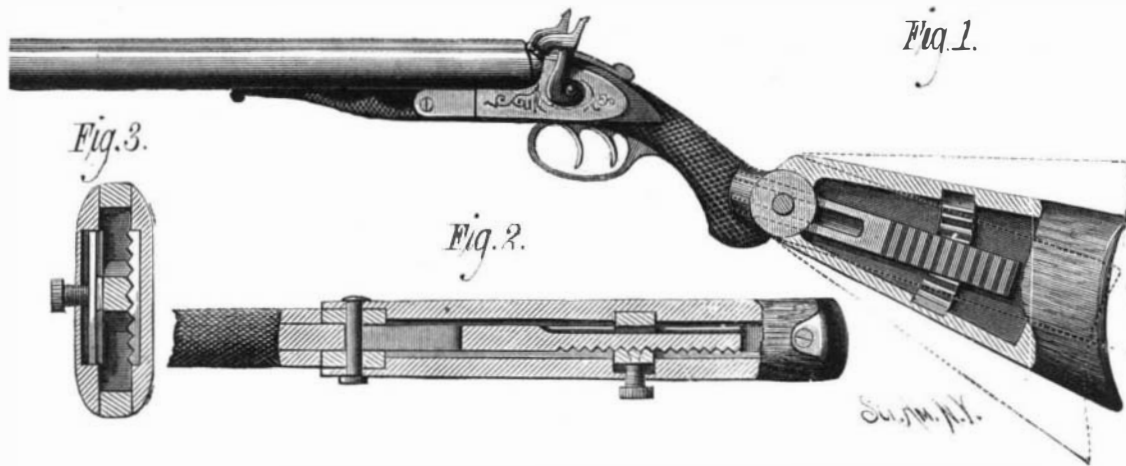
It occurred to me to try the effect of a lead bullet upon the instrument, placing it at different distances and separating it from the coil by insulating material, but I found that the ordinary microphone with carbon electrodes was entirely useless, inasmuch as a very strong current is required to get results from lead, which of all metals, unfortunately, produces the least effect on the instrument. As a strong current burned the carbon of the microphone, I devised a current interrupter operated by a clock which interrupted the current at regular intervals and insured uniform results.

With this current breaker the result exceeded my anticipations, as with a set of coils that were by no means sensitive I was able to locate the bullet with the coils raised a vertical distance of nearly two inches. I suggested to Mr. J. Stanley Brown, the President's private secretary, that, by passing a pair of coils over the President's back and abdomen, the bullet might be located, and that by making comparative tests the depth of the bullet might be ascertained.

At the request of the secretary my apparatus was sent to Washington, but nothing can be said at present in regard to the success of the experiment.

If the missile were of iron or steel no difficulty would be experienced in locating it at a depth of four to five inches, but being lead, it is questionable whether it will disturb the electrical balance at a greater depth than two inches.

The diagram shows the arrangement of battery, microphone, and primary and secondary circuit wires.



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The battery and microphone are in a closed circuit with the coils, A, A, and the coils, B, C, are in a closed circuit with the telephone receiver, E. One of the secondary coils, B, C, is reversed, so that the electrical pulsations induced in one secondary coil by one of the primary coils, A, is exactly counterbalanced or neutralized by the opposing current induced in the other secondary coil by its primary, A. Now,

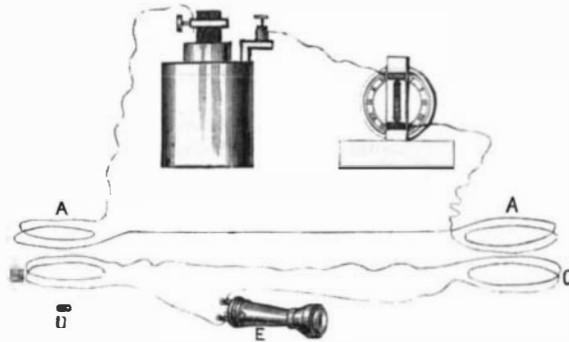


Fig. 2.—Diagram showing circuits of the induction balance.

by placing a piece, D, of any metal in or near one of these pair of coils the electrical balance is destroyed, and the preponderating current produces audible effects in the telephone.

## RECENT INVENTIONS.

An improvement in spring-beds has been patented by Mr. Hubert Hebert, of Lake Linden, Mich. The invention con-



Fig. 1.—THE INDUCTION BALANCE USED AS A BULLET FINDER.

sists in a spring-bed formed of a series of slats resting on crossed inclined spring-slats, the outer lower ends of which are fastened to the longitudinal side bars of a base-frame. The middle of these spring-slats is supported by two adjustable longitudinal rails passing through the middle of the base-frame, by means of which middle rails the elasticity of the spring-slats can be adjusted.

Mr. J. Paris Dunn, of Brooklyn, N. Y., has patented an

improved railroad signaling mechanism. The object of this invention is to provide a device especially adapted to elevated and other railroads, where the stations are but a short distance apart, for announcing to approaching trains whether the track is clear or occupied, and thereby to prevent all collisions.

An improved package or receptacle in which granulated or lump bluing can be placed for transportation or use, has been patented by Mr. Daniel Dunscomb, of New York City. The invention consists of two hemispheres, preferably of metal, fitted to or upon each other so as to form a sphere, which is suspended so that it can rotate from a handle of wire or other suitable material that enters centrally into the upper hemisphere, and has its entered end bent or looped so as to form a stirrer for agitating the contents of the receptacle.

An improved compound for removing paint has been patented by Mr. Herman Gasser, of Platteville, Wis. The object of this invention is to provide for the use of painters or others a solvent compound for softening or dissolving old or hardened paint preparatory to washing off or removing the same from glass, wood, or other surfaces to which it may have been applied. The compound is formed of a solution of a caustic alkali with a gelatinous solution of starch.

An adjustable spur for the heel of a boot or shoe for enabling persons to walk on ice or icy surfaces without slipping, has been patented by Mr. Charles E. Friel, of Fredericton, New Brunswick, Canada. The invention con-

sists in a spur mounted on a shaft in a recess in the heel, which can be adjusted to project through a transverse slot in the heel plate by means of a crank attached to the shaft of the spur, which shaft can be locked in any desired position by means of a notched slide fitting over this shaft and sliding on the back of the heel.

An improved gas-engine has been patented by Mr. George Wacker, of New York City. The object of the invention is to utilize the power that is obtained by the explosion of gas in a closed vessel, and to utilize the power produced by the pressure of the air on a piston at the outer end of a cylinder in which a vacuum has been formed by an explosion. The invention consists in a gas-engine having its piston-rod pivoted to a guide-rod pivoted to the frame of the machine, to which guide-rod one end of the connecting-rod is pivoted at or near the joint with the piston, whereas the other end is attached to the crank of the fly-wheel.

An improved king bolt has been patented by Mr. Horace L. Kingsley, of Racine, Wis. The construction is such that the head block and axle are not weakened by having a hole formed through them to receive the king bolt, the wear of the various parts is lessened, and the fixtures can be made and applied to the vehicle at less cost than the ordinary ones.

An improved portable head rest has been patented by Mr. Robert W. Sharp, of Brooklyn, N. Y. This head rest can be secured to any ordinary chair, and is capable of adjustment in all directions.

An improved paper bag has been patented by Mr. Charles A. S. Lockwood, of Haverstraw, N. Y. The object of this invention is to facilitate the manufacture of paper bags and economize the use of stock in their construction.

An improved lever button has been patented by Mr. Willis H. Howes, of New York city. The object of this invention is to facilitate and cheapen the construction of lever buttons. The invention consists in the combination with the hinge or joint connecting the elastic posts of the head and the shank of the shoe, of interlocking teeth, whereby the shoe will be held securely when parallel and when at right angles with the head without a separate spring.

A magnetic support for scale beams has been patented by Mr. Solomon H. Brackett, of St. Johnsbury, Vt. This invention relates to beam or even balance scales, or other scales depending on pivoted levers. The main feature of this invention consists in the combination, with the pivotal beam or

lever, of a magnet arranged to attract the central or pivotal part of the beam and suspend it against the action of gravity.

An improved velocipede has been patented by Mr. Alfred J. Harrison, of Parkville, Conn. The invention consists in constructing one or two of the three driving gear-wheels of a tricycle with revolving teeth, that the fixed toothed wheel or wheels geared with them may move with less friction.