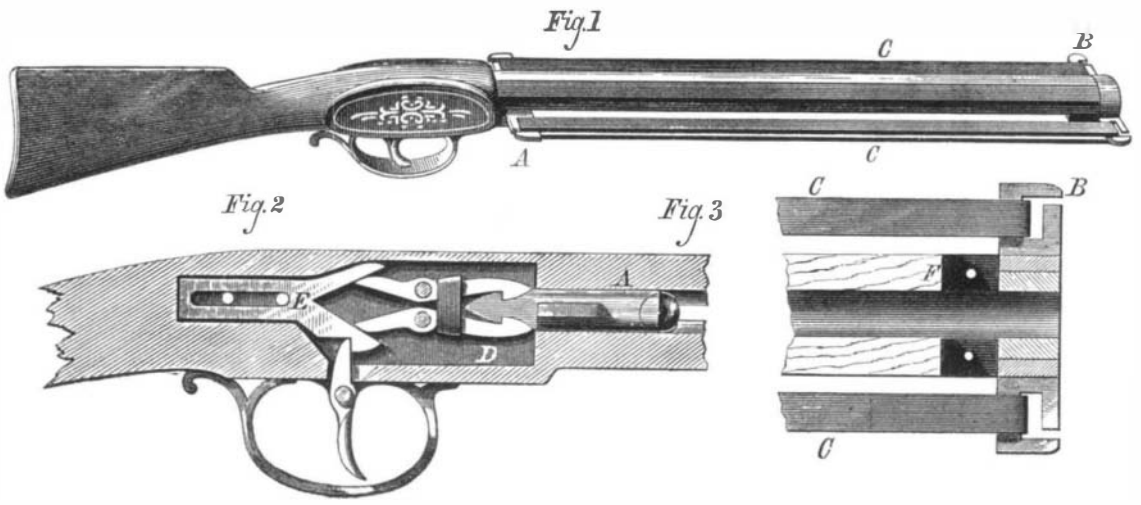
IMPROVED TOY GUN.

The annexed engraving represents a novel device which may be utilized to "teach the young idea how to shoot," or, in other words, placed in the hands of children as a plaything, or may be employed to kill rats or birds or any other small game. It consists of a gun constructed after the well known pea-shooter plan, that is, the missile is thrown by the contraction of a released elastic band, to moderate distances, with accuracy and considerable force. A general view of the invention is shown in Fig 1; Fig. 2 shows the trigger mechanism, and Fig. 3, a section the muzzle.



The barrel is slotted longitudinally, the slots forming guides for the sliding piece, A, therein. Extended between stationary hooks, B, at the muzzle, Fig. 3, and the arms of piece, A, which protrude through the slots, are strong rubber springs, C. These are extended when the slide piece is retracted.

The rear portion of the slide piece is provided with a hook or arrow, which catches in the pivoted spring jaws, D, Fig. 2. A slotted piece, E, with V-shaped front end, slides on lateral guide pins and acts on the rear ends of said jaws. The trigger engages in a recess of slide, E, and carries the same forward on being pulled. The rear arms of the spring jaws, otherwise held apart by a rubber spring encircling the front arms, are thereby forced together, and the front part opened. The rear of the slide piece, A, is thus released, and the latter is pulled quickly forward by the contraction of the bands, thus throwing the missile out of the barrel. Elastic cushions, F, Fig. 3, arranged in the ends of the barrel slots, break the force of the shock of the slide as it reaches the muzzle.

On pulling back the slide piece for the next shot, the arrow end spreads the jaws, which carry, by their action on the V-shaped slide, the same and the trigger back, ready for another discharge. Buckshot or bullets may be fired; and to retain the same in place, the forward end of the slide piece, A, is hollowed, and a light spring provided, which grasps the ball and prevents its escaping when the gun is carried muzzle downward.

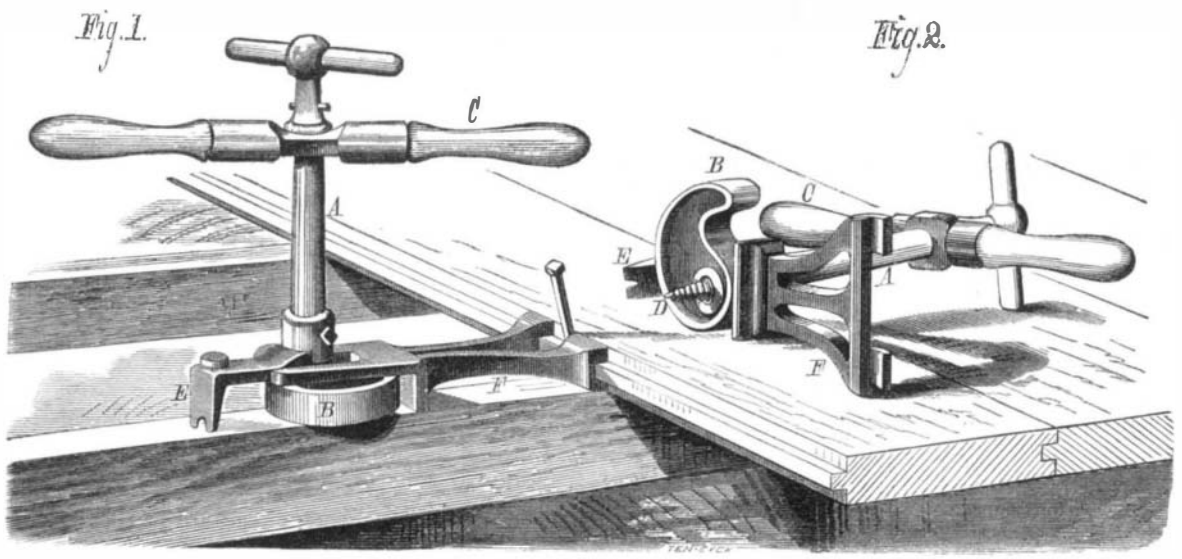
For dispelling cats in city backyards, we should imagine this invention admirably adapted. It certainly would be a cheap substitute for the air guns now used for target practice. It may also be trusted in the hands of children, to whom it would be dangerous to allow the handling of a weapon charged with powder and ball.

Patented through the Scientific American Patent Agency, May 25, 1875. For further information, relative to sale of patent, address the inventor, Mr. William H. Martin (until 1st of September next), Burnt Ordinary, James City county, Va.; after that date, at Mobile, Ala.

IMPROVED FLOOR CLAMP.

Carpenters, cabinet makers, and others who find it frequently necessary to clamp flooring boards or portions of furniture together are provided, in the device illustrated herewith, with a novel and simple tool especially adapted to such purposes. It consists of a sleeve, A, which at its lower extremity carries a cam, B, Fig. 2, and at its upper end has a handle, C. Passing through the sleeve is a rod having a screw point, D, at its lower end, and turned by the upper handle shown. Attached to a collar on the sleeve, A, is a rearward extending arm, E, the end of which is turned downward and toothed so as to engage with the surface of the joist. F is a slotted and grooved arm which is pressed by the cam against the boards when said cam is suitably revolved by the handle, C. The holding arm, E, prevents any rearward motion of the device, which is still further secured by the screw point, D, entering the wood of the joist.

The invention was patented June 8, 1875, to Mr. W. D. Clark, of Springfield, Ill., to whom inquiries for further particulars may be addressed.



CLARKE'S FLOOR CLAMP.

To Distinguish Benzine from Benzol.

Benzol, $C_6 H_6$, was first discovered by Faraday in the cylinders in which coal gas was delivered to consumers in London many years ago. Much more recently, a volatile substance resembling it in several particulars was found among the products of petroleum refineries, and to this too was given the name benzol or benzine. At length the name benzol became confined to the coal tar product, while in this country the name benzine has generally been limited to the petroleum product; but in England and France both are known as benzine. The former is much more valuable than the latter, since it is employed in the manufacture of aniline and the aniline dyes. There is great similarity in color, odor, etc., and the benzine is sometimes sold as benzol, or mixed with it. Dr. Hagar distinguishes the two by means of iodine. A small crystal of iodine, placed in a test tube containing the liquid to be tested and gently agitated, dissolves and imparts to benzol a violet red color; to benzine it imparts a raspberry red color. In a mixture of the two, the color of the solution is also a mixture of violet red and raspberry red, the latter prevailing, so that the addition of the smallest quantity of benzine to benzol can be detected in this way. A few experiments will soon enable a person to judge of the amount of adulteration.

IMPROVED PRESSURE BLOCKS FOR PLANING MACHINES.

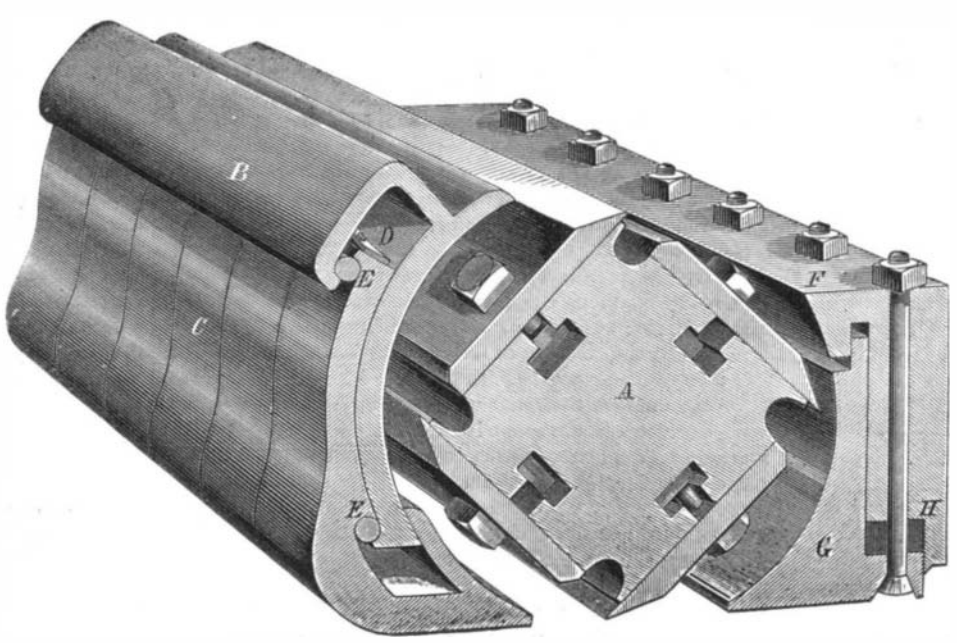
We illustrate herewith a novel improvement in planing machines, which consists in a series of independently operating pressure blocks, arranged on lines parallel with the axis of the rotating cutter. Their object is to hold the lumber while being planed, and in so doing to take the place of the pressure bar or pressure rollers now generally employed. The advantages claimed are that the operator is enabled to feed two boards of different thicknesses at the same time, holding both alike; or he may plane one board on one side of the machine and have it held alike at both edges, thereby securing a uniform thickness and even surface, giving the same amount of wear on the side of the machine as at the middle, and thus keeping the cutters and bed worn alike and even.

At a suitable distance in front of the cutter head, A, is secured a guide, B, the inner side of which is made circular and concentric with the circle described by the cutters in their revolution. On this guide are hung the independent chip breakers or pressure blocks, C. The latter are constructed in the same curve as the guide, and are held down by the spring, D. In the guide are made suitable recesses for the reception of friction rollers, E, for the blocks to work against with an easy movement.

In rear of the cutter head is a crossbar, F, which holds another series of pressure blocks, G, which hold the board after it is planed. These are also curved on their inner sides, and the proper amount of pressure is given to each by means of a rubber spring, H. Each block and its spring is held by means of a bolt, as shown. The tendency of the blocks, G, is to bring down the thinner part of a board not planed alike on both edges, and to keep it from vibrating, thereby securing uniformity of thickness and an even surface.

This invention, which the inventor claims in no wise conflicts with the Woodbury patented pressure bar, offers, as has doubtless already been noticed, a means of overcoming several difficulties peculiar to that appliance.

It was patented in the United States May 25, 1875, and also in Canada, to Mr. Chester R. Patterson, of 438 North Main street, Pittston, Pa., to whom inquiries for further particulars may be addressed.



PATTERSON'S PRESSURE BLOCKS FOR PLANING MACHINES.

Soda Manufacture.

Siebel proposed to make carbonate of soda by fusing together phosphate and nitrate of soda, so as to obtain at the same time nitric acid. Aside from the difficulty that the vessel, in which the fusion was made, would be rapidly destroyed, this process has no practical value, because, in the first place, a number of operations are requisite, and, in the second place, the separation of phosphate from the carbonate of soda is either imperfect, or so expensive on a large scale, that nitric acid, as well as soda, would be much more costly than when prepared in another way. That communication induced the author to publish his process for making nitric acid and caustic or carbonate of soda from Chili saltpeter at one operation, which was patented in Prussia in 1867, in the hope that further experiments or the use of more suitable vessels would render this process a profitable one in industrial chemistry, for obtaining at once, from cheap Chili niter, valuable nitric acid and caustic soda.

In 1805 and 1806 the author had numerous experiments made in his laboratory for the purpose of obtaining nitric acid and caustic soda from Chili saltpeter. It was fused and ignited with various substances like silica, alumina, oxide of zinc, and carbonate of magnesia, but all these required so high a temperature for the decomposition of the nitrate of soda that the greatest part of the liberated nitric acid was completely decomposed, and only a small portion of it was obtained. The least heat was required with carbonate of lime. The author mixed fine chalk with Chili saltpeter in nearly equivalent proportions, with a slight excess of the former. The mixture was heated first in an iron retort, afterwards in large iron pans under a stone vaulted cover, until no more gas was evolved, and the mass be