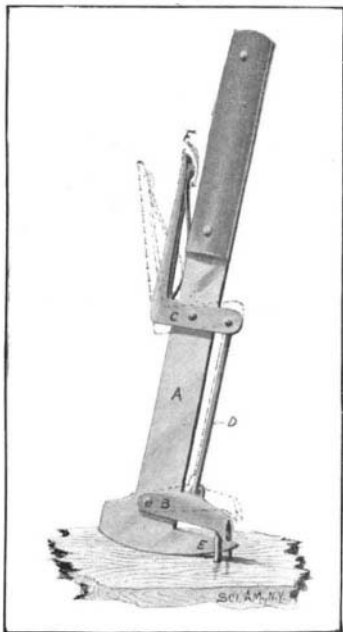


**STAPLE PULLER.**

The accompanying illustration shows a simple form of staple puller which is capable of drawing straight out the longest fence-wire staples and of retaining the drawn staples until purposely removed from the device. This prevents the loss of staples when drawn out, and since they are not bent out of shape, they may be conveniently reused, if desired. The tool is the invention of Mr. George P. Haley, of Mexico, Mo. It consists, as illustrated, of a shank, *A*, provided with a handle at one end and a clawhead, *E*, at the other end. The clawhead has a hammer section at one end,

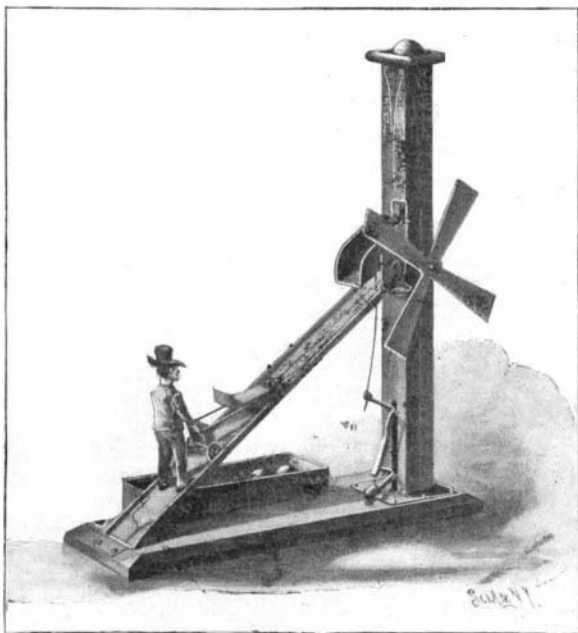
**IMPROVED STAPLE PULLER.**

and is pointed at the opposite or claw end. The under surface of the claw is curved, so as to form proper leverage for pulling out the longest staples in use for fence wire. A clamp *B* is used in conjunction with the claw. This consists of a U-shaped piece pivoted to the shank, and having teeth adapted to close over the sides of the claw. The clamp *B* is connected by a rod, *D*, to a bell crank, *C*, and is normally held out of engagement with the claw by a spring on the gripping end of the crank. In operation the claw is introduced beneath the

bow-section of the staple, and driven well in by striking the hammer section of the claw head. At the same time the gripping section of the bell crank, *C*, is carried up close to the handle, bringing the teeth of the crank over and at each side of the point of the clawhead. The shank is then rocked upon the convex surface of the clawhead, and the staple is withdrawn. The clamp holds the staple upon the clawhead as long as the grip section of the lever is parallel with the handle of the device.

**AUTOMATIC TOY.**

A very ingenious mechanical toy has been invented by Messrs. R. H. and R. D. Adams, of 3126 Fourth Avenue, South, Minneapolis, Minn. It represents an old windmill and a quaint little miller who is busily engaged in running up and down a chute, trundling a wheelbarrow which he uses in unloading the contents of the mill tower. Normally, the wheelbarrow remains at the top of the chute, being held in this position by a cord and counterweight suspended in the lower portion of the tower. The upper portion of the tower serves as a magazine for a number of spherical weights. These weights are prevented from rolling out through a hopper on to the chute by a trigger normally blocking the hopper. When the wheelbarrow is at the top of the chute, the counterweight depresses the lever

**AUTOMATIC TOY.**

which withdraws the trigger and permits a weight to roll out on to the wheelbarrow. This weight being heavier than the counterweight causes the wheelbarrow and the miller to travel down the chute, at the bottom of which a trip is encountered, which tilts the wheelbarrow sideways and rolls off the load into a receptacle. In the meantime the rest of the weights in the magazine are prevented, by a stop pin, from entering the hopper until the counterweight has been drawn to its highest position, when this pin is lifted, and the lowest weight is permitted to roll into the hopper against the trigger projecting therein, so that when the vehicle on being relieved of its load is drawn to the top of the chute again, this ball is ready to roll out on to it. The operations are thus repeated as long as the magazine is supplied with weights. The wind wheel shown serves as a governor to prevent the toy from operating too rapidly.

**SAFETY HEEL FOR FOOTWEAR.**

The invention described below has been suggested by the increasing use of rubber treads on heels of shoes. These treads while having many advantages over the leather tread possess the serious drawback of giving a very treacherous foothold on icy and wet pavements. In order to overcome this difficulty Mr. Henry C. Karpenstein, of 155 Vernon Avenue, Brooklyn, N. Y., has designed a tread having an inverted cup-shape which will adhere by suction to the pavement. The method of fastening the tread in place is shown in the sectional view, Fig. 3. A circular recess is cut out of the heel body to receive the rubber tread. In the center of this recess a nut is let into the heel body. This is secured to the heel by screws passing through an annular flange on the nut. The tread is now held in place by the broad head of the screw which is tightly screwed into the nut as illustrated. In order to protect the corners of the heel body from injury, metal protectors, shown in Fig. 2, are secured thereto. Fig. 1 shows the position of these protectors on the heel and how they protect weak corners. Aside from insuring safety to the wearer by reason of the suction cavity in the rubber tread, this arrangement offers still another advantage, namely, that when one portion of the tread is worn down more than the other, it can readily be turned on its center to present a less worn surface to the side which receives the greatest wear. When the tread is completely worn out a new one may be quickly applied and secured by the retaining screw.

**DIAPHRAGM METER AND EXERCISER.**

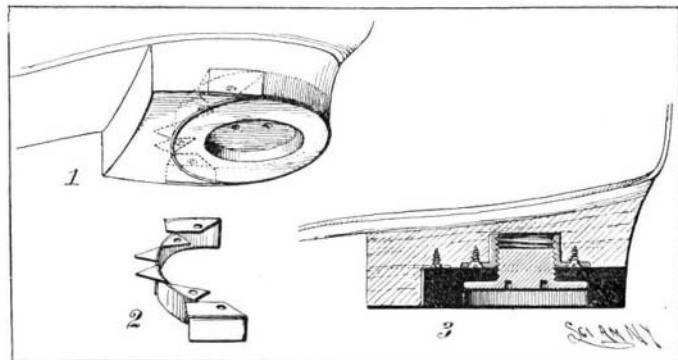
Respiration depends chiefly upon the action of the diaphragm or the muscular organ intervening between the thorax and abdomen. The diaphragm descends into the abdominal cavity and compresses all the abdominal organs while the lungs are inhaling, and in expiration it mounts into the thoracic cavity in the form of a conical arch. Contraction of the diaphragm is auxiliary to the action of the muscular walls of the esophagus by which the cardiac opening of the stomach is regularly closed during inspiration. In the case of the greater majority of persons the lungs are usually inflated to but one-third their capacity and the stomach and abdominal organs are also agitated but slightly during respiration. The results are that the blood is not duly oxygenated, digestion and assimilation are imperfect, congestions of the lungs or abdominal organs are not duly relieved, and the tone of the nervous system is lowered, so that vulnerability to disorders or diseases of various kinds is greatly increased as compared with the normal standard.

These facts point to the usefulness of an apparatus invented by Dr. John E. Ruebsam, of Washington, D. C. This apparatus is adapted to test the strength of the diaphragm and also to exercise it, so as to avoid the results above stated. The apparatus proper is mounted upon two vertical standards and may be adjusted to any desired height. It consists of a track on which a small carriage is mounted to travel. A blow-tube is secured to one end of the track, and is provided with a piston, the rod of which projects from the tube and is secured to the forward end of the carriage. The carriage is normally held in its forward position by a weighted cord attached thereto and passing over a pulley at the forward end of the track. Various weights may be attached to the cord according to requirements. In using the apparatus a person blows through the pipe, and the carriage is moved backward a distance depending upon the strength of that person's diaphragm. By graduating the track in inches and fractions of the same, one can determine the progress of the patient from day to day in developing this organ.

**Women Inventors.**

In the first year of the United States Patent Office's existence, 1790, a woman took out a patent. Up to the present time about 3,958 patents have been granted to women. Among the early women inventors may be mentioned Miss Mary Kies, who in 1809 perfected a device for weaving straw and thread. Three years later Miss Mary Brush designed a new corset, which she thought would preserve the shape of the womanly figure.

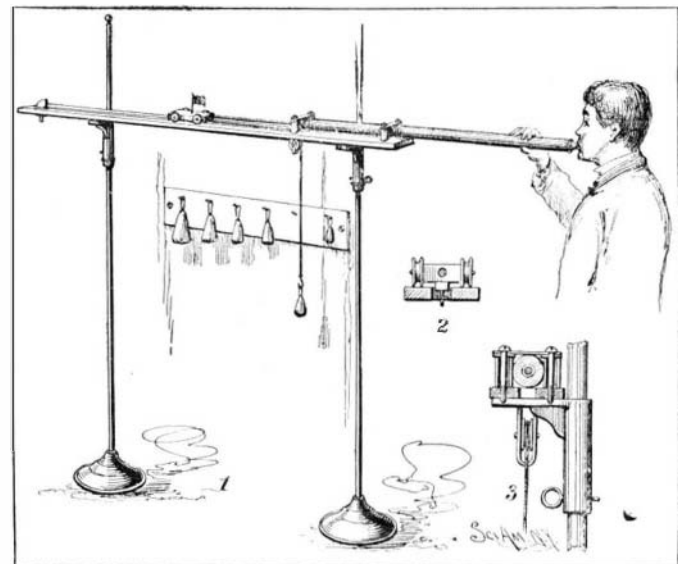
Like Miss Brush, many modern women inventors confine their inventiveness to the contriving of beautifying devices. Mrs. Batchelder, for example, has devised means for the improvement of certain facial features that have been distorted. Among her inventions may be mentioned an ear straightener which remedies imperfectly formed and lopping ears. Another invention for the restoration of facial symmetry is a spring attachment for the teeth, which relieves their severity and improves the mouth lines. Some women inventors, however, have devoted themselves to other things besides the perfection of womanly beauty. Mrs. Martha J. Coston, although not the first inventor of the signal lights of that name, has nevertheless made some important improvements in her

**SAFETY HEEL FOR FOOTWEAR.**

husband's invention. Mrs. Cynthia W. Alden is the inventor of an improved dump cart. Some years ago Mrs. Lena Sittig devised a waterproof garment which has come to be known as the duckback. The ruled slate was devised by Mrs. Louise Dyer, of Yazoo City. An important attachment to the sewing machine was invented by Miss Helen Blanchard. Miss Philips, of Dorchester, Mass., is the inventor of the hand refrigerator and lunch box. Miss Emma D. Mills made an improvement on a typewriter for which it was necessary to construct special tools. She did the special construction herself. Mrs. Kate Eubank, of Oakland, Cal., has devised a combined trunk and bureau, which when closed appears as a Saratoga trunk and when open as a handsome dressing case.

There seems to be one professional woman inventor in America, and her name is Miss Montgomery. As far back as 1864 she took out a patent on an improved locomotive wheel. Later she secured a patent on an improved war vessel. A number of other patents have been issued to her, which have proved remunerative.

During the past year 1,520 locomotives were constructed at the Baldwin Locomotive Works in Philadelphia. This overtops all previous records at this plant. For the previous year the number was 1,375, and during the year 1900, the number of engines completed was 1,217. In the matter of tonnage the increase was much greater. Of the number built last year, 93 were sent abroad, the greatest number going to West Australia. The year's output was valued at \$20,000,000.

**DIAPHRAGM METER AND EXERCISER.**