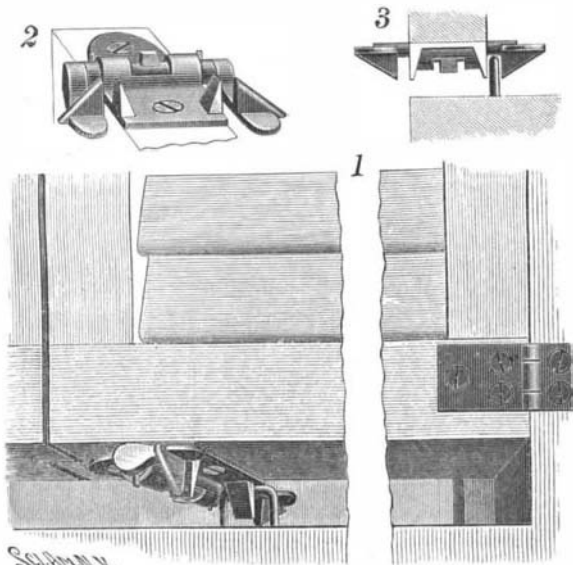


**A SIMPLE SHUTTER-FASTENER.**

The shutter-fastener which we illustrate herewith is a simple and ingenious device for locking a blind to the window-sill or to the outer wall of a building. The fastening means operate entirely by gravity, no spring being included in the construction. The patent on the fastener is the property of Mr. Ubert K. Pettingill, of 22 School street, Boston, Mass.

Fig. 1 shows part of a blind and window-sill, with the fastener in locking position. Fig. 2 is an inverted bottom view of the device. Fig. 3 represents a section of the blind and sill, with the fastener in elevation.

The fastener is attached to the under surface of the



PETTINGILL'S SHUTTER-FASTENER.

blind and is composed of only two parts—a plate held in position by screws, and a rod or spindle rotating in a socket in the plate.

The plate is provided at its sides with stops, one of which is designed to engage the staple on the window-sill, and the other of which is designed to engage a corresponding staple or fixture on the wall of the building, both stops serving the purpose of limiting the swinging movement of the blind.

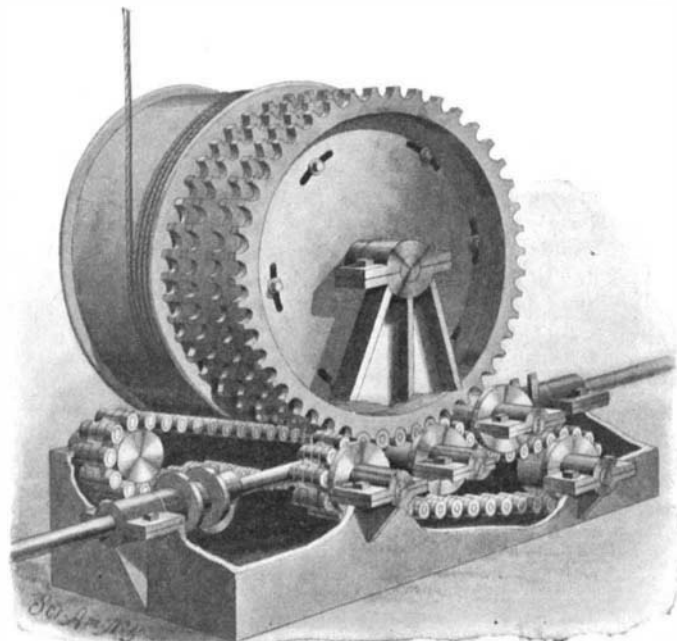
The rotating rod or spindle is provided at its ends with arms carrying on their under surfaces lugs, beveled so as to ride over the staples. The arms and lugs are heavy enough to swing the spindle downwardly, to permit their engagement with the staple.

As the blind is swung inwardly, the lug on the inner arm strikes the staple on the window-sill, rises as it rides over the top of the staple, and falls by its own weight and that of its arm to the position shown in Figs. 1 and 3. The inner stop at the same time engages the staple and arrests the blind. The blind is now locked by the stop on one side and the lug on the other. To release the shutter it is necessary merely to lift the arm and turn the spindle upwardly. To limit the drop of the spindle, the socket in the plate is recessed (Fig. 2) to receive a stop on the spindle, of smaller width than the diameter of the recess.

The device can be cheaply made, consisting as it does of but two pieces of cast metal. From a working model loaned to us by the patentee, the device seems to be very efficient in its operation.

**A WORM AND CHAIN DRIVING-GEAR FOR ELEVATORS.**

To provide a worm and chain driving-gear for elevators and hoisting machinery which will avoid the objections raised against devices of a similar nature is the purpose of an invention for which a patent has been granted to Mr. Daniel Corcoran, of Yonkers, N. Y.



A NEW DRIVING-GEAR FOR HOISTING-DRUMS.

Mr. Corcoran's gear, as our illustration shows, comprises a right worm and a left worm secured to a common shaft. Each worm is engaged by a chain passing about two flanged guide-pulleys and meshing with toothed disks secured to the hoisting-drum. The links of these two chains are of Z-shape, being composed of two sections offset from each other and pivoted together. The pivot-pins carry rollers which are the portions of the chains which enter the grooves formed by the threads of the worms. The chains are firmly held up against the worms by thrust-disks bearing against the outer edges of the chains and turning on their pivots.

Power being applied to the worm-shaft in any suitable manner, the worms will engage the link-rollers, causing the chains to travel over their guide-pulleys and to rotate the toothed disks to which the hoisting-drum is secured. The chains, it will be seen, are so driven by the oppositely threaded worms and conducted by the guide-pulleys that both are caused to rotate the drum in the same direction. The lower guide-pulley of each chain dips within an oil-box constituting the base of the gear. By this means the chains are thoroughly lubricated.

Owing to the use of right and left worms, the end thrust is taken up by the chains and thereby neutralized. The chains, moreover, are so arranged that they lie on opposite sides of the worm-shaft.

It is desirable that one of the toothed disks be adjustable so as to regulate the strain upon the two chains. For this purpose the inventor has provided segmental slots in one of the disks, which disk is not rigidly secured to the drum-shaft, but is held in place by bolts passing through the slots and fastened to the adjacent disk.

**AN AMATEUR'S CAMERA FOR PHOTOGRAPHING IN NATURAL COLORS.**

The camera illustrated herewith for photographing in natural colors was devised by M. L. Ducos du Hauron for the use of amateur photographers, and it is said to give very satisfactory results.

The principle upon which it operates is well known, and consists simply of making three negatives through three colored screens, blue, green and red.

To accomplish this, the box, *F*, of the camera is divided into three compartments, one above the other, and each having a separate lens. The box, *A*, containing the three mirrors, *M*<sup>1</sup>, *M*<sup>2</sup> and *M*<sup>3</sup>, set at an angle of 45°, is slipped into a groove, *L*, in front of the lenses. The mirrors face the lenses, and the image is projected upon them by a fourth mirror, *M*, also set at 45°, but in the inverse direction, in the top of the box. The first two mirrors, *M*<sup>1</sup> and *M*<sup>2</sup>, are transparent, and reflect only a part of the luminous rays, allowing the rest to pass through and be reflected by the silvered mirror, *M*<sup>3</sup>.

By means of this arrangement, each lens, although receiving only part of the luminous rays emanating from the object being photographed, throws an exact image of it on the sensitive plate at the back. A frame, *E*, slides into the groove, *H*, in front of the plate-holder containing the sensitive plate. In this frame are the three colored glasses, the blue at the top, the green in the middle, and the red at the bottom. The plate-holder shown at the top of the illustration is of the ordinary kind, and made to hold a single plate of the proper size to receive all three images. The use of isochromatic plates is indispensable for this kind of photography and as these plates are very sensitive, it is necessary to take every precaution and not expose them to the red light during development any more than is absolutely necessary.

It will be noticed that the blue screen—the one through which the most actinic light passes—is the one to receive the first reflection of light coming from the object, and consequently the most intense reflection. The red glass, on the contrary, receives only the light that has not passed through the others. As the result of this, the upper image is always too brilliant; but the inventor has remedied this by placing a horizontal yellow screen with a small hole in the center between the first mirror which reflects the object and the first transparent glass. By this arrangement, the greater part of the blue rays are stopped, as they can only pass through the small hole, while the other rays are in no way hindered by the yellow screen, and are reflected by the other mirrors through their respective lenses.

In order to prevent any halation it is well to coat the back of the plates with a special "backing." There are several formulas for this, but, in order to have it easy to apply, M. Ducos du Hauron has invented a slightly sticky composition having all the properties of an efficacious "backing," and which can be spread on sheets of paper. These are cut the proper size and stuck on the back of the plate before

placing it in the camera. The "backing" can be removed from the plate before development by taking one corner of the sheet and carefully pulling it off, after which it can be used again on another plate if desired.

The focusing is done very simply, in much the same way as with an ordinary camera. Two of the mirrors are covered, so that but one image is thrown on the ground glass in order to avoid confusion. The ground glass frame is slipped in the plate-holder groove in the regular manner, and the tri-color frame removed.

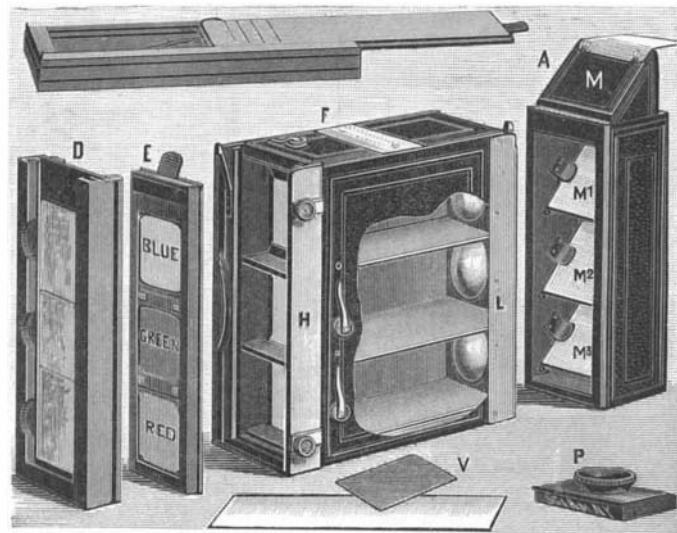
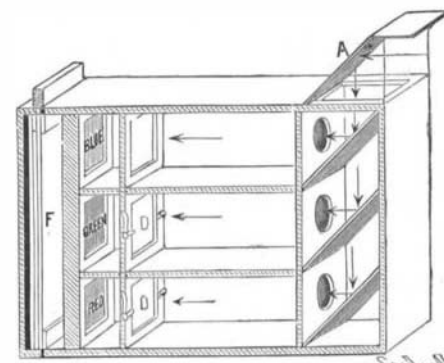


Fig. 1.—M. DUCOS DU HAURON'S APPARATUS FOR PHOTOGRAPHY IN COLORS.

Then the operator can focus as with an ordinary camera, and move the frame, *H*, backward or forward a short distance by means of a rack and pinion.

It will be seen from the above description that the negative can be made as easily as with an ordinary camera, and by any amateur. The positive is obtained still more easily by contact, and any good lantern slide or stereoscopic chloride plates may be used. It is always well, however, to back them while making the exposure, in order to prevent the slightest halation.

Upon developing the positive, three transparencies on one plate will be obtained, in which the clear por-



SECTION OF THE CAMERA.

tions of each correspond to the opaque parts of its respective negative. If the plate thus obtained be slipped into the open frame, *D*, and the latter be placed in the groove which held the plate-holder when making the negative, i. e., the groove just behind the colored screens, each image will be properly colored proportionally to the quantity of light which acted upon the sensitized plate.

To view the image obtained, the receiving mirror, *M*, is removed and replaced by a small eyeglass, *P*, and the camera is held near a window with its back at an angle of about 45° with the horizon, as is shown in Fig. 2. A ground glass, *V*, slipped in a groove in front



Fig. 2.—USING THE CAMERA FOR VIEWING THE POSITIVE IN COLORS.