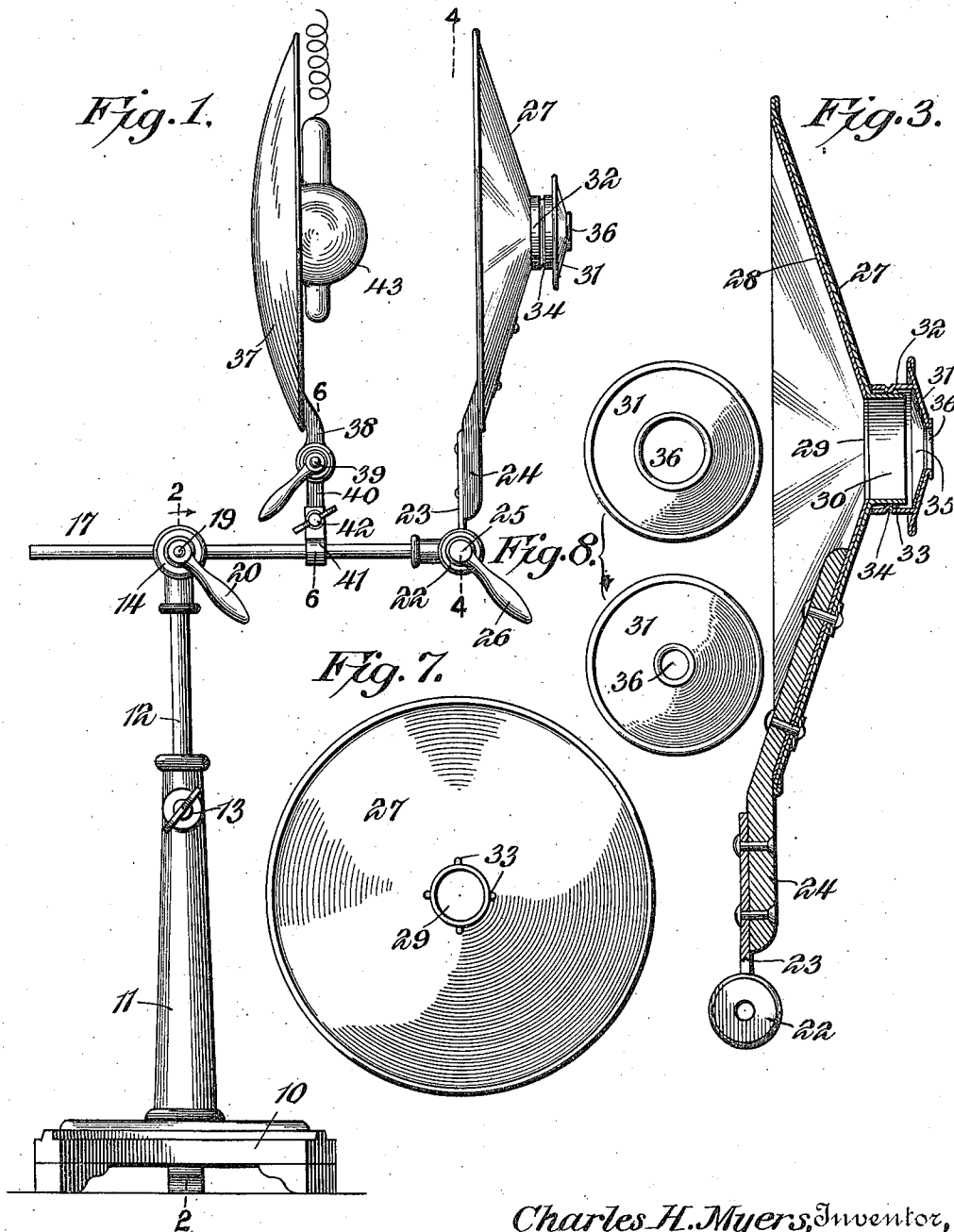


C. H. MYERS.
X-RAY SCREEN OR SHIELD.
APPLICATION FILED OCT. 16, 1905.

965,533.

Patented July 26, 1910.

2 SHEETS—SHEET 1.



Witnesses

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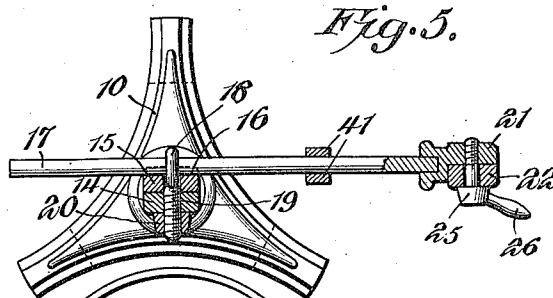
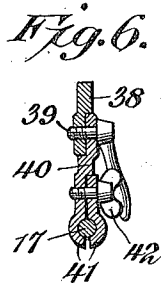
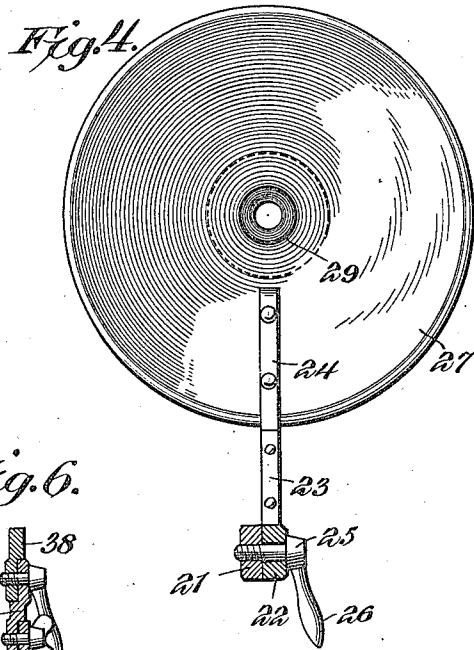
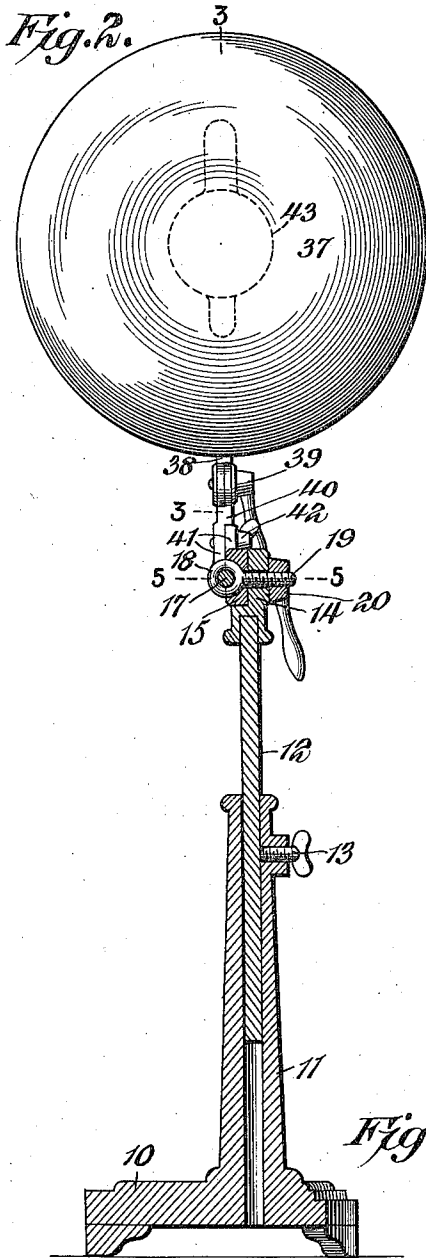
Attorney

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UNITED STATES PATENT OFFICE.

CHARLES HENRY MYERS, OF BUFFALO, NEW YORK.

X-RAY SCREEN OR SHIELD.

965,533.

Specification of Letters Patent.

Patented July 26, 1910.

Application filed October 16, 1905. Serial No. 282,993.

To all whom it may concern:

Be it known that I, CHARLES HENRY MYERS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful X-Ray Screen or Shield, of which the following is a specification.

In the treatment of diseases with X-rays, it is the customary practice to expose the diseased tissues to the rays and to shield and protect the surrounding healthy tissues by coatings of putty, sheets of lead, and the like, applied directly to the person, and having openings through which the diseased parts are exposed. It has also been found necessary to protect the physician's or operator's hands when the X-rays are employed for diagnosing and examinations, because of the deleterious effects of the continuous exposure of the hands to the rays.

The primary object of the present invention is to provide means which will eliminate the necessity of the application of shielding material directly to the body of the person, said means protecting both the patient and the operator from the deleterious effects of X-rays, and said means, furthermore, being readily and properly adjustable to different conditions of use.

A further object is to provide a structure in which all danger of electric shocks being transmitted from the apparatus to the patient will be eliminated.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of the apparatus. Fig. 2 is a sectional view therethrough on the line 2—2 of Fig. 1. Fig. 3 is a vertical sectional view through one of the shields taken on the line 3—3 of Fig. 2. Fig. 4 is a sectional view on the line 4—4 of Fig. 1. Fig. 5 is a horizontal sectional view on the line 5—5 of Fig. 2. Fig. 6 is a detail vertical sectional view on the line 6—6 of Fig. 1. Fig. 7 is a front elevation of the front shield. Fig. 8 are views in elevation of two of the caps, and Fig. 9 is a view in elevation of a shield, particularly useful for examination purposes.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated, an extensible standard is employed, comprising a base 10, carrying a tubular section 11, in

which is slidably mounted a rod section 12, that can be held in different positions by means of a set screw 13. The upper end of the extensible standard is provided with a pair of relatively rotatable members 14 and 15, the former of which forms a part of the upper end of the standard, the other, namely, 15, consisting of a disk having a groove or slot 16, in its outer side. A supporting arm or rod 17 is slidably engaged in the groove or slot, and an eyebolt 18, surrounding the supporting arm or rod, is provided with a threaded shank 19, passing through the members 14 and 15. A lever nut 20, threaded upon the shank, serves to draw the bolt and thereby the arm and the members into clamping relation to hold said arm against its sliding movement and the members against relative rotation. By this arrangement, the arm is capable of longitudinal, rotary and angular adjustment, and it is also movable vertically upon the standard.

One end of the supporting arm or rod 17 carries an enlargement in the form of an eye 21, and rotatably associated therewith is another eye 22, formed upon the lower end of a stem 23, that is secured to an insulating arm or block 24, which arm or block is of wood. The eyes 21 and 22 are normally held against relative rotation by means of a clamping bolt 25, having a handle 26 at one end, said bolt passing through the eye 22, and being threaded in the eye 21, as shown in Fig. 5. The block 24 is secured to a shield consisting of a substantially conical body 27, lined with sheet metal, such as lead 28, that is impervious to the passage of the X-rays. This shield has a central opening 29, surrounded by a projecting collar 30, forming a passageway for the X-rays, as hereinafter described. A series of caps are employed in connection with the shield, two of said caps being illustrated in Fig. 8. These caps consist of face plates 31, carrying annular flanges 32, adapted to overlap the collar 30, of the shield, said collar being provided with suitable projections 33, and the flanges having ridges 34 that engage thereover. The face plates 31 of the caps are lined with suitable material 35, that is impervious to the X-rays, and the face plates, moreover, are provided with openings 36, the openings of the different caps being of different diameters, as clearly shown in Fig. 8.

Coöperating with the shield above de-

scribed, is another shield 37, preferably concavo-convex in form and mounted on a frame or support which is movable horizontally upon and rotatable about the arm 17, said frame or support comprising, in the present instance, an ear 38 on the shield 37, pivotally connected by a clamp bolt 39, to another ear 40, said ear 40 including a pair of clamping arms 41, that embrace the supporting arm or rod 17, and can be frictionally engaged therewith by a bolt 42, so that the shield 37 may be held in practically any position desired. An X-ray generator in the form of a Crooks' tube is shown at 43, and is interposed between the two shields, being preferably located directly contiguous to the shield 37 and in spaced relation to the shield 27.

In using the device, a cap is employed having an opening substantially the size of the part to be treated. If the shape of such part is irregular, a piece of foil is cut with an opening of the proper shape and is fitted upon one of the caps. The shield is then placed substantially against the patient with the diseased part exposed through the opening, the various adjustable features of the support permitting substantially any desired arrangement of the shield, without regard as to whether the patient is seated or is located in a recumbent position. The generator 43 is preferably entirely independent of the shield 27, and may be adjusted with the shield 37, which constitutes a holder for the generator, so that the proper application of the rays to the part treated can be secured, and in any case, it will be observed that the tube can be disposed in spaced relation to the shield in order to avoid the transmission of electrical shocks through said shield to the patient. The shield 37 is adjusted to the tube or generator so as to protect the operator or physician. The relative and independent adjustment of the shields is thus important.

In case of examinations, the shield disclosed in Fig. 9 may be substituted for the shield illustrated in Figs. 1, 3 and 4, said shield consisting of a conical body 27^a, having an opening 28^a, of comparatively large diameter. This shield is mounted on the supporting arm 17 in place of the shield 27 and by the same means as disclosed for said shield 27. A further description of this slight modification is believed to be unnecessary.

From the foregoing it is thought that the construction, operation, and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without de-

parting from the spirit or sacrificing any of the advantages of the invention.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:

1. In an apparatus of the class described, the combination of a standard having a rotatable and vertically-adjustable section, a clamp for holding the section in fixed position, an arm, means for adjustably connecting the arm with the adjustable section of the standard, a pair of shields relatively slidable back and forth on the arm, and an X-ray generator arranged between the shields, said means comprising a clamping bolt, and a member cooperating therewith for holding the arm in fixed position, said bolt serving when loosened as a pivot on which the arm swings and also permitting the arm to be adjusted longitudinally and turned about its axis.

2. In apparatus of the class described, the combination with a support, of spaced independent shields comprising walls mounted on the support and relatively adjustable upon the support toward and from each other, said walls being impervious to X-rays, one of the walls being provided with an X-ray passageway, the other being imperforate, and an X-ray generator located between said adjustable walls and adjustable with the imperforate shield to change the distance between the generator and the part of the patient exposed through the said passageway.

3. In an apparatus of the class described, the combination of a supporting arm, a mounting in which the arm is rotatably and longitudinally adjustable and in which the arm is adapted to swing, a shield, a support connecting the shield with an intermediate portion of the arm, said support being composed of jointed sections, a clamping bolt connecting the said sections together and serving as a pivot therefor, a clamping means slidably connecting the support with the arm, a second shield disposed opposite the first and having an X-ray passage, a support including an insulating member, and a clamping means for securing the last-mentioned support to the extremity of the arm and constituting a pivot for the support.

4. In apparatus of the class described, the combination with a support, of shields separately and adjustably mounted on the support, an X-ray generator located between the shields, one of said shields having an X-ray passageway therethrough, the other being entirely imperforate and impervious to the passage of X-rays, said generator being adjustable with the imperforate shield to change the distance between the generator and part of the patient exposed through the

said passageway, and an interchangeable exposing device for the passageway for varying the cross-sectional area of the active X-rays, said device having an opening and provided with a lining surrounding the opening and consisting of material impervious to X-rays.

5. In apparatus of the class described, the combination with a supporting arm mounted for rotary, pivotal and longitudinal adjustment, of a shield comprising a wall impervious to X-rays and pivotally mounted on the arm, said wall having an X-ray passageway therethrough, means for holding the shield against its pivotal movement and in different positions with respect to the arm, and another shield slidably and pivotally mounted on the arm and comprising an imperforate wall wholly impervious to X-rays.

6. In apparatus of the class described, the combination with a supporting standard rotatably and vertically adjustable, of rotatably associated members, one of which is carried by the standard, a supporting arm rotatably and slidably mounted on the other member, clamping means for holding the members against their relative rotation and the arm against its sliding movement, said means serving, when loosened, as a pivot on which the arm swings, and an X-ray screen carried by the arm.

7. In apparatus of the class described, the combination with a supporting standard, of relatively rotatable members carried by the standard, a supporting arm slidably mounted on one of the members, an eyebolt engaging the arm to normally hold the same against sliding movement, said bolt passing through the members to hold them against relative rotation, and an X-ray screen carried by the arm.

8. In apparatus of the class described, the combination with an extensible standard comprising slidably associated sections, of means for holding the same against their sliding movement, an arm rotatably and slidably associated with the standard, a screen pivotally mounted on the arm and having an opening and a collar surround-

ing the same, caps arranged to be placed upon the collar and having openings of different sizes therethrough, and another screen slidably and pivotally mounted on the arm and movable toward and from the first mentioned screen.

9. As an article of manufacture, an X-ray screen consisting of a hollow frusto-conical structure provided with a central opening, a lining within the structure consisting of material impervious to X-rays, an outwardly-extending collar surrounding the opening, a detachable cap having an exposing opening, a lining surrounding the opening consisting of material impervious to X-rays, and means for detachably securing the cap over the outer end of the collar.

10. In apparatus of the class described, the combination with a supporting arm, of spaced shields mounted on the arm and relatively adjustable thereon toward and from each other, one of said shields having a convexed and a concaved side, the other being substantially conical in form and having a central opening, the inset sides of the shield being located in opposing relation to receive an X-ray generator between them, a collar fixed on the shield having the opening and extending axially from the outer face of the shield to form an X-ray passageway, a detachable cap fitted on the collar and provided with an opening, and a lining on the cap surrounding the opening and consisting of material impervious to X-rays.

11. A device of the class described, comprising a standard, an arm movable vertically upon the standard, a frame movable horizontally upon and rotatively about the arm, a tube holder and means for moving the same in an arc at right angles to the plane of rotation of the frame.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES HENRY MYERS.

Witnesses:

D. A. MINARD,
W. A. CRAWFORD.