Description of an improved extension apparatus for the treatment of fracture of the thigh : in use in the New York Hospital for the past six years, and in the United States Army General Hospitals during the Civil War / introduced by Gurdon Buck.

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DESCRIPTION OF AN IMPROVED

EXTENSION APPARATUS

FOR THE TREATMENT OF

FRACTURE OF THE THIGH,

In use in the New York Hospital for the past six years, and in the United States Army General Hospitals during the Civil War.

INTRODUCED BY

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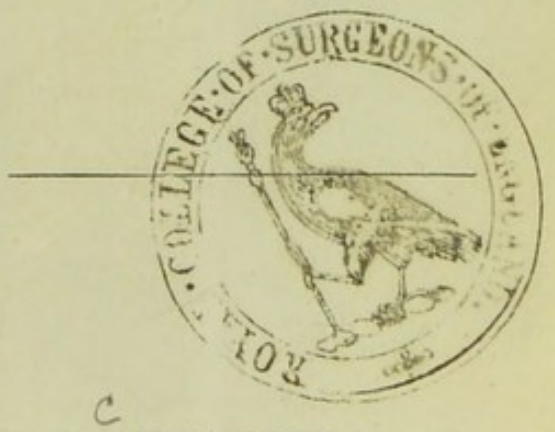

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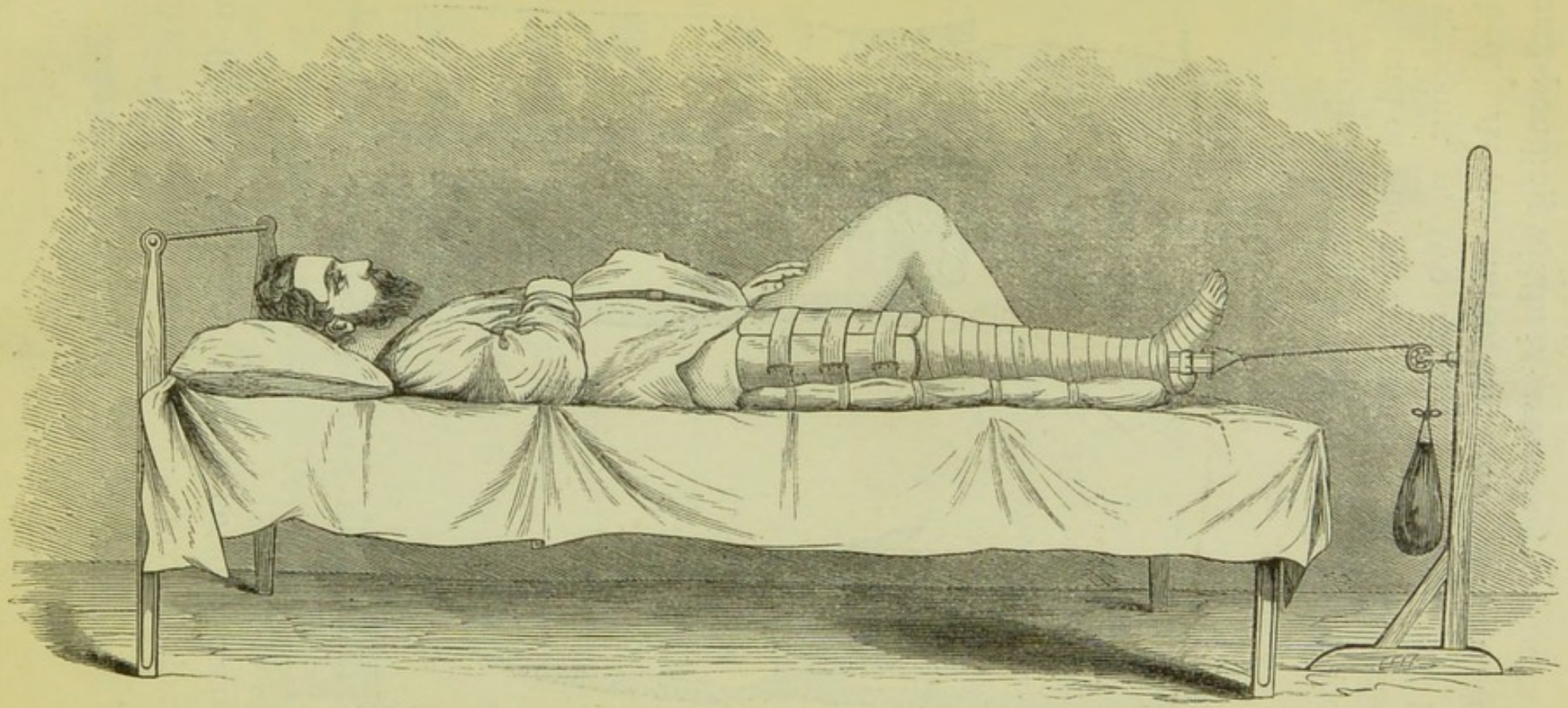

Fig. 1.—*A patient under treatment with the Apparatus applied.*

Fig. 2. Two bands of Adhesive Plaster spread on Canton flannel, or thick twilled cotton; each band

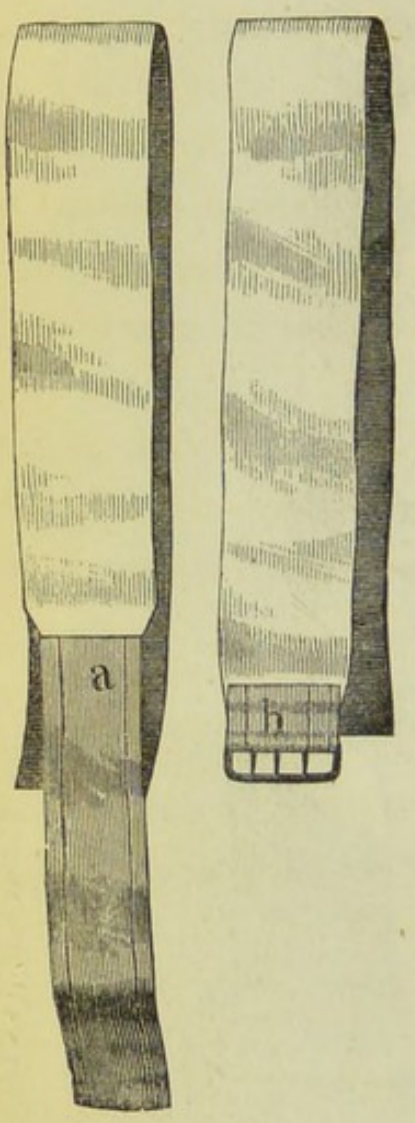

Fig. 2.

Fig. 3.

Fig. 4.

being two inches and a half wide, and two feet long. At the end of one of the bands, a piece of elastic rubber webbing, *a*, two inches wide and ten long, is attached. At one end of the other band, a buckle, *b*, of corresponding width, is fastened.

Fig. 3. A thin block of wood three inches and a half wide transversely, and three inches vertically.

Fig. 4. *A Perineal Band for Counter-Extension*—*a*, the perineal portion consists of rubber tubing of one inch calibre, having inside of it a tube of muslin stuffed with bran, and left an inch longer than the rubber tube at both ends. At each end of the muslin tube, a metallic ring is first fastened, and then shoved within the rubber tube, to the end of which it is also fastened. This arrangement preserves the rubber tube from being overstretched.

b, *b*. Two straps fastened to the rings at the ends of the perineal portion, serve to lengthen it, and allow it to be made fast to the head of the bedstead.

c. A belt that passes around the opposite side of the body, and maintains the bearing of the perineal band in a line with the axis of the body and limb. The perineal portion should be wound with a narrow strip of Canton flannel, or other soft material, and this should be changed as often as soiled.

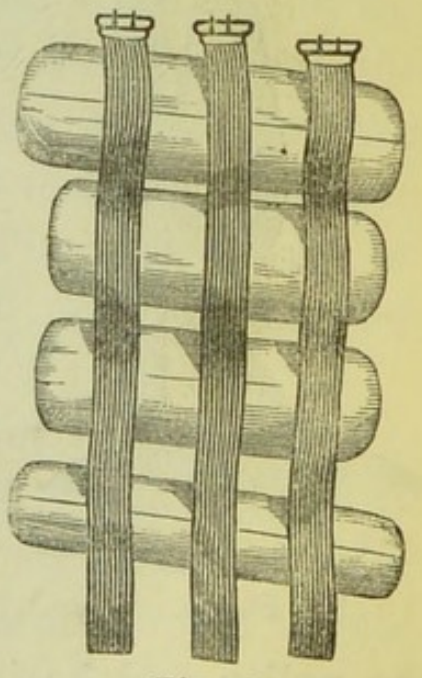

Fig. 5.

Fig. 5. Four guttered coaptation splints, covered with flannel, are intended to

surround the fracture, and be secured in place by three elastic bands each having a buckle at one end.

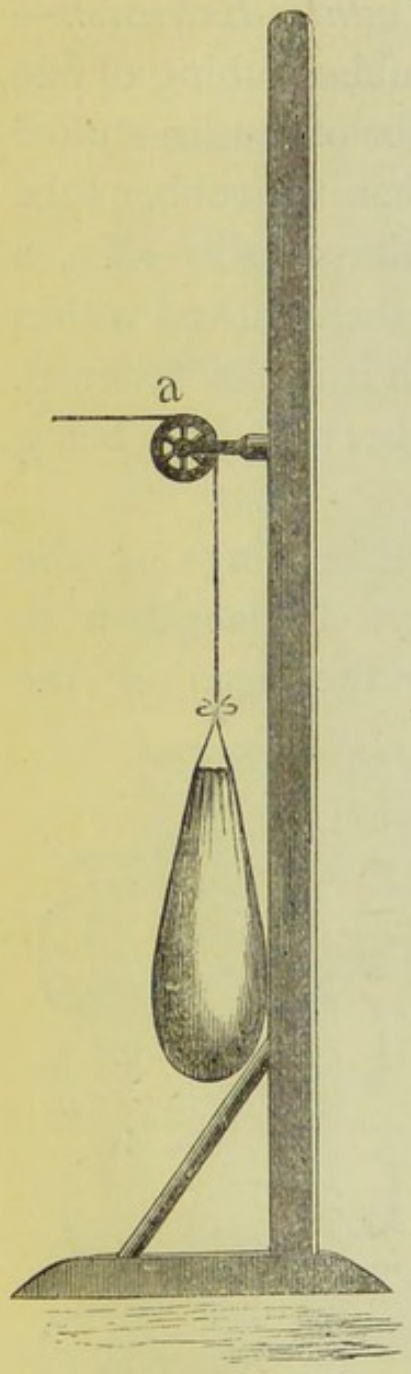

Fig. 6.

Fig. 6. An upright, supporting a pulley-wheel, *a*, to be fastened by three screws to the floor opposite the foot of the bed.

MODE OF APPLICATION.

The bands of adhesive plaster are first to be applied, one on either side of the limb from a point above the ankle upwards as high as the seat of fracture. The limb is then to be bandaged in the usual manner; beginning at the toes, and covering the plasters, but leaving their lower ends free. The band of elastic webbing is next passed round the sole of the foot, and fastened to the buckle on the other side of the foot. The block of wood should then be interposed between the loop of webbing and the foot. A cord fastened to the block thus adjusted is passed over the pulley, and has a weight suspended from it. This arrangement combines elasticity with the extending force, keeps the bands stretched out smooth, and pre-

vents pressure upon the ankles. The amount of weight required must be proportioned to the resistance to be overcome, and the toleration of the patient. Sometimes five or six pounds only can be borne at the outset, and an increased weight subsequently.

After a fracture has taken place, the sooner the limb is put up and subjected to treatment the better. Spasmodic twitchings of the muscles are controlled, and the patient made comfortable from the outset. To permit the application of lotions to the seat of injury during the first few days, the bandage should not be carried above the knee, and the ends of the plaster should be rolled up and kept in reserve. At the end of six or eight days the plasters may be extended up on the thigh, and the bandage continued over them. The Coaptation Splints are now to be applied around the thigh and secured by the three elastic bands. To complete the apparatus the perineal band should be adjusted, and its ends fastened to the head of the bedstead, so as to be in a line with the axis of the body and limb. The limb should be raised on a hair cushion, sufficiently to keep the heel from pressure.

In the employment of this method of treatment, experience has shown that in a large majority of cases the use of the perineal band may be dispensed with, the weight of the body being sufficient to resist the extending force. This resistance may be further increased by raising the foot of the bedstead five or six inches above the floor.

ADVANTAGES OF THE METHOD.

The advantages claimed for this method over others heretofore in use, are its great simplicity of arrangement, facility of management, and especially the comfort it affords the patient during a long confinement in bed. The efficiency with which uninterrupted extension of the limb can safely be kept up, secures, it is believed, better results than have been obtained by any other method. The sitting posture may be allowed without disturbing the action of the apparatus, an indulgence for which patients are always very grateful, and one which greatly alleviates the irksomeness of their condition. The materials required for employing this treatment are obtainable under almost any circumstances, the only indispensable article being adhesive plaster. If this is of the ordinary description, it is better to use it of double thickness. All the other articles requisite may be improvised. The elastic band may be dispensed with, and a round stick properly placed across the foot of the bedstead, may serve instead of a pulley.

RESULTS OF TREATMENT.

The following statement shows the results of this method of treatment in the New York Hospital, since September, 1860, a period of six years.

TOTAL NUMBER OF SIMPLE FRACTURES OF SHAFT OF OS FEMORIS TREATED. 146 CASES, AGED FROM 2 YEARS TO 63 YEARS.

Under 15 *years of age*, 54 *cases, of which* 45 *male*, 9 *female.*

Primitive Shortening in 46 of 54 cases.	Weight employed in 38 cases.	Result of Treatment in the 54 cases.
½ inch to 2½ inches. Average 1⅛ inches.	3 pounds to 20 pounds. Average not quite 9 pounds.	No Shortening in 33 cases. Maximum of Shortening, 1 inch in 2 cases. Average of total 54 cases, about 1-6 inch.

Over 15 *years of age*, 92 *cases, of which* 79 *male*, 13 *female.*

Primitive Shortening in 83 of 92 cases.	Weight employed in 79 cases.	Result of Treatment in 89 cases recorded.
½ inch to 3½ inches. Average 1⅝ inches.	3 pounds to 28 pounds. Average 14½ pounds.	No Shortening in 12 cases. Maximum of Shortening, 1½ inches in 2 cases. Average scarcely ½ inch.

In all cases the measurement was taken with a graduated tape from the anterior superior spinous process of the ileum, to the extremity of the internal malleolus.

The employment of a weight and pulley, for the purpose of maintaining constant extension of the limb in the treatment of morbus coxarius, was first brought to the notice of the medical profession in New York by Henry G. Davis, M.D., and to this source the author acknowledges his indebtedness for the suggestion of its application to the treatment of fracture of the thigh.

APPLICATION OF THE METHOD TO STUMPS.

Another important application of the weight and pulley extension has been made by A. Hermance Smith, M.D., Assistant Surgeon U. S. Army, to the treatment of stumps of the lower limb, in which retraction of the soft parts leaves the end of the bone exposed, and sometimes necessitates reamputation. It was first employed by Dr. Smith in the U. S. Army General Hospital at Frederick, Maryland, in September, 1862.

Subsequently, Assistant Surgeon Robt. F. Weir, M.D., in charge of the same hospital, extended its use to the treatment of stumps immediately after amputation to prevent painful twitchings, and found it afforded great comfort to the patient, and that without interfering with the application of the requisite dressings to the stump.

It has since been extensively employed in civil as well as military practice, and its superiority established as the best means we possess of preventing retraction.

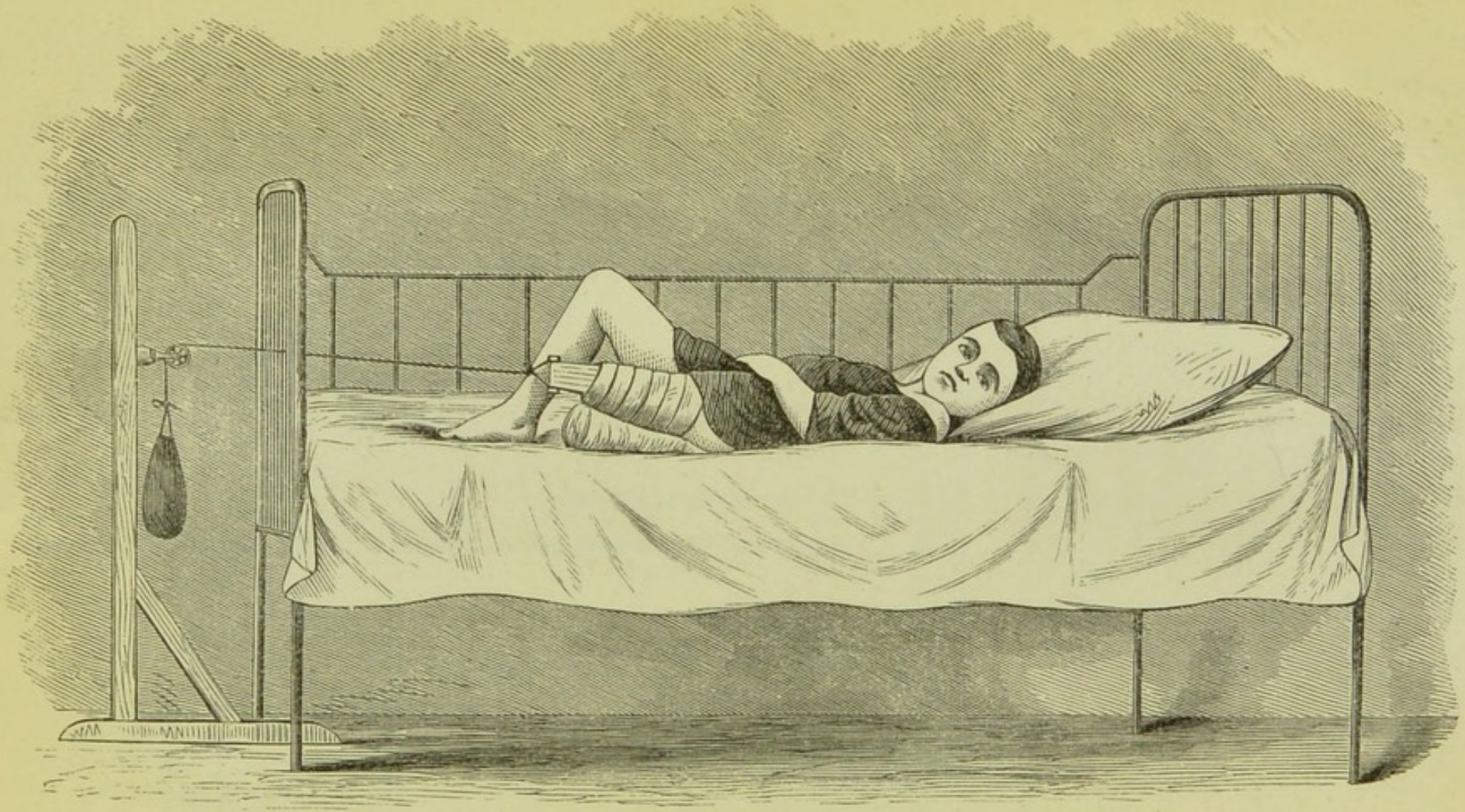

Fig. 7.—*A patient with the apparatus applied to a stump of the thigh.*