

designated as the upright form, to distinguish it from the one to which I now take pleasure in inviting your attention. This, which I shall refer to as the *recumbent* (see fig. 4), is constructed upon

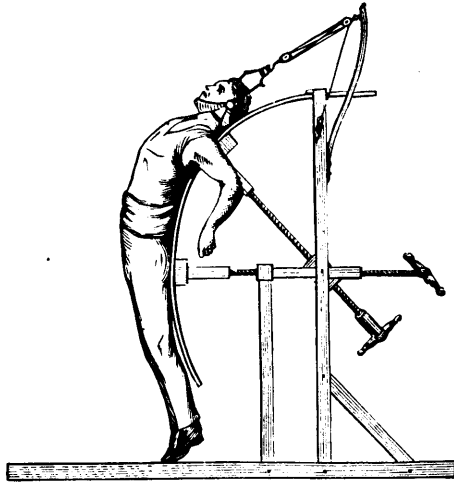


Fig. 3.—Stillman's Upright Spinal Extension Frame. (Posterior Curved Position.)

the same principle, but a longer continuance of the traction is permitted while resting upon it than while using the upright form, and it is therefore better adapted for patients of delicate physique and those in advanced stages of disease.

It should not be lost sight of, that in the use of these frames the patient is combining rest with traction in a greater degree than is possible in suspension by the Sayre method.

I shall proceed to the consideration of my subject mainly with reference to two conditions, viz.: 1st, the Influence of Traction, exerted during *posterior* curving of the spine, as a method of treatment in Pott's Disease and Lateral Rotary Curvature; and 2nd, the Influence of Traction, exerted during *anterior* curving of the spine, as a method of treatment in Locomotor Ataxia.

The use of these frames is not by any means confined to the treatment of these three conditions, but they are the only ones which will engage our attention this evening.

The changes in form of the spinal column under the influence of traction may chiefly be referred to two causes, viz.: the character of the inter-vertebral substance and ligaments connecting the vertebrae—and the shape of the vertebrae.

The inter-vertebral substance at its circumference is composed of fibro-cartilage and fibrous

tissue, disposed in laminæ—these being arranged concentrically one within the other, with their edges turned toward the corresponding surfaces of the vertebrae. The plates of which these laminæ are composed are not quite vertical in their direction, those nearest the surface being curved outward, and closely approximated, protection being thus secured for the vertebrae in case an unsuspected jar or impact is received by them while the spine is curved.

The centre of each inter-vertebral disk is composed of soft, elastic, pulpy matter, and the combined effect of the circumferential and central composition of the inter-vertebral substance is to produce an elastic, tough material, which is both extensible and compressible in its nature, acting as an elastic "buffer" between the bodies of the vertebrae, while superincumbent weight is borne upon the spinal column, and allowing elongation of the vertebral column during traction.

The natural curvatures of the spine in the neck and loins are due in a great measure to the variation of the inter-vertebral disks in shape, size, and thickness.*

In *shape* they accurately correspond with the surfaces of the bodies between which they are placed, being oval in the cervical and lumbar regions, and circular in the dorsal.

In *size* they are greatest in the lumbar region.

In *thickness* they vary not only in the different regions of the spine, but in different parts of the same region; thus they are uniformly thick in the lumbar region; thickest in front in the cervical

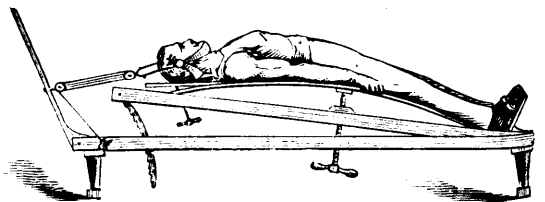


Fig. 4.—Stillman's Recumbent Spinal Extension Frame. (Posterior Curved Position.)

and lumbar regions, which are convex forward, and behind, to a slight extent, in the dorsal region.

The cervical and lumbar regions are thus necessarily given a greater freedom and pliancy of movement than the dorsal region, which has, in proportion to its length, a much smaller quantity

* The writer is indebted to "Gray's Anatomy" for the accuracy of these descriptions.