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*Tate's method of Raising and Lowering Weights.*

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a friction strap and the load on the swing begins to descend, carrying out with it the arms from which it hangs. The swing when held in its position having its centre of gravity in advance of the axis of the arms, is consequently at the end of a lever, whose length equals the distance between its centre and the centre of the axis of the arms. A curved lever has its shortest end at this moment engaged by the lifting end of the platform, and this short end, the descending load, connected with it by the means described above, causes it to rise. The swing in descending describes an arc of a circle, and as it leaves its original position increases its leverage; the curved lever also as it revolves on its axis, increases gradually the length of its arm, which equalizes the motion of the descent, and enables the person about to apply this principle, to obtain such height of lift as he may require, by adjusting the parts one to the other; when the swing has descended with its load as far as the arms will allow, the platform is in its upper position and is held there by means of four small catches, a small flap falls down and the barrels fall forward towards the swing. Should it be requisite to allow the barrels to descend still lower, the operator relieves a weight on a clip or lever, and the barrels in the swing outweighing the counterpoise, cause the swing to descend as far as is requisite. When the swing is unloaded by withdrawing the pins which hold the top, and rolling out the barrels, the operator being notified again relieves the weight on the clip, and the counterpoise causes the swing to ascend to its original position. The ascending platform is unloaded, the catches which held it are withdrawn by pressing on a pedal, the friction strap is relieved of its weight, and the arms with the swing are raised up to their original position by a balance weight which is attached to their lower end, at the same time the platform descends. The small catch again secures the swing, the top is raised, the barrels roll in whilst another load is delivered into the rising platform below, when the whole operation is again gone through and another load deposited in the hold of the ship or vessel as the case may be.

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