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LATTA'S APPARATUS FOR THE REDUCTION AND RETENTION OF FRACTURES.

We present our readers this week with full engravings of a new apparatus for the reduction and retention of fractures of the lower extremities. As these injuries are of daily occurrence, liable to happen to every one, any attempt to improve their treatment is of public importance. The old mode of treatment compelled the patient to lie on his back in a state of enforced idleness for at least two months, while this new apparatus not only enables him to sit up, recline, or lie down at pleasure, but to pursue any business or to do any kind of work that he could do while sitting in a chair if well. When it is recollected that the loss of time is often considered the most serious result of the injury, the value of the improvement will be clear enough. It is evident that this freedom of posture and occupation of the body and mind tends to preserve the health of the patient, to increase the reparative power of the system, and promote a rapid cure.

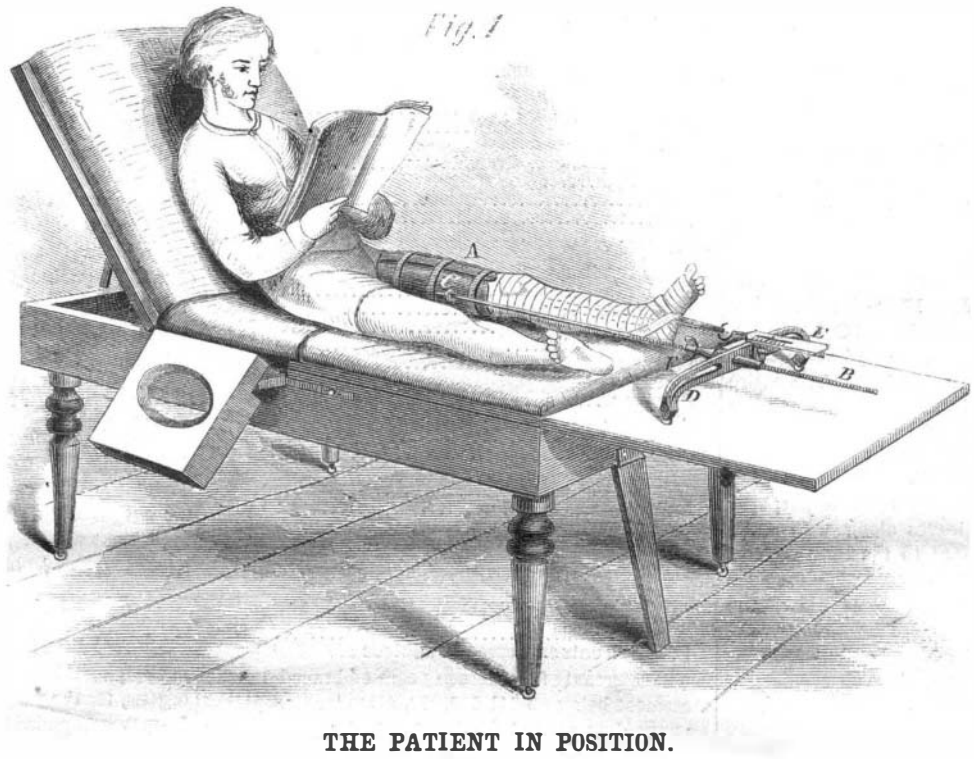
In Fig. 1 the details are given. The bed splint is shown at A, and a long steel rod, B, is attached to the top of it by a socket, C, and at the bottom passes through a cross bar, D, on rollers. To the crossbar a scale and spring balance, E, is attached by a clamp which slides in a slot in the cross bar, and may be changed from one side to the other. The frame of he spring balance has also a slot in it to enable the scale to be elevated or depressed at pleasure. The lower half of the rod has a thread cut on it, on which is a thumb screw, F.

It is admitted by the highest medical authority that the management of fractures of the lower extremity is the most difficult part of surgery; and it is further admitted, that with the best means of treatment heretofore in use, not more than one-half of the cases can be brought to a satisfactory conclusion.

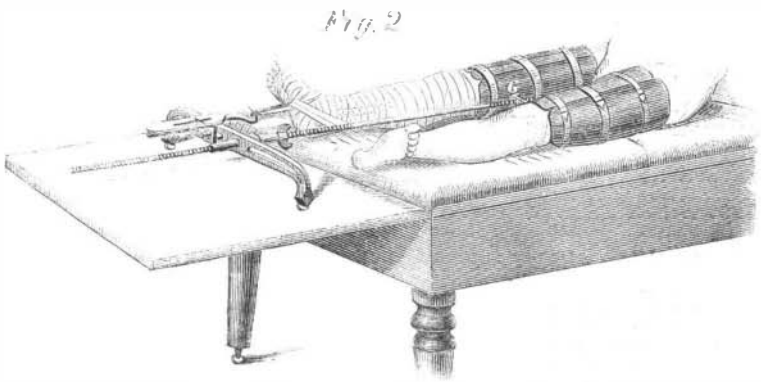
The number of cases annually occurring in the United States is estimated at over six thousand; consequently more than three thousand persons, many of them young, are every year turned out upon the world in a crippled condition. This simple statement shows the urgent necessity for improvement in the mechanical appliances made use of in such cases.

The plan here represented is designed, if possible, to obviate the difficulties that surgeons have had to encounter. The mode of application is as follows:—

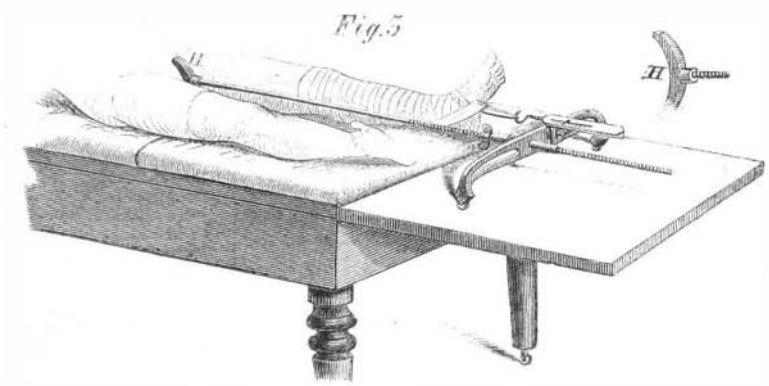
The patient is first placed upon the fracture bed, and the limb is held by assistants until the dressing is applied on the lower part of the leg. The fracture is now reduced, and the bed splint, as shown in Fig. 1, is applied and properly secured by straps around the thigh. The upper end of the rod is slipped into the socket at the top of the bed splint, and the loop of plaster, at the bottom of the foot, is attached to the hook on the scale. The nut on the rod is then turned down, carrying the cross bar with the foot attached along with it until the necessary amount of strain or extension is secured. The amount of strain is shown by the pointer on the scale, and it enables the nurse to keep the tension exactly at the point indicated by the surgeon. A fracture dressed in this way is almost free from pain.



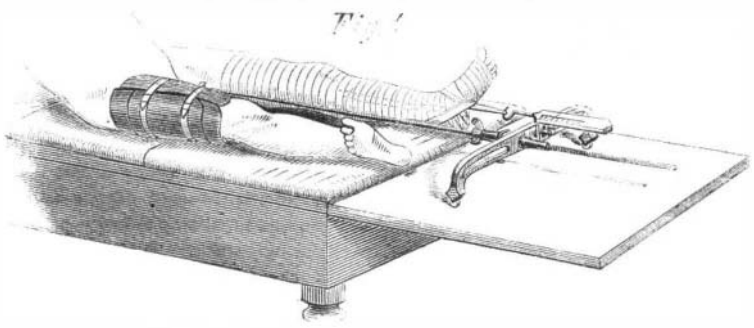
THE PATIENT IN POSITION.



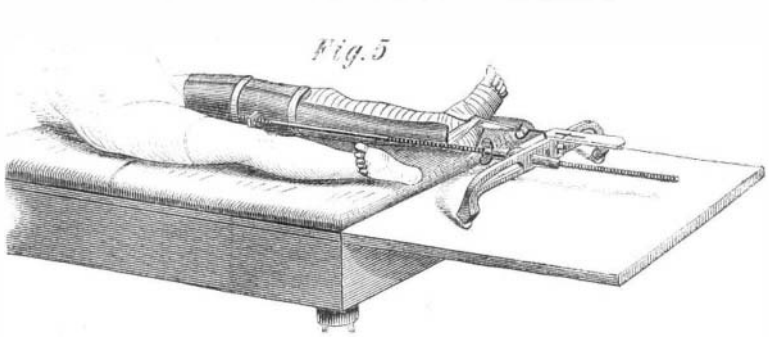
THE APPARATUS ON BOTH LEGS.



HOW THE LENGTH IS OBTAINED.



THE SPLINT ON THE OTHER LEG.



THE SPLINT THE WHOLE LENGTH OF THE LIMB.

The details in Fig. 2 are the same as in Fig. 1, with the addition of a second bed splint, both being attached to the top of the rod by a crosshead, G. This engraving also represents the mode of applying the dressing in case both limbs are broken, both limbs being dressed alike.

Fig. 3 represents a measuring apparatus to make both legs of the same length. A crutch head, H, is substituted for the bed splint. The length of the limb is determined by means of a scale on the extending rod. It is often of the utmost importance for legal, as well as surgical reasons, to be able to get the exact length of the limb, but the old way of doing it with the tape line is entirely unreliable. By the plan here proposed, the surgeon can get the length of the limb as certainly as a carpenter could get that of a plank.

Fig. 4 is the same as Fig. 1, except that the bed splint is placed upon the opposite limb. Sometimes the fractured limb is so bruised or wounded, that pressure upon it can not be borne. Under the old methods of treatment nothing could be done with such a case, but by the adoption of this device the counter extension is shifted to the sound side, and the strain is kept up without difficulty. The same plan is applicable to the treatment of acute inflammation of the hip joint without fracture.

Fig. 5 is the same as Fig. 1, only the bed splint is intended to reach the whole length of the limb. This represents a new plan for the treatment of fracture of both bones of the leg below the knee. When both bones of the leg are broken all control over the foot is lost, and it falls about any way, independent of the will or wish of its owner, and it was a common occurrence to find, after reunion was effected, the foot turned in or out so as to create deformity and lameness. This plan enables the surgeon to keep the foot exactly in the right position.

This apparatus was patented through the Scientific American Patent Agency, June 17, 1862. and another application is pending before the Patent Office, by Dr. M. M. Latta, of Goshen, Ind., who may be addressed for further information at that place. The entire patent is for sale. [See advertisement on another page.]

Indelible Ink.

Gold ink is made by grinding upon a porphyry slab, with a muller, gold leaves along with white honey, till they become reduced to the finest possible division. The paste is then collected upon the edge of a knife or spatula, put into a large glass, and diffused through water. The gold by gravity soon falls to the bottom, while the honey dissolves in the water, which must be decanted off. The sediment is to be repeatedly washed till entirely freed from the honey. The powder, when dried, is very brilliant, and when to be used as an ink, may be mixed up with a little gum water. After the writing becomes dry, it should be burnished with a wolf's tooth.

Silver ink is prepared in the same manner.

Indelible Ink.—A very good ink, capable of resisting chlorine, oxalic acid, and ablution with a hair pencil or sponge, may be made by mixing some of the ink made by the preceding prescription, with a little genuine China ink. It writes well. Many other formulæ have been given for indelible inks, but they are all interior in simplicity and usefulness to the one now prescribed. Solution of nitrate of silver thickened with gum, and written with upon linen or cotton cloth, previously imbued with a solution of soda, and dried, is the ordinary permanent ink of the shops. Before the cloths are washed, the writing should be exposed to the sun beam, or to bright daylight, which blackens and fixes the oxide of silver. It is easily discharged by chlorine and ammonia.

A good permanent ink may be made by mixing a strong solution of chloride of platinum with a little potash sugar, and gum to thicken. The writing made therewith should be passed over with a hot smoothing iron, to fix it.—*Ure.*

Nitrate of silver 1 to 2 dr ; water ¾ oz. ; dissolve, add as much of the strongest ammonia water as will dissolve the precipitate formed on its first addition, then further add mucilage 1 or 2 drachms, and a little sap green to color. Writing executed with this ink turns black on being passed over a hot Italian iron.

Asphaltum 1 part ; oil of turpentine 4 parts ; dissolve, and color with printer's ink. Very permanent.—*Cooley.*

Production of Gold and Silver.

Many questions of interest suggest themselves connected with the relative production of the precious metals. Previous to the discoveries in California, gold uniformly commanded a premium; its influx at that time quickly destroyed this, and the continued demand for silver resulted in its being at a slight premium. The ounce of gold in London in 1848 was 77s. 6d., and the ounce of standard silver 59½ or 15⅝ for 1. With the influx of gold from California, France, as is well known, gradually exchanged her silver for a gold currency, and India absorbed the silver in exchange for silks and other commodities. During the war cotton at high prices has been added to other articles for which silver was sent to India. On Jan. 1, 1866, the price of silver was 62d, or 4·2 per cent rise since 1848.

These facts are of interest in connection with the following tables which we have compiled showing the total production of gold and silver since 1847. The first table gives the estimated amount of gold yielded by all the producing countries from 1848 to 1865, both years inclusive:

PRODUCTION OF GOLD, 1848–1865.

Countries of Production.	
NORTH AMERICA:	
Mexico, etc	71·0
United States (Atlantic)	8·6
SOUTH AMERICA:	
Venezuela and N. Grenada	26·0
Bolivia	17·3
Brazil	42·6
Peru	24·7
Chili	20·3
ASIA:	
Malay Peninsula	28.2
Farther India	72·3
Eastern Archipelago	46·2
Japan	130·5
China and Thibet	304·8
NORTHERN EUROPE and ASIA	411·1
EUROPE:	
Germany	9·0
Austria and Italy	29·1
Spain	56·8
AFRICA	110·0
Total, Old sources	1,408·6
UNITED STATES (Pacific)	1,056·5
BRITISH NORTH AMERICA	49·5
AUSTRALIA and NEW ZEALAND	792·0
Total, New Sources	1,897·0
Other Countries	36·0
Grand Total	3,341·5

[The amounts expressed in millions of dollars.]

The aggregate for eighteen years embraced in the statement being $3,341.500,000, gives for that period an annual average of $185,638,888 additional to the world's stock of gold—an average constantly on the increase by the opening of new regions and the adaptation of scientific processes to its extraction.

PRODUCTION OF SILVER, 1848—1865.

Countries of Production:	
NORTH AMERICA:	
Mexico, Etc	580·0
United States	53·0
SOUTH AMERICA:	
Bolivia	72·0
Brazil	29·5
Peru	120·0
Chili	65·8
Venezuela and N. Granada	19·6
ASIA:	
Malay Peninsula	18·0
Farther India	36 0
Japan	144·0
China and Thibet	206·6
NORTHERN EUROPE and ASIA	66·0
EUROPE:	
Germany	39·5
Austria	36·0
Spain	49·5
England	11·3
AFRICA	24·0
Other countries	50·2
Grand Total	1,620·4

For the whole eighteen years the production has thus apparently amounted to $1,620,400,000, or on the average $90,022,222 yearly. Except so far as relates to the United States, there has been but a moderate increase in the annual yield since 1847.

To obtain the weight of metal produced we must multiply the amount in dollars by 25·8 grains for gold and by 412·5 for silver, thus—

Gold.	Silver.
3,341,500,000 dols.	1,620,400,000 dols.
25·0	412·5
86,210,700,000 grs.	668,415,000,000 grs.
12,315,814 lbs.	95,487,857 lbs.
6,157 tuns.	47,743 tuns.

or nearly in the proportion of eight tuns of silver to every tun of gold produced.

The above, however, is gold and silver nine-tenths fine, and to reduce them to fine metal a tenth must be deducted. The quantity of fine gold produced was thus approximately 5,542 tuns avoirdupois, or 307½ tuns a year, and the quantity of fine silver 43,-969 tuns, or 1,832 tuns a year.

A cubic inch of water weighs 252½ grains, and the specific gravity of gold is 19.3, or gold is so many times heavier than water Hence, a cubic inch of gold weighs 4,873¼ grains, 0·69618 lbs. avoird. A cubic foot is 1,728 such cubic inches, and the weight of a cubic foot of gold is about 1,203 lbs. avoird. The whole of the fine gold produced in eighteen years was 5,542 tuns, or 11,084,000 lbs., an amount which would occupy a space equivalent to 9,213½ cubic feet. A solid shaft 92 feet high and 10 feet square would represent this amount. It would build a wall 1,842½ feet long, one foot thick and five feet high. If melted it would fill 68,916 wine gallons, or about 1,094 hogsheads of 63 gallons. Such illustrations will aid the mind in comprehending the magnitude of the gold heap collected from the various sources yearly, or as above, in a period of years. Cut into slabs one inch thick, the same amount would cover a space of 110,562 square feet! Divide any of the above sums by 18 and you obtain the weight, bulk or extent of the annual gold crop.

The specific gravity of silver is 10 5, or it is so many times heavier than water. It will therefore take not much more than one-half the weight of this metal to perform the same offices we have assigned to gold in the above calculations.—*Hunt's Merchants' Magazine.*

NEW INVENTIONS.

Water Wheel.—This invention relates to an improved water wheel of the class commonly termed the "Jonvil Turbine," and it consists in a peculiar construction and arrangement of the buckets, and their application to the wheel, and in a means for relieving the lever end of the wheel shaft and step from the weight of the wheel, as well as in a peculiar arrangement of gates, whereby it is believed that many advantages are obtained over other wheels of the same class in use. Henry Van Dewater, of Buffalo, N. Y., is the inventor.

Musical Instrument.—This improvement consists in applying a large reed to reed instruments or pipe organs, for the purpose of producing a tremulo tone. It may be applied in different ways, and its vibration is to be so slow as not to produce a musical tone. In reed instruments, of the class of melodeons and cabinet organs, it may be inserted in the reed board as are other reeds, and used with the swell closed, when it will put the air in motion both outside and inside of the reeds and reed board, and so produce the tremulo tone. Or it may be placed inside of the wind box with the swell open or closed. It may be used with one or more sets of reeds, as may be desired. A register should be provided to govern the access of the wind to the reed. In applying this invention to pipe organs it may be attached to the side of the conducting pipe between the bellows and wind box, with an air passage through the sides of the conducting pipe sufficient to put the reed in motion, which will cause the air inside of the conducting pipe to be vibrated so as to produce a tremulo. In all cases it is to be used with a valve and register. Joseph and Ephraim Foster, of Keene, N. H., are the inventors.

Water Elevator.—This invention consists in the employment of a friction wheel of novel construction, which, in combination with a crank, also of novel construction, and an automatical operating pawl, the elevation of the bucket is easily accomplished, and the velocity of the descent of the same is perfectly regulated, one hand only being required to operate the entire apparatus. With this elevator, should a carless management of the crank take place, no accident could occur by a too rapid descent of the bucket.

The inventor of this water elevator is Edwin Hoyt, Stamford, Conn., and the patent was issued April 3, 1866.

BACK NUMBERS.—New subscribers are informed hat the back numbers of the present volume are out f print. Subscriptions are entered from the date f their receipt.