Author too says, that the First Year of *Domitian*'s being Emperor was the Eighth of his Consulate; neither of which agree with the Inscription on the Leads.——

I am,

Honoured SIR,

Your most obliged,

Obedient Servant,

S. Kirshaw.

The Dimensions of the Piece of Lead, TAB. II. Fig. 1.

From *a* to *b.*	——	21 Inches.
d to *e.*	——	23 $\frac{1}{2}$.
a to *c.*	——	3 $\frac{1}{2}$.
e to *f.*	——	5 $\frac{1}{2}$.
Perpendicular Depth		4.

IV. *The Description and Draught of a* Machine *for reducing* Fractures *of the* Thigh, *by Mr.* Henry Ettrick, *Surgeon.*

HAving frequently considered the many Inconveniencies, and great Difficulties, attending the common Methods of Reduction, I determined with myself to attempt a Form more mechanical and certain. I immediately fixed on the Axle and Wheel, as the most simple, and yet fully capable of taking in and ingrossing all and every Advantage necessary towards

towards the well reducing of Fractures, *&c.* It conſiſts of no more than a Wheel and Pinion, with their Axles; the Roch, or ſnagged Wheel, being herein accounted as Part of the great Wheel, fixed in a light Frame of about Two Feet long, [ſee Fig. 2. TAB. II.] the Whole not exceeding the Weight of 15 Pounds; and when taken to Pieces, by unſcrewing the Frame-pieces, may be packed up in a common Ruſh-Basket, belted to the Side, and conveyed to any Diſtance. Again, the Room it takes up in working is not a full Yard, and may be ſet up and fixed for Uſe in a few Minutes. In uſing this Machine, the Surgeon need but one Aſſiſtant; whereas, in moſt other Methods, their Number is moſt troubleſome and inconvenient: The Buſineſs of this Aſſiſtant is no farther than to mind the Surgeon's Orders, and move the Winch according to his Direction. When the Extenſion is ſufficient, the Engine ſtays itſelf, and continues the Tenſion of the Limb, by the Aſſiſtance of this Roch, or toothed Wheel, whoſe Teeth are cut fine enough to ſtay the Engine at every Line of an Inch, and which is fixed on the Back of the aforeſaid great Wheel, both to the Croſs by the Help of Screws, and on its Arbor by having its Centre ſquared out, ſo as to fix tight thereon, and ſo near the Frame as only to allow a bare clearidge: Its Teeth, ſtanding counter to the former, admit the Spring or Catch fixed on the Inſide of the Frame, to ſlip over the Vertex thereof, without Interruption; but in a reverſe Rotation, or when the Engine is about to come up, flies into the Spaces thereof, and ſtays the ſame: The upper Part thereof projects about an Inch from the Frame, ſo that being preſſed upon by the Finger of

one Hand, the inferior Part is elevated above the Range of the Teeth, to admit the coming up of the Engine, which is to be directed by the other Hand being applied to the Winch in any Degree. This Engine has its Power ſo commanded, that it may be uſed without Reſtriction, from the moſt robuſt to the moſt tender Frame, ſeeing it acts and exerts its Power in proportion to the Reſiſtance made. Farther, as hinted at before, it is enriched with all thoſe Properties which Authors affirm neceſſary to a ſucceſsful Operation; for this Extenſion, according to their Obſervation, is made deliberately, ſteady, equally, and in one continued Line, without the leaſt Variation. And further, in oblique Fractures of the Thigh, where the Bones are apt to ride, (and therefore, on that Account, require a continued Extenſion in a certain Degree, to prevent the Limbs ſhortening after the Cure) ſuch a Machine muſt be of excellent Service; having the Property of increaſing or decreaſing the Extenſion at Pleaſure, and to be perfected without the leaſt Jar or Tremor.

The neceſſary Appendages are Bands, by which the Engine extends the Limb; and deſerve the following Obſervations: Immediately from the Axle of the great Wheel comes a Girt, at the other End of which Girt is a Hook, which links into a Swivel-Ring at the Bottom of a Sole-plate: This Sole-plate anſwers the Shape of the Foot, and is made of well-hammered Braſs, the Inſide of which is padded, to ſit eaſy to the Foot: The upper Part hath a Strop fixed thereto, which claſps over the upper Part of the Metatarſal Bones; and to keep the Strops ending in the Sole-plate from galling or preſſing the Sides of the Foot

Foot and Ancle, there project Two Arms from the Sides of this Sole-plate, to which the Strops coming from the Ancle-band are faſtened. That the whole Limb may be kept in a Line with the Machine, the Leg is ſuſpended by Bands, one of which is placed at the Ancle, from the Sides of which paſs Two Strops, to join the inferior Knee-band: From this Band paſs Two Strops to the ſuperior Knee-band: All theſe Strops are deſigned to divide the Extenſion, ſo that all Parts may equally bear alike, and ſo to ſecure the Joints of the Limb from the Violence of the Extenſion. The Inſide of theſe Strops are lined; the Bands incircling the Limb are contrived in the ſame Manner as the Bow or Spring of a Truſs, having ſtrong Claſps at the Ends, after the Manner of thoſe for Pocket-books, to fit any Dimenſions. The Band embracing the Part above the Fracture, and from which paſs Two Strops to the Head of the Bed, to make the Counter-extenſion, is of the ſame kind as the former, and is to be kept on, the whole Time of Decumbiture, to prevent the Patient's Body ſinking on the Fracture, and thereby contracting the Limb. The exterior of the Two laſt-mentioned Strops preſſes juſt beneath the great *Trochanter* on its Outſide; the other comes from the anterior Part of the ſame Band, and in ſuch a Scite as to give the Patient Liberty to raiſe himſelf at Diſcretion. To preſerve the natural Curvity of the Thigh, it would be neceſſary to have a large broad Band ariſing from the Bedſide, to encompaſs the fractured Part, and keep it ſteady.

Explanation of Figure 2. TAB. II.

A. A. *Repreſents the Bed.*
B. *The Patient.*
C. *The Machine at the Feet of the Bed.*
D. D. *The Frame.*
E. *The great Wheel.*
F. *The Roch-wheel, with a Catch and Spring, to prevent the Wheel going back.*
G. *The Pinion.*
H. *The Winch.*
I. *The Arbor of the great Wheel, whereon*
K. *the Girt* K *is fixed: The Diameter of the Barrel thereon is Two Inches.*
L. *The End of the Girt fixed by*
M. *the Ring* M. *to*
N. *the Sole-board* N.
O. *The Band which paſſes over the Inſtep.*
P. *The Ancle-band.*
Q. *The Strop which paſſes from the Sole-plate to the Ancle.*
R. *The Strop continued from the Ancle to the Knee.*
S. *The Knee-band.*
T. *The ſuperior Knee-band, with the Strop continued, as before.*
V. *The Band embracing the Part above the Fracture.*
W. W. *The Counter-ſtrops paſſing to the Bed's-head.*
X. *The lateral Band to preſerve the Curvity of the Thigh-bone.*

P. S.

P. S. I thought it would not be improper, if I ſhould attempt to demonſtrate to what great Exactneſs Machines of this Nature may be made to operate.

A Specimen of which I beg Leave to preſent as follows: Admit the Barrel 4 Inches Diameter, the Roch-wheel to be cut with 48 Teeth, the great Wheel to have 32, anſwerable to a Pinion with 8. The Reaſon of pitching on a Barrel of this Dimenſion is, that it may be more preciſely judged what Extenſion has been made; for repeated Revolutions of the Girt upon the Cylinder, in extending, would, by its uncertain Increaſe, ſubject the Judgment to err; whereas the utmoſt Extenſion required comes within one Revolution of this Barrel. The Teeth of the Roch to be numbered at every Fourth, which will be at every Inch, and equals in one Revolution the Periphery of the Barrel; conſequently every Tooth of this Roch will ſtretch the Limb One-fourth of an Inch: So though the Spring or Catch to the ſaid Roch ſhould paſs the capital Numbers, and ſtop in the Interſpaces thereof, it is only counting from the laſt capital Number to the Place where the Spring is, and that gives the Parts of the Inch: By the ſame Rule the Winch, every Turn it makes, will gain a Fourth of this Wheel, which will be 3 Inches, or 12 Teeth; and 4 Revolutions thereof will anſwer to the Periphery of the Barrel: So by meaſuring the ſound Limb, and comparing the fractured therewith, the Extenſion required may be nearly demonſtrated. With the Uſe of this Machine, I ſhould recommend the 18 Tail Bandage to the circular Rollers of *Hippocrates*, ſince they are both leſs troubleſome to the

the Surgeon, and leſs painful to the Patient; nor yet ſo liable to wreath the Muſcles, and diſtort the Ends of the fractured Bones.

And to render this Machine of the like Service at Sea, where we are in the greateſt need of Helps of this Nature; I have deſigned a Bed to ſwing and yield to the Ship's Motion, whereon the Patient is to be laid, with the Engine thereto fixed, that the frequent Diſcompoſure and Diſturbance given to the fractured Part by the Ship's rolling and working at Sea, may be prevented.

V. *De* Oſtreis Petrefactis *Relatio* Cornelii le Bruyn, *Illuſtrata per* Jac. Theodor. Klein, *R. S. S. Reip.* Gedan. *a Secret.*

INdefeſſus peregrinator Cornelius le Bruyn * inter alia ad hiſtoriam naturalem notatu digna, *pag.* 480. *ſeq.* oſtrea exhibet, quorum non ſolum valvas petrefactas, ſed & animal ipſum intra conchas in lapidem mutatum offendit.

Prima facie & narratio & figuræ, quas dedit, ſuſpectæ videbantur, magiſque fidenter quam vere traditæ. Audiamus auctorem:

" A quelque milles de Nicoſie il y a une petite " montagne, qui n'eſt que d'huitres petrifiées — les " ecailles en ſont ſerrées l'une contre l'autre, et, lorſ- " qu'on les ouvre, on voit l'huitre des deux cotés des

---

* *Voyage, Tome Second, à* Paris & Rouen 1725. 4°.

" ecailles,

TAB. II.

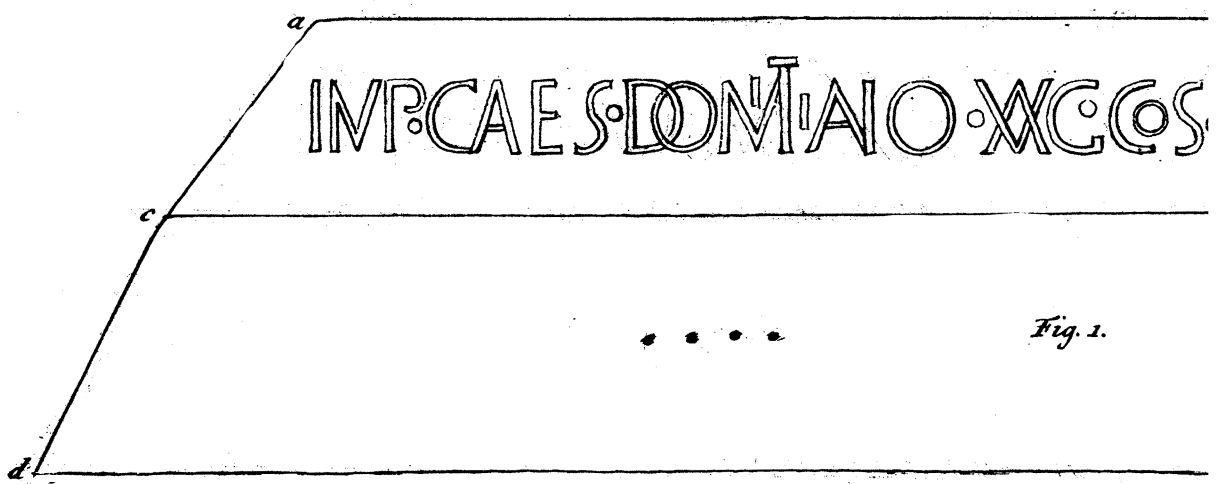


Fig. 1.

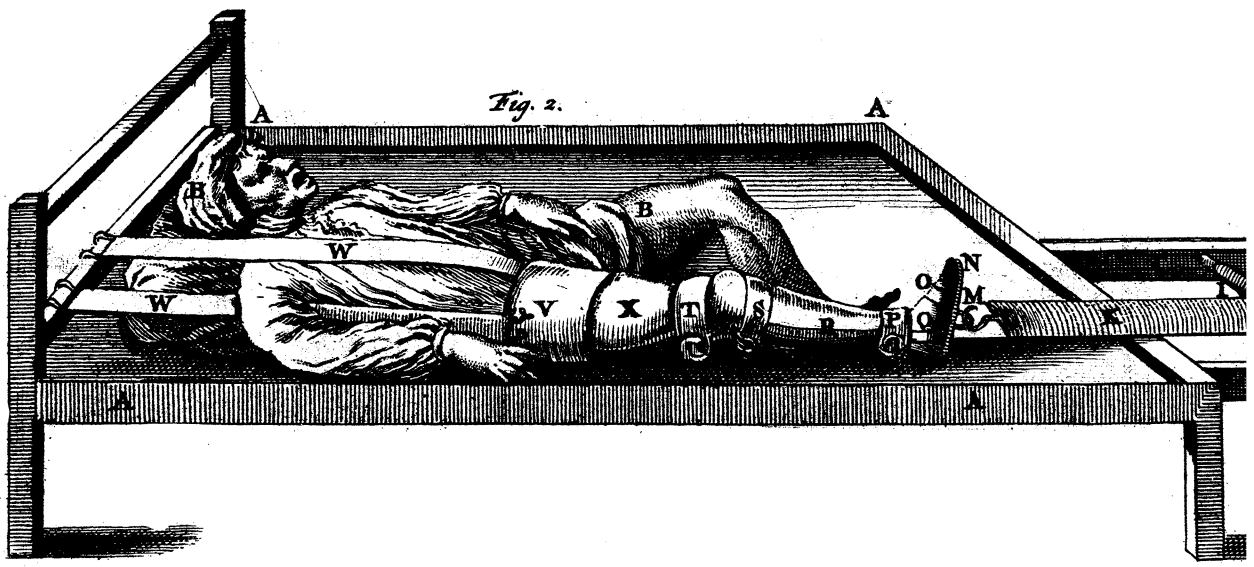
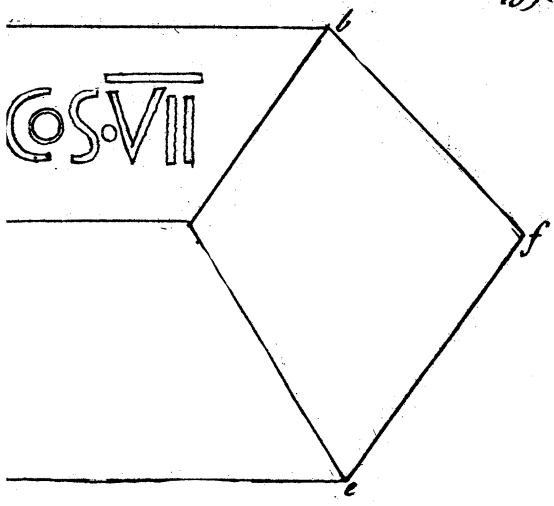
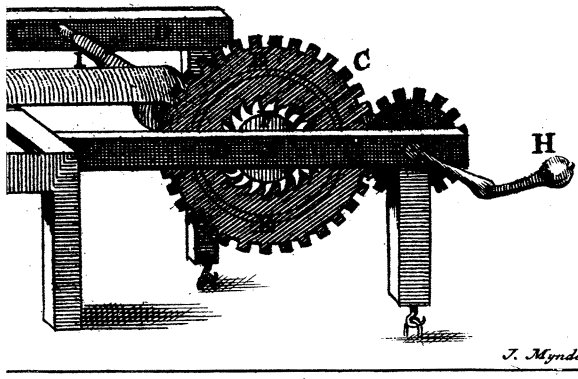


Fig. 2.

Henry Ewrick delin.



COS·VII



J. Mynde sc.

Fig. 1.

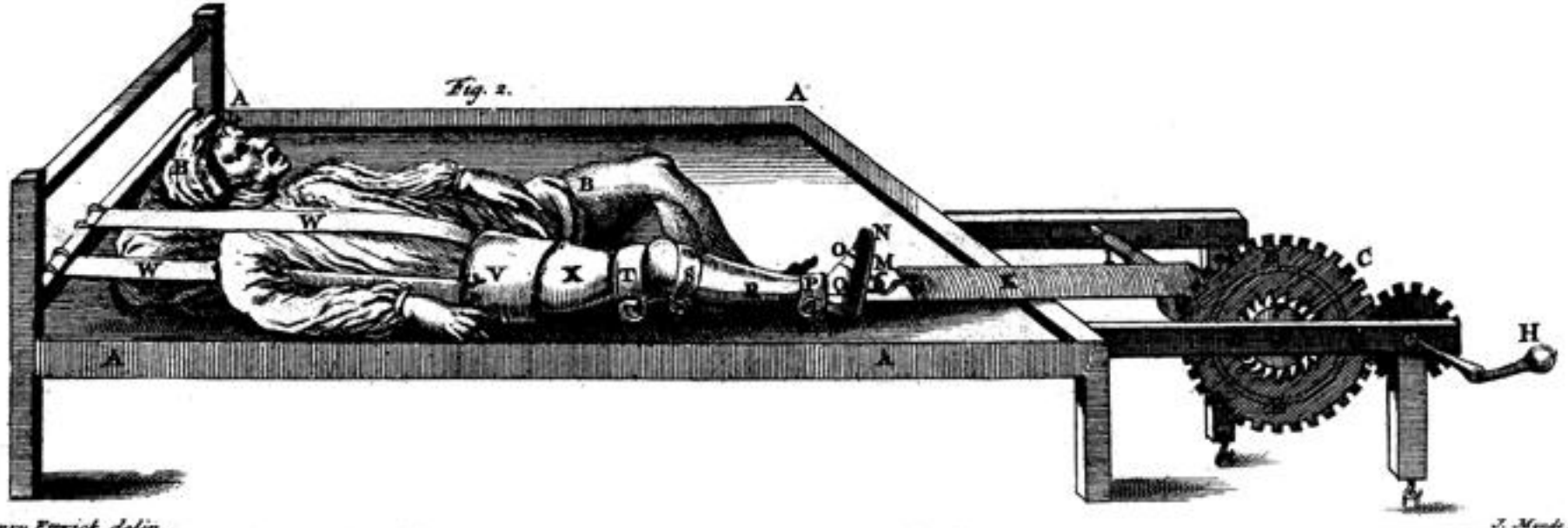


Fig. 2.

Henry Emrick delin.

J. Mynde sc.