Cases in surgery : illustrative of a new method of applying the wire ligature in compound fractures of the lower jaw / by Hugh Owen Thomas.

FRACTURES
OF
THE LOWER JAW.

H. O. THOMAS.

CASES IN SURGERY

ILLUSTRATIVE OF A

New Method of Applying the Wire Ligature

IN

COMPOUND FRACTURES OF THE LOWER JAW.

BY

HUGH OWEN THOMAS.

SECOND EDITION.

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1875.

In the Press, and shortly to be Published,

A NEW AND MORE EFFICIENT MODE OF TREATING

DISEASES AND INJURIES

OF THE

LOWER EXTREMITIES.

Dedicated to

THOMAS BRYANT, Esq.,

IN GRATEFUL ACKNOWLEDGMENT OF THE INTEREST HE HAS

ALWAYS TAKEN IN MY EFFORTS TO IMPROVE

THE TREATMENT OF THIS DEPARTMENT OF SURGERY.

PREFACE TO THE SECOND EDITION.

ABOUT five years ago I began to practise the wire method of treating compound fracture of the lower jaw. Since then I published an account of the method. In the period which has elapsed since the first publication of my pamphlet I have operated upon an average of six cases annually, and am more than ever convinced that the method in question is a decided improvement upon all prior modes of treatment. The cases which have come under my notice since the publication of my pamphlet have enabled me to devise and practically test other varieties in the mode of its application. The wish to place them before the profession, who I am pleased to say have shown some interest in the method advocated, and the first edition being exhausted, have induced me to bring out a second and revised edition.

11, NELSON STREET,
Great George Square,
April, 1875. LIVERPOOL.

CASES IN SURGERY

ILLUSTRATIVE OF A

NEW METHOD OF APPLYING THE WIRE LIGATURE

IN

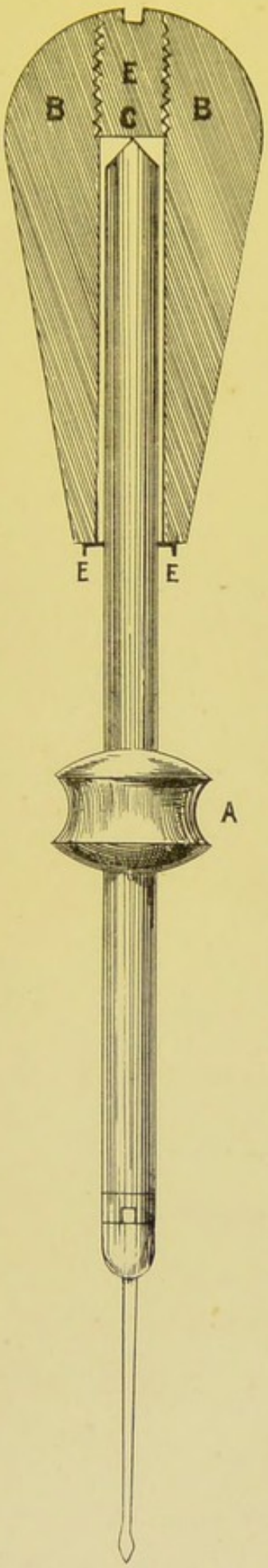
COMPOUND FRACTURES OF THE LOWER JAW.

In the following pages I propose to explain a new method of applying wire ligature in recent fractures of the lower jaw, and to advise this mode as primary treatment in any case of such compound fracture. Some of the cases here reported have been already communicated to the profession through one of the medical journals, but the mode of operating is now published for the first time. Experience of this method, extending over several years, has convinced me that it can be more easily and quickly applied, and with less irksomeness to the patient, than any

mode hitherto practised; and I am so convinced of its superiority that I believe it has only to be known to be adopted, and to supersede the complicated and painful appliances hitherto in use.

It is not necessary for me to enter into the merits of the numerous methods now in practice, the mechanics of this injury have been so well illustrated by Hamilton, Packard, and Heath. I make no claim to originality in the use of wire ligature in fractures of the jaw, as it has been used, though only in exceptional cases, by Dr. Buck, of New York, in 1847; Kinloch, of Charleston, 1859; Hamilton, of New York, 1858; and Mr. Wheelhouse, of Leeds, 1864. In 1863 I operated successfully in a case where a portion of the lower jaw, including two incisor teeth, had been removed by a direct blow from a capstan bar. Since then I have on every occasion practised this plan. The instruments used are the drill (fig. 1) and its bow (fig. 2). The illustration of the drill is full size, and delineated in section to show its construction; A is

FIG. 1.



HANDLE OF DRILL SHEWN IN SECTION.

FULL SIZE.

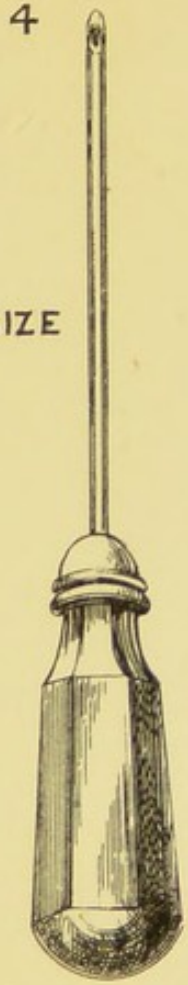
FIG. 2

¼ SIZE

3

½ SIZE

4



½ SIZE

5

½ SIZE

the bell-metal ball, to which is applied the string of the bow; BB is the bell-metal handle; C a steel hard-tempered screw, on which the tempered steel drill works; EE steel face to handle, when in use the friction is confined to EE and C. This design makes a useful, handy, and smooth working drill for surgical operations, and allows the operator the use of the left hand for steadying the part to be operated upon.

Fig. 3, the key for coiling the wire, drawn half size; the slit should taper slightly.

Fig. 4, the straight tube with an oblique orifice to guide the return end of wire.

Fig. 5, the watchmaker's broach to broach between the teeth. It is well to have one bent at right angles as well.

The wire used should be full 1-32nd inch silver annealled wire; a stronger cannot be manipulated with ease; and wire made less than 1-32 inch if used would not set or retain its hold, but would become loose immediately; and to make certain

that the coil will retain its curl, the key must not exceed 1-8 of an inch in diameter; the diameter of the curl must be regulated by the thickness of the wire; 1-32 inch wire requires key 1-8 of an inch diameter, slot in key from 1-24 to 1-32 inch.

This operation is advocated for compound fractures of the jaw only, meaning by compound fractures of the lower jaw, fractures in which the periosteum and surrounding tissues have been lacerated and allow some degree of primary displacement. Simple fractures seldom require the aid of the surgeon. Having applied in the early part of my practice the wire ligature with the ordinary tie or cross-twist, I could not avoid noticing that, however firm the fracture may be fixed on the day of operating, it became relaxed on the second or third day; and as the wire with a cross-twist would not bear the strain of several extra turns without breaking, it necessitated a second application of new wire, at a stage of the treatment so painful that it was often objected to by the patient. To obviate

this difficulty I devised the coiling which is detailed in the following cases, and which enables the surgeon to tighten, as often as he judges the case demands, without pain to the patient, and in a few seconds of time.

I find, also, that a very frequent cause of difficulty of adaptation and delay in union in these injuries arises from not removing a tooth often on one side and sometimes on both sides of the fracture; I have sometimes had occasion to remove two on the same side. These offending teeth, if requiring removal, mostly come away readily, so that there is no danger from the force necessary to remove them. Often a tooth which I made use of in fixing, &c., at the early stage of treatment required removal when the cure was effected, having been slightly displaced at the time of injury, and giving the wired bones an appearance only of not being in normal line. I would also advise that the operator should not be too anxious for a nicety of adaptation during the first four to seven days, as

absorption, diminished tumefaction, and consolidation of parts assist replacement at a later period; the one thing needful during the first days is to fix the fracture.

The first case illustrates one method of applying the wire (fig. 1).

T. S—, while engaged in a street brawl, April 5, 1866, received a blow on the lower jaw. On making an examination the following morning I found a compound fracture of the lower jaw at the symphysis, with great mobility of the fracture. I prepared to fix the fracture. Having directed an assistant to steady the head, and another to evert the lower lip, I passed the drill through the bone on both sides of the fracture at the reflection of the mucous membrane, care being taken not to injure the fangs of the teeth. Fig. 1 illustrates the mode followed in this case. The silver wire was then passed through the opening at A. Next, the tubular needle was passed through B, into the open end of which the return end of the wire was intro-

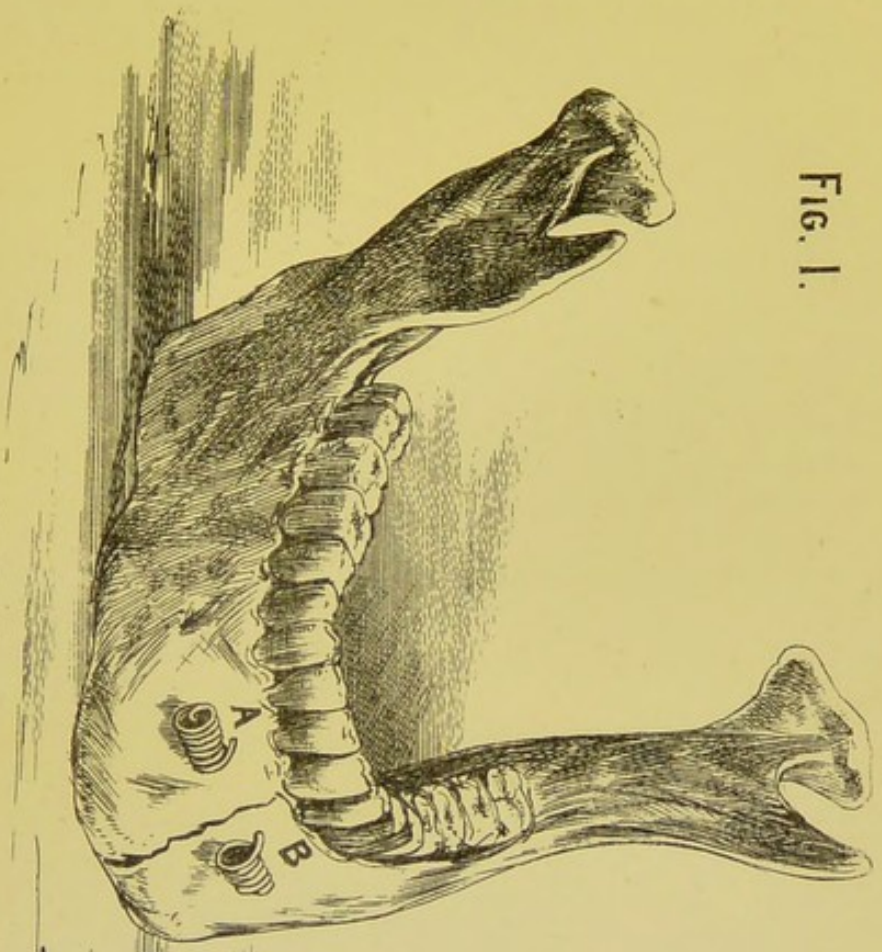
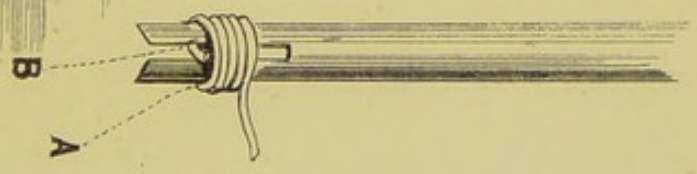


Fig. 1.

Fig. 2.

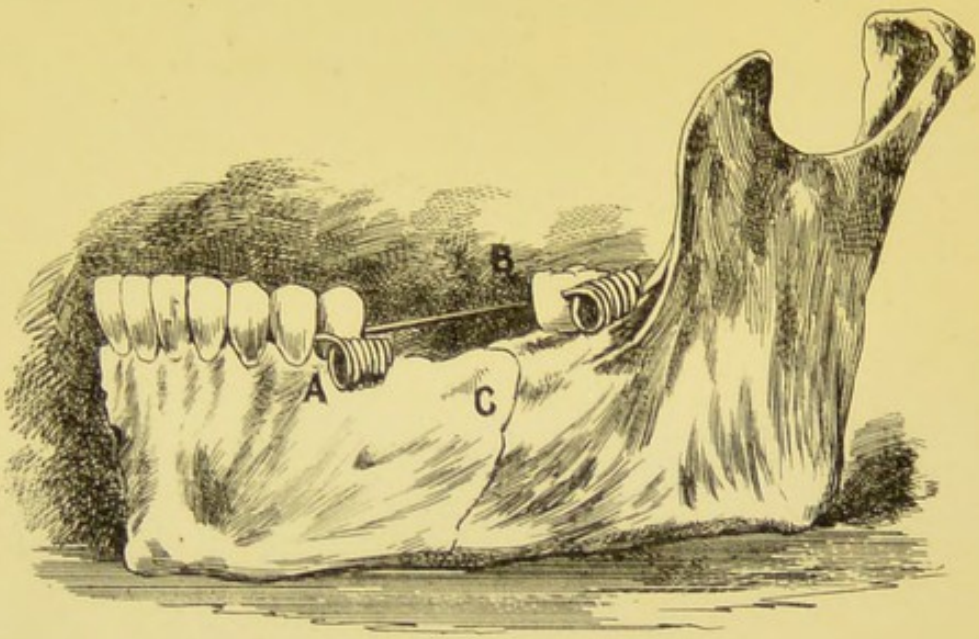


duced. Then the tubular needle was withdrawn, and with it the wire. The object of this needle is to act as a director to the posterior opening of the aperture at B, and to obviate difficulty and delay in searching for the entrance from behind forwards of the aperture B. Afterwards the end of the wire at A was inserted into the slit of the key (fig. 2) and twisted in three or four coils, the same being repeated with the end of wire at B, until the fracture was fixed. On the fifth day it had slackened and required the use of the key in the coil at A or B—either would do—though it is best to choose the shortest coil for tightening, and to notice first if the cross piece of the wire A (fig. 2) is well into the slit B (fig. 2). This case required tightening every three or four days. In twenty days the fracture was firm and united. The patient, from the commencement, expressed his ability to masticate, which I did not permit. Afterwards he informed me that he had occasionally disregarded my veto in this respect. The application in this situation, at

or near the symphysis, need not occupy more than three minutes in its performance. The wire, when requiring removal, can be withdrawn without difficulty in this way—introduce the key into the coil and reverse the coiling, then enter the key into the remaining coil and wind up, continuing to do so until all the wire has been coiled around the stem of the key, or it will suffice to introduce the key in one coil only, and winding it, the coil at the other extremity will uncurl until the wire is withdrawn and wound around the key.

Case 2.—T. B—, a ship carpenter, was struck by a piece of heavy timber on the face, which caused him to fall seventeen feet from a work stage. On examining him, an hour after the accident, I detected a compound fracture of the lower jaw on the left side, at the situation of the first and second molar teeth, which had been removed by the force of the blow. With one exception I never before witnessed so much mobility in a fracture of this part. The remaining teeth were firm *in sitû*. Agreeably to

Fig. 3.

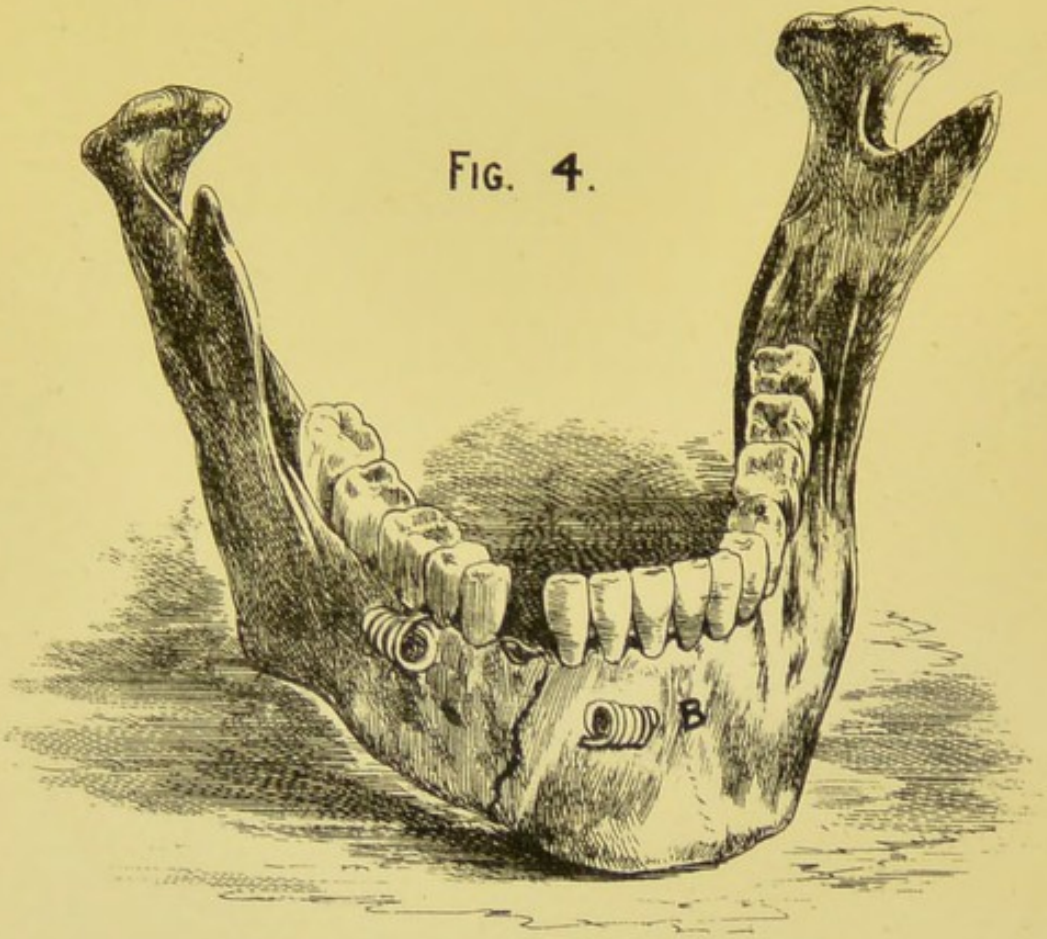


my instructions, my assistant exposed the injured portion by drawing aside the cheek, and the third molar tooth was steadied with a piece of wood directed across the mouth from the side opposite to the fracture. Then using the drill, a hole was bored from without backwards and inwards across the third molar tooth below the enamel, this tooth being firm in the posterior portion of the fracture. The wire was then passed through the hole in the molar tooth B (fig. 3) from without inwards, and brought forward between the bicuspid and canine teeth A (fig. 3). As these latter teeth were closely set in the anterior fragment of the fracture, the broach was used between them to enable the thick wire (1-32 in.) to pass. Finally, the ends of the wire were coiled with the key, an operation which was repeated from time to time as required. In three weeks there was union; on the fourth week the bone was firm, and the wire removed. The patient was with difficulty restrained from using the jaw in mastication.

In this case it will be noticed the bone was not drilled; but had the bicuspid and canine teeth not been firm, I should have drilled at a point between A and C (fig. 3). A metallic amalgam was easily introduced into the aperture in the third molar, closing the hole in the corner of the molar tooth.

Case 3.—W. T—, during a street riot, Feb. 18, 1867, was severely injured about the face. On making an examination next morning I found a compound fracture of the lower jaw, half an inch to the right side of the symphysis, and also at the left angle of the jaw, accompanied with great swelling of the surrounding tissues, &c. I operated on the fracture at the symphysis, repeating the method as in Case 1. The fracture at the angle was supported with bandage and adhesive plasters. On the fifth day the parts over the injured angle of the jaw became the seat of inflammation and abscess, which, combined with an attack of pneumonia on the eighth day, made it impossible to assist the fracture at the angle with mechanical aid. The

FIG. 4.



fracture at the symphysis was tightened at periods, and on the expiration of six weeks it was firmly united, at which time there was no union at the angle. The patient now returned to his native town.

Case 4.—W. H—, while at work, fell into a dry dock, March 8, 1867, and received a compound fracture of the arm, fracture of base of skull, and severe compound fracture of the lower jaw at the symphysis. From the very serious nature of his other injuries I did not think it prudent to interfere with the injured jaw in this case during the first week. On the 15th of March, the condition of the patient being much improved, on examination I found the fractured portion of the jaw was separated by an interval of a quarter of an inch. It was now wired by the method followed in Case 1. The treatment was the usual tightening of the coils. There was perfect recovery in four weeks after the operation. This patient made use of the jaw in mastication, abstaining only from animal flesh.

Case 5 is illustrated by fig. 4. Captain T—

applied to me on November 11, 1867, to fix a fracture of the lower jaw. The fracture was compound, and situated between the right bicuspid and canine teeth; there was also a fracture of the left ramus, from which I removed, at a later stage, a portion of necrosed bone. To fix the fracture it was drilled through the anterior fragment at B (fig. 4), and a broach passed between the bicuspid and molar teeth. The wire was then passed through the drill-hole at B, and then backwards and outwards between the molar and bicuspid teeth. The ends were then coiled and tightened with the key, but I could not reduce and fix the displacement until I had removed the canine tooth, which had been displaced, and hindered proper adaptation of the fracture. The fractured ramus was aided with bandage and plaster. At the expiration of seven weeks the parts were firm and united. On the patient's recovery the gap between the bicuspid and incisor teeth did not exist, nor was there any trace of the site of the removed canine.

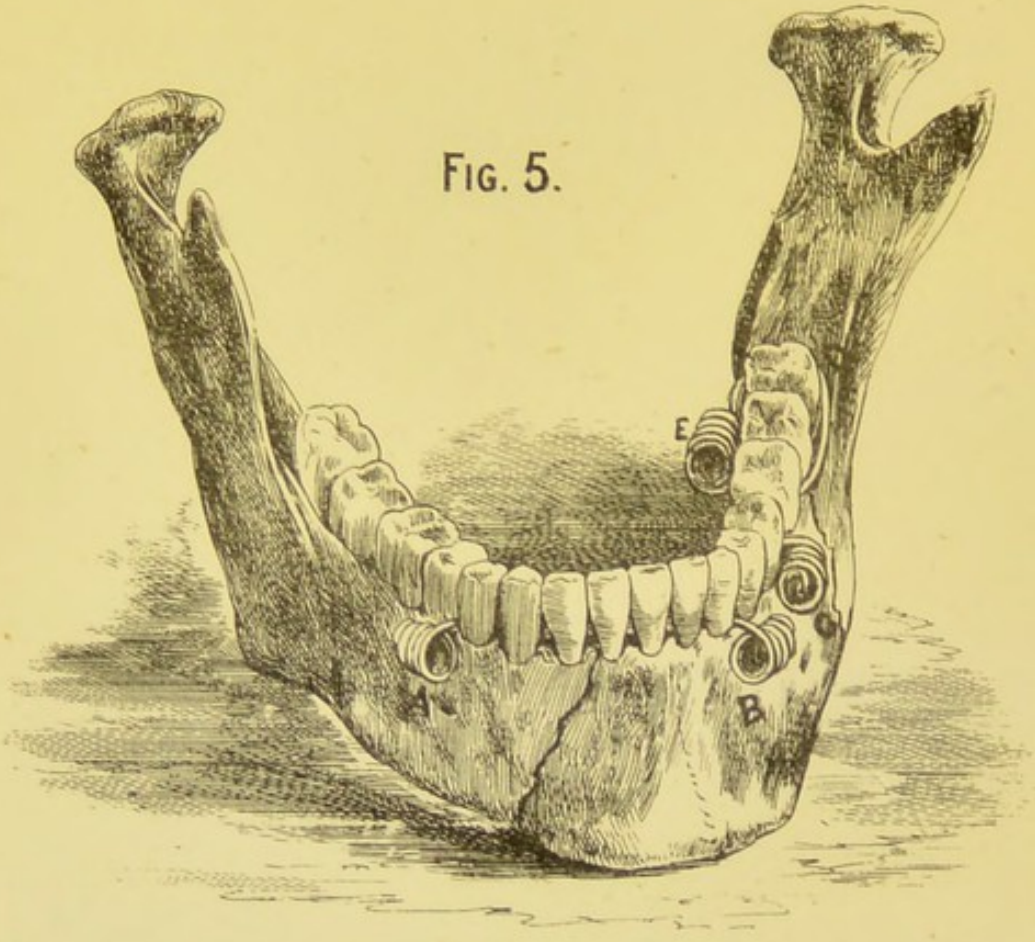
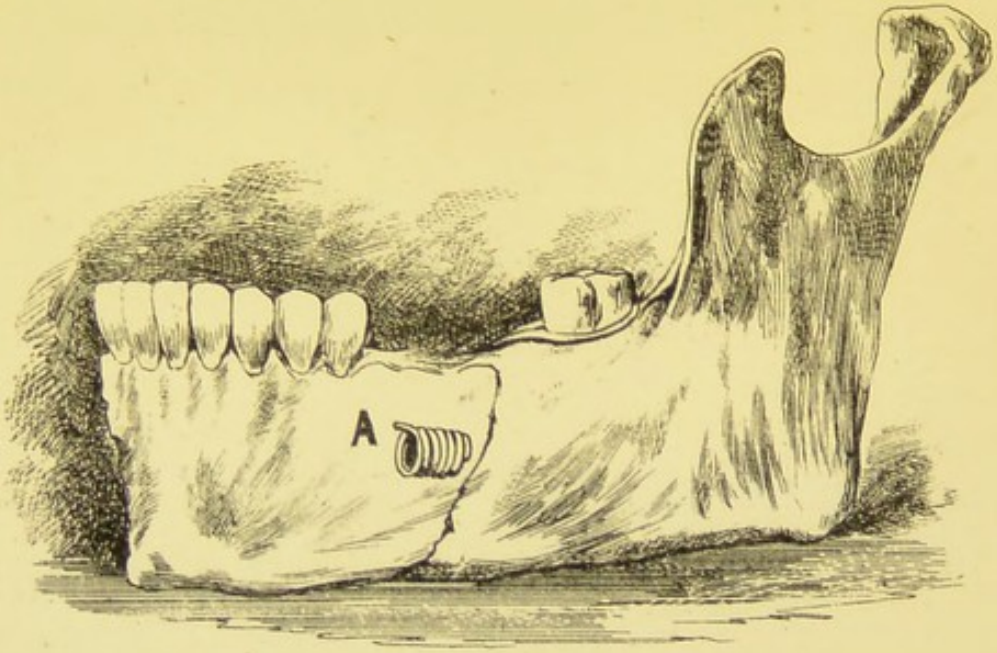


FIG. 5.

FIG. 6.



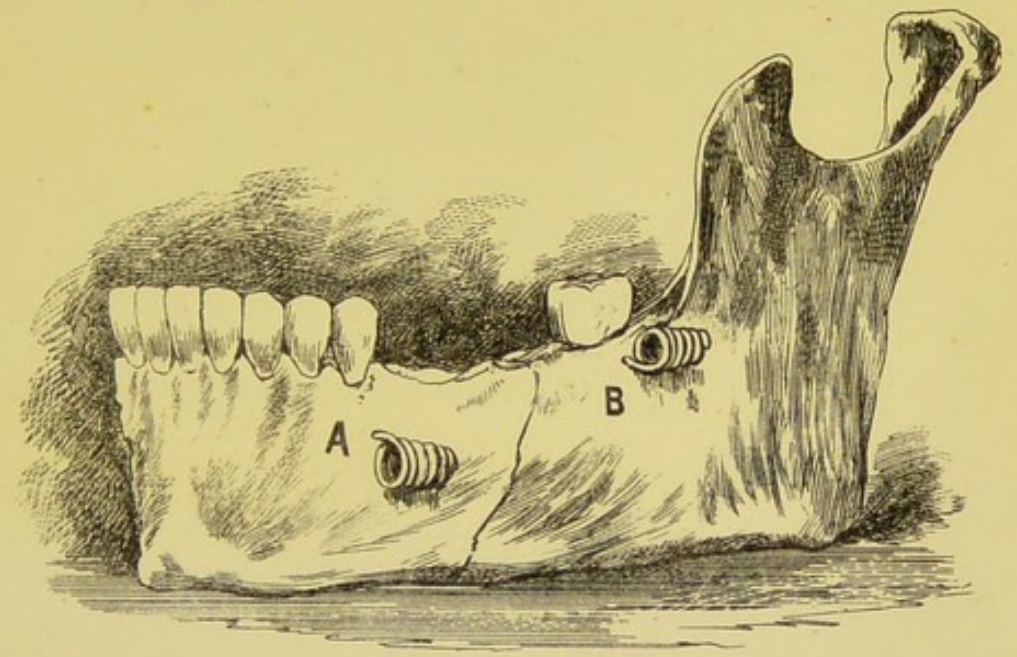
Case 6.—April 16, 1868, J. P— was struck a severe blow on the jaw by a pugilistic acquaintance, with such effect that there resulted a compound fracture of the left side, between the first and second molars, and a simple fracture to the right of the symphysis. The molar teeth at the site of the fracture were large and firm, which induced me to operate, as illustrated in fig. 5, by the method C E D. Had the simple fracture required any treatment, I should have followed the method represented by A and B (fig. 5). The wire was tightened occasionally. The simple fracture was firm in three weeks. The compound fracture was united at the end of the seventh week.

Fig. 6 illustrates the case of John O'N—, who, while standing at a street corner, Sept. 13, 1874, was assaulted by a ruffian, during which he received a compound fracture of the left ramus near the third molar tooth; the first and second was dislocated and removed prior to my examining him. I found, on the second day of the accident, when he

consulted me, the face much swollen and tender, the remaining teeth all firm, and the third molar prominent, so I decided to operate by encircling the third molar crown with the wire, making a loop, twisting the wire and placing it around the neck of the tooth, and as the fracture was deep in the mouth and the part tumified and tender, I could not drill the anterior fragment through the mouth. so I drilled it through the cheek at A. I found no difficulty in so doing, and on withdrawing the drill I introduced the tubular needle, entered the wire through the jaw from within, but as soon as I felt that the wire, which I had sharpened at the point, had come through the jaw, I incised the mucous membrane and withdrew the wire through the mouth, then applied the key and curled it as at A in fig. 6. This case occupied six weeks in recovery, but on the tenth day the patient had an attack of erysipelas, caused by exposure in crossing the river on a very cold evening.

The next case (fig. 7) illustrates another variety.

Fig. 7.

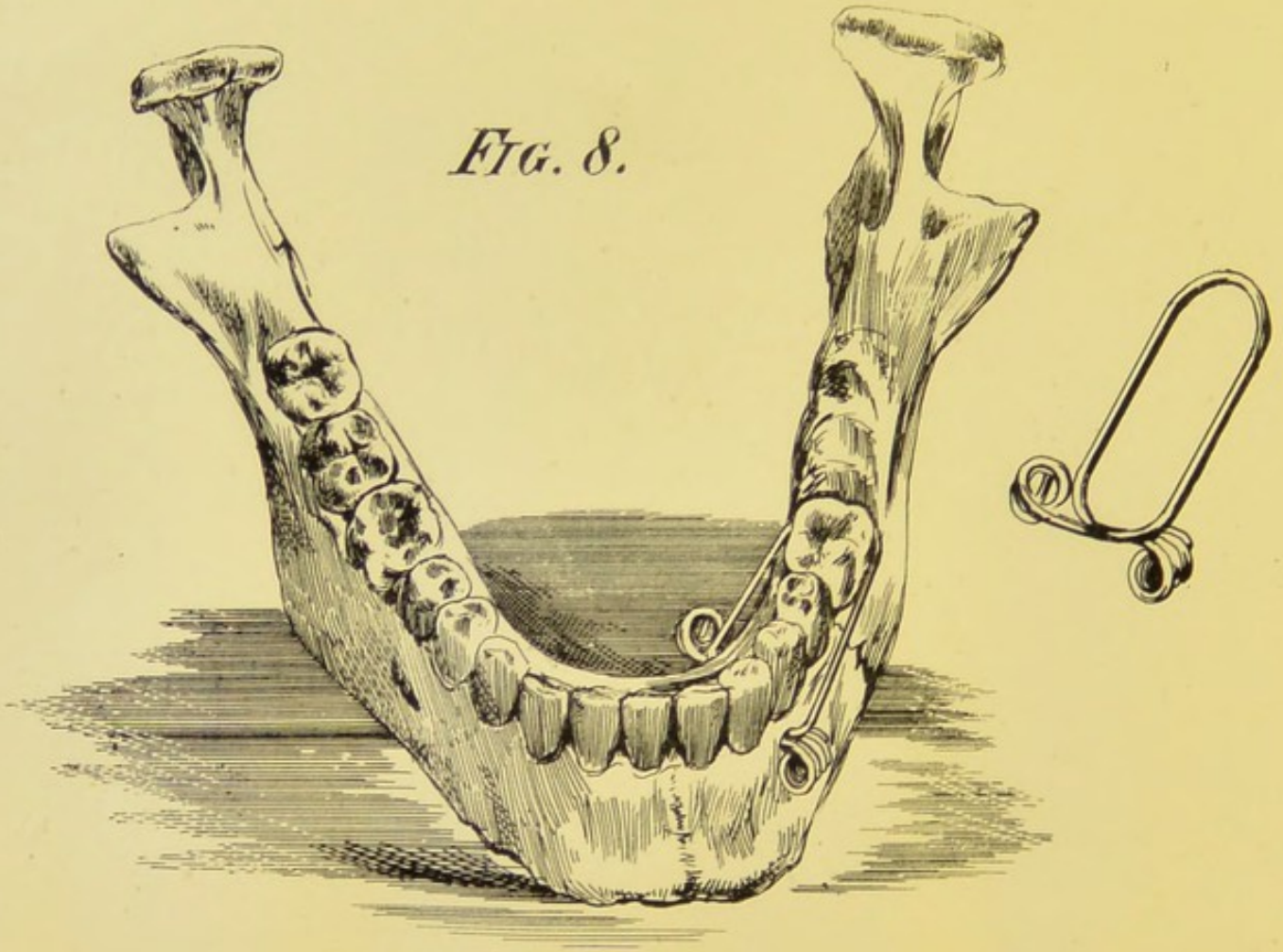


During the latter part of 1874 a gentleman of some local celebrity had a compound fracture of the left side of the jaw at the situation of the second molar tooth, first and second molars removed, third molar firm in posterior portion, but so depressed and nearly level that no use could be made of it to attach the wire; consequently I drilled the posterior fragment through the cheek in this way, placing the index-finger of left hand inside the mouth, slightly beyond and opposite the third molar. Thus I was able to steady the jaw, and to detect when the drill was through, also, it assisted to indicate the point outside the cheek that I was to select. Thus prepared, I pushed the drill through the cheek, drilled the posterior fragment, and on withdrawing the drill entered the wire through the puncture in the cheek and hole in the jaw until I felt the wire at the base of the tongue, then drew forward the end (minus 1-4 in.), which I also bent to a right angle to avoid overdrawing it, then stretched the cheek, and the bent end disappeared; now I

introduced the finger betweenthe jaw and the cheek, incised the mucous membrane over the bent end of wire, grasped it with pliers, drew it forward, then used the key as in fig. 7. The curl at B is done reversed—twisted from right to left, that it might be got at easier when requiring removal—the others are all wound from left to right. This method, as illustrated in Cases 6 and 7, obviates the necessity for an external incision of the soft parts, and enables the surgeon to operate on any portion of the body or ramus of the jaw without risk of disfigurement of the features.

Case 8.—T. S—, a young man returning home on the evening of December 26, 1874, was assaulted by corner roughs, who usually supply me with cases in this department of surgery, and who on this occasion, as on most others, operated with such success on his head as to inflict, among other injuries, a compound fracture of the left jaw between the bicuspid and first molar teeth. The second and third molars were absent, the remaining molar

FIG. 8.



was firm and very prominent. I operated by the method shown in fig. 8, viz., passed both ends of the wire through the drilled anterior fragment, and placed the loop thus formed over the molar. I found this operation very easy, as the same end of wire could be passed twice (antero-posterior), and coiled in front and behind the jaw, requiring no needle. Had this variation of the method occurred to me at an earlier date, I should have practised it in Case 2 and some others. In this case consolidation was complete at the fracture in four weeks.

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