

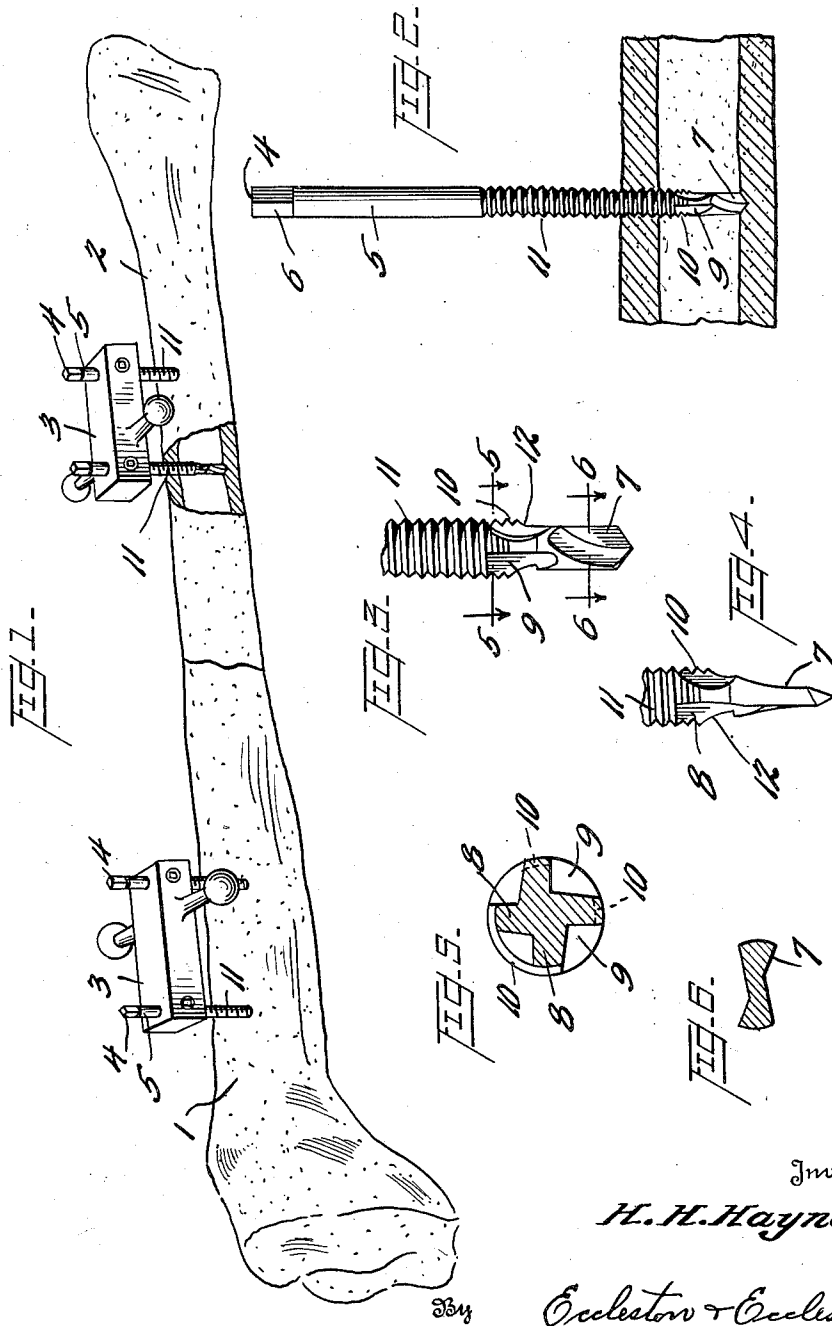
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SURGICAL SCREW

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SURGICAL SCREW

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2 Claims. (Cl. 10—140)

This invention relates to surgical apparatus and has for its primary object to provide a simplified means for firmly securing skeletal splints, such as shown in my United States Patent #2,238,870, in position in an expeditious manner.

More specifically, it is an object of the invention to provide a skeletal screw which is adapted to pierce the outer cortex of the bone, cross the medullary canal, and imbed its point in the opposite cortex, without the necessity of using finders, flanged sleeves, etc.

Another object of the invention resides in the provision of a skeletal screw having drilling and self-tapping features, whereby the screw can be firmly anchored in the bone in a single operation, thus reducing the time involved in applying the splint, which is of course a major factor.

A further object of the invention consists in providing a skeletal screw having the foregoing features, and which is also so constructed as to provide for the discharge of the fine particles cut from the bone by the drill, thereby not only reducing to a minimum the chances of infection, but also avoiding the possibility of clogging the tapping element of the screw which would render it useless.

Other objects and advantages of the invention will be apparent from the following description when taken in connection with the accompanying drawing, in which,

Figure 1 is a perspective view illustrating the use of the novel screws in securing splint blocks to bone sections.

Figure 2 is an enlarged fragmentary section through a bone and showing one of the screws in its final position.

Figure 3 is an enlarged elevational view of the lower portion of one of the screws.

Figure 4 is a view similar to Figure 3, but taken at a 90° angle, and

Figures 5 and 6 are enlarged horizontal sectional views taken on line 5—5 and 6—6 respectively of Figure 3.

Referring to the drawing in more detail and particularly to Figure 1, the numerals 1 and 2 indicate the two sections of a broken bone which is to be "set," and the numeral 3 indicates the splint blocks. These blocks, which form a part of the ambulatory splint described in the above-mentioned patent, are firmly secured to the bone fragments 1 and 2 by means of the novel self-tapping screws 4.

Each screw 4 comprises a shaft portion 5 on the upper end of which may be formed a tool-

engaging portion 6 for use in rotating the shaft when the screw is to be applied to a bone.

Formed on the lower end of shaft 5 is a drill portion 7, the widest dimension of which is somewhat less than the diameter of shaft 5, as shown in Figure 3. Spaced slightly above the drill 7 are four radial arms 8 separated by longitudinal grooves 9. The outer ends of the arms 8 are provided with threads 10 which are interrupted by the grooves 9; these threaded sections serving as taps to cut threads in the bone to receive the continuous threads 11 formed on the shaft 5 immediately above the thread-tapping portion.

The grooves 9 extend downwardly below the tapping sections 8—8, and provide passages for the upward travel of the cuttings to prevent their entrance into the medullary canal and also to prevent clogging of the screw; the grooves 9 are of sufficient length to receive the bone cuttings and permit the exit of some of them, thereby leaving the tap threads 10 free to cut clean and well defined threads in the bone structure.

The lower portions of the arms 8 are preferably tapered downwardly as indicated by the numeral 12 to facilitate movement of the screw into the bone.

The operation and advantages of the novel screw are believed to be apparent. After an incision is made in the flesh at the desired point the drill point is inserted and then rotated by an implement attached at the point 6. This rotation, with the desired pressure, causes the drill 7 to initiate an opening in the outer cortex of the bone, such opening being of slightly smaller diameter than the shaft 5. Continued rotation of the shaft causes the interrupted threads on the arms or tapping portion 8 to cut threads on the walls of the opening provided by the drill 7. The threads 11 on shaft 5 are then readily received in the opening upon continued rotation of the shaft. The rotation of the shaft is continued until the point of the drill is imbedded slightly in the remote cortex of the bone as shown in Figures 1 and 2. This final position of the screw becomes apparent to the surgeon through increased resistance presented to the screw when the drill contacts the opposite cortex of the bone. The partial imbedding of the drill point in the remote cortex of the bone provides additional rigidity for the screw as well as serving as a stop signal to the surgeon.

It should be noted that in the foregoing operation of installing this surgical screw in the bone, the drilling, tapping and final positioning of the screw were accomplished without the use

of the usual finders, flanged sleeves, and the like which were deemed necessary in installing the ordinary attaching means. Moreover, the longitudinal grooves provide for the outward discharge of cuttings produced by the drilling and thread-cutting operations, and the screw is installed in sterile condition and in a minimum of time.

In accordance with the patent statutes I have described what I now believe to be the preferred form of construction, but inasmuch as various changes may be made in the structural details without departing from the spirit of the invention it is intended that all such changes be included within the scope of the appended claims.

What I claim is:

1. A device of the character described comprising a surgical screw for securing skeletal splints, said surgical screw including a shaft, a drill portion formed on an end of the shaft, said drill portion provided with relatively shallow grooves and terminating in a tapered point, screw threads formed on the shaft above the drill portion and extending a sufficient distance to permit the threads to engage the adjacent cortex of a bone when the drill point is imbedded in the opposite

cortex, and one or more longitudinal grooves extending from within the threaded section to the drill point on the end of the shaft, said groove or grooves being parallel to the axis of the shaft and terminating in a surface having a radius of curvature.

2. A device of the character described comprising a surgical screw for securing skeletal splints, said surgical screw including a shaft, a drill portion formed on an end of the shaft, said drill portion provided with relatively shallow grooves and terminating in a tapered point, screw threads formed on the shaft above the drill portion and adapted to engage the adjacent cortex when the drill point is imbedded in the opposite cortex of a bone, the threads adjacent the drill portion being interrupted to provide a self-tapping portion, and one or more longitudinal grooves in said shaft, said groove or grooves being parallel to the axis of the shaft and terminating in a surface having a radius of curvature, the interrupted thread of the self-tapping portion being formed by said longitudinal groove or grooves, said groove or grooves extending to the drill portion on the end of the shaft.

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