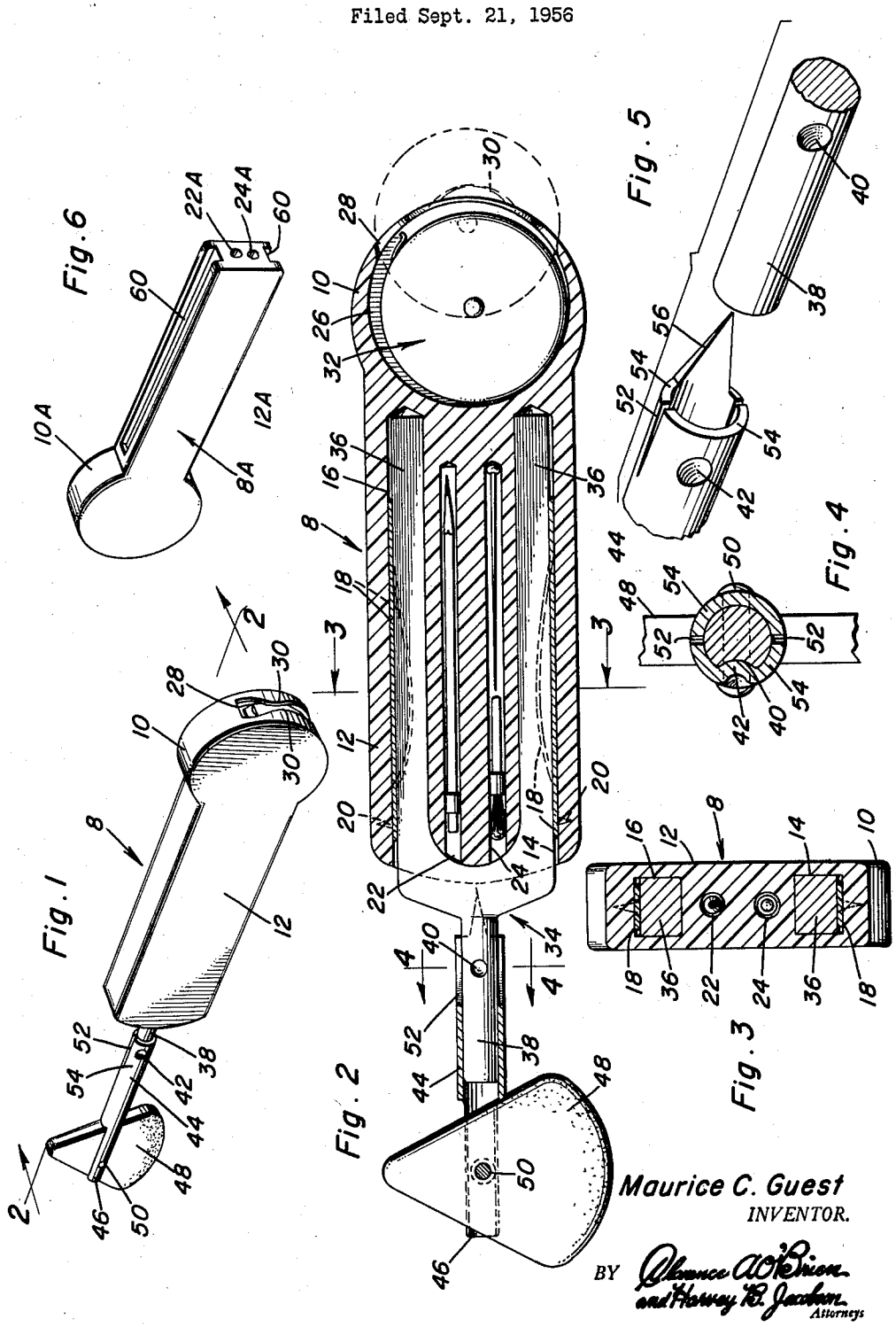
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NEUROLOGICAL DIAGNOSTIC INSTRUMENT

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NEUROLOGICAL DIAGNOSTIC INSTRUMENT

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This invention relates to certain new and highly useful improvements in a diagnostic instrument used primarily for the neurological phases of a complete physical check-up on a patient.

Construed in terms of generalities and, patentably speaking, the concept has to do with an improved neurological percussion hammer which is novel in that it is of sectional construction and hence knockdown for ease of cleaning and repairing and embodies mutually cooperating components which enhance the over-all utility of the hammer as an entity.

It is a matter of common knowledge and the lament of many diagnosticians that errors in a complete examination of a patient for admission to a hospital are traceable to the fact that an examination may be carried out in the patient's home or perhaps at a hospital where required instruments and tools are not available. It follows that if the physician does not have the required instruments with him, the resultant examination is incomplete in proportion to the stages of the examination which were not carried out. There has long existed, therefore, a recognized need for a single instrumentality which, being a compact and convenient entity, places at the physician's disposal the means needed. It follows that a significant objective in the instant matter is to provide a single structural device which, as afore-stated, is essentially a percussion hammer, but includes within its over-all construction selectively usable components, for example, a hammer having a so-called scratching element which is complemental to the hammer in eliciting reflexes.

Then, too, novelty is predicated on the stated precussion hammer utilizing a handle, that is, a handle of a composite character which provides a hand grip affording the necessary handling and leverage properties, and a structurally unique shank structure affording a connection between the hammer head and the hand grip and which is such in construction that it also functions as a tuning fork.

Stated otherwise, the handle in an over-all sense is extensible and contractible and the components thereof are separable. In fact, the hand grip is so constructed that it constitutes a sheath-like case for the prongs of the tuning fork and also has a holder in which a conveniently usable measuring tape is stored for expedient use.

Other objects, features and advantages will become more readily apparent from the following description and the accompanying sheet of illustrative, but not restrictive, drawings.

In the drawings, wherein like numerals are employed to designate like parts throughout the views:

Fig. 1 is a perspective view of a neurological diagnostic instrument, primarily a percussion hammer, constructed in accordance with the principles of the invention;

Fig. 2 is an enlarged view of the invention and partly in elevation taken on the plane of the line 2—2 of Fig. 1 looking in the direction of the arrow;

Figs. 3 and 4 are cross sections on the lines 3—3 and 4—4, respectively, of Fig. 2;

Fig. 5 is an exaggerated perspective view of an exploded type showing certain of the structural details; and

Fig. 6 is a perspective view of a modified form of hand grip.

Referring now to the drawings and particularly to Figs. 1 to 5, inclusive, it will be seen that the "handle" is sectional, knockdown and extensible and contractible. It embodies the aforementioned hand grip, and this is denoted by the numeral 8. It is preferably constructed from moldable plastics. It is elongate and rectangular in cross section, as seen in Fig. 3, and has an enlarged head portion 10 at one end and a body portion 12. The body portion is recessed. That is to say, it is recessed in such a way that it provides spaced parallel bores 14 and 16. At the left in Fig. 2 the bores are shown open and the opposite ends are closed. Mounted in each bore is a longitudinally bowed leaf spring 18 secured in place at 20. The central portion of the body may be provided with extra bores or sockets 22 and 24, which may be used for readily insertable and removable accessories often used during the course of a neurological examination. These are not to be dwelled upon here. In the enlarged head portion there is a recess 26 which provides a pocket and which has a slot 28 along its margin and openable and closable flaps 30, and this provides a pocket for storage of an insertable and removable measuring tape 32.

The shank structure or means is of a composite type. The major portion thereof is denoted at 34 and, specifically, this takes the form of a tuning fork, the prongs 36 of which are fitted in the socket-like bores 16 and held frictionally against displacement by way of the springs 18. At the left hand end there is an axial extension 38 which may be used as the handle of the tuning fork when used by itself, and this is provided with a depression 40 providing a keeper seat. This serves to accommodate a detent 42 forming a part of a socket member 44 which is fitted in a sleeve-like manner over the shank portion 38. The shank is therefore made of the pronged body portion 34 adjustably and removably mounted in the sheath-like hand grip 8, the extension 38 and the socket member 44. The outer end of the socket member is provided with a pair of spaced, parallel terminal members 46 which serve to support the triangular rubber impact or hammer head 48. This is secured in place between the members 46, as at 50 It will be noted that the rearward end of the socket member is formed with diametrically opposite slits 52, providing springy grips 54 which, as shown in Fig. 4, serve to frictionally grip the shank extension 38. Also, and as brought out in Fig. 5, a pointed scratching element 56 is provided and constitutes one of the reflex elements of the hammer head means.

With a view toward acquainting the reader with the significance and purposes of the components which go to make up the composite hammer structure, brief coverage of the functions of the components is thought to be in order, to wit:

The prime use would be as a percussion hammer and as the complete tool stands that is what it is. This is also probably the most commonly carried tool of the combination. The rubber hammer head is used to elicit deep reflexes. It is used to hit just above the patella on the knee to make the knee jump. As a result, it is possible to tell whether there is an unbroken nerve circuit or pathway to carry the sensation of the blow on the knee to the spinal cord and then return a nerve impulse to move the muscles and make the knee jerk.

The pointed projection on the shank structure or means

is merely a convenient element for scratching to elicit reflexes, such as the Babinski reflex, from the bottom of the foot. When a normal person's foot is so scratched, the toes will move downwardly. However, when the same is done to babies under four months or to people who have defects in the lateral part of their spinal cord, such scratching will cause the toes to flair and go upward. Quite often a doctor may break a tongue blade or use a key to do this, and those things work, but it would be handier to always have the instant means readily available for use.

A tuning fork is used for several different tests. Two commonly used tests for hearing make use of it. One test places the vibrating fork at the vertex of the head. The ability to hear the vibrations differently in the opposite ears is a function of the test. Another test uses the vibrating fork to tell the difference between deafness due to disease of the acoustic nerve and to deafness due to occlusion or something wrong with the ear itself. In this test the vibrating fork is alternately held in front of the ear and on the mastoid bone behind the ear. The purpose of the test is to find out which can be heard best, the vibration coming through the air or that transmitted through the bone.

In addition, the fork is used to reveal nerve damage which is associated with inability to feel vibrations. With the fork vibrating, it is placed against a boney prominence on the lower extremity. A normal person can feel this, but a person afflicted with pernicious anemia and the accompanying nerve disease cannot feel this. Occasionally, this is the first symptom of such a disorder; so, it is important to make this test.

For measuring circumferences of chest, abdomen, extremities, etc., a tape measure is very essential and such measurements are quite often required. Usually, however, when one is most needed, it isn't available. This invention provides a convenient space for such a tape, either as a loose tape wound and inserted in the handle or in case with spring for retracting the tape into its separate little case as is shown in the patent drawings. In addition, the enlarged or bulbous end of the handle is of such a shape as to fit the palm of the hand.

While I have stated that this invention functions primarily for neurological examinations, the simple tests I have mentioned in conjunction with the contributing components of the same are those used by every first and second year medical student and recommended for use in any complete examination recorded on a patient for admission to a hospital. Of course, in practice many of these examination steps are never done by a physician once he leaves the place of his training, but that is not because he shouldn't, but just because of the fact that no one enforces the training he has been taught. It is the common lament of most diagnosticians that generally errors in a diagnosis are not made because of ignorance, but because an adequate examination was not done. It is my belief that this instrumentality will, by having the tools readily available in the one, easily carried combination do much to get both students and graduate physicians to do a more complete examination. One of the main reasons why the examination is not as complete as it should be is that it may be done in a home, or in a hospital where there just aren't any such tools available. Such tools are not generally furnished by the hospital and if the doctor doesn't have them with him, he doesn't do what should be done. It follows that the need for this invention in its entity is outstandingly important.

The inherent correlation and cooperation of the components which go to make up the over-all percussion hammer obviously make for the mutual contribution thereof and promote the new and improved results desired.

With reference now to the modification seen in Fig. 6, the basic construction is the same as that already described. That is to say, the hand grip **8A** will be constructed much the same as that already covered, except that instead of having a socket for the prongs of the tuning fork embodied in the body portion **12**, the body **12A** here has lengthwise keying grooves **60** formed therein. The holes **22A** and **24A** are as already described. So is the recessed, knob-like enlargement **10A**. In other words, the only difference is in substituting the groove **60** for the bores **14** and **16**. Obviously, these grooves serve to permit the prongs **64** to be keyed removably therein in an evident manner.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling in the scope of the invention as claimed.

What is claimed as new is as follows:

1. For use by a neurologist, a self-contained ready-to-use diagnostic instrument adapted for use in conducting a physical or neurological examination comprising, in combination, an extensible and contractible handle embodying a hand-grip, a shank slidingly and removably mounted on said hand grip and having an axial extension at an outwardly disposed end, and reflex means, including a percussion hammer, carried by said axial extension and serving to elicit deep reflexes, said hand grip being recessed and the inward end portion of said shank having spaced parallel prongs removably but retentively fitting into recesses provided therefor in said hand-grip one recessed portion of said hand-grip constituting a pocket in which a measuring tape may be removably stored for procedural use.

2. For use by a physician, a neurologist for example, a self-contained ready-to-use diagnostic instrument adapted for use in conducting a physical or neurological examination comprising, in combination, an extensible and contractible handle embodying a hand grip, a shank slidingly and removably mounted on said hand grip and having an axial extension at its outwardly disposed end, and reflex means, including a percussion hammer, carried by said axial extension and serving to elicit deep reflexes, said hammer embodying a socket member and head, said extension constituting a shank, the latter fitting telescopically and removably in said socket member, said socket member having a detent and said axial extension having a keeper seat in which the detent is removably seated and latched in place while in use.

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