

June 19, 1951

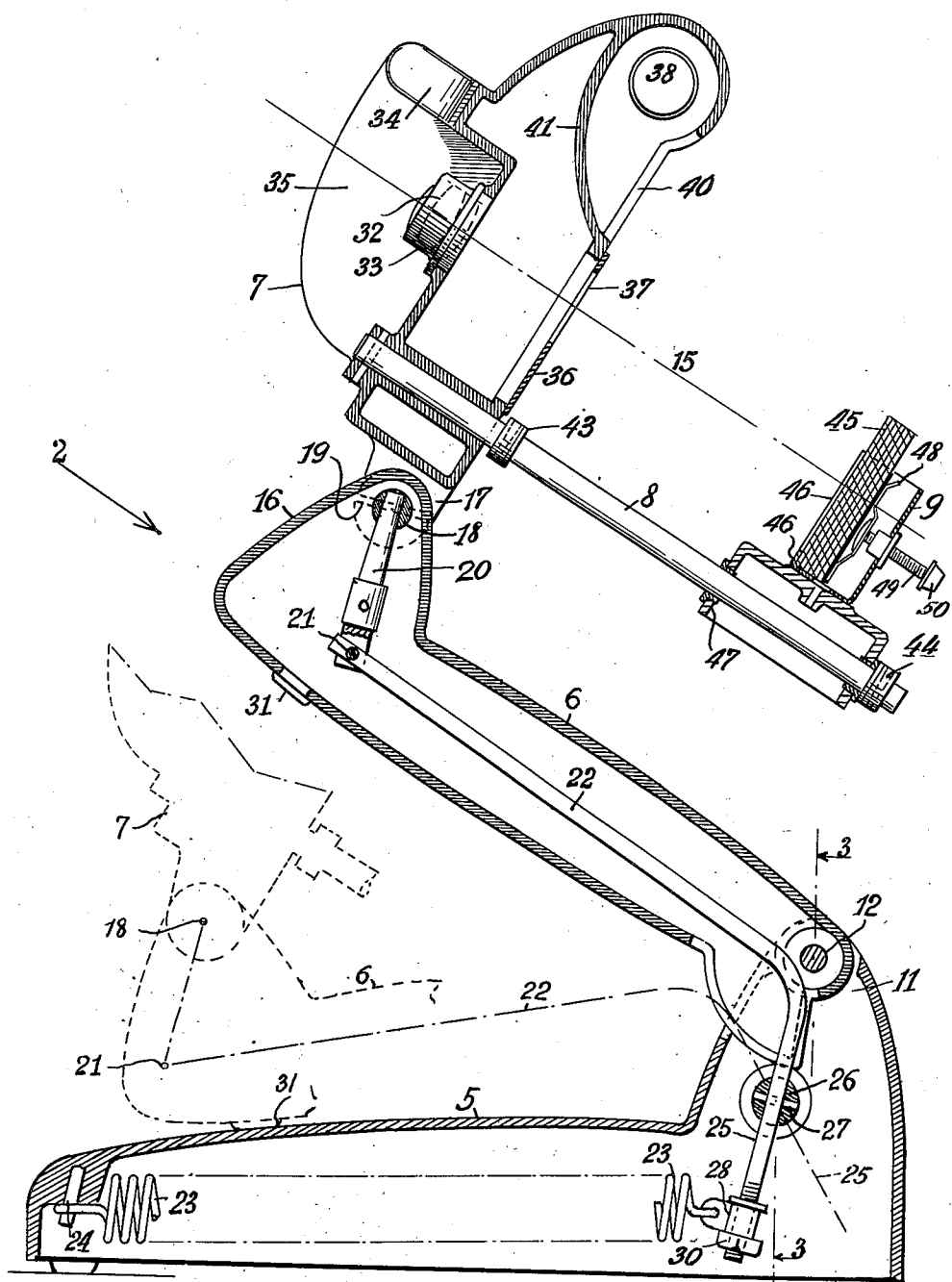
G. M. MAST ET AL

2,557,608

STAND

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2 Sheets-Sheet 1



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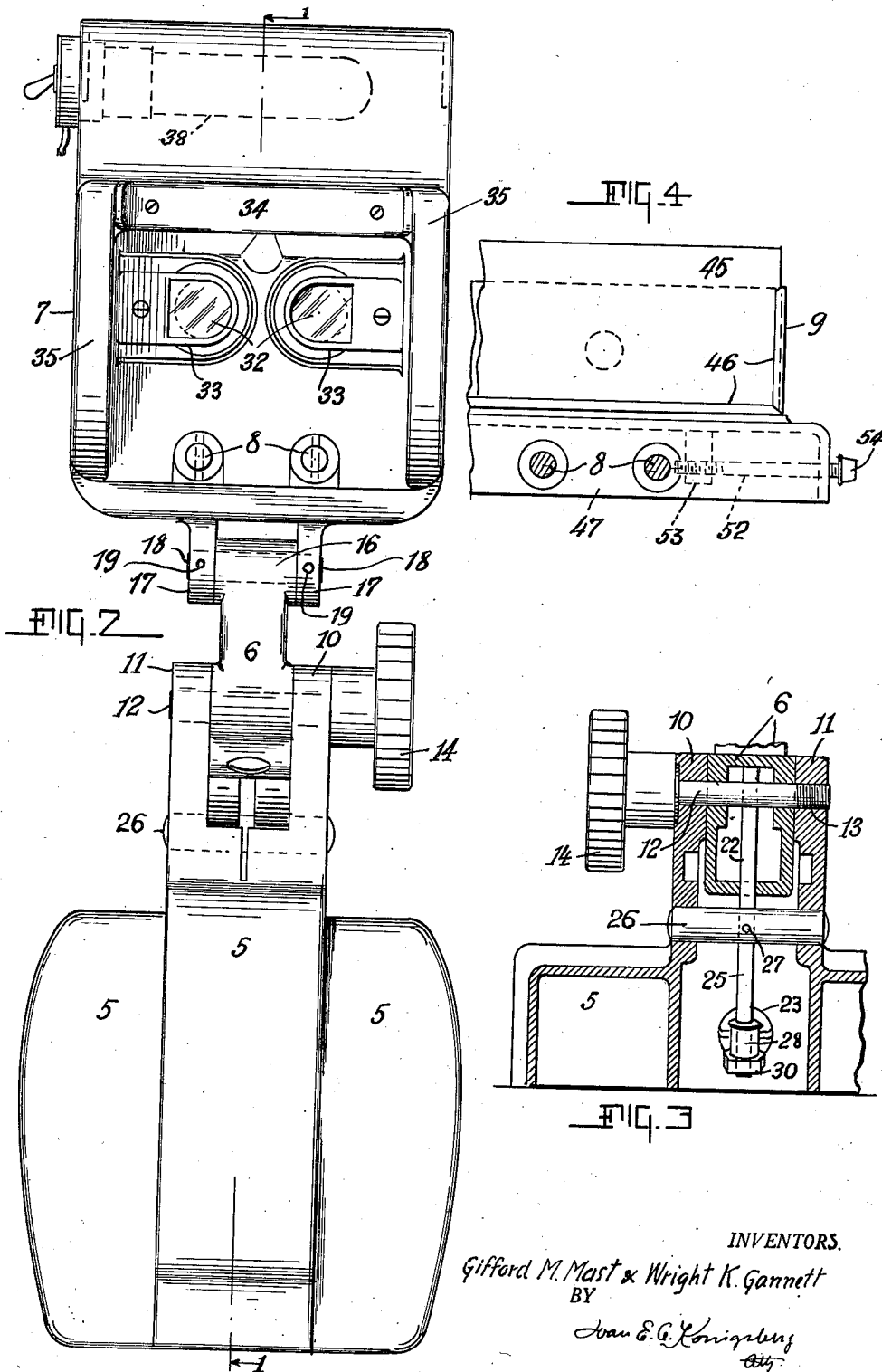
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STAND

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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STAND

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1 Claim. (Cl. 248—123)

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The object of this invention is to provide an improved instrument for conducting visual surveys particularly in schools for the purpose of ascertaining whether a student has normal patterns of seeing or whether they are subnormal or abnormal so that the services of a professional specialist are needed. The instrument is known as a telebinocular for visual surveys and is used for conducting different kinds of visual tests such as near and far point reading, simultaneous perception, vertical and horizontal imbalance, depth appreciation, color vision and many others.

The invention is embodied in a telebinocular instrument comprising a stand, an elevating arm, a head assembly with a fixed optical system and a magazine adapted to contain test cards. Inasmuch as such tests are conducted mainly by a teacher or school nurse the instrument is characterized by being of extremely simple efficient construction and operation. A novel balancing system is incorporated in the instrument so that adjustments of the head assembly may be made with little or no effort and the person conducting the tests may devote his attention to the tests themselves without having to pay too much attention to the operation of the instrument. In the accompanying drawings illustrating a telebinocular embodying the invention,

Fig. 1 is a longitudinal central sectional view taken on the line 1—1 of Fig. 2.

Fig. 2 is a front end view looking in the direction of the arrow 2 in Fig. 1.

Fig. 3 is a detached sectional view of a friction locking mechanism taken on the line 3—3 of Fig. 1.

Fig. 4 is a view of the card magazine with parts broken away.

In the drawings the stand of the instrument forms a base 5. In it is pivoted an arm 6. To the latter is pivoted a head assembly 7 and upon rods 8 fixed in the assembly the card magazine is slidably supported. The base 5 is hollow and of suitable length and width to form a firm support for the instrument. The base extends to all sides beyond the other parts for convenience in packing and shipping and so that the assembly and the magazine may be operated without fear of upsetting. At its rear end the base 5 is formed with two upstanding pivot lugs 10 and 11, Fig. 3. The arm 6 is pivoted between the lugs on a bolt 12 which passes through the lugs 10 and 11 and through the arm 6 being threaded into the lug 11 as at 13. The bolt 12 has a hand knob 14 so that by turning the bolt the arm may be clamped between the lugs if so desired.

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A main feature of the invention resides in the manner in which the arm 6 is mounted and operated with respect to the base 5 so that, as the head 7 is raised or lowered to accommodate the position of the subject, the head assembly is maintained at a fixed angular inclination with respect to the base. The axis of view from the eyes of the subject, through the optical system and to the test cards in the magazine 9 is marked 15 in Fig. 1, and remains at the same angular inclination regardless of the elevation of the head. Thus all separate adjustments of the head and optical system are avoided.

The arrangement is as follows: The arm 6 is pivoted on the bolt 12 in the base 5 and extends forwardly above the base. At its forward end the arm has an upstanding head which forms a bearing 16. The assembly head has two depending lugs 17, 17. A pivot pin 18 passes through the lugs 17 and the head 16. The lugs 17 are pinned to the pivot pin 18 by pins 19, 19.

A crank lever 20 is rigidly secured in the pivot pin 18. The lower end of the crank is pivotally connected at 21 to a dog leg link 22 which lies inside the arm 6 and extends down into the base 5. In the latter the short arm 25 of the leg 22 passes through a pivot bolt 26 rotatably carried by the base 5. The arm 25 of the link is pinned to the bolt by a pin 27. The lower end of the link 22 is connected to the one end of a spring 23, the other end of which is secured to the base at 24. The connection between the link and the spring is by way of a nipple 28 adjustably positioned on the link by a screw 30.

As seen from Fig. 1, the parts just described form a parallelogram having one side 12—26 in fixed relation to the base. A second side is formed by the dog leg link between the points 26 and 21. The angle part of the link strikes against the bolt 12 when the assembly head is raised to its highest elevation and thus forms a stop. A third side of the parallelogram is formed between the points 12 and 18, that is the arm 6 which carries a rubber button 31 to act as a lower stop, see dotted position in Fig. 1. The fourth side is formed between the points 18 and 21, i. e. the crank 20.

The head assembly maintains its angular inclination unaltered irrespective of its vertical position because the side 18—21 of the parallelogram is at all times parallel with the side 12—26 which is fixed in the base 5. The construction is of particular advantage in that by adjusting the nipple 28 on the short arm 25 of the dog leg link a so-called floating action may be obtained

in the movements of the head assembly. The weight of the latter may thus be slightly more than counterbalanced by the spring 23 so that elevation of the assembly may be done with fingertip control. That a greater pressure is required to depress the assembly is not objectionable because it does not tend to upset the instrument.

When the operator raises the head assembly 7, the arm 6 moves upwardly clockwise about the bolt 12 and the link 22 executes a similar movement about the pivot 26. Because of the parallelogram formation the side 18—21 must at all times remain parallel to the fixed side 12—26. Hence the crank 20 rotates the pivot 18 counterclockwise to place the assembly in its predetermined angular position which remains the same in all elevations. When the instrument is collapsed the parts execute reverse movements until the arm comes to final lowest position on the base.

The head assembly 7 is a housing which carries a fixed optical system comprising the lens systems 32, 32 in removable lens holders 33, 33. Above the lenses there is provided a forehead rest 34 against which the student places his head when taking a test and whereby the eyes are kept in spaced relation to the lenses. Side cheeks 35, 35 exclude side lights from interfering with the observations of the test cards. A shield 36 is spaced a suitable distance in front of the lenses and has view openings at 37. A lamp 38 is mounted in the housing above the optical system. The housing is open as at 40 so that the light is thrown rearwardly toward the card magazine to illuminate the cards. A wall 41 below the lamp prevents the light from shining into the eyes of the student.

The rods 8 are fixed in the housing 7 and carry near stops 43 and far stops 44 for near and far reading tests. The stops limit the movements of a base 47 which supports the card magazine 3 upon the rods 8 and whereby the cards 45 may be accurately placed with respect to the optical system and the eyes of the student. The magazine is adapted to contain the test cards 45 and is formed with front flanges 46 against which the cards are held by a follower 48 adjusted by a shaft 49 operated by a knob 50. The magazine may be further adjusted in any position between near point and far point position by operating a bolt

52 which is in threaded engagement with a lug 53 on the magazine base 47. The bolt has a hand knob 54 so it can be screwed fast against a rod 8, Fig. 4.

In Fig. 1, the head assembly is shown elevated above the base but not in its extreme position. In dotted lines the assembly is shown in its lowest position. In conducting tests suitable cards are placed in the magazine which preferably should always be filled with cards. The student is then told to observe the cards and report his observations which are then recorded for further use. The telebinocular as herein disclosed is a compact easily operated instrument for its purposes and includes a minimum of parts required.

We claim:

An eye testing instrument of the character described including a supporting housing for a base for the instrument, means for supporting said housing upon said base for raising and lowering the housing and instrument with respect to the base and automatically and simultaneously therewith maintaining the optical axis of the said instrument in a predetermined angular inclination from the perpendicular, said means comprising an arm pivoted at its one end to the base and at its other end to the housing, a dog leg link located within the arm and the base and pivoted intermediate its ends to the base at a point below the pivotal connection between the arm and the base, a crank connection between one end of said dog leg link and the said housing to move the latter as the said arm is moved with respect to the base and a counterbalancing spring secured between the other end of the dog leg link and the base to counterbalance the combined weights of the moving parts aforesaid as the said housing and instrument are raised and lowered with respect to the base.

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