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W. M. PARKER.  
APPARATUS FOR SIGHTING DRILLS.  
APPLICATION FILED OCT. 1, 1906.

3 SHEETS—SHEET 1.

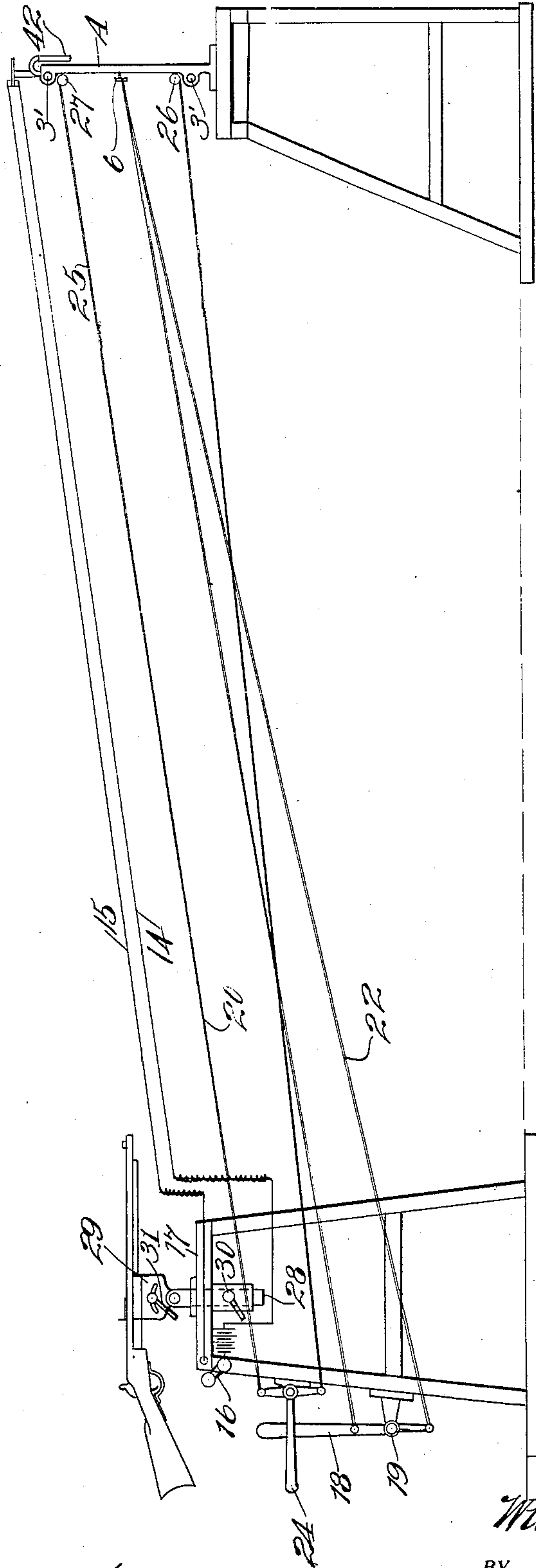


Fig. 1.

WITNESSES:

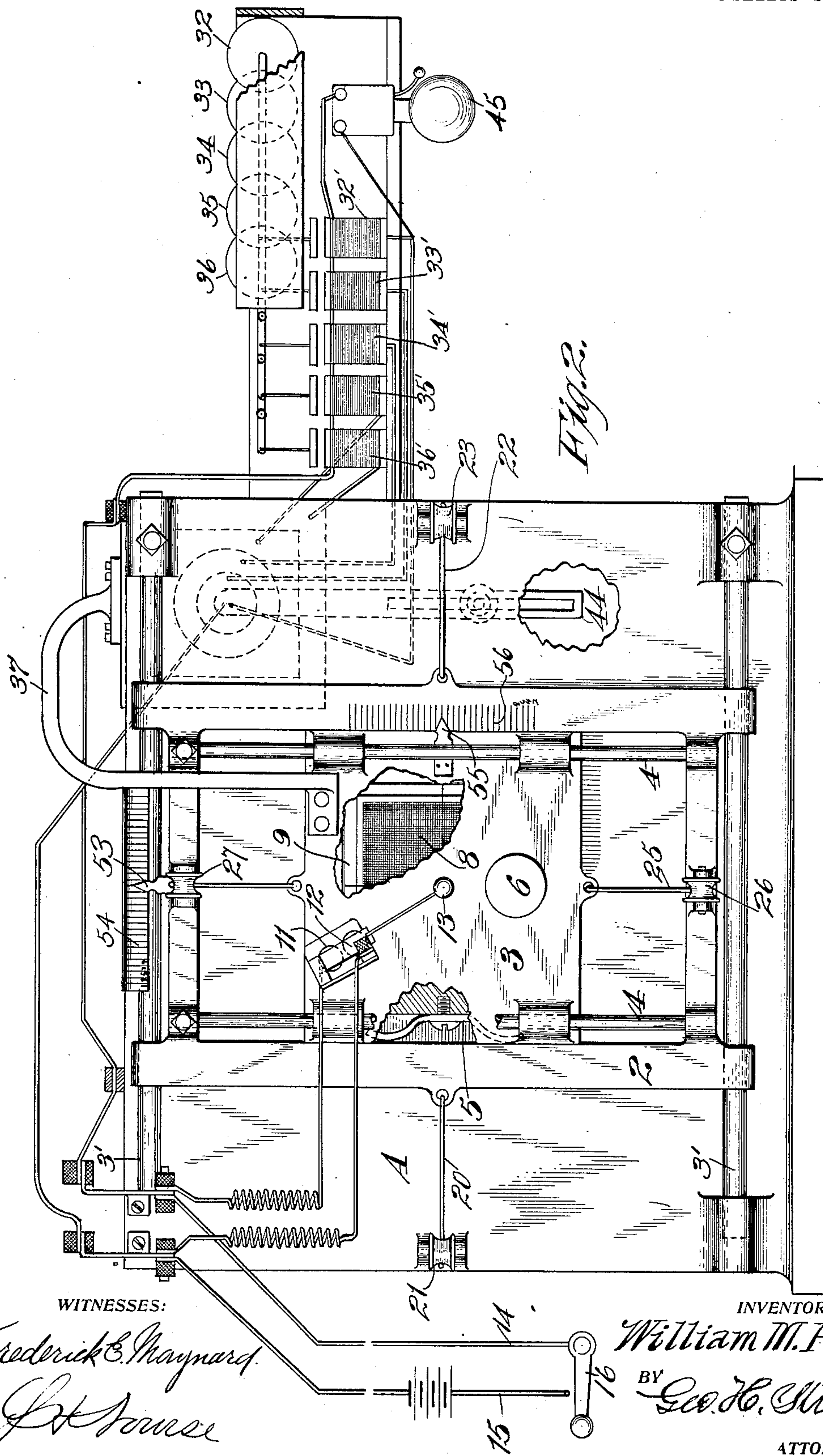
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3 SHEETS—SHEET 2.



WITNESSES:

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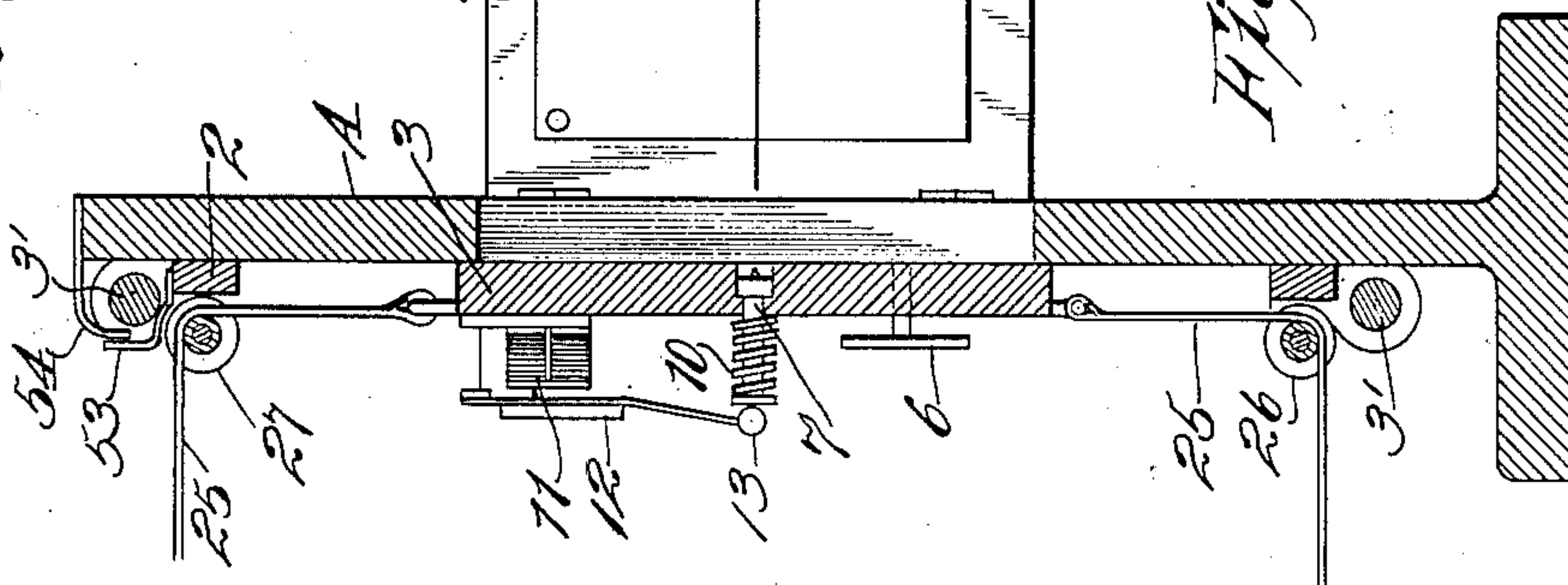
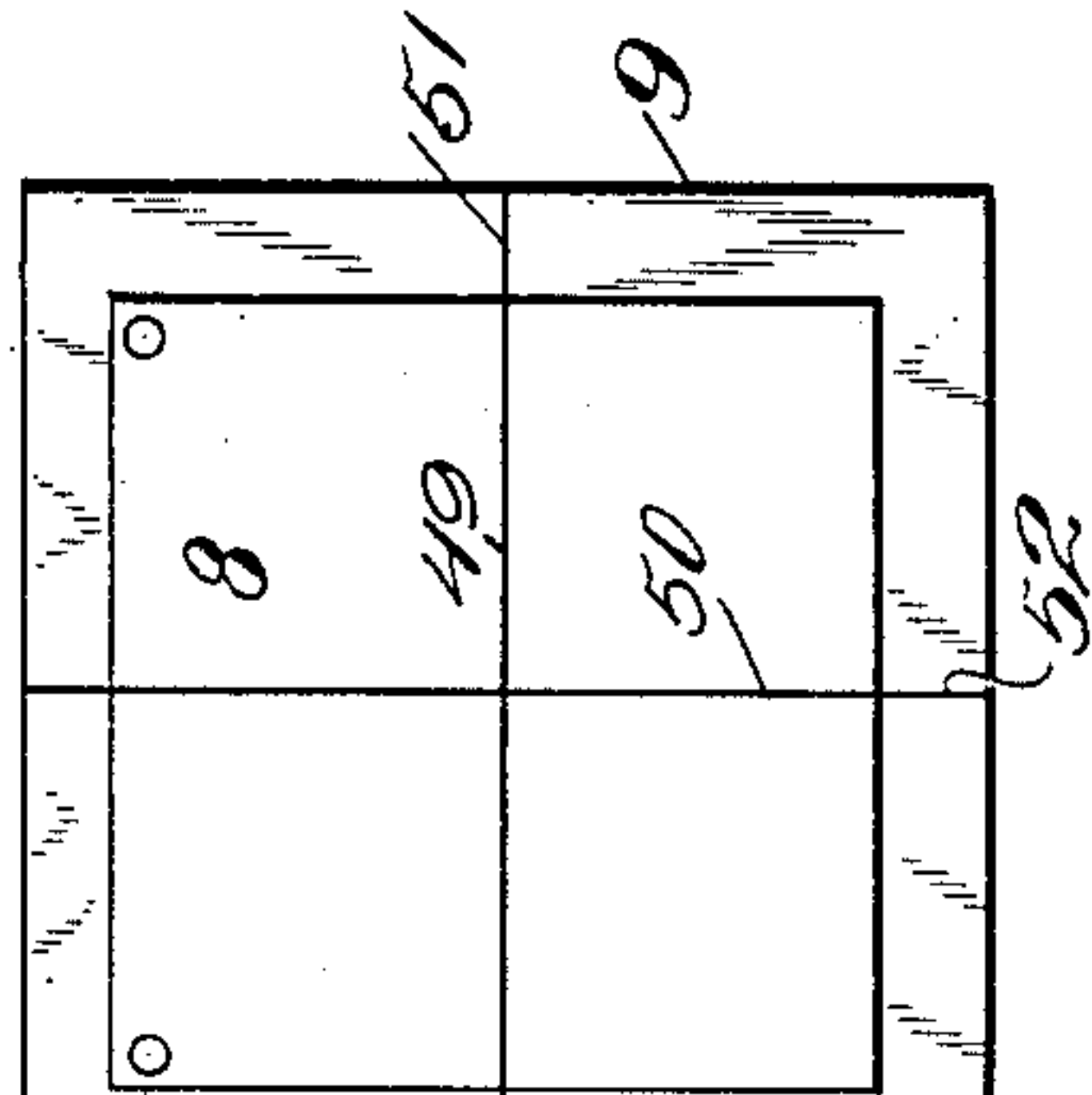
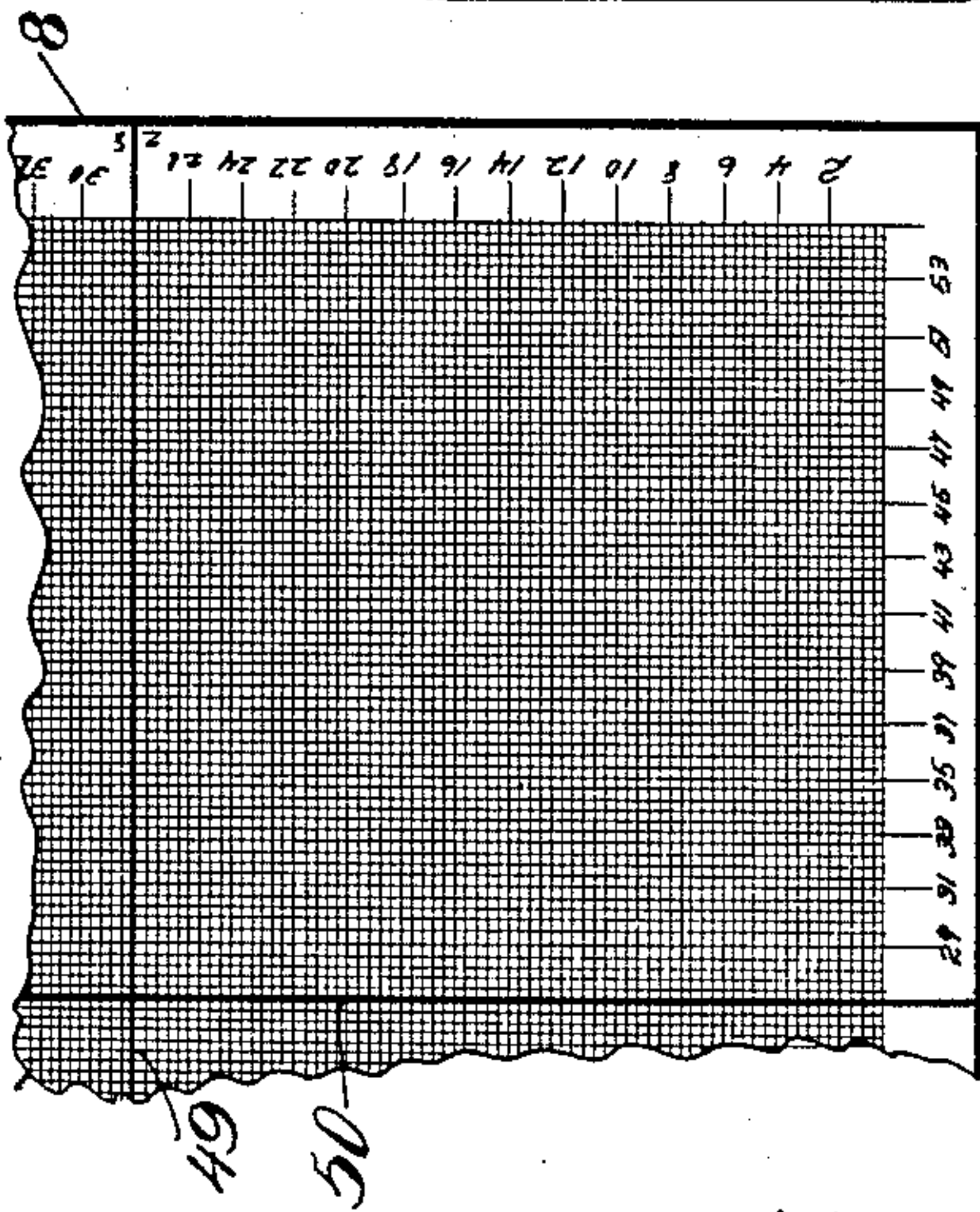
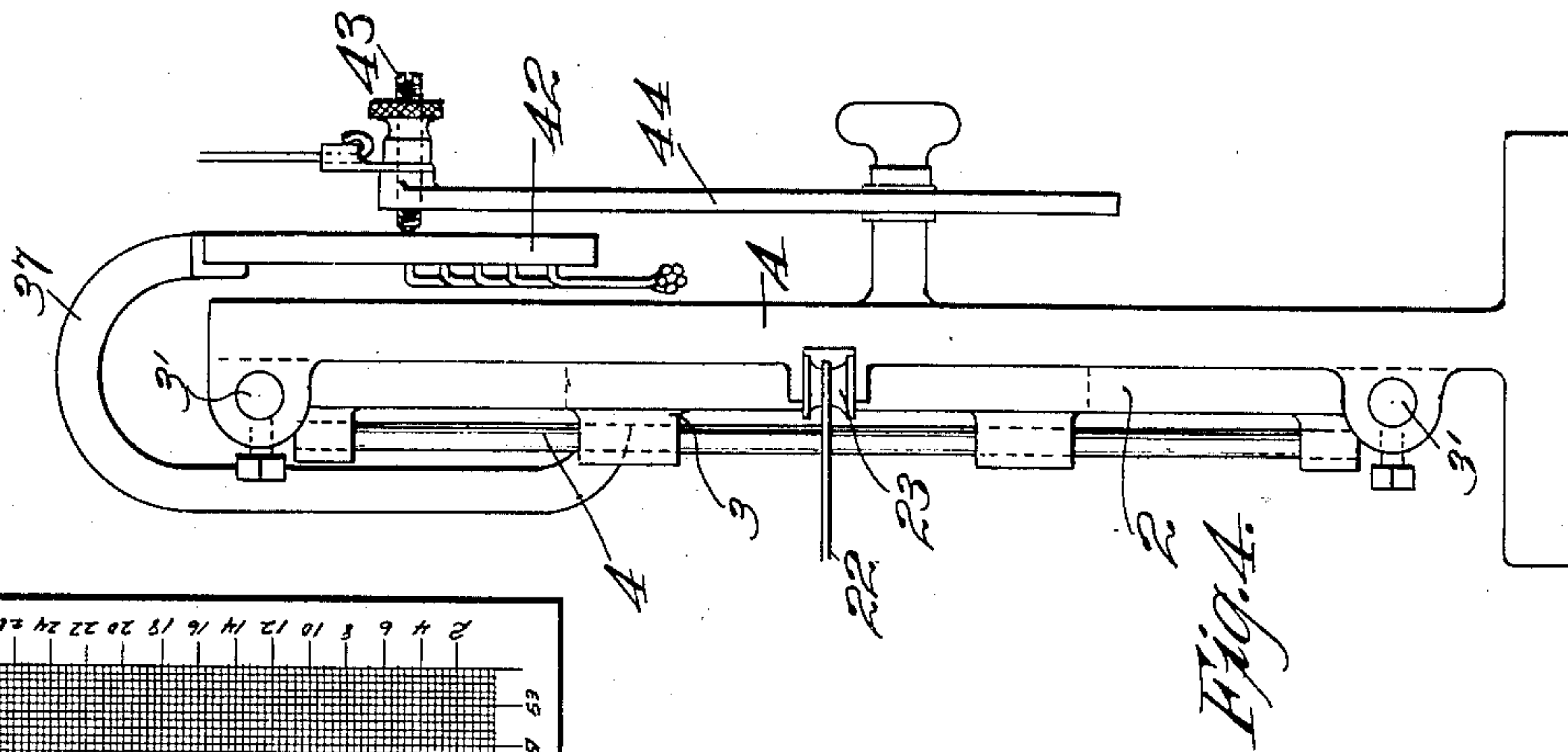
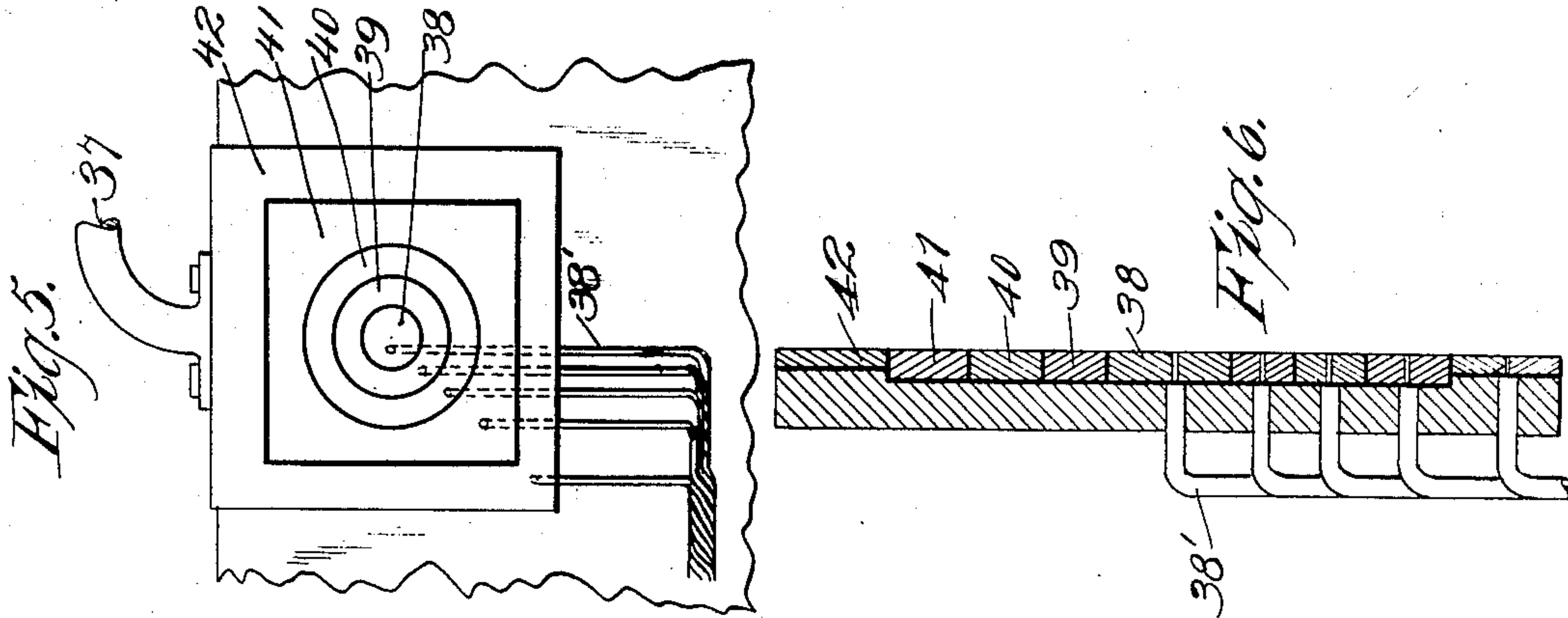
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APPLICATION FILED OCT. 1, 1906.

3 SHEETS—SHEET 3.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

WILLIAM M. PARKER, OF THE UNITED STATES ARMY.

## APPARATUS FOR SIGHTING-DRILLS.

No. 863,574.

Specification of Letters Patent.

Patented Aug. 13, 1907.

Application filed October 1, 1906. Serial No. 336,955.

*To all whom it may concern:*

Be it known that I, WILLIAM M. PARKER, United States Army, a citizen of the United States, residing at Washington, District of Columbia, have invented  
5 new and useful Improvements in Apparatus for Sighting-Drills, of which the following is a specification.

My invention relates to an apparatus for use in drilling soldiers and others to sight correctly.

It is found in practice that the instructed recruit is  
10 often unable to aline the sights of his piece with accuracy on the mark, unconsciously committing the same error which radically affects the aim. To discover and demonstrate this error before firing begins is all important. To determine this error with precision  
15 and to demonstrate its nature and amount to the recruit with exactness, a series of systematic exercises is necessary. The gun must be taken out of the hands of the recruit and placed in some form of rest in which the rifle admits of adjustment in position in both a  
20 vertical and horizontal direction.

The method commonly in vogue in the army and as established by the regulations is to support the gun in fixed position on a sand bag, or the like, mounted on a tripod. At a suitable distance from the gun,  
25 usually about 20 feet, a sheet of white paper is tacked on the barracks' wall, and the gun sighted by the instructor on this sheet of paper. A marker is used consisting of a small rod with a disk of white card board about three inches in diameter, bearing a black bull's  
30 eye about one-half inch in diameter, pierced in the center with a hole just large enough to admit the point of a lead pencil or of a chalk crayon. This marker is held by a man standing near the sheet of paper and is moving over the sheet of paper according to the signals given by the recruit at the rifle. The latter by  
35 proper movement of the hands, directs the man to move the disk to the right or left, or up or down until the lower edge of the bull's eye is brought into the line of sight, when he says, "Mark", the marker then  
40 records through the hole in its center the position of the disk; the disk is lowered, the soldier straightens himself a moment and then without removing the rifle repeats the operation. This exercise is performed, say three times; the points thus determined joined  
45 by straight lines, and the soldier's attention called to the triangle thus formed. The shape of this triangle and the position of its sides will indicate the nature of the variations made in aiming. It is manifest that by such a system where the indicated accuracy of the  
50 soldier's aim is dependent on the steadiness and expertness of the marker, the results achieved are not all that might be desired.

My object is to provide an apparatus which will give every beneficial result sought to be obtained by

the present exercise; which will eliminate all chance  
55 of error other than that directly attributable to the recruits themselves; which apparatus will provide an adjustable means for holding the gun in fixed position; which will allow the recruit to adjust the target himself and to adjust it positively, and to any degree by mechanical means directly under his control; which will,  
60 on the completion of the sighting operation, indicate to the recruit both by audible and visible signals the character of the shot, whether a "5," "4," "3," "2," or miss, which he has made, or assumed to have made;  
65 which apparatus will be adaptable to indicate the relative score made at different ranges, 200, 300, 500 yards, &c.; which will have mechanical means for marking each recruit's score card; which latter means may be operated directly by the recruit; which score  
70 card may be taken from the target and kept for reference, and which may be replaced later in the target, if desired for the purpose of showing to the recruit just how his error arose.

The invention has other objects and advantages  
75 which will be manifest on further consideration of the mechanisms employed.

The invention consists of the parts and the construction and combination of parts, as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a view of the device as used. Fig. 2 is a front elevation partially in section. Fig. 3 is a vertical section taken centrally through the main frame and slides. Fig. 4 is a side elevation. Fig. 5 is a view of  
80 the pattern target. Fig. 6 is a section of same. Fig. 7 shows a fragmentary view of a "score" card.

A represents a suitable stationary support or back for my adjustable target. The target comprises two movable members or sections 2—3. The section 2 is  
90 mounted on suitable guides 3' on back A to slide horizontally, and the section 3 is mounted on suitable guides 4 carried by section 2 and adapted to slide vertically.

The vertically movable section 3 is adapted to be held  
95 at any desired point by suitable means as the friction brake 5. The horizontal and vertical movements of the sections 2—3 are sufficient for all the purposes of the invention; usually each section having a movement on its guides of 6 inches more or less.

The vertically movable section 3 carries the bull's eye or sighting point, which latter is of any suitable description. I prefer to use a removable bull's eye in the form of a button 6 having a stem to fit a suitable socket in the section 3. The size of this bull's eye corresponds to the range at which the recruit is supposed  
105 to be sighting; the gun being placed as before stated at about 20 feet from the target. If the test is made



for a 200 yard range, a larger bull's eye is employed than if the test is being made for a greater range. By having a number of removable bulls eyes as 6. It is apparent that any one of them can be used according to the test desired.

Carried by the section 3 is the marking device 7 which is here shown as consisting of a rod operating in a guide or perforation in section 3 and having a prick point, which is adapted to be projected beyond the rear surface of the section 3 and to impinge upon and mark the record card 8, which latter is tacked or otherwise secured to the movable card support 9 hinged in an opening in the stationary back A.

A spring 10 acts on the perforator 7 normally to retract the perforating or marking point inside of the section 3 and allow the target to be moved freely in any direction over the face of the record sheet or card 8 without marking or marring the latter.

While any suitable means may be employed to actuate the marker 7 at the proper moment, I prefer to do this by electrical means as here shown. Accordingly I employ an electro-magnet 11 fixed to and movable with the vertical section 3 of the target and having its armature 12 provided with a hammer extension 13 adapted on the excitation of the electro-magnet to strike a blow on the end of the marking device 7 compressing the spring 10 and marking the record sheet. This marking device is controlled from any suitable point, but preferably from some point proximate to the gun support, and also the movements of the target are preferably controlled from near the same spot. Therefore I have shown the terminals of the coils as connected by the wires 14, 15, with a suitable switch or push button 16 on the table 17.

The horizontally movable section 2 of the target is operated in either direction by the lever 18, arranged within easy reach of the operator; the lever being fulcrumed between its ends as 19 and having a cord 20 connected to it on one side of said fulcrum and leading around suitable direction pulleys 21 to connect with one side of the horizontal movable section 2 and a cord 22 leading around corresponding direction pulleys 23 and connecting with the opposite side of section 2; the two cords being arranged on opposite sides of fulcrum 19 and equidistant therefrom. Correspondingly the vertical section 3 of the target is operated from the same point by a lever 24 and the connecting cords 25 passing over suitable upper and lower direction pulleys 26—27.

While any suitable means may be employed to support the gun, preferably I employ the following, which allows for the necessary vertical and horizontal adjustments and inclinations of the piece: The post 28 is suitably mounted for both a vertical and a rotatable adjustment. The top of the post is bifurcated and the gun rest 29 is pivotally supported in the bifurcation. The post is locked against rotary and up and down movements by suitable means as the clamp 30, and the gun rest is also adapted to be locked in fixed position by suitable means as the thumb-screw 31.

As before stated the levers 18—24 for operating the target and the push button 16 for actuating the marker, are preferably arranged close by the gun support and within easy reach of the recruit who is sighting so that he can bring the bull's eye 6 on the target into what he considers most accurate alinement with his sights.

Having determined what he thinks is the correct alinement of the bull's eye and sights, he pushes the button which actuates the marker and causes the latter to indicate the results on the score card. The instructor then may throw the levers 18—24 to move the target so that the bull's eye is no longer in alined position with the sights and the recruit then sights again along the piece, and by the manipulation of the levers seeks to bring the bull's eye once more into line with the sights pressing the button to mark the result; thus repeating the operation the required number of times.

When one soldier has finished the exercise, the instructor by means of the adjustable devices of the gun support slightly changes the angle of the piece so that while the bull's eye may still be moved into alinement with the sights, the relative position of the bull's eye with respect to the stationary record card 8, will have been changed so that when the marker 7 is operated for the second recruit the prick points will not be on the same part of the paper.

For the purpose of indicating accurately to the marksman or sighter, what the relative value of his different sights or shots are, and to acquaint him as to whether he actually made a bull's eye or only secured a "4" or "3" or "2," or made a miss, I arrange a series of semaphores 32—33—34—35—36; each of these semaphores representing a corresponding degree of excellence of marksmanship: thus semaphore 32 representing a bull's eye or "5," semaphore 33 representing a "4," et cetera. These semaphores are electrically operated and are suitably mounted on the stationary back A; each semaphore arm being properly colored and having its own actuating electro magnet 32'—33', etc. These several magnets are connected in multiple in the electric circuit 14—15 leading from the push button to the coil 11 which operates the marking device. Suitably supported on the vertically movable section 3 of the target as by the curved arm 37, is a pattern target which consists of a series of concentric metal rings 38—39—40—41—42 suitably insulated from each other.

The curved arm 37 is shown as extending over the back A and the pattern target partakes of the same movements as the horizontal and vertically movable target section 3. The several rings of the pattern target are connected electrically with a respective semaphore magnet. Thus the central disk, or bull's eye 38, of the pattern target is flexibly connected by a wire 38' with a coil 32'; correspondingly the "4" ring 39 is connected with the "4" magnet 33' of the "4" semaphore 33 and &c. An adjustable contact member 43 mounted on the lengthwise slotted adjustable arm 44, is adapted to have a suitable surface contact with any one of the rings of the pattern target.

The adjustment of the arm 44 is effected by means of a set screw operating in the slot of this arm.

The contact 44 is in series with wire 15 which leads to the push button 16. Thus it will be seen that if a pattern target is in such position that the contact 43 bears on any of the metal rings or conducting portion of the pattern target and the push button 16 is operated to close the circuit, not only will the marker 7 be actuated in the manner hereinbefore described, but the semaphore corresponding to the ring with which the contact 43 is in engagement, will be displayed: thus if the contact 43 is on the central or bull's eye disk 38, the bull's



eye or "5," semaphore 32 will be operated, and if the contact 43 is on the "zero" plate 42, the "zero" semaphore 36 will be displayed.

In addition to the foregoing visible signals, I may provide an audible signal device which will only sound when the correct bull's eye is hit or sighted on. This signal device simply consists of an ordinary electric bell 45 having its coil in circuit with the "5" magnet 32'; thus when a bull's eye is correctly sighted and the push-button operated, both a visible and audible signal will be given.

The pattern target and the contact member 43 are set each time by the instructor before the recruit begins the exercise; the instructor first sighting through the gun himself and moving the target until the bull's eye 6 aligns to his satisfaction with the sights of the piece. He then steps to the back of the target and adjusts the arm 44 until the contact 43 is in the center of the bull's eye disk 38 of the pattern target. The arm is then locked in fixed position so that both the sighting target and the pattern target may be moved in any direction and again brought back with the two bull's eyes 6 and 38 in their same original relative position and with the contact 43 on the bull's eye 38.

Having thus set the pattern target correctly with respect to the alinement of the bull's eye 6 and the sights on the piece, the instructor turns one or the other, or both of the levers 18—24 to throw the target out of position. The recruit now takes his position at the piece and by manipulation of the levers 18 and 24 finally brings the target 6 into alinement, or as near as he is able to do so, with the sights of the piece; he then pushes the button 16 and the result is recorded and indicated in the manner described.

The record sheet or card 8 is preferably ruled into numerous squares formed by vertical and horizontal lines; the vertical lines being numbered by the odd numbers as 1—3—5, etc., and the horizontal lines designated by even numbers as 2—4—6—etc. The central vertical line and the central horizontal line of the card are preferably ruled heavier or darker than the other lines as indicated at 49—50. This central vertical and horizontal heavy lining is for the purpose of accurately positioning the card on the hinged support 9; the latter having vertical and horizontal marks 51—52 corresponding to the heavy central vertical and horizontal lines 49—50. The horizontal movable target section 2 carries a pointer 53 which is movable over a graduated scale 54 on the fixed support A. This scale 54 has its graduations numbered by the odd numerals 1—3—5, etc., corresponding to the odd numbers of the vertical lines on the card 8; likewise the vertically movable target section 3 carries a pointer 55 which is movable with respect to a scale 56 on the section 2. The graduations of the scale 56 are even-numbered, corresponding to the even numbers of the horizontal lines of the score card 8. The object of thus using a checked card with its odd- and even-numbered vertical and horizontal lines in conjunction with the scales 54—56 with their respective pointer 53—55, is to enable the target to be re-adjusted to the position occupied when the recruit sighted along the gun at the bull's eye and as the result of this sighting was recorded on the card. Thus if the recruit had sighted for five shots and each shot had been recorded by means of the pointer 7 and if there

were any essential variation between these shots such as it is desired to point out to the recruit, he may be shown why and how his error arose, since the target and sheet can be reset in the position occupied when the particular sight was taken by simply observing on the score card the location of the record mark by a reference to those vertical and horizontal lines which intersect most adjacent to this record mark; that is to say, suppose this mark was at the intersection of the number 3, vertical line, and the number 4, horizontal line, the sections 2—3 of the target are moved until the pointer 53 is on the number 3 mark of scale 54, and the pointer 55 is on the number 4 mark of the scale 56. The bull's eye is then in exactly the position it was when the recruit sighted on it for that particular shot.

Since the bull's eye, or the part aimed at, is supported by the section 3, and since the said section is in turn supported by the section 2, the target sections 2 and 3 could be called target supports, but I prefer to regard the whole apparatus comprising these sections as well as the part A as a target, and therefore to call the parts 2 and 3 target sections.

It will thus be seen that my invention involves a radically new principle in this art. It is the only device with which I am acquainted that teaches the recruit the constancy of his error, the amount thereof, and to what it is due. All other machines of this character, merely show him that he has or has not made an error. In said machines said error, in case the sighting apparatus is movable, may be due to the trigger pull, or it may be due to an error in the aiming. That is to say, the aim or actual line of sight taken by the recruit may, and usually does, differ from the true line of sight of the gun. And again, the said error heretofore disclosed by prior machines, may be and usually is due to both the trigger pull and to the difference between the aim and true lines of sight. Therefore, in such machines the recruit can never be sure whether his total error is due to the trigger pull, to his inaccuracy of aiming, or to both, and he is at a loss to know just what he should do to correct his combined errors. In my machine, on the other hand, by rigidly clamping the sighting device, all error due to the trigger pull is at once eliminated, and the recruit at once knows his observed errors are due to incorrect aiming, and since he can compare one shot with another taken under exactly the same conditions, he can easily estimate and be convinced of the amount and of the constancy of his errors due to incorrect aiming. He can then always allow for this error in the future, and can continue to practice with this machine until he knows the same, or his personal equation of aiming is mastered.

An important feature of my invention lies in the combination of a target, adjustable by the marksman, and a concealed record sheet. For by having the gun stationary, and enabling the marksman to adjust the target, all the advantages of aiming with a movable gun are obtained, and by having the record sheet concealed the marksman is not liable to correct successive aims by looking at his previous ones, and thereby fail to acquire a correct and constant habit of sighting, which is soon attained if he has only the sights and the target to look at.

Another important feature of my invention is the combination of a removable bull's eye and an adjust-



able target with a concealed record sheet. With bull's eyes made to scale, such as I use, and exactly representing those on different ranges, the marksman can get the benefit of practice for different ranges, while at the same time he is compelled to correct his aiming errors by acquiring a correct and constant habit of sighting from looking at his sights alone, as above stated.

After having mastered the problem of aiming, the sighting apparatus proper may be unclamped and the target left fixed, and then the errors due to the trigger pull may be mastered in any suitable way well known to the art. This feature of striving for constancy in aiming while trying to approach a criterion, and thereby teaching the recruit the value and the constancy of his errors and how to correct the same, is a most important part of my invention; therefore, I do not wish to be understood as limiting myself to the particular construction disclosed, for it is evident that the same may be varied without departing from the spirit of my invention, but

What I claim and desire to secure by these Letters Patent is:—

1. In apparatus of the character described, the combination of an adjustable gun rest, an adjustable target, means under the control of the marksman at the gun for adjusting the target, a recording means, a record surface, and means for concealing said surface through which said recording means passes.
2. In apparatus of the character described, the combination with a gun rest, of a vertically and horizontally adjustable target, means operable by the marksman at the gun for controlling the adjustments of the target, a recording means, a record sheet, and means for concealing said record sheet through which said recording means passes.
3. In a sighting apparatus, the combination with a suitably supported fire-arm, of an independently supported target comprising horizontally and vertically movable sections, a recording means, a record sheet supported independent of the target, means for concealing said sheet, through which the said recording means passes, and means for adjusting the target sections.
4. In a sighting apparatus, an adjustably mounted target and means operable from a point remote from the target for adjusting the same, a concealed record sheet over which the target is adjustable, and electrically operated means for indicating the value of the aim on said sheet.
5. In sighting apparatus, the combination of a movably-mounted sighting target, a pattern target movable in unison with the sighting target, and electrically-operated signal mechanism associated with the pattern target.
6. In a sighting apparatus the combination of a sighting device adapted to be immovably clamped and an adjustably mounted sighting target, a pattern target carried by the sighting target and movable therewith, said pattern target consisting of electrically conducting sections, a contact member independent of said sections, and means for moving the target to bring said sections successively in circuit with said contact member.
7. In a sighting apparatus, the combination of a movably mounted sighting target, a pattern target carried by the sighting target and movable therewith, said pattern target consisting of electrically conducting sections, a contact member independent of said sections, means for moving the target to bring said sections successively in circuit with said contact member, and semaphore-actuating-magnets in circuit with said sections.
8. In sighting apparatus, the combination of an adjustable sighting target, a pattern target composed of concentric electrically conducting insulated sections, a contact-member engageable with said sections, and signal

mechanism operative on the contact of said contact member with said sections.

9. The combination with a gun having front and rear sights, of a target mechanism including a marker and a record sheet associated with the target for recording data indicative of the variation between the true line of sight and the aim, or actual line of sight, and means through which said marker passes for concealing said sheet.

10. The combination with a gun having front and rear sights, of a target and mechanism associated with the target for recording data indicative of the variation between the true line of sight and the aim, or actual line of sight, said mechanism including a graduated record sheet, and a marking device movable relative to the record sheet, means to operate the marking device, and means to conceal the said sheet through which the marking device passes.

11. The combination of a gun having front and rear sights, of an adjustable target, a concealed record sheet over the surface of which said target is adjustable, means to move the target, and means passing through the target to indicate on said record sheet the aim, or actual line of sight.

12. The combination of a gun having front and rear sights, of an adjustable target, a concealed record sheet over the surface of which said target is adjustable, means to move the target, and means to indicate on said record sheet the aim, or actual line of sight, said last-named means including an electrically operated marker carried by the target.

13. The combination of a gun having front and rear sights, of an adjustable sighting target, a record sheet supported stationary with respect to the targets means for concealing said sheet, a marking device carried by the target and operable on said record sheet and through said concealing means, and mechanism operable by the man at the gun to record by means of said marker the actual line of sight.

14. In a sighting apparatus, the combination of a sighting target, comprising horizontally and vertically adjustable sections, a pattern target carried by one of said sections, a marking device carried by the sighting target and electrically operated signaling devices actuated by said pattern target, and means to move the sections of the sighting target.

15. In a sighting apparatus, a target composed of horizontally and vertically adjustable sections, an electrically operated marking device carried by the sections, a concealed record sheet, and a movable support for the same independent of the target and normally stationary with respect to the target.

16. In a sighting apparatus, a target composed of a horizontally movable section and a vertically movable section, and an electrically operated marking device carried by one of the sections, a record sheet, and a movable support for the same independent of the target, and normally stationary with respect to the target, said record sheet and said target sections having corresponding respective horizontal and vertical scales.

17. In a sighting apparatus, the combination of a gun with front and rear sights, an adjustable target with means for making a record passing therethrough, means at the gun for alining the target with the sights, and a stationary concealed record sheet for recording the aim.

18. In sighting apparatus, a target composed of horizontally and vertically movable sections, a horizontally and vertically graduated record sheet supported independent of the target, said target sections having respective scales corresponding to graduations of the record sheet, and a marking device.

19. In sighting apparatus, a movable sighting target, a pattern target composed of insulated electrically conducting sections, a contact-member adjustably mounted independent of the pattern target, indicating mechanisms corresponding with said conducting sections of the pattern target, and electrical connections for operating corresponding sections of said signal mechanisms on the closing of the circuit between said contact-member and one of the other of said electrically conducting sections.



20. In sighting apparatus, a movable sighting target, a pattern target composed of electrically conducting sections, signal mechanisms corresponding with said sections, and electrical connections between said sections and said signal mechanisms to indicate the sight upon said sighting target.

21. In sighting apparatus, a movable sighting target, a record-sheet supported stationary with respect to said target and over the surface of which sheet said target is movable, and a marking device carried by the target and operable to impinge upon and mark said record-sheet.

22. In a sighting apparatus, the combination of an adjustable target, a stationary frame provided with indices supporting said target and a record sheet also provided with indices adapted to register with those on said frame.

23. In a sighting apparatus the combination of an adjustable target, a removable bull's eye therefor, a concealed record sheet and electrical means on said target for recording the marksman's aim on said sheet.

24. In a sighting apparatus the combination of an adjustable target, a removable bull's eye a concealed record sheet and means operable from the gun for adjusting said target across the line of sight, and means for recording the aim on said sheet.

25. In a sighting apparatus the combination of a movable sighting target, consisting of vertically and horizontally movable sections, means for moving the same from the gun, a pattern target rigidly connected to one of said sections, and means for showing the marksman the value of his aim.

26. In a sighting apparatus the combination of an adjustable sighting target provided with movable sections, a

pattern target rigid with one of said sections, connections between said target sections, and indicators for showing to the marksman the character of his aim.

27. In a sighting apparatus, a target having an independently adjustable section, and means including a record sheet, means for concealing the same, and a recorder passing through said concealing means by which the marksman may learn the constancy of his error.

28. In a sighting apparatus the combination of an adjustable target, means for adjusting the same at the gun and means including a record sheet, means for concealing the same, and a recorder passing through the concealing means, whereby the marksman may be taught the constancy of his error.

29. In a sighting apparatus the combination of means to eliminate errors in aiming due to the trigger pull, and means including a record sheet, a target for concealing the same, and a recorder passing through said target, whereby the marksman may be taught the value and constancy of his errors in aiming.

30. In a sighting apparatus the combination of a gun capable of being immovably fixed, an adjustable target, means by which the marksman may adjust the same while aiming, and means including a concealed record sheet, and a recorder passing through the target, by which the accuracy of his aim is recorded.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM M. PARKER.

Witnesses:

S. H. NOURSE,

FREDERICK E. MAYNARD.