

Jan. 2, 1923.

1,440,385

E. M. FOSTER.
GUIDE MECHANISM FOR SHEET METAL ROLLING MACHINES.
FILED NOV. 24, 1919.

2 SHEETS-SHEET 1

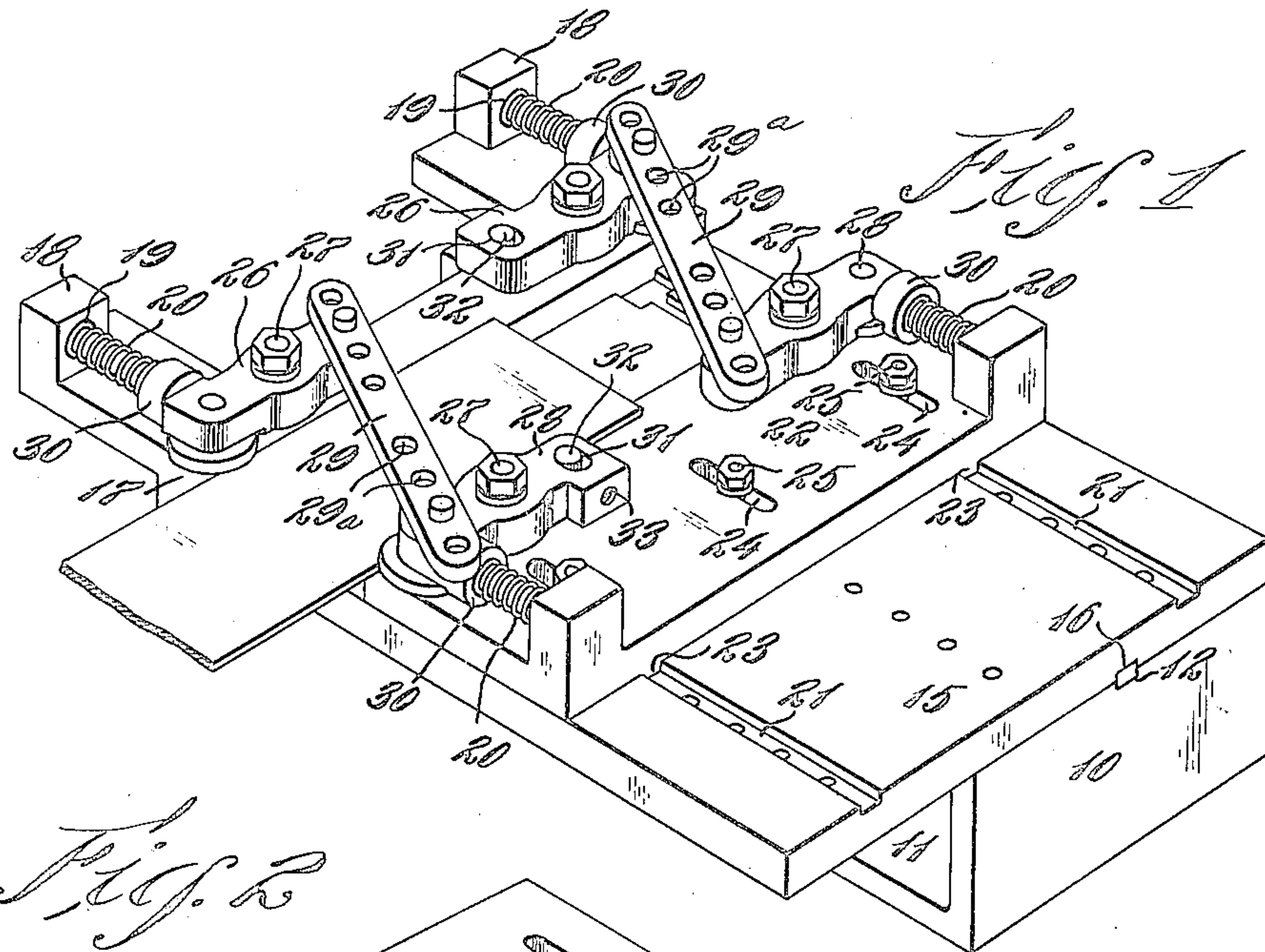


Fig. 2

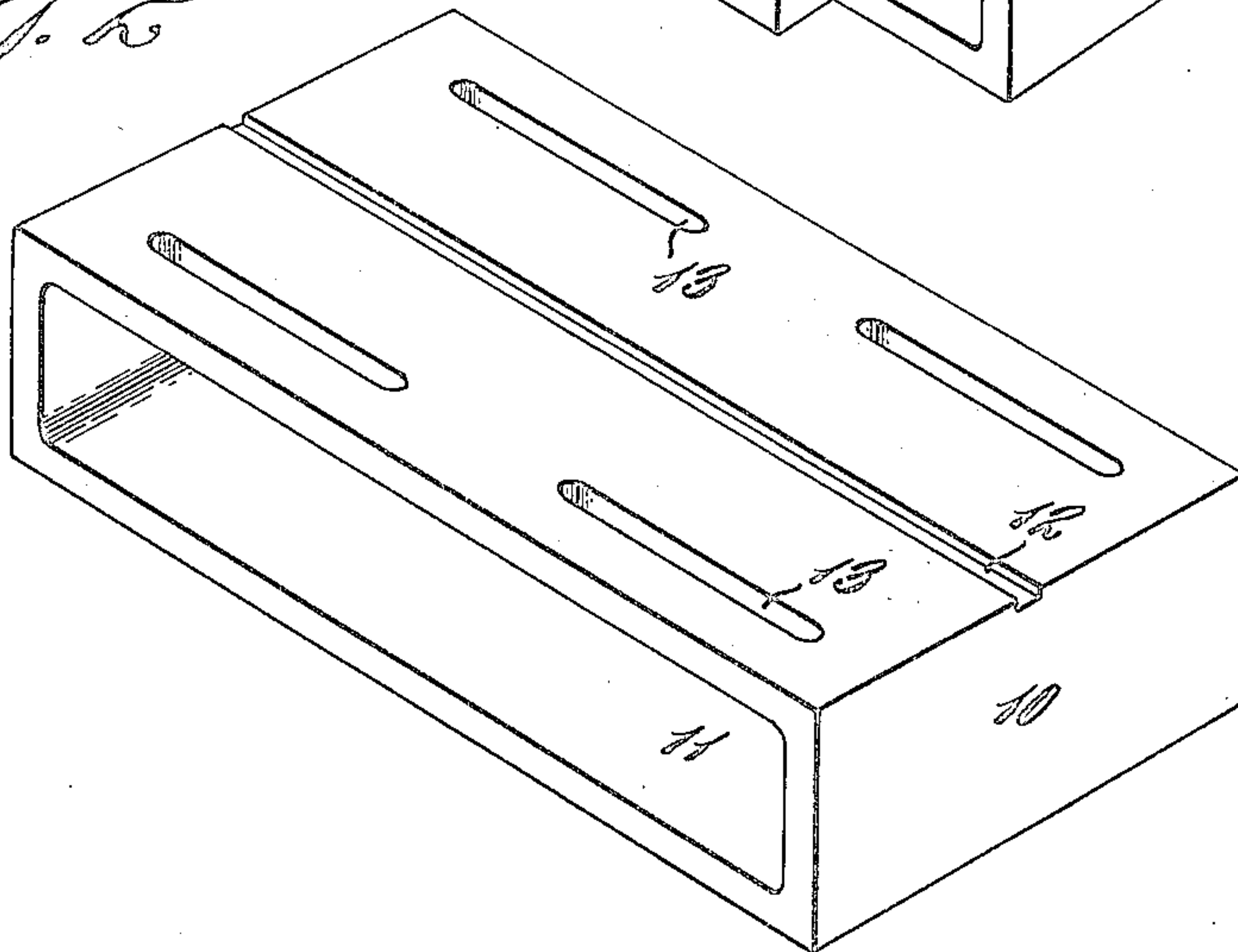
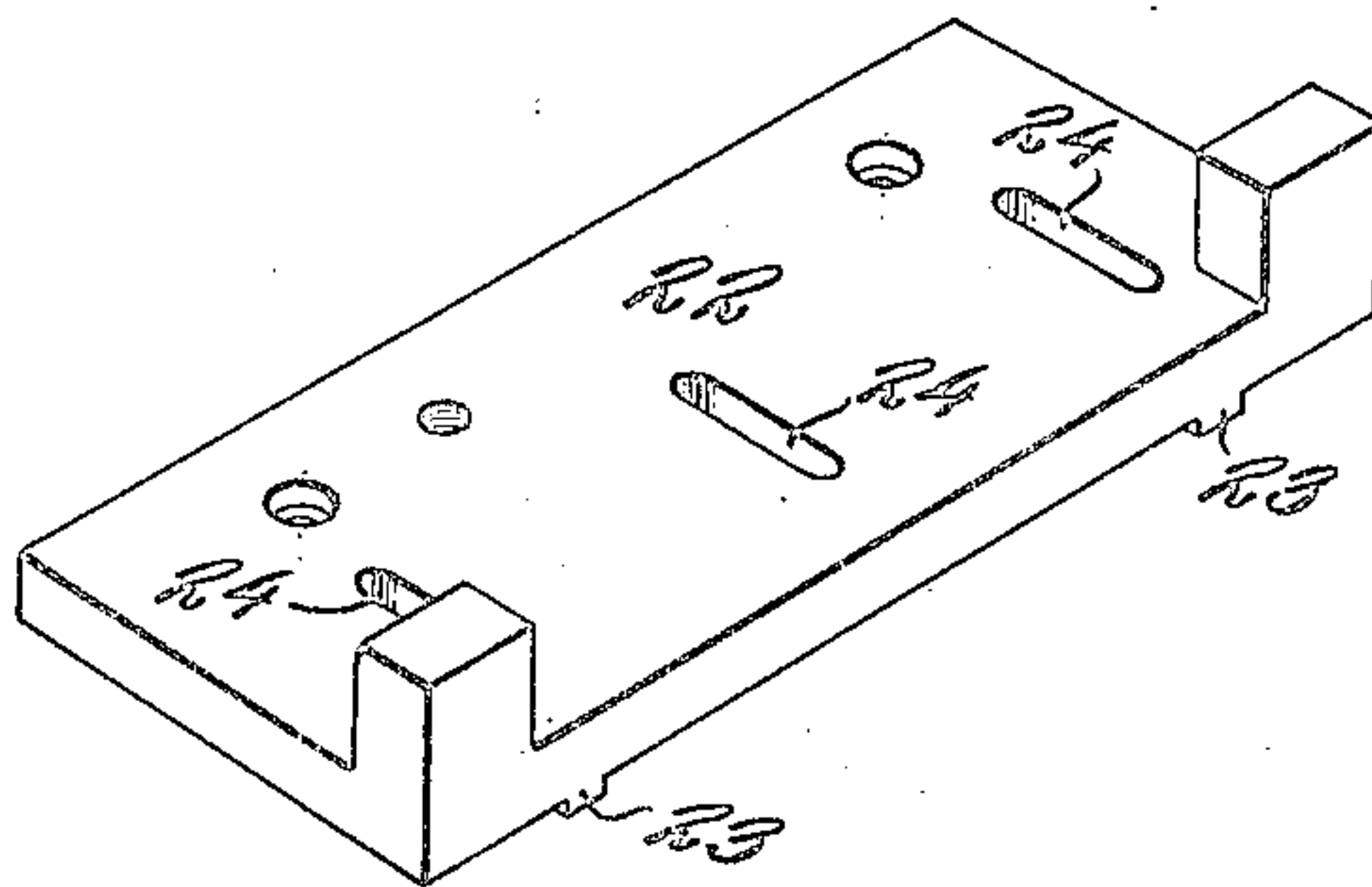


Fig. 3



Inventor
E. M. Foster

By Hull Smith Brock & West
Attorneys

Jan. 2, 1923.

1,440,385

E. M. FOSTER.
GUIDE MECHANISM FOR SHEET METAL ROLLING MACHINES.
FILED NOV. 24, 1919.

2 SHEETS-SHEET 2

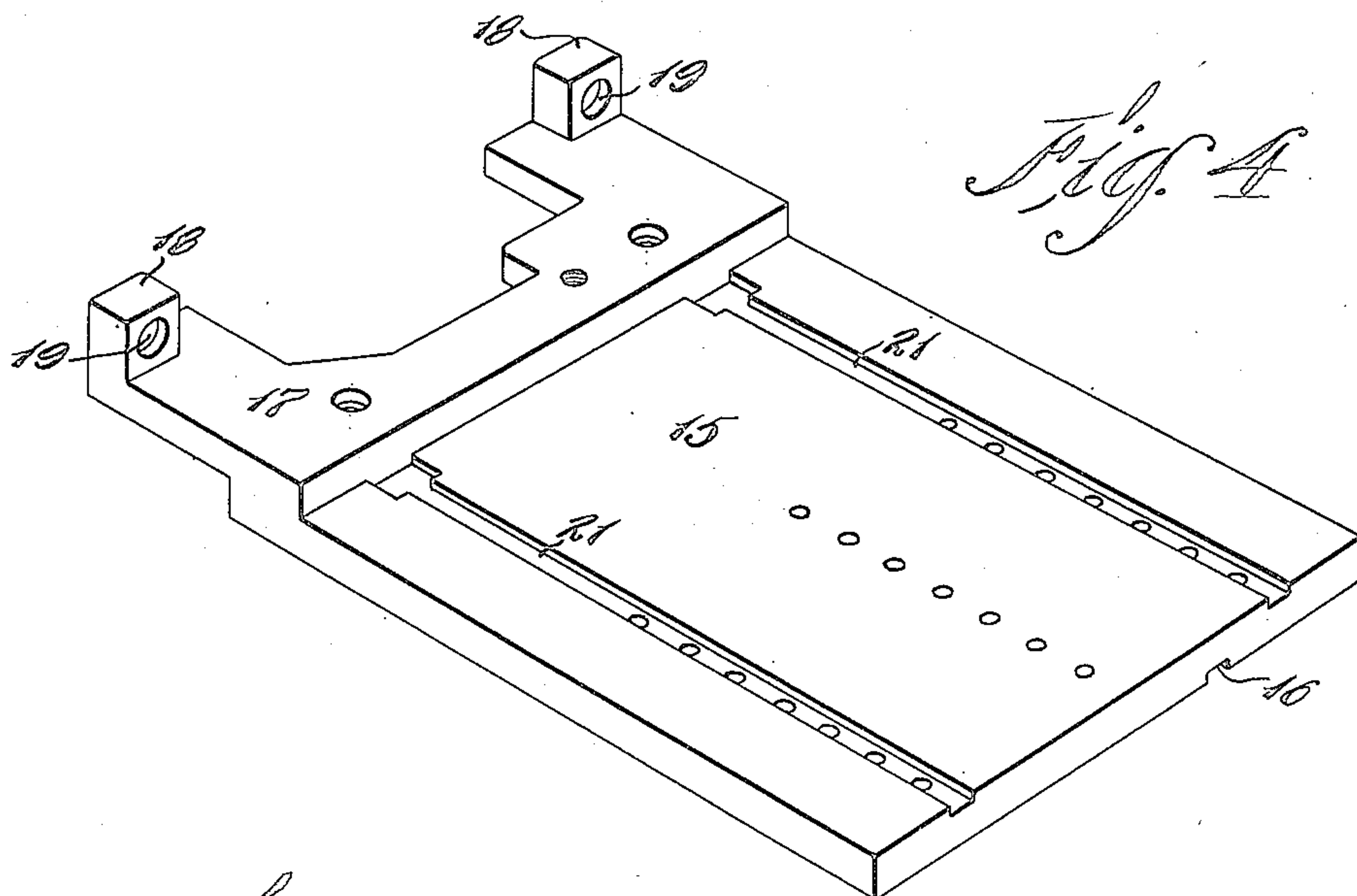


Fig. 4

Fig. 5

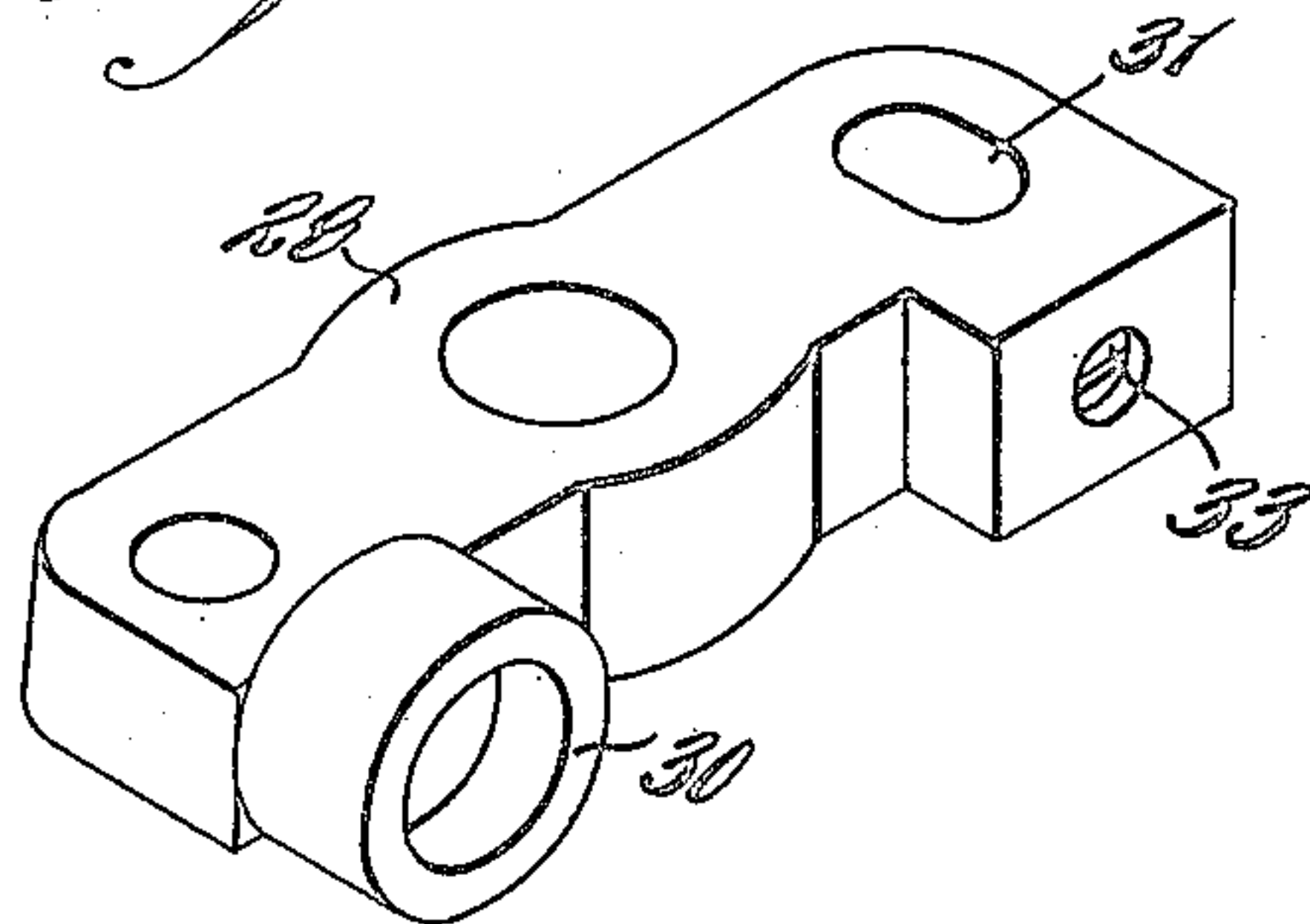


Fig. 6

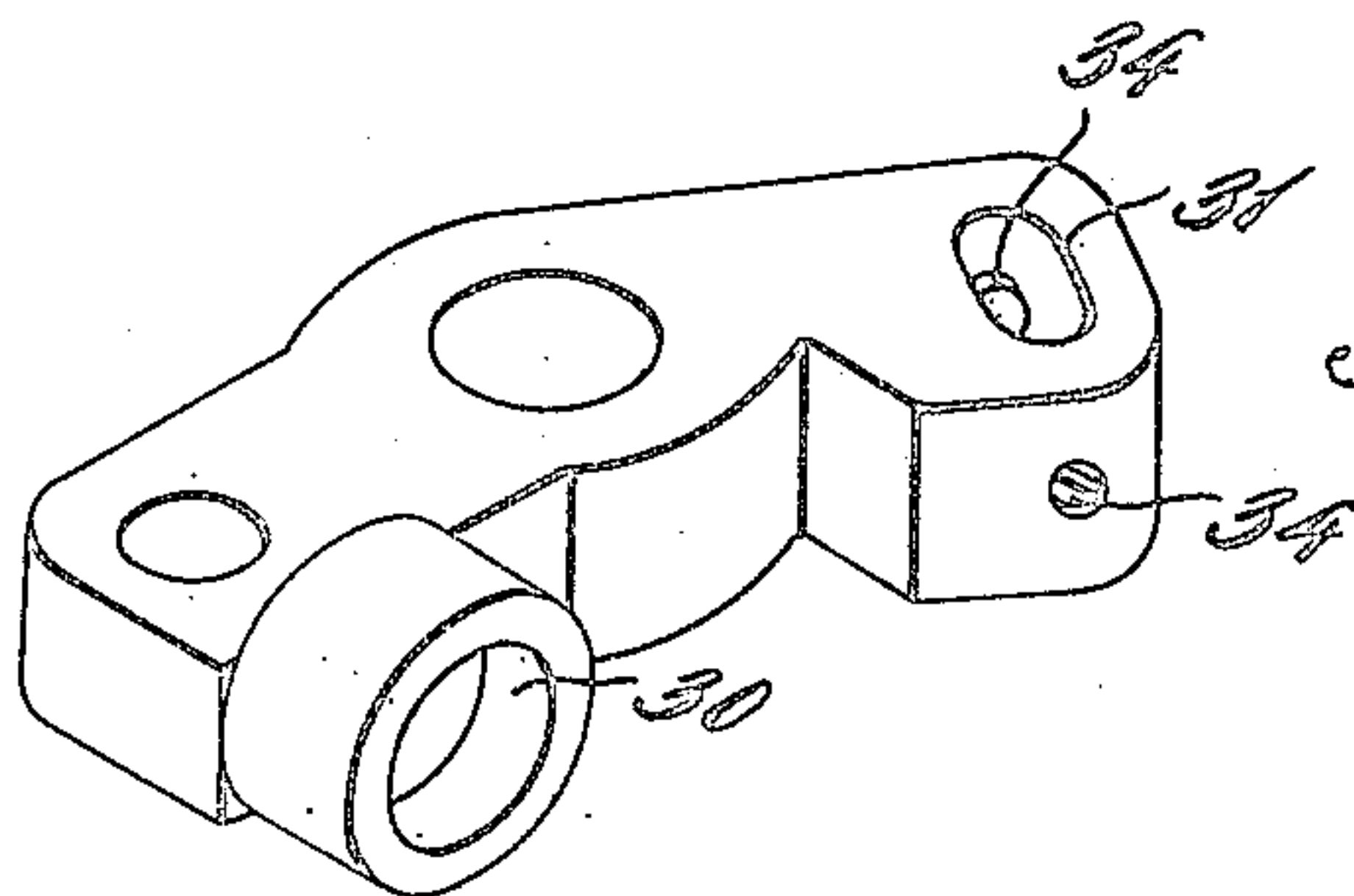
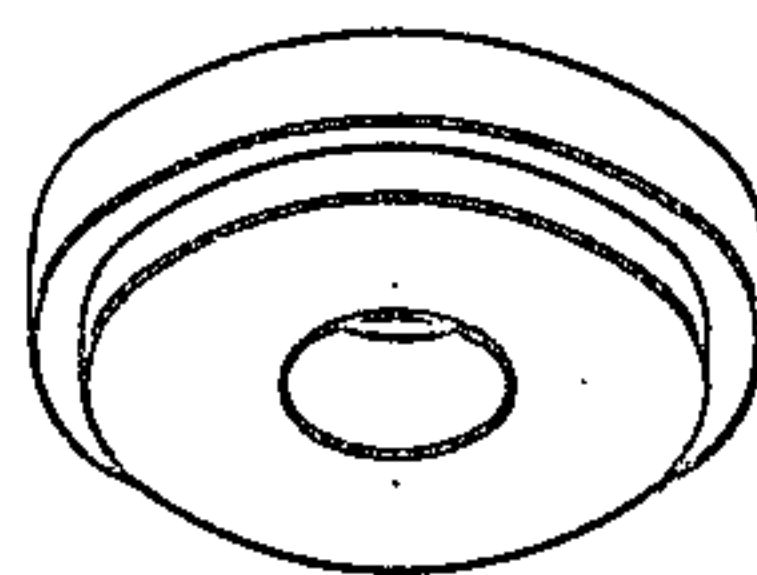


Fig. 7

Inventor
E. M. Foster

By Hull Smith & Brock & West
Attorneys

Patented Jan. 2, 1923.

1,440,385

UNITED STATES PATENT OFFICE.

EMORY M. FOSTER, OF CLEVELAND, OHIO, ASSIGNOR TO THE HYDRAULIC PRESSED STEEL COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

GUIDE MECHANISM FOR SHEET-METAL-ROLLING MACHINES.

Application filed November 24, 1919. Serial No. 340,228.

To all whom it may concern:

Be it known that I, EMORY M. FOSTER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Guide Mechanism for Sheet-Metal-Rolling Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates generally to machines for rolling strips of sheet metal into grooved or tubular form, and more particularly to a guiding mechanism to be used in connection with such machine; the object of such guiding mechanism being to insure the delivery of the flat stock to the shaping rolls so that a given longitudinal line upon the flat stock will register continuously with a given point upon the shaping rolls.

It sometimes happens that the strip of metal is improperly sheared, and is not of uniform width from end to end, and unless some provision is made in guiding such improperly sheared strip to the shaping rolls the finished or shaped product will have an excess of material upon one side of a given line and a shortage of material upon the opposite side, and this excess and shortage tends to impair the finished product at these points; and it is with the idea of compensating for such possible inaccuracy in the metal strip that the present form of guiding mechanism has been devised.

With this object in view the invention consists broadly in the employment of a pair of yielding guide rollers so positioned as to contact with the opposite edges of the sheet metal strip fed between them, said rollers being connected with each other in such a manner that they operate in unison, and such connection to be of such character that the movement of one roller will effect a corresponding reverse movement in the other roller whereby the strip of material passing between said rollers will always be maintained in a definite longitudinal relation with reference to the shaping rolls. The invention consists also in certain details of construction and novelties of combination, all of which will be fully described hereinafter and pointed out in the appended claims.

In the drawings forming a part of this specification, Fig. 1 is a perspective view of

one form of guide mechanism embodying my invention; Fig. 2 is a detailed perspective view of the base block; Fig. 3 is a detailed view of the upper plate; Fig. 4 is a view of the lower guide plate; Fig. 5 is a detailed view of one of the levers; Fig. 6 is a detailed view of the guide roller; and Fig. 7 is a detailed view illustrating the modified construction of lever adjustments.

In the practical embodiment of my invention, I employ a base block 10 which is preferably cored horizontally as shown at 11 and in the upper face of this block and centrally thereof is a longitudinal keyway 12. Elongated slots 13 are produced in the upper portion of the block upon opposite sides of the central keyway, these slots being of sufficient length to permit ample adjustments as hereinafter referred to. This block 10 is firmly bolted to the frame of the machine at proper distance in advance of the shaping rolls (not shown) and with its longitudinal edge in parallel relation with the axis of said rolls.

Adjustably mounted upon the base block 10 is the lower plate 15 having the keyway 16 in the bottom thereof corresponding with the keyway 12 in the top of the base block said keyways being adapted to receive a suitable guiding key therein. The lower plate 15 is adjustably connected to the base block by means of short bolts passing upwardly through the slots 13 and entering the bottom plate 15 and inasmuch as these bolts are located in the longitudinal slots 13 the bottom plate can be adjusted with reference to the axis of the shaping rolls. The bottom plate 15 is formed at one end with an offset extension 17, and at each corner and at the opposite outer corners of said extended portion I provide upwardly extending lugs 18 having recesses 19 in the faces thereof to receive the ends of helical springs 20. The main portion of the bottom plate 15 has longitudinal grooves 21 cut in the upper face thereof and movable upon the bottom plate 15 is a top or upper plate 22 having longitudinal ribs 23 in the lower face thereof working in the longitudinal guides 21 and this top or upper plate 22 is also provided with slots 24 through which pass screws into the lower or bottom plate for the purpose of connecting the two plates together, the longitudinal slots permitting the adjust-

ment of the upper plate upon the lower one in order to accommodate different widths of material fed to the shaping rolls. A lever 26 is pivotally connected to the upper face of the offset portion of the plate 15 near each end thereof by means of a stud bolt 27 and a lever 28 is connected to the upper face of the plate 22 by means of similar stud bolts 27, said pivotal points being in a line parallel with the axis of the shaping roll. A guide roller is journaled in the end of each lever 26 and 28 and a link 29 connects the opposite end of each lever 26 with the end of the lever 28 which carries the guide roll, and each lever 26 and 28 is formed with a recessed boss 30 in the end where the guide roller is journaled, said recessed bosses being adapted to receive the opposite ends of the springs 20 previously referred to. These springs are compression springs and tend to force the guiding rollers towards each other and it is obvious that inasmuch as the opposite ends of the levers are connected by means of the diagonal link 29 that any movement of one roller will be immediately communicated to the opposite lever and effect a corresponding movement in the other guide roller in the reverse direction, that is to say, that by means of the construction and arrangement of the particular features herein shown and described, the guiding rollers will be made to equally and simultaneously approach and recede from each other.

In practice I prefer to employ two sets of levers and links as illustrated in order to more efficiently guide the strip of material to the shaping rolls, it being understood that the guiding rolls have their peripheries shaped to engage the edges of the metal strip and hold the same in sliding contact with the face of the offset portion of the lower plate and the upper face of the upper plate. It is obvious that as a strip of metal is fed between the guiding rolls, that any irregularity in the shape of said strip will be communicated to the guide roll at one side or the other and will affect the position of such guide roll to the extent of such irregularity and also that when one guide roller is affected by such irregularity the other guide roller will be simultaneously and correspondingly affected in the opposite direction thereby maintaining the strip in a perfectly true longitudinal line while being fed to the shaping roll; that is to say that if a strip of metal should gradually increase in width the roller at one side will be forced outwardly and will affect the corresponding outward movement of the other roller and the rollers constantly contacting with the opposite edges of the strip will maintain the strip properly centered as it passes to the shaping rolls.

In order to properly gauge the guiding rollers through their respective levers, I pro-

vide the end of each lever to which no link is connected with an elongated opening 31 and in which fits a stop bolt 32 carried by the upper plate and the lower plate, and working through the end of the lever is a set screw 33 which is adapted to contact with the stop bolt 32, and this set screw is adjustable in or out in order to stop the lever at the desired point.

If desired, the end of the lever can be bored completely through and two oppositely disposed adjustable set screws 34 can be employed. The link 29 is provided with a plurality of openings 29^a therein so as to accommodate varying widths of sheet metal stocks and to accommodate the adjustments of the upper and lower plates with reference to each other in order to accommodate such stock.

By means of the guide rollers carried by the levers as herein shown and described, and provided with the equalizing means it is obvious that a strip of metal once started between said rollers will be maintained in a true longitudinal line with reference to a fixed point upon the shaping rolls, and that any variation in the stock upon either or both sides thereof will be communicated to either or both rolls and immediately compensated for.

Having thus described my invention, what I claim is:—

1. In a device of the kind described, a pair of guide rollers adapted to receive a strip of metal therebetween together with means for simultaneously causing said rollers to move in opposite directions, thereby to cause the longitudinal axis of said strip to move along a definite line between said rollers.

2. In a device of the kind described, a pair of yieldable guide rollers adapted to receive a strip of metal therebetween together with means connecting said rollers whereby they approach or recede from each other in unison thereby to cause the longitudinal axis of said strip to move along a definite line between said rollers.

3. In a device of the kind described, a pair of guide rollers adapted to receive a strip of metal therebetween, levers carrying said rollers and means connecting said levers, whereby said rollers approach and recede from each other in unison to automatically retain the longitudinal axis of said strip along a definite line.

4. In a device of the kind described, a pair of guide rollers, levers carrying said rollers, means acting upon said levers to normally force said rollers toward each other, and means connecting said levers to cause them to move simultaneously thereby to cause the longitudinal axis of said strip to move along a definite line between said rollers.

5. In a device of the kind described, a pair of guide rollers, levers carrying said rollers, means acting upon said levers to normally force said rollers toward each other, and means connecting said levers to cause them to move simultaneously, together with means for limiting the inward movement of said rollers.

6. A guide mechanism for sheet metal rolls, comprising a base, a plate adjustable upon said base and carrying a guide roller, a second plate adjustable upon the first named plate and also carrying a guide roller, and equalizing means connecting said rollers to cause them to move in unison in opposite directions.

7. In a device of the kind described, a pair of guide rollers, levers carrying said rollers, plates to which said levers are connected, one of said plates being adjustable upon the other, a link connecting the rear end of one lever with the forward end of the opposite lever, springs acting upon said levers, and normally forcing said rollers toward each

other, and means for limiting the movements of said levers.

8. In a device of the kind described, a base block, a plate adjustable upon said block, a second plate adjustable upon the first named plate, levers arranged in pairs upon said plates, guide rollers carried at the ends of said levers, springs acting upon said levers, lugs carried by said plates and against which the springs also bear, equalizing links connecting each pair of levers, and means for limiting the movements of said levers.

9. In a device of the kind described, a pair of guide rollers adapted to receive a strip of metal therebetween together with means for automatically moving said rollers to cause the longitudinal axis of said strip to move along a definite line between said rollers.

In testimony whereof, I hereunto affix my signature.

EMORY M. FOSTER.