Sheet 1 - 2 Sheets.

M. Foster,

Making Spikes,

No. 38,818. Patented June 9, 1863.

Fig. 2.

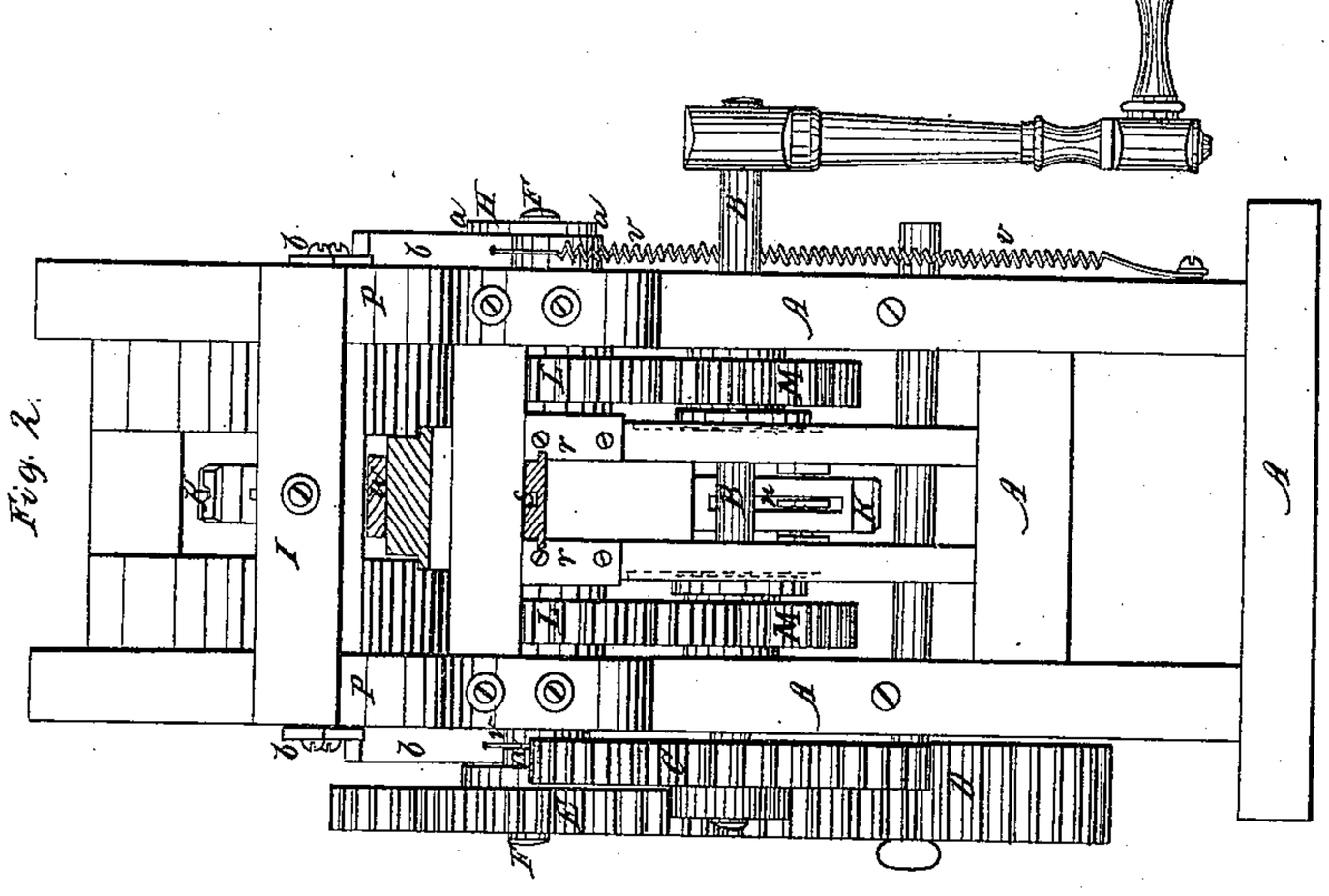
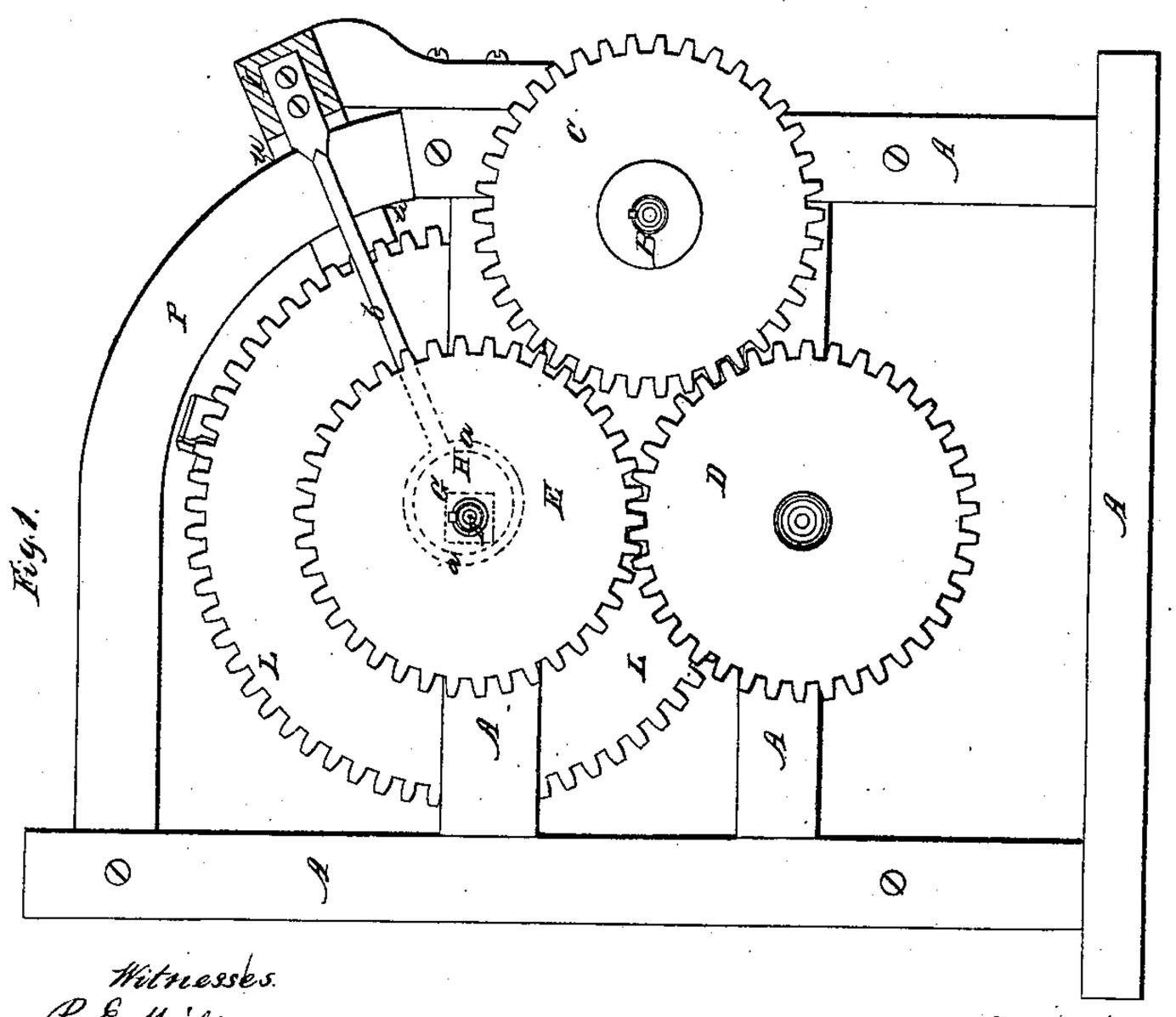


Fig. 1.



Witnesses.
P. E. Wilson
E. Evans Jr.

Inventor.
Morrison Foster.
By atty. A. B. Stoughton.

Sheet 2 - 2 Sheets.

M. Foster,

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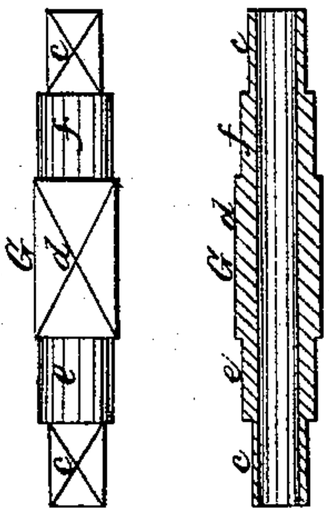
Fig. 4.



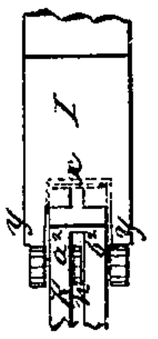
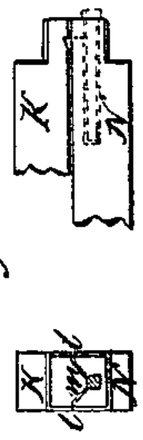


Fig. 5.



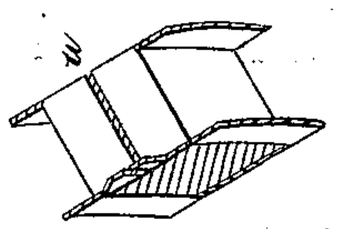
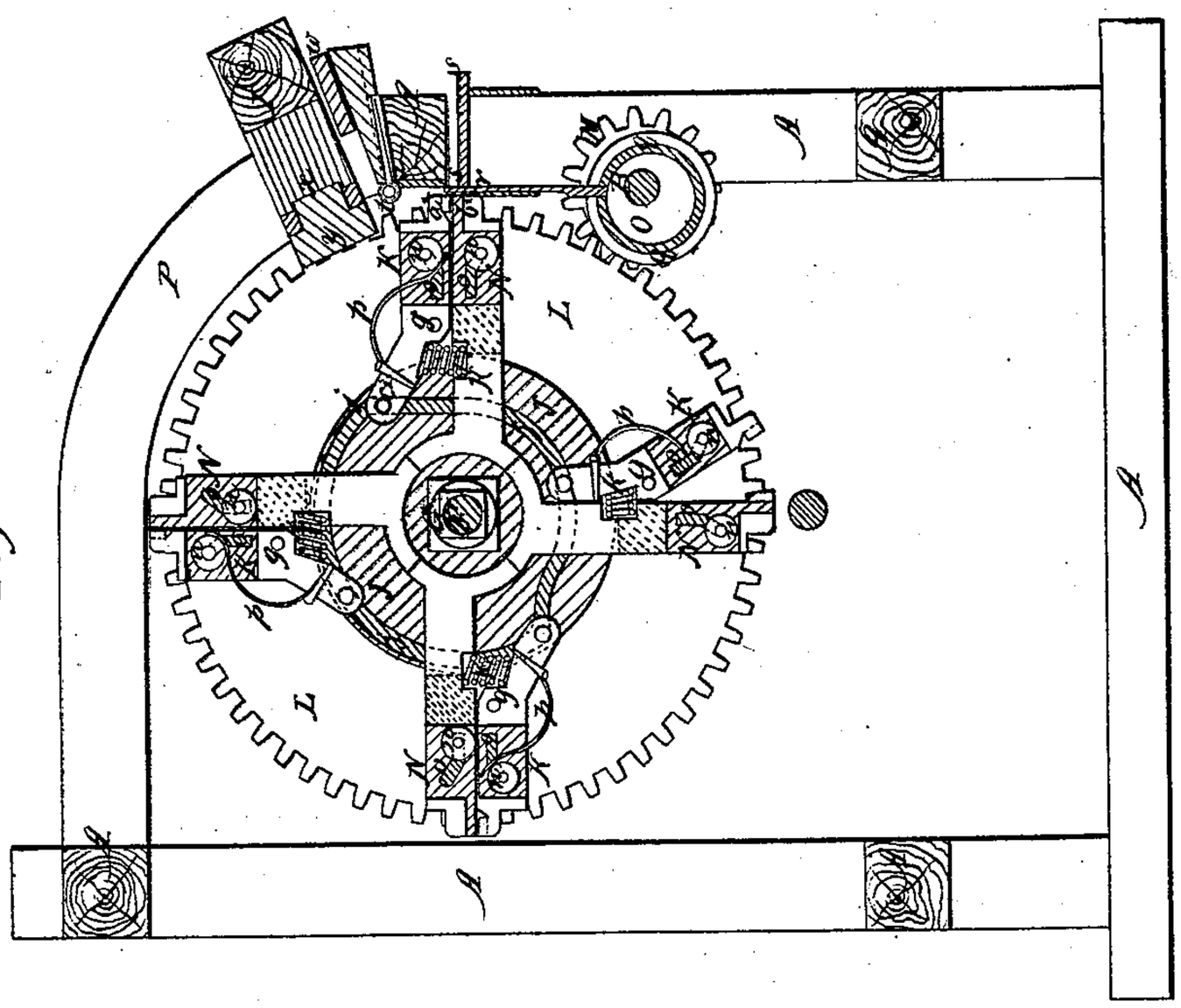


Fig. 3



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UNITED STATES PATENT OFFICE.

MORRISON FOSTER, OF CLEVELAND, OHIO.

IMPROVED MACHINE FOR MAKING RAILROAD, BOAT, AND OTHER SPIKES.

Specification forming part of Letters Patent No. **38,818**, dated June 9, 1863.

To all whom it may concern:

Be it known that I, MORRISON FOSTER, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful improvements in machines for making railroad, boat, and other spikes, also rivets, screw-blanks, nails, bolts, &c.; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents an elevation of one side of the machine. Fig. 2 represents an elevation of the front end thereof. Fig. 3 represents a longitudinal vertical section through the machine. Fig. 4 represents the shafting. Fig. 5 represents detached views of the jaws for gripping the blanks.

Similar letters of reference, where they occur in the separate figures, denote like parts of the machine in all cases.

The leading characteristics of my invention consist in so combining a heading and pointing mechanism with a series of continuously-rotating gripping-jaws as that the head and point of the spike, rivet, screw-blank, nail, or bolt may be formed while the blank is in motion, and without stopping the motion of the grippers for that purpose; and the nature of my invention consists in the construction and mode of operation of the several parts of the machine for accomplishing this leading purpose, which parts will be specifically pointed out in the subjoined description.

To enable those skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A represents a main frame, which should be substantially built of iron. In suitable bearings on this main frame is supported a shaft, B, through which motion is communicated to the several parts of the machine. On one end of this shaft B there is a cogged wheel C, that gears with and operates a power-transmitting cogged gear, D, which latter in turn gears with another cogged wheel, E, on a turning shaft, F, that passes through a hollow stationary shaft, G, to the opposite side of the main frame. The shaft F has upon each of its ends a cam, H, around which a yoke, *a*, passes, and to this yoke, on each side of the main frame, is connected a rod or bar, *b*, the upper end of which bar connects with the end or cross-head of the header I on its side of the frame. This cam and yoke arrangement gives to the header I a motion toward and from the center of the shaft F at stated periods, while it also receives another motion from the grippers as they revolve, as will be presently described. The shaft F is a rotating one, and it passes through a hollow stationary shaft, G, as has been above stated. This stationary shaft, as seen in Fig. 4, has portions of it, as at *c d*, square, and other portions, as at *e f*, round. The square portions *c* are for permanently securing it to the main frame, and to prevent it from turning—that, *d*, for holding the cam disks or plates J, that open and close the gripping-jaws K, and prevent said plates from turning, while the rounded parts *e f* form bearings or journals for the cogged wheels L, that carry around the series of grippers. The hollow stationary shaft G performs another material function—viz., it receives all the force of the heading and pointing mechanism, which, if allowed to come upon the gear-shaft F, would spring it out of true, and mar its operation. The shaft B carries two small gears or pinions, M M, which mesh with the cogged gears L L, and give these gears L a rotating motion around their supporting-shaft G. The gripper-arms N N N N are secured to these revolving wheels L, and move around with them. The gripping-jaws K are hinged, respectively, as at *g*, to these arms N, and when not influenced by the cam-grooves *j* in the disks or plates J the jaws K are thrown from the arm N by the coiled springs *k*, to close them on the blank. The gripper and gripper-arm K N come together, as shown in Fig. 5, with horizontal and inclined joints *l m*, which prevents any lateral working of the jaws.

n n are the pointing-rolls, there being a pair of these rolls hung in each pair of grippers. The journals of these rolls work in cam-slots *o o*, so that they may come together to pinch a point or taper on the end of each blank while it is being headed by the header. When these pointing-rolls are not influenced by the header, their respective springs *p* move them out of the way, so that a blank can be readily inserted between the grippers or a finished article delivered therefrom.

On the shaft B are two eccentrics, O, having in their opposite faces cam-grooves *q*, in which projections on the lower end of a knife or cutter, *r*, work, for the purpose of giving said cutter a reciprocating motion at proper intervals to cut off a blank from the rod as it is fed in at *s*, said cutter, when severing a blank from the bar, moving in the direction in which the grippers move, which makes a better clearance.

When a hook-headed spike is to be made, a projection, *t*, which may be a simple roller, is used, against which the projecting end of the blank comes, and bends down said portion, so that when the header acts it forms the head on one side of the shank of the spike. If square heads are required on the article to be made, this projection *t* is slipped out of the way. The header I is moved toward and from the center of the shaft F by means of the cams, yokes, and rods heretofore mentioned. The header I works through a flanged guide, *u*, which guide moves upon the upper curved portions, P, of the main frame.

To the rods *b b* are connected coiled springs *v*, their other ends being connected to the main frame, so that when the header rides up on the gripper with which it is for the time being working these springs are expanded, and when the head is formed, and the motions of the cams H release it from the gripper, the springs *v* contract and draw back the header to its normal position; and that the header may not drop hard upon the frame, a cushion, *w*, of rubber, or other material, is used to catch it. The header should be adjustable, so that it may be moved toward or from the grippers, as occasion may require; and it may have a die formed in it of the form desired to be given to the spike, nail, or other thing to be made by the machine.

The feeding up of the rod may be done automatically. I have not represented this feeding mechanism, as it is well known and constitutes no part of this invention.

The operation of the machine is as follows: The gripper shown on the under side of the shaft F, Fig. 3, is represented as open, and as having just delivered up the finished spike or other article being made in it. This gripper, by the beat of the cam-grooves *j*, remains open until it arrives at the point *s*, where the rod is fed in. As the rod is fed in, its protruding end enters between the gripping-jaws K N, the cutter *r* cuts off the blank, and the jaws instantly close on it, enough of the blank protruding to form the head of the spike or other article being made. The grippers, with the blank in them, continue to advance until it arrives in the same radial plane with the header I. At this point the throw of the cams H are so timed as to draw the header down upon the blank, the portion *x* of said header coming against the protruding portion of the blank, while the portions *y y* thereof, which straddle the grippers laterally, take against the journals of the pointing-rolls *n n*, moving them through their cam-slots *o o*, which bring them together, and in doing so roll out a point on the spike or other article. The making of the head is going on simultaneously with the pointing, both being effected by the motion of the header toward the center of the shaft F, and the header travels with the gripper, it being guided in so doing by its guide *u* and the curved frame-pieces P. After moving a short distance with the gripper, just long enough to accomplish the heading and pointing of the blank, the cams H raise or move out the header from the gripper, and thus release it from contact therewith. The moment this is done the springs *v* contract, drawing down the header into position for the next similar operation. The finished spike or other article remains in the grippers until they have made somewhat more than a half-revolution, and until the throw of the cam-groove *j* changes, so as to open them, when the spike or other article drops out, or may be forced out, should it still adhere thereto, by a mechanism well known as applied to spike-machines. When the cams H draw the header I down upon the ends of the grippers K N, and before the blank is reached by the header I or the pointing-rolls *n n*, the portion of the header *y y* grasps or straddles the under and upper sides of the grippers K N at a^2 and b^2, which causes the header to travel with the grippers, as stated, and also holds the grippers more firmly together to resist the strain when the header and pointing-rolls have reached and are pressing on the blank. In the preliminary bending of the end of the blank for hook-headed spike before the grippers have been straddled by the header I, the grippers are held sufficiently firm together by the pin c^2, resting against the edge of the cam-groove *j* at its farthest point from the center of the stationary disk or plate J.

Having thus fully described the construction and operation of the machine, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The heading and pointing of the spike or other article (one or both) during the revolution of the jaws, substantially as described.

2. The use of the bar or roller, or its equivalent, for bending the protruding portion of the blank to form the head upon one side of the spike, substantially as described.

3. So arranging the header that it shall travel in the same radial plane with and upon the jaws, in order to perform its functions without disturbance of any of the other parts of the machine, substantially as described.

4. The curved guides P, in combination with the header, as and for the purpose substantially as described.

5. In combination with the curved guides P and the header, the guide *u*, for the header to play through and to prevent lateral motion thereof, substantially as described.

6. Combining the pointing-rolls with the revolving jaws and header in such manner that the points of the spikes shall be formed during the rotation or movement of the jaws and header, substantially in the manner and for the purpose described.

7. The inner revolving shaft, F, with its outer stationary shaft, each carrying its respective parts, as described and represented, so that the outer shaft may take the strain of the heading and pointing operation without springing or straining the inner shaft, substantially as described.

MORRISON FOSTER.

Witnesses:
GEO. WILLEY,
J. S. ALLEN.