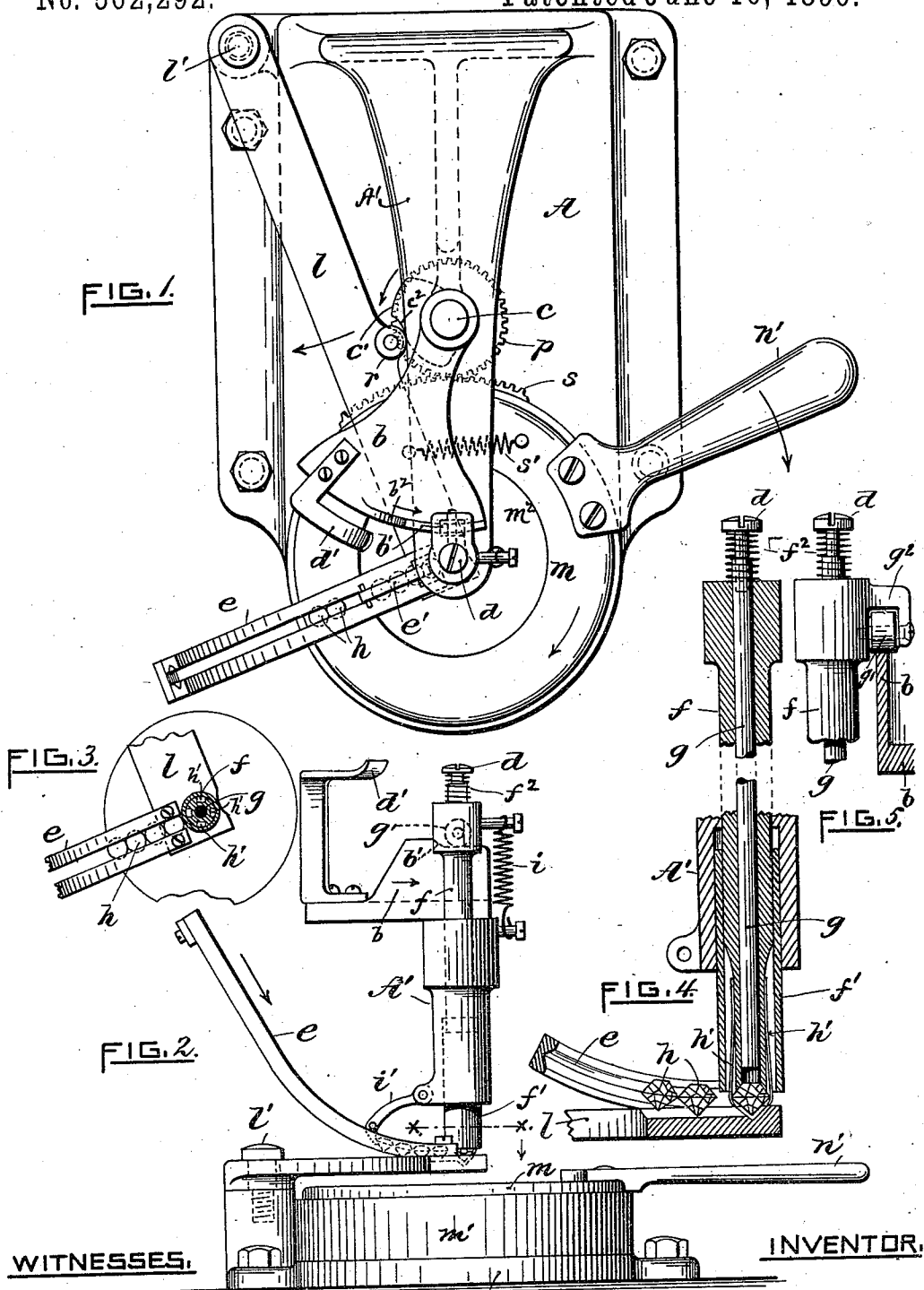


C. H. FIELD.
GEM SETTING MACHINE.

No. 562,292.

Patented June 16, 1896.



WITNESSES.

INVENTOR.

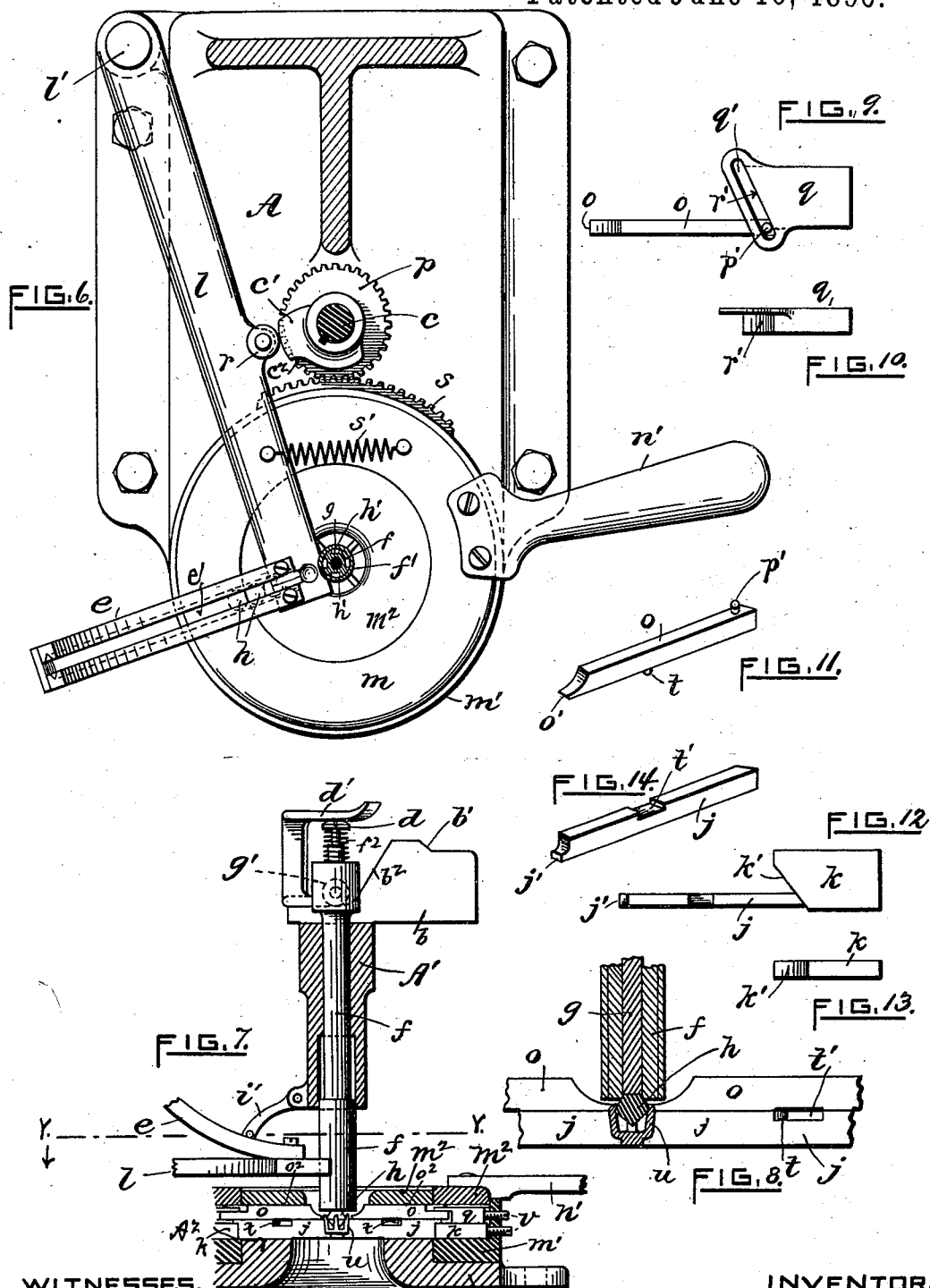
Charles Hannigan
John S. Lynch

Charles H. Field
per A. Scholfield
attorney

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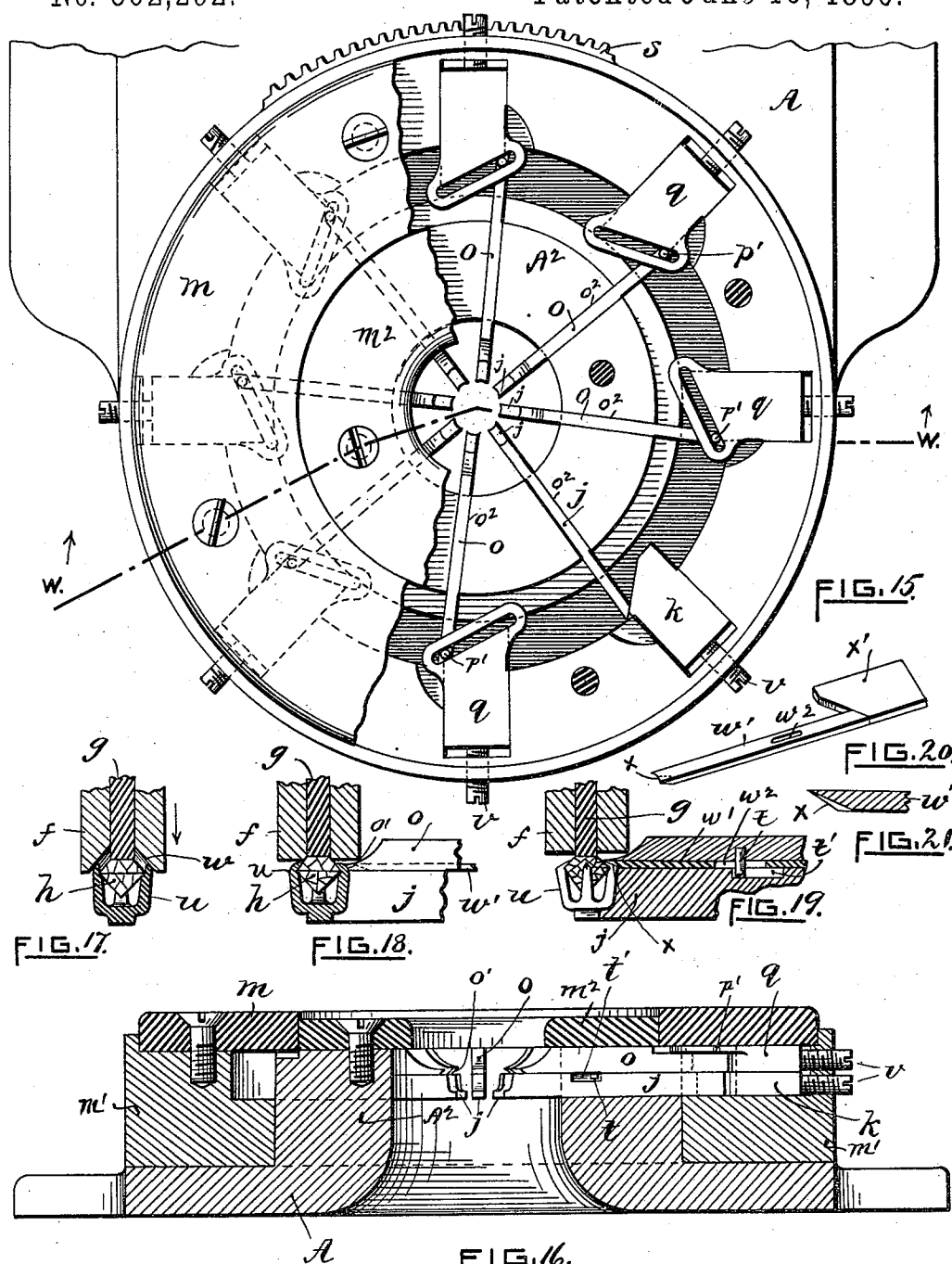
(No Model.)

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Charles Hannigan;
John S. Lynch

FIG. 16.

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UNITED STATES PATENT OFFICE.

CHARLES H. FIELD, OF PROVIDENCE, RHODE ISLAND.

GEM-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 562,292, dated June 16, 1896.

Application filed January 29, 1895. Serial No. 536,601. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. FIELD, a citizen of the United States, residing at Providence, in the State of Rhode Island, have invented a new and useful Machine for Setting
5 Gems, of which the following is a specification.

The method heretofore employed for setting a gem consists in holding the setting with the inserted gem in one hand, and then, by means
10 of a blunt tool or burnisher held in the other hand, separately forcing the prongs over the edge of the gem. And in the costly articles, made of gold, this method is supplemented by trimming that portion of the prongs which
15 projects inward over the edge of the gem.

The object of my invention is to provide a suitable machine for effecting this result in an expeditious manner, and at less cost than
20 heretofore; and my invention consists in the improved construction and arrangement of the parts of the machine, and in the method employed, as hereinafter fully set forth.

In the accompanying drawings, Figure 1 represents a top view of the machine. Fig. 2
25 represents a front elevation of the same with the rearward portion omitted. Fig. 3 represents a section taken in the line *xx* of Fig. 2. Fig. 4 represents an enlarged detail longitudinal section of the plunger. Fig. 5 represents
30 an enlarged detail side view of the upper portion of the plunger. Fig. 6 represents a top view with the upper portion of the machine removed. Fig. 7 represents a detail section of the jaw-holding bed with the setting and the inserted gem, in position between
35 the holding-jaws, ready for the action of the forcing-jaws. Fig. 8 represents an enlarged sectional view showing the setting and gem after the ends of the prongs of the setting have been forced inward over the edge of
40 the gem. Fig. 9 represents an enlarged top view of the upper inclined cam for operating the forcing-jaws. Fig. 10 represents an edge view of the same. Fig. 11 represents a perspective view of one of the forcing-jaws. Fig. 12
45 represents a top view of the lower inclined cam for operating the holding-jaws. Fig. 13 represents an edge view of the same. Fig. 14 represents a perspective view of one of the holding-jaws. Fig. 15 represents an enlarged
50 or full size top view of the jaw-holding bed, with the covering portion broken away to

show the forcing-jaws and their operating-cams. Fig. 16 represents a full vertical section of the jaw-holding bed, taken in the line
55 *ww* of Fig. 15. Fig. 17 is a sectional view showing a modification in the mechanism for closing the ends of the prongs of the setting upon the edge of the gem. Fig. 18 is a sectional view showing a modification, in which
60 an auxiliary cutting-jaw is employed for trimming the turned end of the setting-prong. Fig. 19 is a sectional view illustrating the modification shown in Fig. 18 and showing the setting after its several prongs have been
65 trimmed. Fig. 20 represents a perspective view of the auxiliary cutting-jaw and its operating-cam. Fig. 21 represents an enlarged detail longitudinal section of the end of the cutting-jaw.
70

In the drawings, A represents the frame of the machine, which is to be fastened to a suitable bench in such a manner that the setting
75 *u* may be readily placed within the jaws *jj* of the holder, the said frame being provided at its rear with an upwardly and forwardly extending arm A', which supports the vertical plunger *f*, the said plunger being provided at its upper end with an arm *g*², (shown
80 in Fig. 5,) which supports an antifriction-roller *g'*, adapted for engagement with the segmental cam *b*, by means of which the plunger is actuated in its upward movement against the resilience of the spring *i*, by means
85 of which the opposite downward movement of the plunger is effected. The lower end of the plunger *f* is provided with the inclosing tube *f'* and with the clasp spring-jaws *h'* *h'*, the said clasp spring-jaws being adapted to seize and hold the gem by its edge, as shown
90 in Fig. 4; and within the bore of the plunger *f* is placed the sliding forcer *g*, the said forcer being held in its upper position by means of the spring *f*², held under the head of the adjusting-screw *d* and serving to force the gem
95 downward from the clasp spring-jaws *h'* *h'*, as shown in Figs. 7 and 17, into the setting *u*. The annular head *m'* is turned back and forth to a limited extent on its axis by means of the handle *n'*, and the rear edge of the said
100 head is provided with the segment-gear *s*, which engages with the gear *p*, secured to the upright shaft *c*, to the upper end of which is attached the segmental cam *b*, to which is at-

tached the cam-arm d' , which serves to depress the forcer g at the proper time to expel the gem h from the clasp-jaws $h' h'$ of the plunger. To the shaft c , at near the gear p , is secured the cam c' , which acts against the antifriction-roller r upon the side of the carrier-arm l , which arm is pivoted at l' to the bed of the frame A , the said carrier-arm being held against the cam c' by means of the spring s' .

To the outer end of the carrier-arm l is attached the curved or inclined raceway e , provided with a channel e' , in which the gem to be fed to the holding-jaws may be placed, the said gem being caused to gravitate to the lower end of the raceway, as shown by the dotted lines, which represent the gem in Fig. 2. To the side of the portion A' of the frame is pivoted the claw i' , which upon each back-and-forth vibration of the carrier-arm l will serve to draw another gem forward to replace the one previously taken by the clasp-jaws h' of the plunger. The holding-jaws $j j$ for the setting are held to move back and forth in the radial grooves $o^2 o^2$, made in the upwardly-extending circular boss A^2 of the frame A , upon which circular boss the annular head m' is made to turn, when operated, by means of the handle n' ; and to the annular head m' are secured the cams k for operating the several jaws j inwardly, the said cams being made capable of adjustment by means of the adjusting-screws v . Immediately above the jaws j of the holder and in the same grooves $o^2 o^2$ are placed the jaws $o o$ for forcing the outer ends of the prongs of the setting over the edge of the gem, the said jaws being provided with the beveled ends o' and actuated in both directions by means of the slotted cams $q q$, which are adapted to receive the pin p' , which projects upwardly from the rear ends of the said jaws, the said cams being made adjustable by means of the adjusting-screws v .

The holding-jaws j are provided at their upper sides with a recess t' , as shown in Fig. 14, the said recess being adapted to receive the downwardly-projecting pin t at the under side of the forcing-jaw o , the pin t serving to impart backward movement to the holding-jaw through the action of the cam q , which imparts movement in both directions to the forcing-jaw o . The jaws j and o are retained in place within the grooves $o^2 o^2$ by means of the annular covering-plate m^2 , and the several cams in the annular head m' are covered by means of the annular covering-plate m .

In a gold setting it is customary to trim off the ends of the setting-prongs, after they are turned over the edge of the gem, and this may be accomplished by means of a cutter w' , placed between the holding-jaw j and the forcing-jaw o , as shown in Fig. 19, the said cutter being operated in the forward direction by means of a cam x' , (shown in Fig. 20,) and provided with a slot w^2 , adapted to receive the pin t , which extends downward from

the under side of the forcing-jaw o into the recess t' at the upper side of the holding-jaw j , thus providing for backward movement, and the forward end x of the cutter w' is beveled under and recessed, as shown in the enlarged section Fig. 21. In the section Fig. 18 the gold setting is shown as having its prongs turned over onto the gem, the backward position of the point of the cutter w' at this time being shown by dotted lines, the succeeding forward position of the cutter w' to effect the trimming of the turned end of the prong being shown in the section Fig. 19, the setting being there represented as trimmed.

In operating the machine from the rearward position of the handle n' , as shown in Fig. 1, with a number of gems h in the raceway e , and a gem in engagement with the clasp-jaws $h' h'$ of the plunger f , as shown in Fig. 4, the initial forward movement of the handle n' will cause the forward movement of the cam b , whereby the rise b' of the cam will engage with the roller g' , thereby causing the rise of the plunger f with the clasped gem from the carrier-arm l ; and as the gem clears the said carrier-arm the rise c^2 of the cam c' will cause the backward movement of the carrier-arm from under the plunger f , and upon such backward movement the operation of the claw i' upon the gem contained in the channel e' of the raceway e will be such as to cause the forward movement of the gem in the channel e' , so that the end gem of the series will be made to take the place of the gem which has just been removed by the clasp-jaws $h' h'$ of the plunger f . Upon the continued forward movement of the handle n' the holding-jaws $j j$ will be brought forward by means of the cams k to grasp a properly-presented setting u , and the roller g' of the plunger f will pass down the incline b^2 of the cam b , thus allowing the spring i to act and carry the plunger down until the said plunger arrives at a point near the ends of the upwardly-projecting prongs of the setting, as shown in Fig. 7, the gem being thereafter forced out of the clasp-jaws $h' h'$ and into the setting by the downward movement of the forcer g , caused by the engagement of the cam-arm d' with the top of the screw d . Now the continued forward movement of the arm n' will cause the inward movement of the forcing-jaws $o o$ to force the ends of the prongs of the setting over the edge of the gem, which operation will be completed at the extreme forward movement of the handle n' , and while the forcer g is pressing upon the gem, and thus holding the same in an upright position. The reverse backward movement of the handle n' will cause the return of the forcing-jaws $o o$ and the holding-jaws $j j$ to their original position, and also cause the rise of forcer g within the bore of the plunger f , and the rise of the roller g' of the plunger to the top of the cam b , and then the action of

the spring *s'* and cam *c'* will cause the carrier-arm *l* to again come under the plunger *f*, with a gem in proper position to be clasped by the spring-jaws *h' h'* upon the downward movement of the plunger-roller *g'* at the incline *b'* of the cam *b*, at the extreme backward movement of the handle *n'*, and upon the succeeding forward movement of the handle *n'* the operation of setting a gem will be repeated.

In the modification shown in Fig. 17, in which the plunger *f* is beveled inwardly, at its end *w*, the downward movement of the plunger may suffice to cause the inward forcing of the points of the setting over the edge of the gem.

I claim as my invention—

1. In a machine for setting gems, the combination of a holder for the setting, with the opening and closing jaws for forcing the ends of the prongs of the setting over the edge of the gem, and the opening and closing cutters for trimming the turned ends of the prongs, substantially as described.

2. In a machine for setting gems, the combination of a holder for the setting, and means for placing the gem in proper position within the prongs of the setting, with means for forcing the ends of the prongs of the setting

over the edge of the gem, substantially as described.

3. In a machine for setting gems, the combination of a holder for the setting, the carrier for holding the gem, and means for removing the gem from the carrier and placing it between the prongs of the setting, substantially as described.

4. In a machine for setting gems the combination of the holder for the setting, the carrier for the gem, the plunger provided with the spring-jaws for clasping the edge of the gem, and the forcer for forcing the gem from the spring-jaws into the setting, substantially as described.

5. In a machine for setting gems, the combination of the holder for the setting, the carrier for the gem, the plunger provided with the spring-jaws for clasping the edge of the gem, the forcer for forcing the gem from the spring-jaws into the setting, and means for forcing the ends of the prongs of the setting over the edge of the gem, substantially as described.

CHARLES H. FIELD.

Witnesses:

SOCRATES SCHOLFIELD,
HARRY J. GARCEAU.