

MACHINE FOR MAKING AND DRIVING CORRUGATED SHEET METAL FASTENERS.

Patented June 10, 1913.

1,064,007.

Inventor:
W. H. Roy
By Bulkeley & Edmunds
Attorneys

W. H. RAY.

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4 SHEETS—SHEET 2.

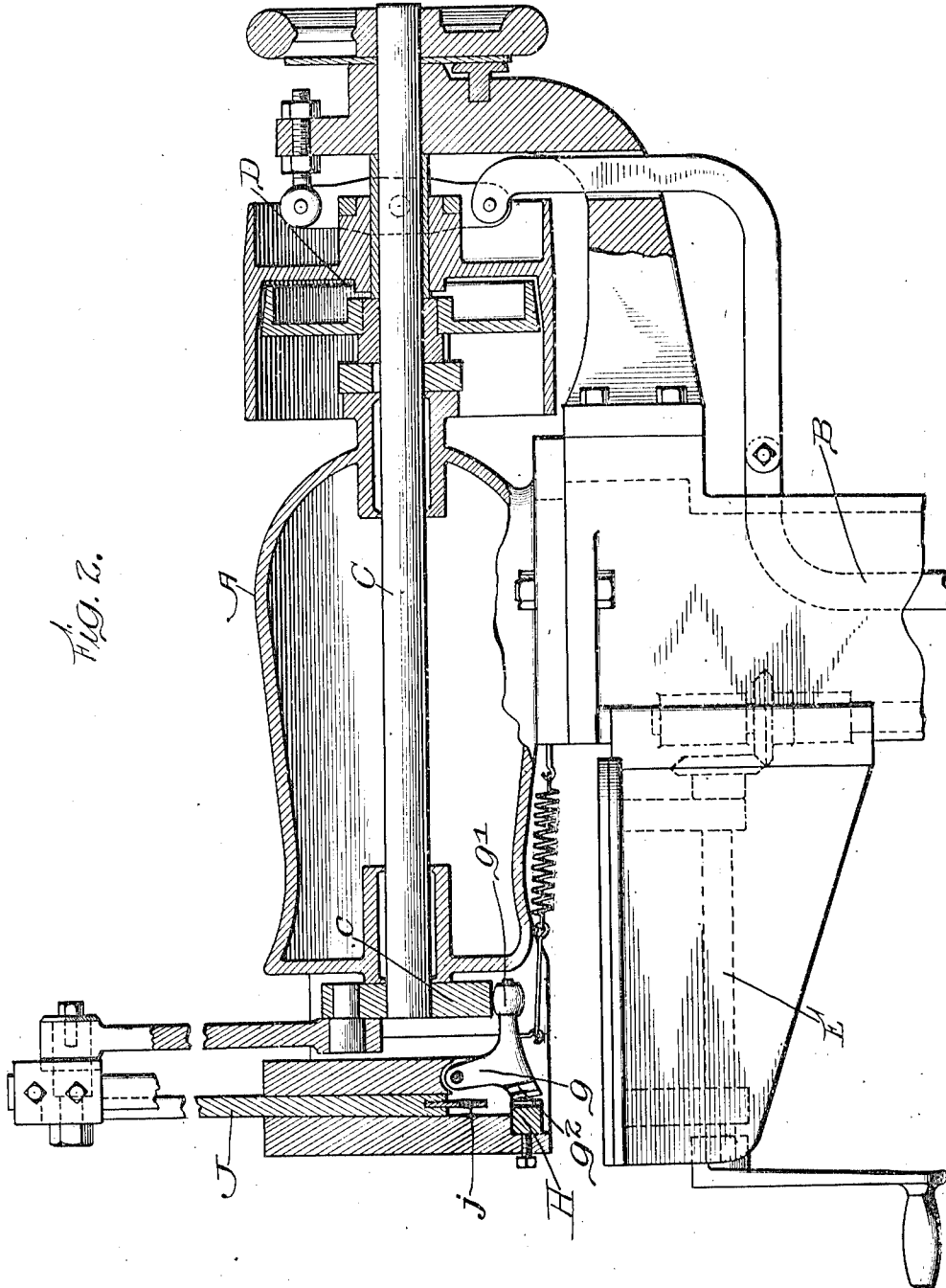


Fig. 2.

Witnesses:
L. V. Donarum Jr.
Albert J. Lamer.

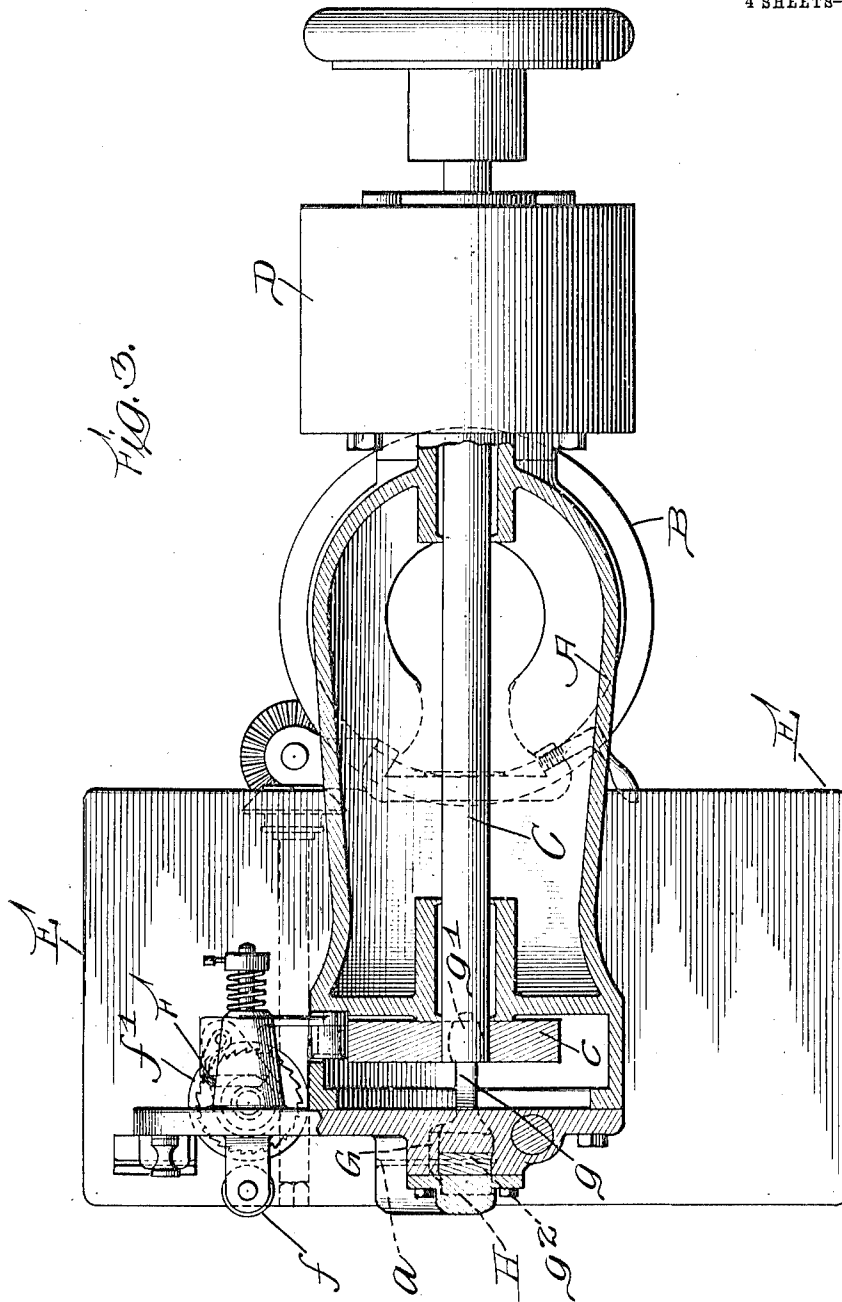
Inventor
W. H. Ray
By Bulkley Donarum
attorney

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Albert J. Lusser.

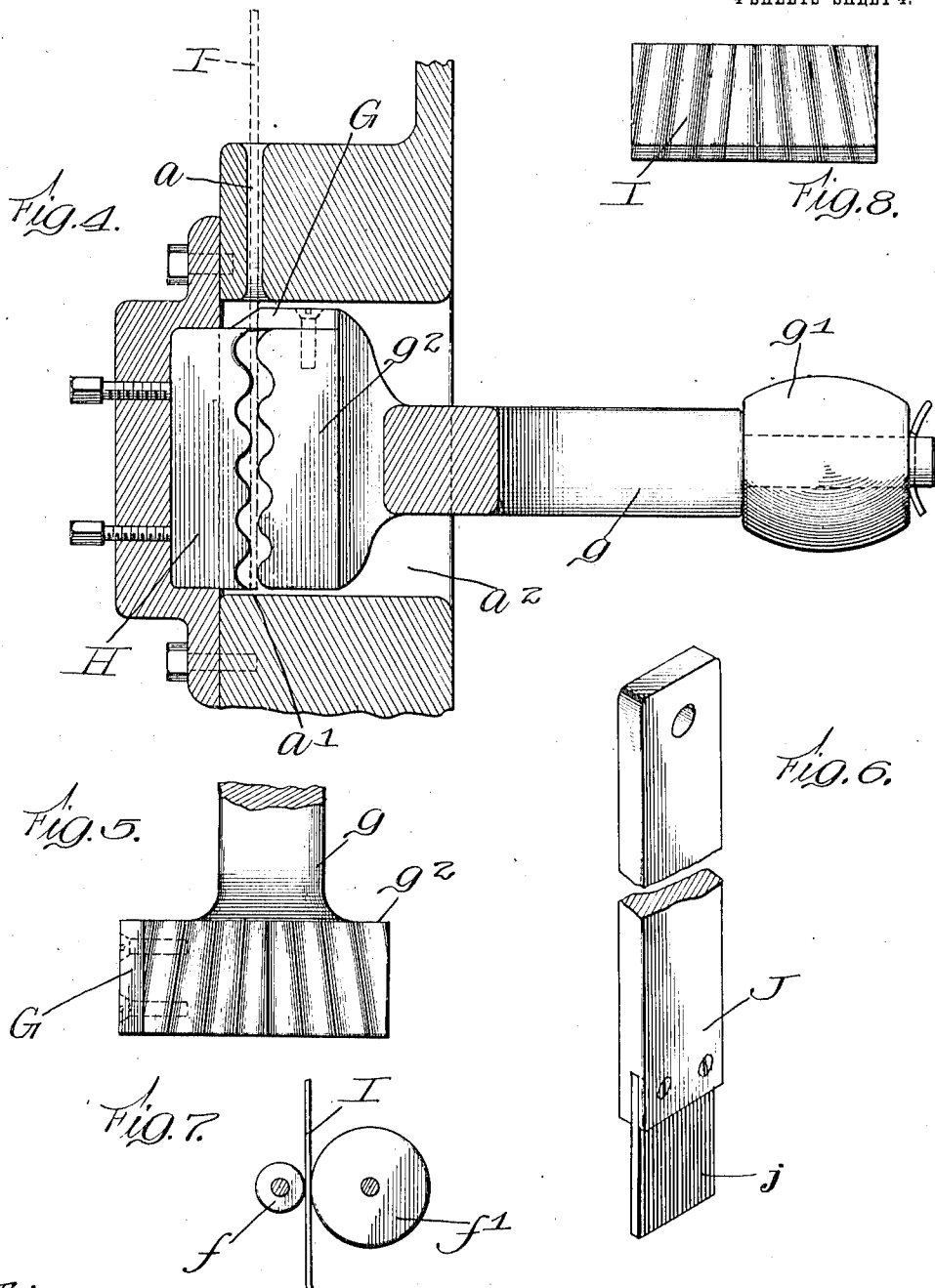
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W. H. Ray
By Bulkley & Associates
Attorneys

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Witnesses:
L. V. Donatus Jr.
Albert J. Sauer.

Inventor:
W. H. Ray
By Bulkeley Donatus & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM H. RAY, OF ST. JOSEPH, MICHIGAN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
SARANAC MACHINE CO., OF ST. JOSEPH, MICHIGAN, A CORPORATION OF MICHIGAN.

MACHINE FOR MAKING AND DRIVING CORRUGATED SHEET-METAL FASTENERS.

1,064,007.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed August 8, 1907. Serial No. 387,602.

To all whom it may concern:

Be it known that I, WILLIAM H. RAY, a citizen of the United States of America, and resident of St. Joseph, Berrien county, Michigan, have invented a certain new and useful Improvement in Machines for Making and Driving Corrugated Sheet-Metal Fasteners, of which the following is a specification.

My invention relates to machines for making and driving corrugated sheet metal fasteners, and contemplates certain improvements on a previous machine of my invention.

In said prior machine, the corrugated sheet metal fasteners are corrugated before they are cut off from the strip of metal, and the corrugations are parallel. In accordance with my present invention, however, the corrugations of each fastener diverge toward the lower or entering edge thereof, and the machine is provided with means for forming such corrugations in the metal of the fastener after the same is cut off from the long strip or ribbon, or after the metal is fed into position to be driven. I find this method of making the fasteners desirable for certain purposes, as, for example, where the corrugations of the fastener are required to diverge toward the cutting or entering edge thereof, in the manner stated.

My invention contemplates broadly, therefore, the automatic making and driving of divergently corrugated sheet metal fasteners.

It also contemplates the automatic making and driving of a corrugated fastener by corrugating the same after the metal is fed into position for driving.

In the accompanying drawings, Figure 1 is a front elevation of a sheet metal fastener machine, embodying the principles of my invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is a horizontal section of the same. Fig. 4 is an enlarged detail sectional view of the knife and the two dies for cutting and forming the fastener, showing adjacent parts of the machine in section. Fig. 5 is a detail face view of the movable die, showing the knife secured to the end thereof. Fig. 6 is a detail perspective view of the driver for inserting the fastener. Fig. 7 shows the feed rolls for feeding the strip or ribbon of steel from which the fasteners

are formed. Fig. 8 is a side elevation of one of the corrugated metal fasteners.

As thus illustrated, the body A and pedestal or upright supporting structure B may be of any suitable character, and are like those of my said prior machine which is now well known. This is also true of the operating shaft C, and the clutch mechanism D, as well as the adjustable table E upon which the work is supported. It will be understood that this table supports the box or other article into which the fasteners are to be driven. The cam *c*, the feed mechanism F, and the connections for operating the same, are all similar to those of my said prior machine, except that said feed wheels *f*, *f*¹, have plain or smooth cylindric surfaces. In other words, these feed wheels are not corrugated as are those of said prior machine. The knife or shear blade G is also like that of my said prior machine, and is secured to a pivoted lever *g*, which latter carries a roll *g*¹ adapted to be engaged by the cam *c*, in the well known manner. It will be seen, however, that this arm *g* is also provided with a movable die *g*². The stationary die H, one end of which serves as a ledger blade is mounted opposite this movable die, and is secured to the body frame in any suitable manner.

The steel ribbon I is fed between the two blades by the said smooth surface feed rolls, through a guide opening *a* in the body frame, and is given a movement sufficient to bring its end against the stop *a*¹ at the other side of the cavity *a*² in which the said dies and knife are mounted for operation. When the rotation of the cam *c* causes the knife to move forward, it also causes the die *g*² to move forward, so that immediately after the length of sheet metal is cut off by the two blades the movable die *g*² then presses the said piece of sheet metal into the corrugations of the stationary die, thus giving the fastener the desired or corrugated character. By referring to Fig. 5, it will be seen that the corrugations on the face of the movable die are divergent in character—that is to say, these corrugations diverge downwardly. It will be understood that the corrugations on the stationary die are similarly formed, and that the raised portions of the movable die are opposite the depressions in the stationary

die. In this way the corrugated fastener, such as the one shown in Fig. 8, is provided with corrugations which diverge toward the lower or entering edge of the fastener.

5 It will be understood, of course, that the cam c is so shaped that after it has forced the movable die g^2 ahead sufficiently to cor-
 10 rugate the steel, it will then allow the said die to recede just enough to allow the lower end of the driver J to engage the upper
 15 end of the fastener, whereby the latter is inserted. The table E is adapted to support the pieces of wood close up against the under
 20 side of the dies H and g^2 , so that the lower edge of the steel ribbon will practically rest thereon. As soon as the die g^2
 25 recedes or moves slightly backward, the thin end portion j of the driver enters the space between the two dies, so as to engage
 30 the upper end of the fastener, and the portion j of the driver then moves downward between the two dies, the latter holding the
 35 fastener upright until the same is inserted far enough into the wood to hold itself in an upright position; or the proportions of
 the parts may be such that the two dies will continue to guide the fastener until it is fully inserted in the wood. By the vertical
 40 adjustment of the table E , the upper surfaces of the pieces of wood to be joined together are brought close up against the under
 45 side of the two dies, or at least close enough so that the fastener will have only a very slight drop or downward movement when
 50 the die g^2 moves back sufficiently to admit the thin lower end of the driver.

From the foregoing, it will be seen that I provide a simple and efficient machine for making corrugated sheet metal fasteners, having provisions for corrugating the fastener after it is cut off from the strip or ribbon of steel, or after it is fed into position to be driven. In this way, a strip or ribbon of plain steel can be fed to the machine, and the feed rollers need only have plain or smooth surfaces, whereby they have the single function of feeding the strip or ribbon of steel, and are not required to do anything else. The compound curves are
 55 formed in the metal after it is fed into position for driving, and while the strip or ribbon is at rest. I do not, however, limit myself to the construction shown and described.

55 What I claim as my invention is:

1. A machine for making and driving corrugated sheet metal fasteners, comprising means for feeding the strip or ribbon of metal in an uncorrugated condition, means
 60 for cutting off a length of said strip or ribbon of metal, means for then forming the compound curves therein, and mechanism for then driving the fastener thus formed.

2. A machine for making and driving
 65 corrugated sheet metal fasteners, compris-

ing means for feeding the strip or ribbon of metal in an uncorrugated condition, suitable instrumentalities for forming the corrugations in the metal after it has been fed into position for driving, and mechanism for then driving the fastener thus formed, and means for cutting off a length of the strip.

3. In a machine of the class described, the combination of means for feeding the strip or ribbon of metal in an uncorrugated condition, cutting and driving devices, and means for forming the corrugations in the fastener after the metal has been fed into position for driving.

4. In a machine of the class specified, the combination of feed mechanism for feeding the strip or ribbon of metal in an uncorrugated condition, cutting and driving instrumentalities to which the strip or ribbon of metal is fed, and means for forming the corrugations in the fastener after the metal has been fed into position for cutting and driving.

5. In a machine of the class specified, suitable means for feeding the strip or ribbon of sheet metal, cutting and driving instrumentalities to which the metal is fed in suitable condition, and means moving simultaneously with the cutting device for forming compound curves in the fastener after the metal is fed into position for cutting and driving.

6. In a machine of the class described, comprising suitable means for feeding the strip or ribbon of sheet metal, and cutting and driving instrumentalities to which the strip or ribbon of metal is fed, a pair of dies for forming divergent corrugations in the fastener after the metal is fed into position for cutting and driving.

7. In a machine of the class specified, means for feeding the strip or ribbon of sheet metal in an uncorrugated condition, mechanism for then cutting off a length of said metal, dies for then forming transverse and divergent corrugations in the fastener, and means for then driving the fastener.

8. In a machine of the class specified, means for feeding strip metal in an uncorrugated condition, means for cutting off and driving fasteners consisting of suitable lengths of said strip of metal, and a pair of dies for transversely corrugating the fastener by producing compound curves therein after it is cut off and before it is driven.

9. In a machine of the class specified, means for feeding strip metal in an uncorrugated condition, means for cutting off and driving fasteners consisting of suitable lengths of said strip of metal, a pair of dies provided with means for producing compound curves in the metal and thereby forming transverse and divergent corrugations in the fastener, after the latter is cut

off from the strip of metal and before the same is driven.

10. The improved sheet metal fastener machine, the same having jaws for forming 5 divergent corrugations in the fasteners, and means for driving the divergent ends of the corrugations into wood or other material, substantially as shown and described.

11. A machine for making and driving 10 corrugated sheet metal fasteners, comprising dies for corrugating the fastener stock, of which dies one is movable, means for operating the movable die, shear and ledger blades juxtaposed to the dies, means for operating the shear blade for the purpose 15 specified, and a plunger acting between the dies and adapted to drive the fastener edgewise into wood.

12. In a machine for making and driving 20 corrugated sheet metal fasteners, the combination of devices for feeding the stock, dies capable of acting on the stock to corrugate the same and thereby forming compound curves therein, means for severing the stock 25 into lengths, and means for automatically driving the fastener edgewise.

13. In a machine for making and driving 30 corrugated sheet metal fasteners, devices for feeding the stock, means for corrugating and thereby forming compound curves in

the stock while the same is at rest, means for severing the stock into lengths, and means for driving the fasteners edgewise.

14. In a machine for making and driving 35 corrugated sheet metal fasteners, means for corrugating and thereby forming compound curves in the stock while the same is at rest, means for severing the stock into lengths, and means for driving the fasteners. 40

15. In a machine for making and driving 40 corrugated sheet metal fasteners, a pair of dies for corrugating the stock and thereby forming compound curves therein, means for causing relative movement between said 45 dies in a direction toward and away from each other, to grip and release the stock, and means for driving the fasteners.

16. In a machine for making and driving 50 corrugated sheet metal fasteners, means for corrugating and thereby forming compound curves in a short length of stock, while the same is at rest, and means for driving the fastener thus made.

Signed by me at St. Joseph Michigan this 55 24th day of July 1907.

WILLIAM H. RAY.

Witnesses:

CHAS. W. STRATTON,
JOSEPH KOURTZ.